# APPENDIX A

# Photographic Log

Geosyntec consultants

# PHOTOGRAPH LOG

| | |
|---|---|
| PROJECT NAME: UNC-CH Cogeneration Facility | PROJECT NO.: GN5219 |
| CLIENT.: The University of North Carolina at Chapel Hill | |

Photograph 1: Site walk - December 2012

Photograph 2: Site walk - December 2012

Geosyntec consultants

# PHOTOGRAPH LOG

| | |
|---|---|
| PROJECT NAME: UNC-CH Cogeneration Facility | PROJECT NO.: GN5219 |
| CLIENT.: The University of North Carolina at Chapel Hill | |

Photograph 3: Utility locating - June 2013

Photograph 4: Utility locating - June 2013

Geosyntec consultants

# PHOTOGRAPH LOG

| | |
|---|---|
| PROJECT NAME: UNC-CH Cogeneration Facility | PROJECT NO.: GN5219 |
| CLIENT.: The University of North Carolina at Chapel Hill | |

Photograph 5: Subsurface Soil Assessment – October 2013

Photograph 6: Monitoring Well Installation - February 2014

Geosyntec consultants

# PHOTOGRAPH LOG

| | |
|---|---|
| PROJECT NAME: UNC-CH Cogeneration Facility | PROJECT NO.: GN5219 |
| CLIENT.: The University of North Carolina at Chapel Hill | |

Photograph 7: Soil Sampling, McCauley St. - April 2015

Photograph 8: Soil Sampling, McCauley St. - April 2015

# APPENDIX B

# Boring Logs

Geosyntec consultants

Geosyntec Consultants of NC, PC
2501 Blue Ridge Riad, Suite 430
Raleigh, NC 27607

# BORING LOG

**BOREHOLE ID:** *SB-1*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/23/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784555.8944*
**EASTING:** *1981732.2924*
**GROUND ELEVATION:** *447.8 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 445 | | Sandy CLAY (CL); dark brown; dry; soft<br>Sandy CLAY (CL); orange; moist; soft | | | |
| | -5 | | | | |
| 440 | | Sandy CLAY (CL); reddish orange; moist; soft | | TIER 1 Notes: Possible ash lens | |
| | -10 | | | | |
| 435 | | CLAY with coarse sand (CL); grayish brown; moist; soft | | TIER 1 Notes: Possible ash | |
| | -15 | | | | |
| 430 | | CLAY with coarse sand (CL); tan; saturated; soft<br>Clayey SAND with ash (SC); grayish black; saturated; soft | | TIER 1 Notes: Ash | SDS-01-19-20-131023 collected from 19-20 ft bgs (area of highest CCB impact) at 14:00 on 10/23/2013 |
| | -20 | | | | |
| 425 | | Clayey SAND (SC); tan; saturated; firm | | TIER 3 Notes: Stereoscope: Black grains appear subangular and larger than ash; Microscope: Trace coal ash grain sized grains observed; approx. <5%<br>TIER 3 Notes: Stereoscope: Gray grains appear to be round and finer; Microscope: Little to no coal ash (suspected native soil) | Soft at 22 ft bgs<br>Refusal at 24 ft bgs |
| | -25 | End of Boring at 25.0 feet bgs. | | End of Boring at 25.0 feet bgs. | |

All depths referenced to ground surface.



Total Depth: 25 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-2*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/23/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784584.4933*
**EASTING:** *1981794.2391*
**GROUND ELEVATION:** *446.5 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 445 | | Silty CLAY with organics (OL); dark brown; dry; soft<br>CLAY with fine sand (CL); blackish orange; dry; hard | | | |
| | -5 | CLAY with fine sand (CL); orange; dry; hard | | | |
| 440 | | | | | |
| | -10 | ASH | | TIER 1 Notes: Ash | SDS-02-10-11-131023 collected at 1420 {hold) |
| 435 | | Coarse grained SAND with silt (SW); (Saprolite) tan; dry; hard | | | |
| | | CLAY with coarse sand (CL); (Saprolite) yellowish orange; moist; hard | | TIER 3 Notes: Stereoscope: Some black grains noted but were angular-possibly biotite and weathered material; Microscope: Approximately two grains observed, little to no CCBs | SDS-03-13-14-131023 collected at 1425 (sent to lab) |
| | -15 | Coarse grained SAND with clay (SW); (Saprolite) yellowish orange; moist; firm | | | |
| 430 | | | | | |
| | -20 | End of Boring at 20.0 feet bgs. | | End of Boring at 20.0 feet bgs. | |

All depths referenced to ground surface.



Total Depth: 20 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-3*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/23/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784604.8684*
**EASTING:** *1981841.6309*
**GROUND ELEVATION:** *446.5 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 445 | | CLAY with medium sand (CL); brown; dry; firm<br>CLAY with medium sand (CL); orange; dry; firm | | | |
| | | ASH | | TIER 1 Notes: Ash | |
| | | CLAY (CL); reddish orange; dry; firm | | | SDS-04-04-05-131023 taken at 1510; "Clean" supposedly native soil |
| | -5 | | | | |
| | | Gravelly SAND (SW); whiteish tan; dry; firm | | TIER 3 Notes: Stereoscope: Black grains observed-trace to no CCBs observed; gray colored grains are fine sand sized; Microscope: No CCBs observed | |
| 440 | | | | TIER 3 Notes: No CCBs observed | |
| | -10 | | | | |
| | | End of Boring at 11.0 feet bgs. | | End of Boring at 11.0 feet bgs. | Refusal at 11 ft bgs |

All depths referenced to ground surface.



Total Depth: 11 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-4*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/23/2013 to 10/23/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784629.9455*
**EASTING:** *1981896.0251*
**GROUND ELEVATION:** *445 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 440 | -5 | CLAY with sand (CL); and gravel; brown; moist; firm<br>CLAY with sand (CL); orange; moist; firm | | TIER 1 Notes: suspect coal specs<br>TIER 2 Notes: CCBs observed; small shards of coal<br>TIER 1 Notes: suspect coal specs<br>TIER 2 Notes: Trace CCBs observed with 8x hand lens | SDS-05-05-07-131023 collected at 1630 (suspected clean soil 2 ft below last visible CCB impacts) may have trace CCBs (sent to lab) |
| 435 | -10 | Clayey SILT (CL-ML); reddish orange; moist; firm<br>GRAVEL (GP)<br>Sandy CLAY (SC); tannish orange; moist; firm<br>CLAY (CL); tannish orange; moist; firm | | TIER 3 Notes: Stereoscope: Trace CCB grains observed; Microscope: <5% CCB grains observed | |
| 430 | -15 | Clayey SAND (SC); tannish orange; moist; firm to soft | | | |
| 425 | -20 | End of Boring at 20.0 feet bgs. | | End of Boring at 20.0 feet bgs. | |

All depths referenced to ground surface.



Total Depth: 20 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-5*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/24/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784675.6693*
**EASTING:** *1981877.0024*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | CLAY with fine sand (CL); tan; dry; soft | | | |
| | | CLAY with medium sand (CL); tan; dry; soft | | TIER 3 Notes: Trace coal fragments/CCBs observed on stereoscope | |
| | | Clayey SAND (SC); orangeish tan; dry; firm | | TIER 3 Notes: Small coal fragments visible ~5%, no ash visible | |
| | -5 | | | | SDS-06-06-07-131024 collected at 1135 believed to be clean and below all CCB impacts<br>Native soil at approximately 7 ft bgs |
| | | Medium to coarse grained Clayey SAND (SC); whiteish tan; moist; hard | | TIER 3 Notes: Approximately 5 suspect grains observed; little to no impacts | |
| | -10 | | | | |
| | | Medium to coarse grained Clayey SAND (SC); whiteish tan; moist; firm | | | |
| | -15 | | | | |
| | | End of Boring at 18.0 feet bgs. | | End of Boring at 18.0 feet bgs. | Refusal at 18 ft bgs |

All depths referenced to ground surface.



Total Depth: 18 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-6*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/24/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784632.9685*
**EASTING:** *1981781.1169*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Sandy CLAY (OL); brown; moist; soft<br>Sandy CLAY (SC); orange; moist; soft | | TIER 3 Notes: CCB grains observed under stereoscope<br>TIER 1 Notes: Maybe coal | |
| | -5 | | | | SDV-3-07-08-131024 (verification sample-CCBs visible only under microscope) |
| | | CLAY with fine sand (CL); and gravel; grayish brown; moist; soft | | TIER 3 Notes: CCBs observed in significant proportion (>10%) | |
| | -10 | Sandy CLAY (CL); orange; moist; soft<br>CLAY with coarse sand (CL); orange; moist; soft to firm | | TIER 1 Notes: Maybe ash streak<br>TIER 1 Notes: some black streaks<br>TIER 3 Notes: Trace to no CCBs observed | SDS-07-10-11-131024 (clean sample below all visible CCB impacts) |
| | -15 | Coarse grained SAND with clay (SC); and gravel; orange; dry; firm | | | Refusal at 15.5 ft bgs |

End of Boring at 15.5 feet bgs.

End of Boring at 15.5 feet bgs.

All depths referenced to ground surface.



Total Depth: 15.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-7*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/24/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784534.6702*
**EASTING:** *1981683.2851*
**GROUND ELEVATION:** *449 ft (NAVD 88) (Approximate)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | GRAVEL | | | |
| 445 | -5 | Sandy CLAY (OL); brown; moist; soft<br>CLAY (CL); orange; moist; soft | | TIER 1 Notes: Possible Ash | |
| | | CLAY (CL); red; moist; firm | | | |
| 440 | -10 | CLAY with medium to coarse sand (CL); tannish orange; moist; firm to soft | | TIER 3 Notes: CCBs observed, approximately <10% under stereoscope. Also observed sand, muscovite, mica and garnet<br>TIER 3 Notes: Trace CCBs, several suspect grains observed under stereoscope | Saprolite |
| 435 | -15 | | | TIER 3 Notes: No CCBs observed | SDV-4-14-15-131024 (collected as a clean verification sample)<br>SDS-08-15-16-131024 (clean analytical saample below all observed CCB impacts) |
| 430 | -20 | | | | |

End of Boring at 20.0 feet bgs.

End of Boring at 20.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 20 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-8*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/24/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784572.4824*
**EASTING:** *1981658.1822*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | GRAVEL (GP) | | | |
| | | CLAY with sand (CL); (Fill) and gravel; brownish orange; moist | | | SDV-09-02-03-131024 taken at 1600 (>20% ash under stereoscope); |
| | | CLAY with sand (CL); (Fill) and gravel; dark brown; moist | | TIER 2 Notes: Mostly ash | SDV-1-02-03-131024 taken at 1640 |
| | | | | TIER 2 Notes: Mostly ash | SDV-2-04-05-131024 taken at 1650 |
| | -5 | | | | |
| | | CLAY with sand (CL); black; moist; soft | | TIER 2 Notes: Mostly ash | |
| | | CLAY with sand (CL); orange; moist; soft | | | |
| | | | | TIER 3 Notes: Trace CCBs observed under stereoscope. Mostly clay fill. | SDS-10-08-09-131024 taken at 1620 (below all observed at CCB impacts) |
| | -10 | | | | |
| | | CLAY (CL); orange; moist; soft | | | |
| | | | | TIER 2 Notes: No CCB impacts | |
| | | CLAY with coarse sand (CL); orange; moist to dry; firm | | | |
| | -15 | | | | |
| | | End of Boring at 18.5 feet bgs. | | End of Boring at 18.5 feet bgs. | Refusal at 18.5 ft bgs |

All depths referenced to ground surface.



Total Depth: 18.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-9*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/24/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784507.7385*
**EASTING:** *1981622.8598*
**GROUND ELEVATION:** *455.5 ft (NAVD 88) (Approximate)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 455 | | Clayey SAND (SC); brown; dry; medium dense | | TIER 2 Notes: Some small coal fragments <5% under 8x hand lens | |
| | | Sandy CLAY (CL); whiteish orange; dry; firm to hard | | TIER 3 Notes: No CCB impacts | |
| 450 | -5 | | | | |
| | | CLAY with coarse sand (CL); whiteish orange; moist; firm | | TIER 3 Notes: Trace coal fragments <5% | Native soil assumed to be at 8 ft bgs; SDS-11-08-09-131024 taken at 1700 |
| 445 | -10 | | | | |
| 440 | -15 | | | | |
| | | CLAY with fine sand (CL); orange and brown; moist; firm to soft | | | Saprolite |
| | | CLAY with coarse sand (CL); orange and tan; moist; firm | | | Saprolite |
| 435 | -20 | | | | |
| | -25 | End of Boring at 25.0 feet bgs. | | End of Boring at 25.0 feet bgs. | |

All depths referenced to ground surface.



Total Depth: 25 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-10*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/25/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784667.333*
**EASTING:** *1981977.4352*
**GROUND ELEVATION:** *447.4 ft (NAVD 88) (Surveyed)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 445 | | CLAY with sand tannish brown; dry; soft to firm | | | |
| | | CLAY with sand (CL); orange; dry; firm | | | |
| | | CLAY with fine sand (CL); tan; dry; firm to hard | | | SDS-13-03-04-131025 was taken at 1135 |
| | | CLAY with fine sand (CL); orange; dry; firm | | TIER 3 Notes: Trace coal fragments; small black trace grains, likely mineral content; No CCBs observed | |
| | -5 | | | TIER 3 Notes: Trace coal fragments; small black trace grains, likely mineral content; No CCBs observed | |
| 440 | | | | | |
| | -10 | | | | |
| 435 | | CLAY with medium sand (CL); orange; dry to moist; firm | | | Saprolite |
| | -15 | | | | |
| 430 | | Sandy CLAY with clay (SC); and gravel; gray; saturated; soft | | | Saprolite<br>Hard at 18 ft bgs |
| | -20 | | | | |

End of Boring at 20.0 feet bgs.

End of Boring at 20.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 20 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-11*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/25/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784709.3747*
**EASTING:** *1981960.9916*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | CLAY with sand (CL); and gravel; brownish orange; moist; firm | | TIER 3 Notes: No CCBs observed<br>TIER 1 Notes: Maybe suspect coal fragments | SDS-14-03-04-131025 taken at 1145 |
| | -5 | CLAY with sand (CL); and gravel; tan; moist; firm | | TIER 3 Notes: Trace-no CCBs. Observed small black particles that could be coal or minerals<br>TIER 3 Notes: Trace amount of small black particles but no ash. No smearing-black particles may be minerals<br>TIER 3 Notes: Trace amount of small black particles but no ash. No smearing-black particles may be minerals | |
| | -10 | | | | Refusal at 11 ft bgs |

End of Boring at 11.0 feet bgs.

End of Boring at 11.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 11 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-12*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/25/2013*
**GEOSYNTEC REPRESENTATIVE:** *Caitlin Collins*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784505.445*
**EASTING:** *1981819.584*
**GROUND ELEVATION:** *427.8 ft (NAVD 88) (Approximate)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| 425 | | TOPSOIL with organics grayish brown; dry; very loose<br>Clayey SILT (CL-ML); orange; moist; soft<br>Silty SAND (SM); yellowish brown; dry; loose<br>Silty SAND with organics (SM); gray; moist; loose<br>Fine grained SAND (SP); gray; moist to wet; loose<br>End of Boring at 3.5 feet bgs. | | TIER 3 Notes: No CCBs observed, small black grains appear to be mineral content<br>TIER 3 Notes: No CCBs observed, small black grains appear to be mineral content<br>TIER 3 Notes: No CCBs observed, small black grains appear to be mineral content<br>End of Boring at 3.5 feet bgs. | Saprolite<br>SDS-12-02-03-131025 MS and MSD taken at 1000 (clean, no CCBs impacts);<br>SDS-9-12-02-03-131025 (duplicate) |

All depths referenced to ground surface.



Total Depth: 3.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-13*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/25/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784685.2194*
**EASTING:** *1981928.2927*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Sandy CLAY (CL); brownish orange; moist; soft | | TIER 3 Notes: Small coal particles visible. Trace (5%) CCBs | |
| | -5 | | | | |
| | | Sandy CLAY (CL); tannish orange; moist; soft<br>ASH gray; moist; soft<br>CLAY with coarse sand (CL); tannish orange; dry; firm | | TIER 3 Notes: Ash visible 10-20%<br>TIER 3 Notes: No ash | SDS-15-07-08-131025 at 1440 (dirty; fragments of wood observed)<br>SDS-16-09-10-131025 at 1445 (clean) |
| | -10 | | | | |
| | -15 | End of Boring at 15.0 feet bgs. | | End of Boring at 15.0 feet bgs. | Refusal at 15 ft bgs |

All depths referenced to ground surface.



Total Depth: 15 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-14*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/25/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784664.1336*
**EASTING:** *1981676.6476*
**GROUND ELEVATION:** *460.8 ft (NAVD 88) (Surveyed)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 460 | | GRAVEL (GP) | | | |
| | | Coarse grained SAND some clay (SC); (Fill) gray; moist; dense | | | |
| | | Coarse grained SAND some clay (SC); (Fill) tannish orange; moist to dry; medium dense | | | |
| 455 | -5 | | | | |
| 450 | -10 | Coarse grained SAND some clay (SC); (Fill) grayish tan; moist to dry; medium dense | | | |
| 445 | -15 | | | | |
| | | ASH black; saturated; soft | | TIER 1 Notes: Ash from 17-27 ft bgs | SDS-18-19-23-131025 taken at 1620 |
| 440 | -20 | | | | |
| 435 | -25 | | | | |
| | | Coarse grained SAND some clay (SC); gray; saturated; soft | | TIER 3 Notes: Trace ash<br>TIER 3 Notes: Trace to no ash | SDS-17-27-28-131025 taken at 1600<br>Refusal at 28 ft bgs |

End of Boring at 28.0 feet bgs.

End of Boring at 28.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 28 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-15*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/28/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784644.3883*
**EASTING:** *1981627.5254*
**GROUND ELEVATION:** *460.2 ft (NAVD 88) (Approximate)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 460 | | GRAVEL (GP) | | | |
| | | CLAY with coarse sand (CL); (Fill) tannish orange; dry; soft to firm | | TIER 1 Notes: Suspect ash/CCBs | |
| 455 | -5 | | | | |
| | | CLAY with sand (CL); (Fill) orange; dry to moist; firm | | TIER 1 Notes: Specs of coal | |
| | | ASH black; saturated; soft | | | |
| 450 | -10 | | | TIER 1 Notes: Ash from 9-14.5 ft bgs | SDS-20-11-12-131028 taken at 1145 ("source zone" sample) |
| 445 | -15 | SAND with clay (SC); grayish tan; saturated; soft | | TIER 1 Notes: Suspect CCBs<br>TIER 3 Notes: Ash visible. 20-50% ash | |
| | | SAND with clay (SC); grayish tan; saturated; soft<br>SAND with clay (SC); orange; moist to dry; firm | | TIER 1 Notes: Suspect CCBs<br>TIER 3 Notes: No ash or coal fragments visible | Hard at 17 ft bgs<br>SDS-19-18-19-131028 taken at 1020 ("clean" bottom of boring) |
| 440 | -20 | | | TIER 3 Notes: No ash or coal fragments visible | |
| 435 | -25 | | | | |
| | | End of Boring at 28.5 feet bgs. | | End of Boring at 28.5 feet bgs. | Refusal at 28.5 ft bgs |

All depths referenced to ground surface.



Total Depth: 28.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-16*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/28/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784618.9028*
**EASTING:** *1981571.023*
**GROUND ELEVATION:** *462.2 ft (NAVD 88) (Approximate)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | GRAVEL | | | |
| | | CLAY with sand (CL); grayish brown; dry to moist; hard | | | |
| 460 | | | | TIER 3 Notes: 5-10% (mostly coal, <1% ash) coal fragments | |
| | | | | TIER 3 Notes: 5-10% (mostly coal, <1% ash) coal fragments | SDS-21-04-05-131028 at 1340 |
| | -5 | CLAY with sand (CL); orange; dry to moist; hard | | | |
| | | | | TIER 3 Notes: coal fragments but no ash visible | |
| 455 | | | | | |
| | | CLAY with medium sand (CL); tannish orange; dry to moist; firm to soft | | | |
| | -10 | | | TIER 3 Notes: <5% ash. Small flecks visible but may be minerals | SDS-22-11-12-131028 at 1345 |
| 450 | | | | | |
| | | | | TIER 3 Notes: Trace-no ash visible | |
| | -15 | Clayey SAND (SC); tannish orange; dry to moist; medium dense | | | |
| 445 | | | | | |
| | | | | TIER 3 Notes: Trace-no ash visible | |
| | -20 | | | | |
| | | Clayey SAND (SC); orange; dry; medium dense | | TIER 3 Notes: Trace-no ash visible | Refusal at 22 ft bgs |

End of Boring at 22.0 feet bgs.

End of Boring at 22.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 22 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-17*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/28/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784704.7757*
**EASTING:** *1981604.8256*
**GROUND ELEVATION:** *465.8 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 465 | | GRAVEL (GP) | | | |
| | | CLAY with sand (CL); and gravel; grayish orange; dry to moist; firm | | TIER 3 Notes: Ash and coal fragments visible. ~5% ash, 5% coal | SDS-23-04-05-131028 at 1515 (lots of coal fragments in sample) |
| 460 | -5 | | | | |
| | | CLAY with sand (CL); reddish orange; moist; soft | | TIER 3 Notes: Ash and coal fragments visible. <5% ash, <5% coal fragments | |
| 455 | -10 | | | TIER 3 Notes: Ash and coal fragments visible. Trace ash, <1% coal fragments | SDS-24-11-12-131028 at 1510 (Sample at the location of ash in SB-15, the nearest "dirty" boring) |
| 450 | -15 | Coarse grained SAND (SW); (Saprolite) tan; dry; medium dense | | TIER 3 Notes: No CCBs observed. Small black particles may be coal but appear to be rounded like minerals | |
| 445 | -20 | | | | |

End of Boring at 22.5 feet bgs.

End of Boring at 22.5 feet bgs.

All depths referenced to ground surface.



Total Depth: 22.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-18*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/28/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784741.2892*
**EASTING:** *1981769.3968*
**GROUND ELEVATION:** *461.5 ft (NAVD 88) (Approximate)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 460 | | CLAY with sand (CL); and gravel; brownish orange; moist; soft to firm | | TIER 3 Notes: Ash visible ~10% with coal fragments ~5% | SDS-25-04-05-131028 at 1620 (impacted with coal fragments, npt ash) |
| | -5 | | | | |
| 455 | | CLAY with coarse sand (CL); brownish orange; moist; firm | | TIER 3 Notes: <5% ash and coal | |
| | -10 | | | | SDS-26-11-12-131028 at 1615 (below all observed impacts, "clean" but had a strong petroleum smell as the sample was being mixed. Some green/blackish staining observed due to coal) |
| 450 | | | | TIER 3 Notes: Trace ash/coal | |
| | | Clayey SAND (SC); orange; moist; firm | | | |
| | -15 | Coarse grained SAND with gravel (SW); orange; dry to moist; medium dense | | TIER 3 Notes: No ash or coal | |
| 445 | | | | | Refusal at 18 ft bgs |

End of Boring at 18.0 feet bgs.

End of Boring at 18.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 18 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-19*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/29/2013*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784711.0369*
**EASTING:** *1981712.5311*
**GROUND ELEVATION:** *461 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 460 | | | | | |
| | | Medium to coarse grained SAND trace clay (SW); some gravel; orangeish brown to gray; moist; loose | | | |
| | -5 | | | | |
| 455 | | | | | |
| | | Medium to coarse grained SAND some gravel (SW); orangeish brown; moist; loose | | | |
| | | Medium to coarse grained SAND with clay (SC); orange and gray; moist; dense | | | |
| | -10 | | | | |
| 450 | | | | | |
| | | ASH: dark gray; moist; firm | | TIER 1 Notes: Ash from 12-13 ft bgs, grading into clay below | |
| | | ASH: CLAY gray; moist; firm | | | |
| | | CLAY with fine sand (CL); orangeish brown; moist; firm | | | |
| | -15 | | | | |
| 445 | | | | | SDS-27-16-17131029 taken at 0940; "Clean" sample below all observed CCB impacts |
| | | | | TIER 3 Notes: <1% coal fragments and <1% ash (trace) observed. | |
| | | | | TIER 3 Notes: <1% coal fragments or minerals. No ash. | |
| | -20 | | | | |
| | | CLAY (CL); orangeish brown and gray; moist; hard | | | |
| 440 | | | | | |
| | -25 | | | | |
| | | Clayey SAND (SC); orangeish brown; moist; dense | | TIER 3 Notes: Trace ash may be visible but <5% | |
| 435 | | | | TIER 3 Notes: No ash or coal visible. | |
| | | | | TIER 3 Notes: No ash or coal visible. | Refusal at 27.5 ft bgs |

End of Boring at 27.5 feet bgs.

End of Boring at 27.5 feet bgs.

All depths referenced to ground surface.



Total Depth: 27.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-20*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/29/2013*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784676.3912*
**EASTING:** *1981616.0502*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | Medium to coarse grained SAND with gravel (SW); orangeish brown to gray; moist; loose | | | |
| | | CLAY with medium to coarse sand (CL); orangeish brown; moist; firm | | | |
| | -5 | | | | |
| | -10 | | | TIER 3 Notes: ~20-30% ash and coal fragments. | |
| | | ASH dark gray; moist; loose | | TIER 1 Notes: Ash | |
| | | CLAY with fine sand (CL); (Native) orange; dry to moist; firm | | | |
| | | Fine to coarse grained Clayey SAND (SC); orange and tan; moist; dense | | TIER 3 Notes: <5% coal fragments. No ash. | SDS-28-14-15-131029 taken at 1120 |
| | -15 | | | | |
| | | Fine to coarse grained Clayey SAND (SC); light orange; dry to moist; dense | | TIER 3 Notes: No ash or coal. | |
| | -20 | | | | |
| | | | | TIER 3 Notes: Trace to No ash/coal. | |
| | -25 | | | | |
| | | | | TIER 3 Notes: Trace to No ash/coal. | |
| | -30 | CLAY with fine sand (CL); orangeish brown; moist; firm | | | |
| | | End of Boring at 33.0 feet bgs. | | End of Boring at 33.0 feet bgs. | Refusal at 33 ft bgs |

All depths referenced to ground surface.



Total Depth: 33 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-21*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/29/2013*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784628.3492*
**EASTING:** *1981600.5239*
**GROUND ELEVATION:** *461.6 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 460 | | | | | |
| | | CLAY (CL); red to orange; dry to moist; hard | | | |
| | -5 | | | | |
| 455 | | CLAY with fine sand (CL); orange; moist; firm | | | |
| | | ASH: CLAY black to gray; moist; firm | | TIER 1 Notes: Ash | |
| | | CLAY with fine to coarse sand (CL); orange; dry to moist; hard | | | |
| | -10 | CLAY with fine sand (CL); light orange; moist; hard | | | |
| 450 | | | | TIER 3 Notes: No coal/ash visible. Some black specks-most likely minerals. | SDS-29-12-13-131029 taken at 1155 |
| | -15 | | | | |
| 445 | | | | | |
| | -20 | | | | |
| 440 | | | | | |

End of Boring at 24.0 feet bgs.

End of Boring at 24.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 24 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-22*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/29/2013*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784521.3378*
**EASTING:** *1981653.8722*
**GROUND ELEVATION:** *452 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 450 | | Fine to coarse grained SAND with gravel (SW); gray and orange; dry to moist; dense<br>Fine to medium grained SAND with gravel (SW); tan to orange; dry to moist; dense | | TIER 3 Notes: Trace ash (<5%) | |
| | -5 | CLAY with sand (CL); gray to orange; dry to moist; firm | | TIER 3 Notes: 10% ash | |
| 445 | | CLAY with sand (CL); orange; dry to moist; firm | | TIER 3 Notes: No ash/coal visible | SDS-30-08-09-131029 taken at 1405 |
| | -10 | Clayey SAND (SC); tan to light orange; dry to moist; dense | | TIER 3 Notes: No ash/coal visible | |
| 440 | | | | | |
| | -15 | | | | |
| 435 | | | | | |
| | -20 | End of Boring at 20.0 feet bgs. | | TIER 3 Notes: No ash/coal visible<br>End of Boring at 20.0 feet bgs. | |

All depths referenced to ground surface.



Total Depth: 20 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-23*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/29/2013*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784728.239*
**EASTING:** *1981750.709*
**GROUND ELEVATION:** *460.8 ft (NAVD 88) (Approximate)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| 460 | | Sandy CLAY with gravel orange to gray; dry to moist; loose | | | |
| | | Clayey SAND with gravel (SC); light tannish orange; dry to moist; loose | | | |
| | -5 | CLAY with coarse sand (CL); with gravel; orange to gray; moist; loose | | TIER 3 Notes: Trace to no ash. | |
| 455 | | Clayey SAND (SC); gray; dry to moist; firm<br>Clayey SAND (SC); orange to gray; dry to moist; hard | | | |
| | -10 | | | TIER 3 Notes: May have trace coal fragments but no ash visible. | |
| 450 | | CLAY with fine to medium sand (CL); orange to red; dry to moist; hard | | | SDS-31-12-13-131029 taken at 1500 |
| | | | | TIER 3 Notes: No ash or coal visible. | |
| | -15 | | | | |
| 445 | | Clayey SAND (SC); tan to reddish orange; dry to moist; dense | | | |
| | -20 | | | | |
| 440 | | | | TIER 3 Notes: No ash or coal visible. | |

End of Boring at 23.0 feet bgs.

End of Boring at 23.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 23 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-24*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/30/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784548.291*
**EASTING:** *1981956.734*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | CLAY with sand (CL); and gravel; and organics; dark brown; moist to wet; soft<br>CLAY with sand (CL); and gravel; and organics; dark brown; moist to wet; soft<br>CLAY with sand (CL); and gravel; and organics; tan; moist to wet; soft<br>Sandy GRAVEL with clay (SC); tannish orange; wet to saturated; soft<br>End of Boring at 2.0 feet bgs. | | TIER 3 Notes: ~10% ash/coal<br>TIER 3 Notes: Trace CCBs or minerals visible.<br>End of Boring at 2.0 feet bgs. | SDS-32-00-01-131030 taken at 1225 in the 0.5-1 ft bgs interval; suspected slightly dirty. |

All depths referenced to ground surface.



Total Depth: 2 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-25*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/30/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784466.7285*
**EASTING:** *1981932.489*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | SAND with organics dark brown; dry; soft<br>Clayey SAND with organics brown; dry to moist; soft<br>Clayey SAND with gravel (SC); dark brown; moist; soft<br>SAND with gravel (SW); tannish gray; saturated; medium dense<br>End of Boring at 2.8 feet bgs. | | TIER 1 Notes: Suspect CCBs<br>TIER 3 Notes: ~90% Ash<br>TIER 3 Notes: Some ash (~10%) but mostly black minerals with rounded shape. Too big to be ash.<br>End of Boring at 2.8 feet bgs. | SDS-33-01-02-131030 taken at 1235 (suspected ash contamination) |

All depths referenced to ground surface.



Total Depth: 2.8 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-26*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/30/2013*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784461.684*
**EASTING:** *1981931.425*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | SAND with organics light brown; dry; loose | | | |
| | | Clayey SAND with organics (SC); grayish brown; moist; loose | | TIER 3 Notes: No CCBs visible. | SDS-34-02-03-131030 taken at 1230 (suspected "clean"). |
| | | Clayey SAND (SC); grayish brown; wet; medium dense | | TIER 3 Notes: No CCBs visible. | |
| | | Clayey SAND (SC); gray; saturated; loose | | TIER 3 Notes: May contain ~10% CCBs. | |

End of Boring at 3.8 feet bgs.

End of Boring at 3.8 feet bgs.

All depths referenced to ground surface.



Total Depth: 3.75 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-27*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/30/2013*
**GEOSYNTEC REPRESENTATIVE:** *Caitlin Collins*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784497.6764*
**EASTING:** *1981953.248*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Clayey SAND (SC); grayish tan; dry; loose | | | |
| | | CLAY with fine sand (CL); tan and orange; dry; loose | | TIER 3 Notes: Small black flecks; appear too large and dull to be coal-most likely organic material.<br>TIER 3 Notes: No coal/ash observed. | SDS-35-02-03-131030 taken at 1455 ("clean" sample). |
| | | CLAY with fine sand (CL); tan and orangeish white; dry; loose | | TIER 3 Notes: No coal/ash observed. | |
| | | End of Boring at 3.7 feet bgs. | | End of Boring at 3.7 feet bgs. | |

All depths referenced to ground surface.



Total Depth: 3.67 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-28*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/14/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784717.565*
**EASTING:** *1982024.8934*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | -5 | Medium to coarse grained SAND (SW); reddish brown; dry; loose<br>Fine grained SAND with gravel (SW); brown and white; dry; loose | | TIER 1 Notes: No CCBs observed (0-5') | Two sample jars collected at 1040. |

End of Boring at 5.0 feet bgs.

End of Boring at 5.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-29*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/14/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784748.2876*
**EASTING:** *1981993.8218*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | -5 | Medium to coarse grained Clayey SAND some organics (SC); brown; dry; firm<br>Fine grained SAND some gravel (SW); black; dry; loose<br>End of Boring at 5.0 feet bgs. | | TIER 1 Notes: No CCBs observed (0-5')<br>End of Boring at 5.0 feet bgs. | Two sample jars collected between 3-4 ft bgs at 1050.<br>Hit refusal at 5 ft bgs |

All depths referenced to ground surface.



Total Depth: 5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-30*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/14/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784783.8496*
**EASTING:** *1981775.2569*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | -5<br>-10 | Coarse grained SAND with gravel (SW); gray; dry; loose<br>Clayey SAND (SC); red; dry; medium dense<br>Coarse grained SAND with gravel (SW); brown; dry; loose<br>Clayey SAND (SC); brown and red; dry; medium dense<br>Fine grained SAND (SP); brown; dry; loose | | TIER 1 Notes: No CCbs observed (0-10') | Two sample jars collected between 4-5 ft bgs at 0925. |

End of Boring at 10.0 feet bgs.

End of Boring at 10.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 10 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-31*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/14/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784828.8923*
**EASTING:** *1981755.0503*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Coarse grained SAND with gravel (SW); gray; dry; loose | | | |
| | | Coarse grained Clayey SAND (SC); black; dry; medium dense | | | |
| | | Coarse grained SAND (SW); black; dry; loose | | | |
| | | Fine grained Clayey SAND with gravel (SC); black; moist; medium dense | | | |
| | -5 | Fine grained Clayey SAND (SC); brown and red; moist; medium dense | | TIER 1 Notes: No CCBs observed | Two sample jars collected between 7-8 ft bgs at 1200. |
| | | Fine grained SAND (SP); yellowish brown; moist; loose | | | |
| | -10 | End of Boring at 10.0 feet bgs. | | End of Boring at 10.0 feet bgs. | |

All depths referenced to ground surface.



Total Depth: 10 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-32*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *11/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784452.7949*
**EASTING:** *1981928.7898*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Silty CLAY light brown; dry<br>Clayey SAND with silt (SC-SM); gray; dry<br>Clayey SAND with silt (SC-SM); gray; saturated<br>End of Boring at 2.9 feet bgs. | | TIER 1 Notes: No CCBs observed<br>End of Boring at 2.9 feet bgs. | Sample SB-32 (2.7-2.9) at 1100 |

All depths referenced to ground surface.



Total Depth: 2.9 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-33*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *11/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784460.0353*
**EASTING:** *1981939.2258*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | SAND light brown; dry | | | |
| | | SAND (SP); gray; dry | | TIER 1 Notes: No CCbs observed | Sample SB-33 (1.5-2.5) at 1110 |
| | | Clayey SAND with silt (SC-SM); gray; saturated | | | |
| | | End of Boring at 3.5 feet bgs. | | End of Boring at 3.5 feet bgs. | |

All depths referenced to ground surface.



Total Depth: 3.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-34*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *11/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784478.6941*
**EASTING:** *1981936.8916*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Silty CLAY light brown; dry<br>CLAY with sand (CL); gray; moist<br>SAND with clay (SC); gray; moist | | TIER 1 Notes: No CCBs observed. | Sample SB-34 (1.5-2.5) at 1115 |

End of Boring at 3.3 feet bgs.

End of Boring at 3.3 feet bgs.

All depths referenced to ground surface.



Total Depth: 3.3 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-35*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *11/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784531.4464*
**EASTING:** *1981949.6536*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | SAND with silt (SC-SM); and clay; orangeish brown and gray; moist<br>SAND and gravel (SW); orange | | TIER 1 Notes: CCBs present | Sample SB-35 (0.5-1.0) at 1140 |

End of Boring at 1.7 feet bgs.

End of Boring at 1.7 feet bgs.

All depths referenced to ground surface.



Total Depth: 1.7 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-36*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *11/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784553.9082*
**EASTING:** *1981959.3151*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Silty CLAY with sand (CL-ML); light brown; moist<br>Clayey SAND with gravel (SC); gray and tan | | TIER 1 Notes: No CCBs observed | Sample SB-36 (0.7-2.0) at 1200 |

End of Boring at 2.0 feet bgs.

End of Boring at 2.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 2 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-37*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *11/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Matt Jenny*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Hand Auger*
**RIG TYPE:** *N/A*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Hand Auger*
**NORTHING:** *784755.5303*
**EASTING:** *1982008.0975*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | CLAY with silt (CL-ML); brown; moist<br>CLAY (CL); red and orange; moist | | TIER 1 Notes: No CCBs observed | Sample SB-37 (2.0-2.5) at 1245 |

End of Boring at 2.5 feet bgs.

End of Boring at 2.5 feet bgs.

All depths referenced to ground surface.



Total Depth: 2.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-38*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *4/22/2015*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *SAEDACCO*
**DRILLER NAME:** *Will*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Sonic*
**RIG TYPE:** *Sonic*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Sonic*
**NORTHING:** *784536.8227*
**EASTING:** *1981759.8327*
**GROUND ELEVATION:** *447.3 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|---|
| 445 | | LEAN CLAY some gravel (CL); (Fill) reddish brown; moist; firm | | 4.0 | | |
| | -5 | Medium to coarse grained SAND some gravel (SW); (Fill) blackish brown; moist; medium dense<br>LEAN CLAY (CL); (Fill) reddish brown; moist; firm<br>LEAN CLAY some medium sand (CL); (Fill) reddish brown; moist; firm | | 2.0 | TIER 3 Notes: No ash/coal particles<br>TIER 3 Notes: Some ash particles, small, easily broken, leave smear on paper | SB-38-5.5-6.0-150422@1715 (some ash content suspected; did not submit to lab) |
| 440 | | | | 0.0 | | |
| | -10 | LEAN CLAY and gravel (CL); (Fill) reddish brown and black; moist; loose<br>LEAN CLAY (CL); (Fill) reddish brown; moist; firm | | 4.0 | TIER 3 Notes: No ash/coal particles<br>TIER 3 Notes: No ash/coal particles | |
| 435 | -15 | | | 0.0 | TIER 3 Notes: Some ash particles, small, easily broken apart, leaves smear on paper | Driller indicates hitting boulders at 14 ft bgs |
| 430 | | Trace organics at 18.5 ft bgs: CLAY (CL); (Fill) reddish brown; moist; firm | | 3.0 | TIER 3 Notes: No ash/coal particles, black thin, flexible and sheet like particles. possible organics | SB-38-19.5-20.0-150422@1715 (no visible ash content; submitted to lab) |
| | -20 | Fine to medium grained SAND some organics (SP); (Native Soil) black and gray; moist; loose<br>Fine to medium grained SAND trace gravel (SP); (Native Soil) dark gray to light; moist; medium dense | | 5.0 | TIER 3 Notes: No ash/coal particles<br>TIER 3 Notes: No ash/coal particles | |
| 425 | -25 | | | 0.0 | TIER 3 Notes: No ash/coal particles | |
| 420 | | Fine to medium grained SAND with clay (SW); (Native Soil) dark gray; moist; firm | | 3.0 | TIER 3 Notes: No ash/coal particles | |
| | -30 | Fine to medium grained SAND with gravel (SW); (Native Soil) dark gray; moist; loose | | | TIER 3 Notes: No ash/coal particles | |

End of Boring at 30.0 feet bgs.

End of Boring at 30.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 30 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-39*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *4/23/2015*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *SAEDACCO*
**DRILLER NAME:** *Will*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Sonic*
**RIG TYPE:** *Sonic*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Sonic*
**NORTHING:** *784559.2763*
**EASTING:** *1981808.5012*
**GROUND ELEVATION:** *447.3 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|---|
| 445 | | Fine to coarse grained SAND and gravel (SW); (Fill) reddish brown; dry; loose | | | TIER 3 Notes: probable ash/coal (trace to some) | |
| | -5 | Fine to medium grained SAND (SW); (Fill) brownish black; moist; loose | | 1.8 | | |
| | | LEAN CLAY trace fine to medium sand (CL); (Fill) reddish brown; moist; firm to hard | | | TIER 3 Notes: probable ash/coal (trace) | |
| 440 | | Fine to coarse grained SAND (SW); (Fill) blackish brown; moist; loose | | | TIER 3 Notes: No suspect coal/ash | |
| | -10 | LEAN CLAY little fine sand (CL); (Fill) dark red; moist; firm | | | TIER 3 Notes: No suspect coal/ash<br>TIER 1 Notes: possible ash | |
| 435 | | | | 4.8 | TIER 3 Notes: No suspect coal/ash | |
| | -15 | | | | | |
| 430 | | Sandy CLAY trace gravel (SC); (Native Soil) yellowish brown; moist; firm | | | TIER 3 Notes: Probable ash/coal (trace)<br>TIER 3 Notes: No suspect coal/ash | SB-39-18-18.5-150423 (submitted to lab) |
| | -20 | | | 5.0 | | Driller indicates bottom appears to be densely compacted sand |
| | | Fine to coarse grained SAND some gravel (SW); (Native Soil) light gray; dry; loose to dense | | | TIER 3 Notes: No suspect coal/ash | Driller indicates hard to push at 22 ft bgs; Bedrock at 25 ft bgs |
| 425 | | GRAVEL (GP); (Native Soil) yellowish brown; dry; loose | | | TIER 3 Notes: No suspect coal/ash | |
| | -25 | | | 3.0 | | |

End of Boring at 27.0 feet bgs.

End of Boring at 27.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 27 ft bgs

Geosyntec consultants

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# BORING LOG

**BOREHOLE ID:** *SB-40*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *4/23/2015*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *SAEDACCO*
**DRILLER NAME:** *Will*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Sonic*
**RIG TYPE:** *Sonic*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Sonic*
**NORTHING:** *784578.4418*
**EASTING:** *1981851.8991*
**GROUND ELEVATION:** *447.3 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|---|
| 445 | | Clayey SAND (SC); (Fill) reddish brown; moist; soft to firm | | | | |
| | -5 | Fine to coarse grained SAND and gravel (SW); (Fill) brown and black; dry; loose | | 2.6 | | |
| | | Fine to medium grained SAND and clay (SW); (Fill) brownish red; moist; loose | | | TIER 3 Notes: No CCBs | |
| 440 | | Fine to coarse grained SAND and gravel (SW); (Fill) brown and black; moist; loose | | | TIER 3 Notes: trace dull gray grains. likely gravel not CCBs | |
| | | Clayey SAND (SC); (Fill) brown and red; moist; firm | | | TIER 3 Notes: CCBs, some found in bands throughout | SB40-9-9.5-150423 + DUPLICATE SB940-9-9.5-150423 (submitted to lab) |
| | | Fine to medium grained SAND (SW); (Fill) brownish black; dry; dense | | 5.0 | | |
| | -10 | Clayey SAND (SC); (Fill) brownish red; moist; firm | | | TIER 3 Notes: No CCBs | |
| 435 | | Clayey SAND (SC); (Fill) brownish red; moist; soft | | | TIER 3 Notes: Appears to be gravel not CCBs (no luster and not easily broken) | SB40-12-12.5-150423 (submitted to lab) |
| | | Fine to medium grained SAND (SW); (Native Soil) brown; dry; loose | | 5.0 | | |
| | -15 | Fine to coarse grained SAND trace clay (SW); (Native Soil) brown; dry; loose | | | TIER 3 Notes: No CCBs | |
| 430 | | Fine to medium grained SAND (SW); (Native Soil) brown; moist; loose | | | TIER 3 Notes: No CCBs | |
| | | | | 4.5 | TIER 3 Notes: No CCBs | |
| | -20 | Fine to coarse grained SAND (SW); (Native Soil) light gray; dry; loose | | | | |

End of Boring at 21.5 feet bgs.

End of Boring at 21.5 feet bgs.

All depths referenced to ground surface.



Total Depth: 21.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-41*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *4/23/2015*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *SAEDACCO*
**DRILLER NAME:** *Will*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Sonic*
**RIG TYPE:** *Sonic*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Sonic*
**NORTHING:** *784595.7389*
**EASTING:** *1981893.2408*
**GROUND ELEVATION:** *447.3 ft (NAVD 88) (Approximate)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|---|
| 445 | | Fine to coarse grained SAND with gravel (SW); (Fill) reddish brown; moist; loose | | | | |
| | -5 | Fine to coarse grained SAND with gravel (SW); (Fill) brownish black; moist; loose<br>Sandy CLAY trace fine sand (SC); (Fill) reddish brown; moist; firm | | 2.0 | | |
| 440 | | Fine to medium grained SAND with gravel (SW); (Fill) brown; moist; loose<br>LEAN CLAY trace fine sand (CL); (Fill) brownish red; moist; firm | | | TIER 3 Notes: Fine ash/coal particles (some)<br>TIER 3 Notes: No suspect CCBs, grains are hard and do not break, no luster | |
| | -10 | Banded quartz: fine to medium grained SAND trace clay (SW); (Fill) brown; moist; dense | | | | |
| 435 | | LEAN CLAY some sand (CL); (Fill) some clay; red and white; moist; firm<br>Fine grained SAND (SW); (Native Soil) brown; dry; loose | | 6.0 | TIER 3 Notes: very fine gray particles, leave smear on paper, lighter than other CCB grains, possible CCBs | SB41-11.5-12-150423 (submitted to lab) |
| | -15 | | | | | |
| 430 | | Sandy CLAY (SC); (Native Soil) dark brown; moist; soft | | | TIER 3 Notes: No CCBs<br>TIER 3 Notes: No CCBs | |
| | -20 | | | | | |
| 425 | | Fine to medium grained SAND (SW); (Native Soil) dark brown; dry; loose | | 9.3 | | |
| | -25 | | | | | |
| 420 | | Clayey SAND (SC); (Native Soil) dark brown; moist; soft<br>Fine to coarse grained SAND and gravel (SW); (Native Soil) light gray; dry; loose | | 3.0 | | |
| | -30 | | | | | |

End of Boring at 30.0 feet bgs.

End of Boring at 30.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 30 ft bgs

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# BORING LOG

**BOREHOLE ID:** *SB-42*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *4/23/2015*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *SAEDACCO*
**DRILLER NAME:** *Will*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Sonic*
**RIG TYPE:** *Sonic*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *Sonic*
**NORTHING:** *784624.3199*
**EASTING:** *1981953.6094*
**GROUND ELEVATION:** *447.3 ft (NAVD 88) (Approximate)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|---|
| 445 | | Sandy CLAY and gravel (SC); (Fill) reddish brown; moist; firm to soft | | | | |
| | -5 | Fine to coarse grained SAND and gravel (SW); (Fill) brownish black; moist; loose<br>Fine grained SAND (SW); (Fill) red; moist; medium dense | | 2.0 | TIER 3 Notes: No CCBs | |
| 440 | | Clayey SAND and clay (SC); (Native Soil) yellowish brown; moist; firm<br>Fine to coarse grained SAND and gravel (SW); (Native Soil) brownish black; moist; loose<br>Banded Quartz: Sandy CLAY (SC); (Native Soil) brownish red; moist; very stiff | | 3.0 | TIER 3 Notes: think grains are gravel, no CCBs<br>TIER 3 Notes: No CCBs | |
| | -10 | | | | | |
| 435 | | | | | | |
| | -15 | | | | | |
| 430 | | Banded Quartz: Sandy CLAY (SC); (Native Soil) reddish brown; moist; soft | | | | Driller indicates hard to push at 17 ft bgs |
| | | CLAY (CH); (Native Soil) dark gray; moist; soft to firm | | | TIER 3 Notes: No CCBs | |
| | -20 | Fine to coarse grained SAND trace gravel (SW); (Native Soil) dark brown; dry; loose to dense | | | TIER 3 Notes: No CCBs | |
| 425 | | | | | | |
| | -25 | | | | | |
| 420 | | Fine to coarse grained SAND trace gravel (SW); (Native Soil) dark brown; dry; loose | | 5.0 | TIER 3 Notes: No CCBs | |
| | -30 | | | | TIER 3 Notes: No CCBs | |

End of Boring at 32.0 feet bgs.

End of Boring at 32.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 32 ft bgs

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Geosyntec consultants

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Raleigh, NC 27607

# BORING LOG

**BOREHOLE ID:** *BKG-1*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Medium grained SAND with organics (SP); gray and black; dry; loose | | | |
| | | Fine grained SAND (SP); light brown; dry; loose | | | |
| | | Medium grained SAND with gravel (SW); white and reddish brown; dry; loose | | | |
| | -5 | Medium to coarse grained SAND with gravel (SW); reddish brown; dry; loose | | | |
| | | | | | BKG-1-9-10-101314 taken at 1340. |
| | -10 | | | | |

End of Boring at 10.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 10 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-2*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Clayey SAND (SC); black and red; dry; loose | | | |
| | | Fine grained SAND (SP); black and brown; dry; loose | | | |
| | | Coarse grained SAND with gravel (SW); red and white; dry; loose | | | |
| | -5 | | | | |
| | | Coarse grained SAND with gravel (SW); red and white; dry; loose | | | |
| | | Fine grained SAND (SP); red and light pink; dry; loose | | | |

End of Boring at 8.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 8 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-3*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Fine grained SAND with organics (SW); black and red; loose | | | |
| | | Coarse grained SAND with gravel (SW); brown; loose | | | |
| | -5 | | | | |
| | | Clayey SAND (SC); medium plasticity; red and white | | | BKG-3 taken at 1555 |
| | | Coarse grained SAND with gravel (SW); brown; loose | | | |
| | | End of Boring at 8.0 feet bgs. | | | |

All depths referenced to ground surface.



Total Depth: 8 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-4*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Fine grained Clayey SAND with organics brown and black; dry to moist; loose | | | |
| | | Fine grained SAND (SP); brown and black; dry; loose | | | |
| | | Fine grained SAND some coal (SP); black to light brown; dry; loose | | | |
| | -5 | | | | |
| | | Clayey SAND (SC); medium plasticity; reddish brown; dry to moist | | | |
| | | Fine grained SAND (SP); reddish brown; dry to moist; loose | | | BKG-4 taken at 1055 |
| | -10 | | | | |

End of Boring at 10.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 10 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-5*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Silty SAND with organics black and dark brown; dry to moist; loose | | | |
| | | SAND some coal (SW); brown and pink; dry; loose | | | |
| | | SAND (SP); brown; dry; loose | | | |
| | -5 | Clayey SAND (SC); low plasticity; reddish brown and gray; dry | | | |
| | | Clayey SAND (SC); low plasticity; reddish brown and pink; dry to moist | | | BKG-5 taken at 1105. |

End of Boring at 7.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 7 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-6*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Silty SAND with organics black and brown; dry; loose | | | |
| | | SAND (SP); red; dry; loose | | | |
| | | Silty SAND some gravel (SM); brown; dry; loose | | | |
| | -5 | SAND (SP); reddish brown; dry; loose | | | |
| | | Clayey SAND (SC); low plasticity; reddish brown and gray; moist | | | BKG-6 taken at 1130. |
| | | Coarse grained SAND (SW); brown; dry; loose | | | |
| | -10 | | | | |

End of Boring at 10.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 10 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-7*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Clayey SILT with gravel tan; moist; medium dense | | | |
| | | Clayey SILT (CL-ML); orangeish tan; moist; firm | | | |
| | -5 | Silty SAND trace clay (SM); (Saprolite) orange; moist; medium dense | | | |
| | -10 | | | | BKG-7 taken at 1200. |

End of Boring at 10.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 10 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-8*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Fine grained SAND with organics black; dry; loose | | | |
| | | Coarse grained SAND with gravel (SW); brown and reddish white; dry; medium dense | | | |
| | | Coarse grained SAND with gravel (SW); pink and reddish white; dry; loose | | | |
| | -5 | | | | |
| | | Coarse grained SAND with gravel (SW); pink and reddish white; dry; loose | | | |
| | | Silty SAND (SM); brown; dry; loose | | | BKG-8 taken at 1510. |
| | -10 | | | | |

End of Boring at 10.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 10 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-9*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | | Fine grained SAND with organics black | | | |
| | | Medium grained SAND with gravel (SW); dark reddish brown; dry; medium dense | | | |
| | -5 | | | | |
| | -10 | | | | |

End of Boring at 10.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 10 ft bgs

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# BORING LOG

**BOREHOLE ID:** *BKG-10*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *10/13/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rohit Warrier*
**DRILLING CONTRACTOR:** *N/A*
**DRILLER NAME:** *N/A*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *Direct Push*
**RIG TYPE:** *DPT*
**BOREHOLE DIA:** *N/A*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *Not recorded*
**EASTING:** *Not recorded*
**GROUND ELEVATION:** *Not Recorded*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Visual Tier Assessment | Comments |
|---|---|---|---|---|---|
| | | | | | |
| | -5<br>-10 | Fine grained Silty SAND with organics (OL); black; dry; loose<br>Fine grained SAND some clay (SC); reddish brown; dry; medium dense<br>Medium grained SAND with gravel (SW); red and white; dry; medium dense | | | |

End of Boring at 10.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 10 ft bgs

# APPENDIX C

# Well Construction Diagrams

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# BORING LOG

**BOREHOLE ID:** *MW-1*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *2/24/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *Parrat Wolff*
**DRILLER NAME:** *Arnold*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *HSA*
**RIG TYPE:** *Ingersoll Rand A-300*
**BOREHOLE DIA:** *8"*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784789.1573*
**EASTING:** *1981527.4957*
**GROUND ELEVATION:** *477.05 ft (NAVD 88) (Surveyed)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Well Construction | Comments |
|---|---|---|---|---|---|---|
| 475 | | Sandy CLAY with gravel (SC); low plasticity; reddish brown | | 4.0 | | |
| | | Sandy CLAY with gravel (SC); reddish brown<br>Sandy CLAY (SC); reddish brown | | | | |
| | | Clayey SILT with sand (SC-SM); medium plasticity; red | | | | |
| | -5 | Clayey SILT with sand (SC-SM); medium plasticity; red and brown | | 4.0 | | |
| 470 | | | | | | |
| | | Clayey SILT with coarse sand (SC-SM); red and brown | | | | |
| | -10 | Silty SAND (SM); red | | 4.0 | | |
| 465 | | Silty SAND (SM); 50 % sand; 50 % fines; red | | | Cement grout | |
| | -15 | | | 4.0 | 2-inch PVC casing | |
| | | Silty SAND (SM); reddish brown | | | | |
| 460 | | | | 2.0 | | |
| | -20 | | | | | |
| 455 | | | | 4.0 | | |
| | -25 | | | | | |
| 450 | | | | 4.0 | Bentonite chips | |
| | | Silty SAND (SM); reddish brown and light grayish white | | | | |

*(Continued Next Page)*

All depths referenced to ground surface.



Total Depth: 39.5 ft bgs

Geosyntec consultants

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# BORING LOG

**BOREHOLE ID:** *MW-1*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *2/24/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *Parrat Wolff*
**DRILLER NAME:** *Arnold*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *HSA*
**RIG TYPE:** *Ingersoll Rand A-300*
**BOREHOLE DIA:** *8"*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784789.1573*
**EASTING:** *1981527.4957*
**GROUND ELEVATION:** *477.05 ft (NAVD 88) (Surveyed)*

| Elev. (ft. NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Well Construction | Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| 445<br>440 | -35 | Silty SAND (SM); reddish brown and light grayish white *(continued)*<br>Silty SAND (SM); reddish brown and light grayish white; moist<br>Fine grained SAND some coarse sand (SW); trace silt; trace gravel; gray and orange | | 3.5<br>4.0<br>3.5 | Filter pack (sand)<br>2-inch PVC screen (0.010 inch) | |

End of Boring at 39.5 feet bgs.

All depths referenced to ground surface.



Total Depth: 39.5 ft bgs

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# BORING LOG

**BOREHOLE ID:** *MW-2*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *2/25/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *Parrat Wolff*
**DRILLER NAME:** *Arnold*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *HSA*
**RIG TYPE:** *Ingersoll Rand A-300*
**BOREHOLE DIA:** *8"*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784592.8914*
**EASTING:** *1981808.1606*
**GROUND ELEVATION:** *447.53 ft (NAVD 88) (Surveyed)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Well Construction | Comments |
|---|---|---|---|---|---|---|
| 445 | | Silty CLAY trace sand (CL-ML); orangeish red | | 4.0 | | |
| | -5 | One inch of black staining at 6.75 ft: Clayey SILT some coarse sand (CL-ML); trace gravel; light orangeish red | | 2.5 | | |
| 440 | | Clayey SAND and silt (SC-SM); light orangeish red | | | Cement grout | |
| | -10 | | | 2.5 | 2-inch PVC casing | |
| 435 | | Coarse grained SAND with clay (SC-SM); some silt; orange | | 4.0 | | |
| | -15 | | | | | |
| 430 | | Coarse grained SAND with clay (SC-SM); (Saprolite) some silt; and gravel; orange | | 4.0 | Bentonite chips | |
| | -20 | | | | | |
| 425 | | | | 4.0 | Filter pack (sand) | |
| | -25 | | | | 2-inch PVC screen (0.010 inch) | |
| 420 | | Coarse grained Clayey SAND with gravel (SC); (Saprolite) brown and orange | | | | |

End of Boring at 29.8 feet bgs.

All depths referenced to ground surface.



Total Depth: 29.8 ft bgs

engineers | scientists | innovators

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# BORING LOG

**BOREHOLE ID:** *MW-3*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *2/26/2014 to 2/28/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *Parrat Wolff*
**DRILLER NAME:** *Arnold*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *HSA*
**RIG TYPE:** *Ingersoll Rand A-300*
**BOREHOLE DIA:** *6"*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784567.3372*
**EASTING:** *1981745.7245*
**GROUND ELEVATION:** *447.15 ft (NAVD 88) (Surveyed)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Well Construction | Comments |
|---|---|---|---|---|---|---|
| 445 | | Coarse grained Silty SAND with gravel (SM); and clay; dark brown | | 3.0 | | |
| | | CCBs | | | | |
| | | CLAY with silt (CL); and sand; orange | | 2.0 | | |
| | -5 | CCBs | | | | |
| | | CLAY with silt (CL); orange | | 3.0 | | |
| 440 | | Clayey SILT with coarse sand (CL-ML); red and orangeish brown | | | | |
| | -10 | | | 2.0 | Cement grout; 6-inch PVC outer casing; 2-inch PVC casing | |
| 435 | | Clayey SILT with coarse sand (CL-ML); trace gravel; grayish red and orangeish brown | | 1.7 | | |
| | -15 | | | | | |
| | | CCBs in last 2 inches: Silty SAND with gravel (SM); orange | | | | |
| 430 | | | | 0.5 | | |
| | -20 | Coarse grained SAND some silt (SM); gray; wet | | | | |
| 425 | | Coarse grained SAND some silt (SC-SM); and clay; gray and orange | | 3.0 | Bentonite chips | |
| | -25 | Coarse grained SAND with gravel (SW); with clay; gray and orange; saturated | | 1.6 | | |
| 420 | | Coarse grained SAND with gravel (SW); with clay; gray and orange; dry | | 1.5 | Filter pack (sand); 2-inch PVC screen (0.010 inch) | Hit refusal with splitspoon at 27.5' |

End of Boring at 29.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 29 ft bgs

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# BORING LOG

**BOREHOLE ID:** *MW-4*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *2/27/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *Parrat Wolff*
**DRILLER NAME:** *Arnold*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *HSA*
**RIG TYPE:** *Geoprobe 7822DT*
**BOREHOLE DIA:** *8"*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784501.8497*
**EASTING:** *1981597.5918*
**GROUND ELEVATION:** *458.42 ft (NAVD 88) (Surveyed)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Well Construction | Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| | | | | 2.0 | | |
| | | Clayey SILT with medium sand reddish brown | | 4.0 | | |
| 455 | -5 | | | | | |
| | | Silty SAND (Saprolite) reddish orange | | 4.0 | | |
| 450 | -10 | | | | | |
| | | | | 2.0 | Cement grout | |
| 445 | | | | | 2-inch PVC casing | |
| | -15 | | | 3.3 | | |
| 440 | -20 | | | 3.0 | | |
| 435 | | | | 4.0 | | |
| | -25 | | | | Bentonite chips | |
| | | Silty CLAY some medium sand dark orangeish brown | | | | |
| 430 | | Medium grained SAND light orangeish tan<br>Silty SAND reddish orange | | 3.0 | | |

*(Continued Next Page)*

All depths referenced to ground surface.



Total Depth: 38 ft bgs

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# BORING LOG

**BOREHOLE ID:** *MW-4*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *2/27/2014*
**GEOSYNTEC REPRESENTATIVE:** *Rachel Donahue*
**DRILLING CONTRACTOR:** *Parrat Wolff*
**DRILLER NAME:** *Arnold*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *HSA*
**RIG TYPE:** *Geoprobe 7822DT*
**BOREHOLE DIA:** *8"*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784501.8497*
**EASTING:** *1981597.5918*
**GROUND ELEVATION:** *458.42 ft (NAVD 88) (Surveyed)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Well Construction | Comments |
|---|---|---|---|---|---|---|
| | | | | | | |
| 425 | -35 | Silty SAND reddish orange *(continued)* | | 4.0<br>4.0 | Filter pack (sand)<br>2-inch PVC screen (0.010 inch) | |

End of Boring at 38.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 38 ft bgs

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# BORING LOG

**BOREHOLE ID:** *MW-5*

## GENERAL INFORMATION

**PROJECT NAME:** UNC Chapel Hill Cogeneration Faciilty
**PROJECT NO:** *GN5219*
**SITE LOCATION:** *Chapel Hill, North Carolina*
**BORING DATE:** *8/22/2014*
**GEOSYNTEC REPRESENTATIVE:** *Michael Schott*
**DRILLING CONTRACTOR:** *Parrat Wolff*
**DRILLER NAME:** *Josh*

## TECHNICAL INFORMATION

**DRILLING METHOD:** *HSA*
**RIG TYPE:** *Geoprobe*
**BOREHOLE DIA:** *8"*
**SAMPLING METHOD:** *DPT*
**NORTHING:** *784484.3378*
**EASTING:** *1981852.2958*
**GROUND ELEVATION:** *426.07 ft (NAVD 88) (Surveyed)*

| Elev. (ft, NAVD88) | Depth (ft) | Lithologic Description | Pattern | Recovery (ft) | Well Construction | Comments |
|---|---|---|---|---|---|---|
| 425 | 0 | TOPSOIL (OL); dark brown<br>SAND with silt (SM); and clay; tan; dry; hard | | N.R. | Steel Stick-up<br>Cement grout<br>Bentonite chips<br>2-inch PVC casing | |
| 420 | -5 | CLAY with sand (CL); (Saprolite) medium plasticity; orangeish tan; moist | | N.R. | | |
| 415 | -10 | SAND (SP); orange; dry; firm | | N.R. | Filter pack (sand)<br>2-inch PVC screen (0.010 inch) | |
| 410 | -15 | (Not recorded) | | N.R. | | |
| | -20 | | | | | |

End of Boring at 20.0 feet bgs.

All depths referenced to ground surface.



Total Depth: 20 ft bgs

# APPENDIX D

# Monitoring Well Development Logs

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# WELL DEVELOPMENT LOG

Project Name: UNC Cogen
Date: 2/25/14
Project Number: GN5914
Task: 04
Phase: 01
Location: Chapel Hill
Personnel: B. Hodson

Well ID: MW-1
Screen Interval (ft bgs): 29.5-39.5
Initial DTB (ft): 39
Final DTB (ft): ~~35.09~~ Red 2/28 - before bung cut to grade
Well Washing Performed: (Y) / N
Pump/Tubing Setting (ft bgs): 38
Casing Diameter (in): 2"
Tubing Inner Diameter (in): 3/8"

Development Method: X Pump; ___ Surge; ___ Bailer; ___ Other:
Pump Type: Whale
Depth Measurement Point: X TOC (Inner); ___ TOC (outer); ___ Ground Surface; ___ Other:

| Time | Vol Water Removed (gal) | DTW (ft below measurement pt) | Temp. (°C) | Specific Conductance (µS/cm) | pH | ORP (mV) | Turbidity (NTU) | Comments |
|---|---|---|---|---|---|---|---|---|
| 1000 | | 32.17 | | | | | >1000 | |
| 1100 | 30 | Pump hit dry - allow recharge | | | | | | |
| 1135 | 30 | | 20.77 | .365 | 6.27 | 141 | >1000 | |
| 1200 | 45 | 37.2 | 21.28 | .388 | 6.35 | 106 | 86.8 | allow rest |
| 1225 | 45 | 33.8 | 20.85 | .443 | 6.52 | 117 | >1000 | restart pump |
| 1240 | 55 | | 21.16 | .381 | 6.26 | 118 | 294 | |
| 1247 | 60 | | 21.22 | .383 | 6.21 | 110 | 42.8 | allow rest |
| 1425 | 75 | | 20.67 | .418 | 6.18 | 124 | 140 | allow rest @1445 |
| 1510 | 85 | | 20.36 | .379 | 6.01 | 122 | 142 | |
| 1525 | 95 | | 20.40 | .406 | 6.08 | 124 | 55 | |
| 1615 | 100 | 34.85 | 21.16 | .388 | 6.04 | 114 | >1000 | |
| 1630 | 110 | 34.81 | 21.15 | 0.425 | 6.70 | 106.9 | 83.9 | |
| 1645 | 120 | 35.17 | 21.04 | 0.405 | 6.51 | 107.2 | 6.01 | |

**USEPA Stabilization Guidance**

*Turbidity <50 NTU*

*General guidance: If turbidity doesn't improve more than 10% in 3 consecutive readings following thorough attempt at developing, can be considered developed.*

**NOTES**

Development complete (check one):
X Turbidity < 50 NTU
___ Turbidity readings not improving after 3 readings
___ Other:

N

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( 39.5 feet - 32.17 feet) X 0.16 gallons/foot = 1.1728 gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( 0.006 gal/ft X 39.5 feet) + 0.25 gallons = 0.457 gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# WELL DEVELOPMENT LOG

Project Name: UNC Cogen Facility
Date: 2/26/14
Project Number: BN5219
Task: 04
Phase: 01
Location: Chapel Hill, NC
Personnel: Rachel Donahue

Well ID: MW-2
Screen Interval (ft bgs): 19.5-29.5
Initial DTB (ft): ~~18.85~~ Red 2/28 N/M
Final DTB (ft): ~~19.89~~ 28.51
Well Washing Performed: (Y) / N
Pump/Tubing Setting (ft bgs): 28
Casing Diameter (in): 2
Tubing Inner Diameter (in): 3/8
from casing cut to grade
before being cut to grade
Development Method: X Pump / ___ Surge / ___ Bailer / ___ Other:
Pump Type: Whale
Depth Measurement Point: X TOC (Inner) / ___ TOC (outer) / ___ Ground Surface / ___ Other:

| Time | Vol Water Removed (gal) | DTW (ft below measurement pt) | Temp. (°C) | Specific Conductance (µS/cm) | pH | ORP (mV) | Turbidity (NTU) | Comments |
|---|---|---|---|---|---|---|---|---|
| 915 | 7 | — | — | — | — | — | — | — |
| 920 | ~~2.5~~ Red 2/27 | — | — | — | — | — | 187 | — |
| 940 | 20 | 23.82 | 20.12 | 0.539 | 6.38 | 121.4 | 38.8 | clear |
| 955 | 30 | 26.40 | 19.93 | 0.586 | 6.46 | 105.4 | 51.0 | clear |
| 1010 | 40 | dry | 19.73 | 0.589 | 6.39 | 85.5 | 260.2 | cloudy |
| 1050 | 40 | 22.70 | 18.50 | 0.559 | 6.35 | 98.4 | 212 | cloudy |
| 1115 | 55 | 24.62 | 18.64 | 0.542 | 6.41 | 74.3 | 77.9 | clear |
| 1120 | 58 | 24.68 | 18.87 | 0.539 | 6.40 | 72.7 | 20.8 | clear |
| 1230 | 70 | 19.72 | 14.11 | 0.546 | 5.95 | 127.9 | 11.6 | clear |
| 1240 | 77 | ~~14.70~~ 19.90 | 14.77 | 0.559 | 6.42 | 79.3 | 7.84 | clear |
| 1250 | 84 | 19.96 | 15.36 | 0.568 | 6.42 | 64.9 | 4.31 | clear |
| 1305 | 94 | 19.89 | 15.11 | 0.573 | 6.36 | 49.5 | 2.71 | clear |
| 1320 | 104 | 19.89 | 14.90 | 0.573 | 6.33 | 41.2 | 2.26 | clear |
| 1335 | 114 | 19.89 | 14.55 | 0.569 | 6.34 | 33.0 | 2.98 | clear |

recharging

only observed pump

**USEPA Stabilization Guidance**

*Turbidity <50 NTU*

*General guidance: If turbidity doesn't improve more than 10% in 3 consecutive readings following thorough attempt at developing, can be considered developed.*

**NOTES**

Development complete (check one):
✓ Turbidity < 50 NTU
___ Turbidity readings not improving after 3 readings
___ Other:

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( 29.5 feet - 18.85 feet) X 0.14 gallons/foot = 1.704 gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( 0.006 gal/ft X 34.5 feet) + 0.25 gallons = 0.457 gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# WELL DEVELOPMENT LOG

Project Name: UNC Cogen Facility
Date: 3 / 3 / 14
Project Number: GN5219
Task: 04
Phase: 01
Location: Chapel Hill, NC
Personnel: R. Donahue

Well ID: MW-3
Screen Interval (ft bgs): 24-29
Initial DTB (ft): NM
Final DTB (ft):
Well Washing Performed: (Y) / N
Pump/Tubing Setting (ft bgs): 27.5
Casing Diameter (in): 2" (outer = )
Tubing Inner Diameter (in): 3/8"

Development Method: X Pump ___ Surge ___ Bailer ___ Other:
Pump Type: Whale

Depth Measurement Point: X TOC (Inner) — already cut to grade; ___ TOC (outer); ___ Ground Surface; ___ Other:

pumped dry @ 1000

| Time | Vol Water Removed (gal) | DTW (ft below measurement pt) | Temp. (°C) | Specific Conductance (µS/cm) | pH | ORP (mV) | Turbidity (NTU) | Comments |
|---|---|---|---|---|---|---|---|---|
| 845 | 0 | 15.10 | — | — | — | — | — | brown |
| 900 | ran dry | | | | | | | brown |
| 920 | ran dry | | | | | | | tan |
| 930 | ~~20~~ 20 | 20.10 | 17.70 | 0.922 | 5.10 | 163.3 | >1000 | tan |
| 945 | 30 | below pump | 17.12 | 0.966 | 5.54 | 136.0 | 585 | cloudy |
| 1010 | 40 | 19.55 | 17.87 | 0.940 | 4.97 | 169.3 | — | cloudy |
| 1030 | 50 | 16.90 | 18.09 | 0.960 | 5.61 | 140.9 | 844 | cloudy |
| 1040 | 57 | below pump | 17.60 | 0.982 | 5.61 | 139.3 | 374 | cloudy |
| 1050 | 63 | " " | 17.60 | 0.985 | 5.57 | 139.4 | 19.2 | clear |
| 1115 | 73 | 17.10 | 18.10 | 0.964 | 5.61 | 140.4 | 228 | clear |
| 1145 | 83 | 16.74 | 18.10 | 0.942 | 5.63 | 138.6 | 143 | clear |
| 1150 | 86 | ~~19.8~~ | 17.86 | 1.002 | 5.59 | 137.5 | 285 | clear |

**USEPA Stabilization Guidance**

*Turbidity <50 NTU*

*General guidance: If turbidity doesn't improve more than 10% in 3 consecutive readings following thorough attempt at developing, can be considered developed.*

**NOTES**

Development complete (check one):
X Turbidity < 50 NTU
___ Turbidity readings not improving after 3 readings
___ Other:

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( 29 feet - 15.1 feet) X 0.16 gallons/foot = 2.224 gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( 0.006 gal/ft X 34 feet) + 0.25 gallons = 0.454 gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# WELL DEVELOPMENT LOG

Project Name: UNC Cogen Facility
Date: 2/28/14
Project Number: GN5219
Task: 04
Phase: 01
Location: Chapel Hill, NC
Personnel: R. Donahue

Well ID: MW-4
Screen Interval (ft bgs): 28-38
Initial DTB (ft): 37.80'
Final DTB (ft): 37.81'
Well Washing Performed: (Y) / N
Pump/Tubing Setting (ft bgs): 36.5'
Casing Diameter (in): 2"
Tubing Inner Diameter (in): 3/8"

Development Method: X Pump ___ Surge ___ Bailer ___ Other:
Pump Type: whale

Depth Measurement Point: X TOC (Inner) ___ TOC (outer) ___ Ground Surface ___ Other:
~~before~~ after being cut to grade

| Time | Vol Water Removed (gal) | DTW (ft below measurement pt) | Temp. (°C) | Specific Conductance (µS/cm) | pH | ORP (mV) | Turbidity (NTU) | Comments |
|---|---|---|---|---|---|---|---|---|
| 1005 | — | 28.6 | — | — | — | — | — | — |
| 1015 | 6.5 | 36.21 | → pumped dry | before parameters could stabilize | | | | brown |
| 1045 | 7 | 30.32 | 18.01 | 0.278 | 5.57 | 161.2 | >1000 | brown |
| 1145 | 37 | 32.15 | 18.51 | 0.242 | 5.43 | 158.6 | >1000 | tan |
| 1215 | 52 | 35.02 | 18.55 | 0.238 | 5.53 | 158.4 | 58.5 | clear |
| 1230 | 62 | 29.43 | 18.59 | 0.238 | 5.48 | 161.3 | 15.8 | clear |
| 1300 | 82 | 32.32 | 18.61 | 0.241 | 5.56 | 169.3 | 8.82 | clear |
| 1315 | 92 | 32.30 | 18.44 | 0.240 | 5.48 | 168.3 | 9.81 | clear |
| 1415 | 102 | pump shorted | 18.37 | 0.246 | 5.31 | 185.1 | 359 | cloudy |
| 1435 | 102 | 29.25 | 18.30 | 0.232 | 5.39 | 177.2 | 268 | cloudy |
| 1445 | 110 | 31.02 | 18.36 | 0.273 | 5.49 | 180.6 | 25.0 | slightly |
| 1450 | 114 | 33.33 | 18.41 | 0.237 | 5.48 | 174.6 | 34.3 | ↓ cloudy |
| 1455 | 117 | 33.62 | 18.40 | 0.242 | 5.46 | 175.2 | 16 | clear |
| 1500 | 120 | 34.07 | 18.42 | 0.244 | 5.44 | 175.9 | 8.22 | clear |
| 1505 | 123 | 34.38 | 18.41 | 0.244 | 5.43 | 176.5 | 3.88 | clear |

**USEPA Stabilization Guidance**

*Turbidity <50 NTU*

*General guidance: If turbidity doesn't improve more than 10% in 3 consecutive readings following thorough attempt at developing, can be considered developed.*

Development complete (check one):
X Turbidity < 50 NTU
___ Turbidity readings not improving after 3 readings
___ Other:

**NOTES** from 1200 – 1330, pump was attached to ~~out~~ battery + was periodically shutting off so ~~flow~~ water vol. are approximate. When attached to generator. ~ 0.1 gal/min

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( 38 feet - 28.60 feet) X 0.16 gallons/foot = 1.504 gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( 0.006 gal/ft X 43 feet) + 0.25 gallons = 0.508 gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# WELL DEVELOPMENT LOG

Project Name: UNC Co-generation Facility
Date: 8 / 27 / 14
Project Number: GN5219
Task:
Phase:
Location: Chapel Hill, NC
Personnel: Schott / Jenny

Well ID: MW-5
Screen Interval (ft bgs): 5-20
Initial ~~DTB~~ DTW (ft): 7.97
Final ~~DTB (ft)~~:
Well Washing Performed: Y / N
Pump/Tubing Setting (ft bgs): —
Casing Diameter (in): 2"
Tubing Inner Diameter (in): 1/2"
Initial DTB (ft) 23.15
Final DTB (ft) 23.16

Development Method: X Pump; X Surge; ___ Bailer; ___ Other:
Pump Type: Whale
Depth Measurement Point: X TOC (Inner); ___ TOC (outer); ___ Ground Surface; ___ Other:

| Time | Vol Water Removed (gal) | DTW (ft below measurement pt) | Temp. (°C) | Specific Conductance (µS/cm) | pH | ORP (mV) | Turbidity (NTU) | Comments |
|---|---|---|---|---|---|---|---|---|
| 10:15 ⇒ Surge block 3 times up and down; felt sediment @ bottom | | | | | | | | |
| 10:25 ⇒ Remove turbid water with bailer | | | | | | | | |
| 10:47 ⇒ Start pump | | | | | | | | |
| 10:53 ⇒ Stop pump | | | | | | | | |
| 10:55 ⇒ Surge block 3 times up and down | | | | | | | | |
| 11:13 ⇒ start pump | | | | | | | | |
| 11:21 ⇒ Stop pump | | | | | | | | |
| 11:23 ⇒ Surge block 3 times up and down | | | | | | | | |
| 11:58 ⇒ Start pump | | | | | | | | |
| 12:04 ⇒ | | | 16.3 | 512.2 | 6.11 | 186.0 | 137 | |
| 12:10 ⇒ | | | 16.3 | 499.7 | 5.77 | 179.6 | 666 | |
| 12:14 ⇒ ~~stop pump~~ | | | 16.1 | 493 | 5.77 | 179.4 | 304 | |
| 12:42 ⇒ start pump | | | | | | | | |
| 12:45 | | | 16.7 | 494.9 | 5.84 | 163.0 | 85.7 | |
| 12:47 | | | 16.4 | 493.2 | 5.86 | 165.2 | 126 | |
| | | | 16.3 | 491.1 | 5.85 | 169.6 | 131 | |

**USEPA Stabilization Guidance**

*Turbidity <50 NTU*

*General guidance: If turbidity doesn't improve more than 10% in 3 consecutive readings following thorough attempt at developing, can be considered developed.*

**NOTES**

Development complete (check one):
___ Turbidity < 50 NTU
___ Turbidity readings not improving after 3 readings
X Other: Turbidity didn't seem to improve over time

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

# APPENDIX E

# Groundwater Sampling Logs

Geosyntec consultants

4601 Six Forks Rd
Suite 340
Raleigh, NC 27609

# WATER LEVEL LOG

Project Name: UNC Cogen Facility
Date: 3/10/14
Project Number: GN5219
Phase/Task: 01/04
Weather:
Location: Chapel Hill NC
Personnel: R. Donahue + C. Collins

| WELL ID | DEPTH TO WATER | TIME | COMMENTS |
|---|---|---|---|
| MW-1 | 31.38 | 9:23 | |
| MW-2 | 15.15 | 9:05 | |
| MW-3 | 15.44 | 8:50 | |
| MW-4 | 27.02 | 9:02 | |

# Geosyntec Consultants
## Water Quality Instrument Calibration Form

Project/Site: UNC Cogen Facility  Project #: GN5219  Field Personnel: R. Donahue

Water Quality Meter - Model/Serial #: YSI 556 MPS / 14D7764 AL  Turbidimeter - Model/Serial # Hach 2100Q / 13070026918

| Dissolved Oxygen | DEP SOP FT 1500 | Date | Time | Temp (°C) | Saturation (mg/L)[1] | Reading (mg/L) | Reading (%) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.3mg/L | | |
| CAL ICV CCV | | 3/10/14 | 945 | 10.10 | | 10.44 | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| Specific Conductance | DEP SOP FT 1200 | Date | Time | Standard (mS/cm) | Standard Lot # | Standard Exp. Date | Reading (mS/cm) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 3/10/14 | 1030 | 1.413 | 3AE884 | 05/14 | 2.0413 | P F |
| CAL ICV CCV | | 3/10/14 | 1630 | 1.413 | 3AE884 | 05/14 | 1.473 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| pH | DEP SOP FT 1100 | Date | Time | Standard (SU) | Standard Lot # | Standard Exp. Date | Reading (SU) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.2 SU | | |
| CAL ICV CCV | | 3/10/14 | 958 | 4.0 | 3AF099 | 06/15 | 4.72→4.00 | P F |
| CAL ICV CCV | | ↓ | ↓ | 10.0 | 3AG807 | 07/15 | 8.83→10.02 | P F |
| CAL ICV CCV | | | | 7.0 | 3AG066 | 03/15 | 7.00 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| ORP | SOP N/A | Date | Time | Std. mV @ Temp °C | Standard Lot # | Standard Exp. Date | Reading (mV) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Geosyntec Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 3/10/14 | 1011 | 240 @ 25 | 5245 | 11/2017 | 253.4→240 | P F |
| CAL ICV CCV | | | | | | | 219.3 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

Specific Conductance Probe Cleaned? Yes No  Disolved Oxygen membrane Changed? Yes No

| 0.1 - 10 NTU Std 0.1 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 10% | |
| CAL ICV CCV | 3/10/14 | 5.75 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 11 - 40 NTU Std ___ NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 8% | |
| CAL ICV CCV | | 12.8 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 41 - 100 NTU Std 54 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 6.5% | |
| CAL ICV CCV | 3/10/14 | 52 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| >100 NTU Std 54 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 5% | |
| CAL ICV CCV | 3/10/14 | 525 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification
Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments:

Geosyntec consultants

**Geosyntec Consultants**
**Water Quality Instrument Calibration Form**

Project/Site: UNC Cogen Facility Project #: GNS219 Field Personnel: C. Collins

Geotech # 3807

Water Quality Meter - Model/Serial #: YSI 556 MPS SN: 07K100063 Turbidimeter - Model/Serial # Hach 2100Q

| Dissolved Oxygen | DEP SOP FT 1500 | Date | Time | Temp (°C) | Saturation (mg/L)[1] | Reading (mg/L) | Reading (%) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | Press. | | | 747.5 mmHg | | Acceptance Criteria: +/-0.3mg/L | | |
| CAL ICV CCV | | 3/10/14 | 0930 | 12.47 | | 10.38 | 97.9 | P F |
| CAL ICV CCV | 743.2 mmHg | 3/11/14 | 0830 | 9.84 | | 11.09 | 97.8 | P F |
| CAL ICV CCV | | 3/11/14 | 1050 | 14.43 | | 8.82 | 95.8 | P F |
| CAL ICV CCV | | | | | | | | P F |

| Specific Conductance | DEP SOP FT 1200 | Date | Time | Standard (mS/cm) | Standard Lot # | Standard Exp. Date | Reading (mS/cm) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 3/10/14 | 0938 | 1.413 | 3AF194 | JUN/14 | CC | P F |
| CAL ICV CCV | | 3/10/14 | 1009 | 1.413 | 3AE884 | MAY/14 | 1.413 | P F |
| CAL ICV CCV | | 3/11/14 | 0835 | 1.413 | 3AF194 | JUN/14 | 1.414 | P F |
| CAL ICV CCV | | 3/11/14 | 1052 | 1.413 | 3AF194 | JUN/14 | 1.319 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| pH | DEP SOP FT 1100 | Date | Time | Standard (SU) | Standard Lot # | Standard Exp. Date | Reading (SU) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.2 SU | | |
| CAL ICV CCV | | 3/10/14 | 0945 | 4.00 | 3AF099 | JUN/15 | 4.00 | P F |
| CAL ICV CCV | | 3/10/14 | 0943 | 10.00 | 3AF372 | JUN/15 | 10.00 | P F |
| CAL ICV CCV | | 3/10/14 | 0945 | 7.00 | 3AG659 | JUL/15 | 6.83 | P F |
| CAL ICV CCV | | 3/11/14 | 0840 | 4.00 | 3AF099 | JUN/15 | 4.00 | P F |
| CAL ICV CCV | | 3/11/14 | 0840 | 10.00 | 3AF372 | JUN/15 | 10.00 | P F |
| CAL ICV CCV | | 3/11/14 | 0840 | 7.00 | 3AG659 | JUL/15 | 6.94 | P F |

| ORP | SOP N/A | Date | Time | Std. mV @ Temp °C | Standard Lot # | Standard Exp. Date | Reading (mV) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Geosyntec Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 3/10/14 | 0955 | 240@25°C | 5245 | 11/2017 | 240.0 | P F |
| CAL ICV CCV | | 3/11/14 | 0855 | 240@25°C | 5245 | 11/2017 | 240.0 | P F |
| CAL ICV CCV | | 3/11/14 | | 240@25°C | 5245 | 11/2017 | 223.7 | P F |
| CAL ICV CCV | | | | | | | | P F |

Specific Conductance Probe Cleaned? Yes No Disolved Oxygen membrane Changed? Yes No

| 0.1 - 10 NTU Std 4.95 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 10% | |
| CAL ICV CCV | 3/10/14 | 4.81 | P F |
| CAL ICV CCV | 3/11/14 | 4.80 | P F |
| CAL ICV CCV | 3/11/14 | 4.83 | P F |
| CAL ICV CCV | | | P F |

| 11 - 40 NTU ~~Std ___ NTU~~ CC | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 8% | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 41 - 100 NTU Std 56.6 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 6.5% | |
| CAL ICV CCV | 3/10/14 | 56.3 | P F |
| CAL ICV CCV | 3/11/14 | 56.5 | P F |
| CAL ICV CCV | 3/11/14 | 56.4 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| >100 NTU Std 513 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 5% | |
| CAL ICV CCV | 3/10/14 | 527 | P F |
| CAL ICV CCV | 3/11/14 | 534 | P F |
| CAL ICV CCV | 3/11/14 | 528 | P F |
| CAL ICV CCV | | | P F |

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration

ICV - Initial Calibration Verification

CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: pH cal on back

Geosyntec consultants

Geosyntec consultants

4601 Six Forks Rd
Suite 340
Raleigh, NC 27609

# GROUNDWATER SAMPLING LOG

Project Name: UNC Cogen Facility
Date: 3/10/14
Project Number: GN5219
Task: 01
Phase: 04
Location: Chapel Hill, NC
Personnel: R. Donahue

Sample Type: GW
Location Type: MW
DTW (feet): 31.38
Depth Measurement Location: TOC
DTB (feet) from prior data: 39
Location ID: MW-1
Screen Interval (ft): 29.5-39.5
Pump Setting (feet): 35'
Duplicate ID: ——
Well Diameter (inches): 2"

RP 3/10

Purge Method: low flow Rate (mL/min): 180 mL/min Time - Start: ~~1150~~ 1150 Time-End: 1325

| Time | Drawdown (ft) | pH (S.U.) | Conductivity (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|
| 1210 | 31.64 | 6.43 | 305 | 19.36 | 22.8 | 70.0 | 7.09 |
| 1225 | 31.58 | 6.36 | 307 | 19.69 | 13.3 | 52.4 | 6.56 |
| 1240 | 31.67 | 6.27 | 300 | 19.50 | 25.1 | 51.5 | 6.49 |
| 1255 | 31.69 | 6.25 | 298 | 19.74 | 9.36 | 51.0 | 6.39 |
| 1310 | 31.64 | 6.33 | 294 | 19.51 | 6.77 | 59.8 | 6.23 |
| 1325 | 31.65 | 6.24 | 292 | 19.69 | 4.23 | 47.6 | 6.06 |

Sample Method: low flow Rate (mL/min): 180 mL/min Date: 3/10/14 Time: 1330

| Final/Sample Field Parameters | | Stabilization Guidance | |
|---|---|---|---|
| pH | 6.24 | 0.1 | met? Y / N |
| Conductivity (uS) | 292 | 3% | met? Y / N |
| Temp. (oC) | 19.69 | none | |
| Turbidity (NTU) | 4.23 | 10% or <10 | met? Y / N |
| ORP (mV) | 47.6 | 10 | met? Y / N |
| DO (mg/L) | 6.06 | 10% | met? Y / N |

NOTES: Collected ER-1 ~~MS + MSD~~ which ~~each~~ had 2-500 mL ambers for PAHs, 2-500 mL ambers for D/F + 1 250 mL poly (w/ $HNO_3$) for Total metals.

| Constituent | Method | Container | Preservative | Filtered? |
|---|---|---|---|---|
| PAHs | 8270SIM | amber 1L | NA | N |
| Dioxins/Furans | 8290 | amber 1L | NA | N |
| Total metals/Hg | 6010C | plastic 500mL | $HNO_3$ | N |
| Total Ca/K/Mg/Na | 6010C | plastic 500mL | $HNO_3$ | N |
| Dissolved metals/Hg | 6010C/9034 | plastic 500mL | $HNO_3$ | Y |
| Alkalinity + Cl/Sulf | 2320B/9056A | plastic 250mL | NA | N |
| Sulfide | 9034 | plastic 250mL | Zinc Acetate + NaOH | N |
| TSS | 2540D | plastic 1L | NA | N |
| TDS | 2540C | plastic 500mL | NA | N |

COMMENTS: Sample ID = GWA-MW01-140310

Geosyntec consultants

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Raleigh, NC 27609

# GROUNDWATER SAMPLING LOG

3/11/14

Project Name: UNC Cogen Facility
Date: ~~3/10/14~~ CC
Project Number: GN5219
Task: 01
Phase: 04
Location: Chapel Hill, NC
Personnel: ~~R. Donahue~~ C. Collins

Sample Type: GW
Location Type: MW
DTW (feet): 14.78
Depth Measurement Location: TOC
DTB (feet) from prior data: 28.81
Location ID: MW-2
Screen Interval (ft): 19.5-29.5
Pump Setting (feet): 24.5
Duplicate ID: MS/MSD
Well Diameter (inches): 2"

Purge Method: low flow
Rate (mL/min): <200
Time - Start: 0928
Time-End:

| Time | ~~Drawdown~~ DTW (ft) | pH (S.U.) | Conductivity (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|
| 0928 | 15.31 | 6.57 | 331 | 14.36 | 2.82 | 194.0 | 1.82 |
| 0940 | 15.38 | 6.61 | 328 | 14.80 | 2.05 | 127.3 | 1.00 |
| 0950 | 15.46 | 6.64 | 328 | 15.42 | 1.53 | 110.1 | 0.90 |
| 1000 | 15.53 | 6.62 | 327 | 16.06 | 1.43 | 57.4 | 1.13 |
| 1010 | 15.61 | 6.64 | 328 | 16.53 | 1.64 | -17.3 | 0.95 |
| 1020 | 15.68 | 6.65 | 329 | 17.19 | 1.41 | -142.5 | 0.78 |
| 1025 | Sample | | | | | | |

Sample Method: low flow
Rate (mL/min):
Date:
Time: 1025

| Final/Sample Field Parameters | | Stabilization Guidance | |
|---|---|---|---|
| pH | 6.65 | ~~0.1~~ 0.2 | met? Y / N |
| Conductivity (uS) | 329 | ~3% 5% | met? Y / N |
| Temp. (oC) | 17.19 | none | |
| Turbidity (NTU) | 1.41 | 10% or <10 | met? Y / N |
| ~~ORP (mV)~~ | | ~~10~~ | ~~met? Y / N~~ CC |
| ~~DO (mg/L)~~ | | ~~10%~~ | ~~met? Y / N~~ CC |

NOTES

| Constituent | Method | Container | Preservative | Filtered? |
|---|---|---|---|---|
| | | | | |

COMMENTS

Geosyntec consultants

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Cogen Facility
Date: 3 / 10 / 14
Project Number: GN5219
Task: 01
Phase: 04
Location: Chapel Hill, NC
Personnel: R. Donahue, C. Collins

Sample Type: GW
Location Type: MW
DTW (feet): 15.12
Depth Measurement Location: TOC
DTB (feet) ~~from prior data~~: 29.5 (meas.)
Location ID: MW-3
Screen Interval (ft): 24-29
Pump Setting (feet): 26.5
Duplicate ID: DUP-1
Well Diameter (inches): 2"

Purge Method: low flow  Rate (mL/min): <200  Time - Start: 1320  Time-End:

| Time | ~~Drawdown~~ DTW (ft) | pH (S.U.) | Conductivity (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|
| 1320 | 15.12 | 5.80 | 692 | 17.19 | 3.59 | 124.1 | 1.30 |
| 1330 | 15.85 | 5.80 | 638 | 17.58 | 3.83 | 108.1 | 0.85 |
| 1340 | 15.82 | 5.79 | 637 | 17.51 | 3.37 | 105.5 | 0.63 |
| 1350 | 15.81 | 5.76 | 628 | 17.59 | 2.53 | 101.7 | 0.65 |
| 1400 | 15.83 | 5.77 | 623 | 17.66 | 2.38 | 98.5 | ~~0.5~~ 0.63 |
| 1405 | Sample | | | | | | |

3/10/14

Sample Method: low flow  Rate (mL/min): ~200  Date: 3/10/14  Time: 1405

| Final/Sample Field Parameters | | Stabilization Guidance | |
|---|---|---|---|
| pH | 5.77 | 0.1 | met? (Y) N |
| Conductivity (uS) | 623 | 3% | met? (Y) N |
| Temp. (oC) | 15.83 | none | |
| Turbidity (NTU) | 2.38 | 10% or ≤10 | met? (Y) N |
| ORP (mV) | 98.5 | 10 | met? (Y) N |
| DO (mg/L) | 0.63 | 10% | met? (Y) N |

NOTES: Collected DUP-1 (GWA-MW99-140310) at MW03

| Constituent | Method | Container | Preservative | Filtered? |
|---|---|---|---|---|

COMMENTS

Geosyntec consultants

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Suite 340
Raleigh, NC 27609

# WATER LEVEL LOG

Project Name: UNC Co-gen
Project Number: GC5219
Phase/Task:
Location: Chapel Hill, NC

Date: 9/9/14
Weather: Cloudy ~70°F, Heavy rain on 9/8/14
Personnel: M. Senny / R. Donahue

| WELL ID | DEPTH TO WATER | TIME | COMMENTS |
|---|---|---|---|
| MW 5 | 8.14 ft → TOC | 10:48 | |
| PZ 4 | 27.55 | 10:54 | |
| MW 3 | 16.26 | 10:59 | |
| MW 2 | 15.59 | 11:03 | |
| MW 1 | 32.31 | 11:13 | |

calibrate to 99%

# Geosyntec Consultants
## Water Quality Instrument Calibration Form

Project/Site: UNC Co-gen  Project #: GC 5219  Field Personnel: M. Jenny / M. Schott / M. Donahue

Water Quality Meter - Model/Serial #: YSI 556 / 04D7465 AB  Turbidimeter - Model/Serial # HACH 2100Q 110200007520

| Dissolved Oxygen | DEP SOP FT 1500 | Date | Time | Temp (°C) | Saturation ~~(mg/L)[1]~~ 100% | Reading (mg/L) | Reading (%) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.3mg/L | | |
| CAL ICV CCV | | 9/9/14 | 11:38 | 20.55 | 100% saturation | — | — | P F |
| CAL ICV CCV | | 9/9/14 | 16:17 | 21.82°C | ~~9.04 mg/L~~ 9.04 mg/L | | 103.4% | P F |
| CAL ICV CCV | | | | | 8.77 mg/L | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| Specific Conductance | DEP SOP FT 1200 | Date | Time | Standard ~~(mS/cm)~~ uS/cm | Standard Lot # | Standard Exp. Date | Reading (mS/cm) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 9/9/14 | 11:46 | 22.84°C/359 | 4AE038 | May 15 | 2.675 | P F |
| CAL ICV CCV | | 9/9/14 | 16:22 | 23.72°C 1359 | 4AE038 | May 15 | 927 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| pH | DEP SOP FT 1100 | Date | Time | Standard (SU) | Standard Lot # | Standard Exp. Date | Reading (SU) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.2 SU | | |
| CAL ICV CCV | | 9/9/14 | 11:55 | 4.00 @ 22.76°C pH 4 | 4AE330 | May 16 | 4.00 | P F |
| CAL ICV CCV | | 9/9/14 | 11:58 | 7 @ 22.9°C | 4AC064 | Mar 16 | 7.04 | P F |
| CAL ICV CCV | | 9/9/14 | 12:00 | 10 @ 23°C | 4AD984 | Apr 16 | 10.07 | P F |
| CAL ICV CCV | | 9/9/14 | 16:25 | 4 @ 23°C | 4AE330 | May 16 | 4.14 | P F |
| CAL ICV CCV | | 9/9/14 | 16:27 | 7 @ 23°C | 4AC064 | Apr 16 | 7.05 | P F |
| CAL ICV CCV | | 9/9/14 | 16:30 | 10 @ 23.8 | 4AD984 | May 16 | 10.20 | P F |

| ORP | SOP N/A | Date | Time | Std. mV @ Temp °C | Standard Lot # | Standard Exp. Date | Reading (mV) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Geosyntec Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 9/9/14 | 12:03 | 220 @ 22.4°C | 4AD310 | Jan 15 | 219.9 | P F |
| CAL ICV CCV | | 9/9/14 | 16:32 | 220 @ 23.2 | 4AD310 | Jan 15 | 215.5 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| 0.1 - 10 NTU Std 5.7 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 10% | |
| CAL ICV CCV | 9/9/14 | 5.69 | P F |
| CAL ICV CCV | 9/9/14 | 5.65 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 11 - 40 NTU Std ___ NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 8% | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 41 - 100 NTU Std 50.4 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 6.5% | |
| CAL ICV CCV | 9/9/14 | 50.4 | P F |
| CAL ICV CCV | | 50.7 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| >100 NTU Std 522 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 5% | |
| CAL ICV CCV | 9/9/14 | 524 | P F |
| CAL ICV CCV | 9/9/14 | 521 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

Specific Conductance Probe Cleaned? Yes No  Disolved Oxygen membrane Changed? Yes No

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification

Comments:

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Geosyntec consultants

# Geosyntec Consultants
## Water Quality Instrument Calibration Form

Project/Site: VNC Co-Ben  Project #: GC5219  Field Personnel: M Jenny / R. Donahue

Water Quality Meter - Model/Serial #: YSI 556 / 04D7465 AB  Turbidimeter - Model/Serial # HACH 2100Q 1102GC007520

| Dissolved Oxygen | DEP SOP FT 1500 | Date | Time | Temp (°C) | Saturation (mg/L)[1] | Reading (mg/L) | Reading (%) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.3mg/L | | |
| CAL ICV CCV | | 9/10/14 | 9:40 | 21.98°C | 8.744 | 8.264 | 98.3 | P F |
| CAL ICV CCV | | 9/10/14 | 15:22 | 22.03°C | 8.744 | 8.07 | 92.1 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| Specific Conductance | DEP SOP FT 1200 | Date | Time | Standard (mS/cm) | Standard Lot # | Standard Exp. Date | Reading (mS/cm) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 9/10/14 | 9:42 | 1.359@23°C | 4AE038 | May 15 | 1.360 | P F |
| CAL ICV CCV | | 9/10/14 | 15:25 | 1.413@25.4 | 4AE038 | May 15 | 1.351 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| pH | DEP SOP FT 1100 | Date | Time | Standard (SU) | Standard Lot # | Standard Exp. Date | Reading (SU) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.2 SU | | |
| CAL ICV CCV | | 9/10/14 | 9:45 | 4.00@23°C | 4AE330 | May 16 | 3.88 | P F |
| CAL ICV CCV | | 9/10/14 | 9:49 | 7.00@23°C | 4AC064 | Mar 16 | 7.03 | P F |
| CAL ICV CCV | | 9/10/14 | 9:53 | 10.00@23°C | 4AD984 | Apr 16 | 9.98 | P F |
| CAL ICV CCV | | 9/10/14 | 15:28 | 4.00@25.9 | 4AE330 | May 16 | 4.04 | P F |
| CAL ICV CCV | | 9/10/14 | 15:31 | 7.00@26.14 | 4AC064 | Mar 16 | 6.92 | P F |
| CAL ICV CCV | | 9/10/14 | 15:32 | 10.00@26.07 | 4AD984 | Apr 16 | 10.06 | P F |

| ORP | SOP N/A | Date | Time | Std. mV @ Temp °C | Standard Lot # | Standard Exp. Date | Reading (mV) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Geosyntec Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 9/10/14 | 9:57 | 220@23°C | 4AD310 | Jan 15 | 216.6 | P F |
| CAL ICV CCV | | 9/10/14 | 15:36 | 220@25.19 | 4AD310 | Jan 15 | 214.1 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

Specific Conductance Probe Cleaned? Yes No  Disolved Oxygen membrane Changed? Yes No

| 0.1 - 10 NTU Std ~~5.76~~ NTU 5.76 | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 10% | |
| CAL ICV CCV | 9/10/14 | 5.62 | P F |
| CAL ICV CCV | 9/10/14 | 5.72 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 11 - 40 NTU Std ___ NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 8% | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 41 - 100 NTU Std 50.9 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 6.5% | |
| CAL ICV CCV | 9/10/14 | 50.5 | P F |
| CAL ICV CCV | 9/10/14 | 50.4 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| >100 NTU Std 522 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 5% | |
| CAL ICV CCV | 9/10/14 | 521 | P F |
| CAL ICV CCV | 9/10/14 | 526 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration

ICV - Initial Calibration Verification

CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments:

Geosyntec consultants

Geosyntec consultants

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Raleigh, NC 27609

# GROUNDWATER SAMPLING LOG

Project Name: UNC Co-generation Facility
Date: 9 / 9 / 14
Project Number: GC 5219
Phase/Task:
Location:
Personnel: M. Jenny / M. Schott

Well ID: MW-1
Bladder pump
Screen Interval (ft): 29.5'-39.5'
Pump/Tubing Setting (ft): 36'
Well Diameter (in): 2"
Tubing Diameter (in): 1/4"
DTW (ft): 32.31'
DTB (ft): 39.5'
Depth Measurement Location: Flush mount → from

Measured on downstream side of flow cell

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 12:21 → ~~start pump~~ | | | | | | | | |
| 12:23 → start pump | | | | | | | | |
| 12:40 | 100 | 32.46 | 5.50 | 174 | 19.09 | 28.8 | 62.0 | 6.65 |
| 12:50 | 100 | 32.49 | 5.66 | 167 | 18.91 | 17.8 | 41.5 | 6.61 |
| 13:02 | 100 | 32.50 | 5.90 | 164 | 18.93 | 10.2 | 24.7 | 6.40 |
| 13:12 | 100 | 32.51 | 5.97 | 163 | 18.97 | 5.68 | 20.0 | 6.62 |
| 13:22 | 100 | 32.50 | 5.92 | 161 | 18.87 | 8.40 | 19.9 | 6.49 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

**NOTES**

Sample ID: MW-1-090914
SAMPLE TIME: 13:25

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( 39.5 feet - 32.3 feet) X .16 gallons/foot = 1.152 gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

(mL) ~~Equip Volume~~ Well Volume / (mL/min) Flow rate : time b/w sample readings

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Co-Gen Facility
Date: 9 / 9 / 14
Project Number: GC5219
Phase/Task:
Location: Chapel Hill, NC
Personnel: MJ / RD

Well ID: MW-2
Screen Interval (ft): 19.5-29.5
Pump/Tubing Setting (ft): 24.5
Well Diameter (in): 2"
Tubing Diameter (in): 1/4"
DTW (ft): 15.59
DTB (ft): 29.5
Depth Measurement Location: G.S.

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 15:17 → Start pump | | | | | | | | |
| 15:27 | 135 | 16.97 | 5.65 | 270 | 18.84 | 12.2 | 46.5 | 1.20 |
| 15:34 | 135 | 16.81 | 5.79 | 268 | 19.33 | 9.62 | 28.2 | 2.05 |
| 15:42 | 135 | 17.02 | 5.97 | 270 | 18.92 | 7.74 | 6.7 | 1.58 |
| 15:50 | 135 | 17.16 | 6.04 | 270 | 18.81 | 3.85 | -3.8 | 1.49 |
| 15:56 | 135 | 17.21 | 6.08 | 270 | 18.80 | 3.77 | -15.3 | 1.04 |
| 16:00 | 135 | 17.24 | 6.18 | 270 | 18.93 | 2.90 | -24.0 | 0.88 |
| 16:04 | 135 | 17.29 | 6.15 | 270 | 18.89 | 3.59 | -28.0 | 0.72 |
| 16:06 | 135 | 17.15 | 6.15 | 269 | 18.99 | 3.47 | -29.7 | 0.68 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

**NOTES**

Sample collection time: 16:07

Sample ID: MW-2-090914

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

# Geosyntec consultants

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## GROUNDWATER SAMPLING LOG

Project Name: UNC Co-Gen Facility
Date: 9 / 10 / 14
Project Number: GC 5219
Phase/Task:
Location: Chapel Hill, NC
Personnel: MJ/RD

Well ID: MW 4 / PZ4
Screen Interval (ft): 28-38'
Pump/Tubing Setting (ft): 33'
Well Diameter (in): 2"
Tubing Diameter (in): 1/4"
DTW (ft): 27.68
DTB (ft): 38'
Depth Measurement Location: G.S.

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 10:07 → start purging | | | | | | | | |
| 10:22 | 100 | 27.91 | 4.47 | 155 | 18.07 | 4.48 | 112.9 | 5.61 |
| 10:32 | 100 | 28.0 | 4.76 | 155 | 18.04 | 2.91 | 94.6 | 5.85 |
| 10:42 | 100 | 28.05 | 5.03 | 155 | 18.02 | 2.24 | 75.8 | 5.63 |
| 10:51 | 100 | 27.93 | 5.19 | 157 | 18.03 | 2.48 | 65.8 | 5.58 |
| 10:56 | 100 | 27.99 | 5.24 | 157 | 18.04 | 1.48 | 60.01 | 5.62 |
| 11:01 | 100 | 27.94 | 5.27 | 158 | 18.04 | 1.22 | 58.6 | 5.86 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

**NOTES**

Sample ID: MW-4-091014

Sample Time: 11:05

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( 38 feet - 27.68 feet) X 0.16 gallons/foot = 1.6 gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + .25 gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

$10\ ft\left[\frac{\pi}{4}\left(\frac{2}{12}\right)^2\right] = V\ (ft^3)$ $\frac{7.4805\ gal}{1\ ft^3} = 1.654\ gal$

Tubing length = 33'

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Co-Gen Facility
Date: 9 / 10 / 14
Project Number: GC5219
Phase/Task:
Location: Chapel Hill, NC
Personnel: MJ/RD

Well ID: MW3
Screen Interval (ft): 24-29
Pump/Tubing Setting (ft): 26.5
Well Diameter (in): 2"
Tubing Diameter (in): 1/4"
DTW (ft): 16.85
DTB (ft): 29
Depth Measurement Location: G.S.

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| Start pump @ 1125 | | | | | | | | |
| 1140 | 135 | 17.32 | 5.50 | 643 | 18.83 | 1.80 | 1.9 | 1.10 |
| 1150 | 135 | 17.39 | 5.56 | 651 | 18.93 | 1.07 | -3.2 | 1.04 |
| 1200 | 135 | 17.42 | 5.58 | 678 | 18.88 | 1.08 | -7.1 | 0.32 |
| 1205 | 135 | 17.40 | 5.59 | 688 | 18.79 | 1.38 | -7.9 | 0.3 |
| 1210 | 135 | 17.40 | 5.64 | 696 | 18.86 | 1.94 | -10.9 | 0.25 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES

Sample ID: MW-3-091014
collected duplicate; ID= MW-99-091014
Sample Time: 12:15 ↳ time "17:00"

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Co-Gen Facility
Date: 9/10/14
Project Number: GC5219
Phase/Task:
Location: Chapel Hill, NC
Personnel: MJ/RD

Well ID: MW-5
Screen Interval (ft): ~~5-20~~ 5-20' BGS
Pump/Tubing Setting (ft): 12.5
Well Diameter (in): 2
Tubing Diameter (in): 1/4
DTW (ft): 8.18
DTB (ft): ~~20~~
Depth Measurement Location: TOC (highest point)

→ sample after flow-thru cell

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 1430 | 169 | → start pump | | | | | | |
| 1440 | 169 | 8.25 | 4.84 | 475 | 18.27 | 1.24 | 30.8 | 0.87 |
| 1447 | 169 | 8.26 | 5.00 | 484 | 17.96 | 0.87 | 11.1 | 0.66 |
| 1452 | 169 | 8.27 | 5.08 | 486 | 17.87 | 3.86 | 7.7 | 0.60 |
| 1457 | 169 | 8.27 | 5.12 | 485 | 17.69 | 0.83 | 10.0 | 0.57 |
| 1502 | 169 | 8.30 | 5.12 | 486 | 17.38 | 1.30 | 11.8 | 0.80 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES
Sample ID: MW-5-09/10/14
Sample time: 1510

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# WATER LEVEL LOG

Project Name: UNC Cogen
Project Number: GNS219
Phase/Task: —
Location: Chapel Hill NC
Date: 4/20/15
Weather: 70s + Sunny
Personnel: R Donahue + R Warrier

| WELL ID | DEPTH TO WATER | TIME | COMMENTS |
|---|---|---|---|
| MW-1 | 30.68 | 11:26 | |
| MW-4 | 26.44 | 11:40 | |
| MW-3 | 16.23 | 11:47 | |
| MW-2 | 15.62 | 12:03 | |
| MW-5 | 6.30 (TOC) | 14:12 | meas. from TOC (inlet PVC) |

# Geosyntec Consultants
## Water Quality Instrument Calibration Form

Project/Site: ~~GN~~ UNC Cogen  Project #: GN5219  Field Personnel: R Donahue + R Warrier

Water Quality Meter - Model/Serial #: YSI 556 MPS / 2238  Turbidimeter - Model/Serial # Hach 2100Q / 3428

| Dissolved Oxygen | DEP SOP FT 1500 | Date | Time | Temp (°C) | Saturation (mg/L)[1] | Reading (mg/L) | Reading (%) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.3mg/L | | |
| CAL ICV CCV | | 4/20/15 | 1228 | 29.58 | 7.611 | 6.61 → 7.41 | 80.9 → 99.7 | P F |
| CAL ICV CCV | | 4/21/15 | 915 | 18.50 | 9.371 | 10.46 → | 111.9 → | P F |
| CAL ICV CCV | | 4/24/15 | 920 | 18.3 | 9.409 | 9.35 | 99 | P F |
| CAL ICV CCV | | | | | | | | P F |

| Specific Conductance | DEP SOP FT 1200 | Date | Time | Standard (mS/cm) | Standard Lot # | Standard Exp. Date | Reading (mS/cm) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 4/20/15 | 1232 | 1.413 | 4AK609 | NOV/15 | 1.342 → 1.413 | P F |
| CAL ICV CCV | | 4/21/15 | 922 | 1.413 | 4AK609 | NOV/15 | 1.399 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| pH | DEP SOP FT 1100 | Date | Time | Standard (SU) | Standard Lot # | Standard Exp. Date | Reading (SU) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.2 SU | | |
| CAL ICV CCV | | 4/20/15 | 12:37 | 4.0 | 4AK421 | NOV/16 | 4.1 | P F |
| CAL ICV CCV | | ↓ | 1240 | 10.0 | 4A1735 | SEP/16 | 9.8 | P F |
| CAL ICV CCV | | | 1243 | 7.0 | 4AC064 | MAR/16 | 6.92 | P F |
| CAL ICV CCV | | 4/21/15 | 927 | 4.0 | 4AK121 | NOV/16 | 4.09 | P F |
| CAL ICV CCV | | 4/21/15 | 930 | 7.0 | 4AC064 | MAR/16 | 6.92 | P F |
| CAL ICV CCV | | 4/21/15 | 933 | 10.0 | 4A1735 | SEP/16 | 9.84 | P F |

| ORP | SOP N/A | Date | Time | Std. mV @ Temp °C | Standard Lot # | Standard Exp. Date | Reading (mV) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Geosyntec Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 4/20/15 | 1240 | ~~240~~ 220 | 4AK680 | AUG/15 | 181.7 > 220 | P F |
| CAL ICV CCV | | 4/21/15 | 934 | 220 | 4AK680 | AUG/15 | 236.2 | P F |
| CAL ICV CCV | | 4/24/15 | 939 | 220 | 4AK680 | AUG/15 | 220 | P F |
| CAL ICV CCV | | | | | | | | P F |

Specific Conductance Probe Cleaned? Yes No  Disolved Oxygen membrane Changed? Yes No

| 0.1 - 10 NTU Std 5.7 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 10% | |
| CAL ICV CCV | 4/20/15 | 5.92 | P F |
| CAL ICV CCV | 4/21/15 | 5.43 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 11 - 40 NTU Std ___ NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 8% | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

R.D. 4/21

| 41 - 100 NTU Std 55.2 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 6.5% | |
| CAL ICV CCV | 4/20/15 | 55.2 | P F |
| CAL ICV CCV | 4/21/15 | 53.3 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| >100 NTU Std 94 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 5% | |
| CAL ICV CCV | 4/20/15 | 483 | P F |
| CAL ICV CCV | 4/21/15 | 478 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration

ICV - Initial Calibration Verification

CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: CCV failed DO on 4/20/15 AND ORP on 4/20/15.

Geosyntec consultants

# Geosyntec Consultants
## Water Quality Instrument Calibration Form

Project/Site: UNC COGEN  Project #: GN5219  Field Personnel: R. Warren + R. Donahue

Water Quality Meter - Model/Serial #: YSI 556 MPS / 2238  Turbidimeter - Model/Serial # Hach 2100Q / 3428

| Dissolved Oxygen | DEP SOP FT 1500 | Date | Time | Temp (°C) | Saturation (mg/L)[1] | Reading (mg/L) | Reading (%) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.3mg/L | | |
| CAL ICV CCV | | 4/21/15 | 18:00 | 22.26 | 8.693 | 8.84 | | P F |
| ~~CAL ICV CCV~~ | | ~~4/24/15~~ | ~~8:52~~ | ~~15.74~~ | ~~9.931~~ | ~~10.~~ | | P F |
| CAL ICV CCV | | 4/24/15 | 9:06 | 16.25 | 9.81 | 9.9→9.8 | 100.9→100.3 | P F |
| CAL ICV CCV | | 4/24/15 | 15:20 | 18.86 | 9.295 | 8.35 | 89.6% | P F |

RW

| Specific Conductance | DEP SOP FT 1200 | Date | Time | Standard (mS/cm) | Standard Lot # | Standard Exp. Date | Reading (mS/cm) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 4/21/15 | 18:06 | 1.413 | 4AK609 | NOV/15 | 1.308 | P F |
| CAL ICV CCV | | 4/24/15 | 9:15 | 1.413 | 4AK609 | NOV/15 | 1.339→1.413 | P F |
| CAL ICV CCV | | 4/24/15 | 15:27 | 1.413 | 4AK609 | NOV/15 | 1.402 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| pH | DEP SOP FT 1100 | Date | Time | Standard (SU) | Standard Lot # | Standard Exp. Date | Reading (SU) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.2 SU | | |
| CAL ICV CCV | | 4/21/15 | 18:09 | 4.0 | 4AK121 | NOV/15 | 2.95 | P F |
| CAL ICV CCV | | 4/21/15 | 18:10 | 7.0 | 4AC064 | MAR/16 | 5.62 | P F |
| CAL ICV CCV | | 4/21/15 | 18:14 | 10.0 | 4AI735 | SEP/16 | 8.33 | P F |
| CAL ICV CCV | | 4/24/15 | 9:30 | 4.0 | 4AK121 | NOV/15 | 3.4→4.0 | P F |
| CAL ICV CCV | | 4/24/15 | 9:33 | 7.0 | 4AC064 | MAR/16 | 4→6 | P F |
| CAL ICV CCV | | 4/24/15 | 9:35 | 10.0 | 4AI735 | SEP/16 | 10.72→10.11 | P F |

| ORP | SOP N/A | Date | Time | Std. mV @ Temp °C | Standard Lot # | Standard Exp. Date | Reading (mV) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | @25°C | | Geosyntec Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | | 4/21/15 | 18:17 | 220 | 4AK680 | AUG/15 | 213 | P F |
| CAL ICV CCV | | 4/24/15 | 9:42 | 220 | 4AK680 | AUG/15 | 219.3→220 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| 0.1 - 10 NTU Std 5.7 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | Acceptance Criteria: +/- 10% | | |
| CAL ICV CCV | 4/21/15 | 5.82 | P F |
| CAL ICV CCV | 4/24/15 | 5.65 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 11 - 40 NTU Std ____ NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | Acceptance Criteria: +/- 8% | | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | RW 4/21/15 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 41 - 100 NTU Std 55.2 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | Acceptance Criteria: +/- 6.5% | | |
| CAL ICV CCV | 4/21/15 | 55.9 | P F |
| CAL ICV CCV | 4/24/15 | 54.1 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| >100 NTU Std 482 NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | Acceptance Criteria: +/- 5% | | |
| CAL ICV CCV | 4/21/15 | 484 | P F |
| CAL ICV CCV | 4/24/15 | 484 | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

Specific Conductance Probe Cleaned? Yes No  Disolved Oxygen membrane Changed? Yes No

Comments: 4/24/15 PH CAL/ICV NOT GOOD FOR pH 4, 7 BECAUSE OF FAULTY CABLE - RW

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration

ICV - Initial Calibration Verification

CCV - Continuing Calibration Verification

Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration

Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)

Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)

If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Geosyntec consultants

# Geosyntec Consultants
## Water Quality Instrument Calibration Form

Project/Site: UNC COGEN  Project #: GNS219  Field Personnel: R. Warren + R. Donahue

Water Quality Meter - Model/Serial #: YSI 556 MPS / 2238  Turbidimeter - Model/Serial # Hach 2100Q / 3428

| Dissolved Oxygen | DEP SOP FT 1500 | Date | Time | Temp (°C) | Saturation (mg/L)[1] | Reading (mg/L) | Reading (%) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Acceptance Criteria: +/-0.3mg/L | | |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| Specific Conductance | DEP SOP FT 1200 | Date | Time | Standard (mS/cm) | Standard Lot # | Standard Exp. Date | Reading (mS/cm) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Acceptance Criteria: +/- 5% | |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| pH | DEP SOP FT 1100 | Date | Time | Standard (SU) | Standard Lot # | Standard Exp. Date | Reading (SU) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Acceptance Criteria: +/-0.2 SU | |
| CAL ICV CCV | | 4/24/15 | 1544 | 4.0 | 4AK121 | NOV/15 | -9.99 | P F |
| CAL ICV CCV | | 4/24/15 | 1546 | 7.0 | 4AC064 | MAR/16 | -9.99 | P F |
| CAL ICV CCV | | 4/24/15 | 1549 | 10.0 | 4A1735 | SEP/16 | -9.99 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

| ORP | SOP N/A | Date | Time | Std. mV @ Temp °C | Standard Lot # | Standard Exp. Date | Reading (mV) | Pass or Fail |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Geosyntec Acceptance Criteria: +/- 5% | |
| CAL ICV CCV | | 4/24/15 | 1557 | 220@25C | 4AK680 | AUG/15 | 218.4 | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |
| CAL ICV CCV | | | | | | | | P F |

Specific Conductance Probe Cleaned? Yes No  Disolved Oxygen membrane Changed? Yes No

| 0.1 - 10 NTU Std ____NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 10% | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 11 - 40 NTU Std ____NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 8% | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| 41 - 100 NTU Std ____NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 6.5% | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

| >100 NTU Std ____NTU | Date | Reading (NTU) | Pass or Fail |
|---|---|---|---|
| | | Acceptance Criteria: +/- 5% | |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |
| CAL ICV CCV | | | P F |

1. See Table FS 2200-2 on the back of this form

CAL - Initial Calibration
ICV - Initial Calibration Verification
CCV - Continuing Calibration Verification
Allow adequate time for the dissolved oxygen sensor to equilibrate during air calibration
Calibrate specific conductance using at least two standards that bracket the range of expected sample readings (unless readings < 0.1 mS/cm then one standard of 0.1 mS/cm is acceptable)
Calibrate pH using at least two standards (typ. pH 4 and 7) that bracket the range of expected sample readings; always start with pH 7; add a third calibration point if needed (i.e. pH > 7)
If parameter fails to calibrate within SOP acceptance criteria then append sample results with a "J" qualifier

Comments: pH CCV on 4/24/15 off due to faulty YSI cable.

Geosyntec consultants

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Cogen
Date: 4 / 20 / 2015
Project Number: GN 5219
Phase/Task:
Location: Chapel Hill, NC
Personnel: R. Donahue, R. Uberrier

Well ID: MW-5
Screen Interval (ft): 5-20
Pump/Tubing Setting (ft): 12.5'
Well Diameter (in): 2.0"
Tubing Diameter (in): 1/4"
DTW (ft): 6.30'
DTB (ft): 20'
Depth Measurement Location: TOC

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 1440 | 66 mL/min | 6.30 | | | | | | |
| 1446 | 66 | 6.41 | 4.86 | 372 | 14.46 | 10.6 | 182.9 | 1.70 |
| 1449 | 66 | 6.41 | 4.83 | 383 | 14.42 | 9.12 | 164.0 | 1.57 |
| 1455 | 66 | 6.42 | 5.00 | 417 | 14.63 | 8.36 | 141.0 | 1.22 |
| 1458 | 66 | 6.42 | 5.10 | 421 | 14.65 | 6.40 | 131.0 | 1.01 |
| 1501 | 66 | 6.44 | 5.17 | 428 | 14.64 | 5.33 | 127.0 | 1.11 |
| 1504 | 66 | 6.44 | 5.24 | 432 | 14.70 | 4.82 | 123.5 | 0.90 |
| 1506 | 66 | 6.44 | 5.26 | 436 | 14.76 | 4.12 | 122.5 | 0.87 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES: Sample ID: MW-5-20150420
sample time: 1510

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Cogen
Project Number: GN5219
Phase/Task:
Location: Chapel Hill NC
Date: 4/21/15
Personnel: R. Donahue, R. Warlick

Well ID: MW-1
bladder pump
Screen Interval (ft): 29.5 - 39.5
Pump/Tubing Setting (ft): 35
Well Diameter (in): 2"
Tubing Diameter (in): 1/4"
DTW (ft): 30.59
DTB (ft): 39.5
Depth Measurement Location: TOC

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 10:13 | 200 mL/min | | | | | | | |
| 10:23 | " | 30.89 | 5.95 | 265 | 17.87 | 325 | 80.4 | 6.88 |
| 10:35 | " | 30.91 | 6.09 | 256 | 18.43 | 376 | 92.9 | 6.67 |
| 11:11 | " | 30.69 | 5.97 | 287 | 20.11 | 283 | 123.5 | 7.04 |
| 11:14 | " | 30.69 | 6.07 | 279 | 19.89 | 245 | 123.7 | 7.18 |
| 11:28 | " | 30.69 | 5.77 | 252 | 19.20 | 178 | 138.9 | 6.76 |
| 11:31 | " | 30.69 | 5.79 | 251 | 19.22 | 138 | 136.8 | 6.75 |
| 11:44 | " | 30.69 | 5.81 | 246 | 19.32 | 117 | 141.7 | 6.82 |
| 11:52 | " | ~~30.69~~ 30.85 | 5.85 | 244 | 19.43 | 60.2 | ~~60.2~~ 143.5 | 6.62 |
| 11:55 | " | 30.85 | 5.83 | 242 | 19.44 | 54.2 | 144.6 | 6.78 |
| 11:58 | " | 30.85 | 5.79 | 242 | 19.42 | 56.0 | 146.6 | 6.77 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES: Sample ID: MW-~~1~~ 2 · 20150421
Sample time: 12:00

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Cogen
Project Number: GN5219
Phase/Task:
Location: Chapel Hill, NC
Date: 4/21/15
Personnel: R. Donahue, R. Warrier

Well ID: MW-4
Screen Interval (ft): 28-38
Pump/Tubing Setting (ft): 32'
Well Diameter (in): 2"
Tubing Diameter (in): 1/4"
DTW (ft): 26.05
DTB (ft):
Depth Measurement Location: TOC

bladder pump

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 14:32 | | 26.05 | | | | | | |
| 14:40 | | | -0.11* | 168 | 18.19 | 7.85 | 192.8 | 6.38 |
| | | | | | | | | PW |
| 14:58 | 200 | 26.28 | 5.55 PW | 169 | 16.94 | 3.13 | 198 | 6.43 |
| 14:59 | 200 | 26.32 | 5.55* | 169 | 17.04 | 1.60 | 192.4 | 6.13 |
| 15:02 | 200 | 26.25 | 5.57 | 165 | 17.42 | 5.42 | 190.8 | 6.05 |
| 15:05 | 200 | 26.28 | 5.49 | 163 | 17.49 | 2.23 | 190.0 | 6.04 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 ✓ | 0.2 |
| Cond. / Sp. Cond. | 5% ✓ | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES
SAMPLE ID: MW-4-20150421
SAMPLE TIME: 15:20
*pH calibration seemed off. Turned pump off. Washed YSI w/ Distilled water; tested with pH 7.0 calibrating solution & m-tangled cord to fix problem.

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Ogden
Project Number: GN5219
Phase/Task:
Location: Chapel Hill, NC
Date: 4/21/15
Personnel: R Donahue, R Warrier

Well ID: MW-2
Screen Interval (ft): 19.5-29.5
Pump/Tubing Setting (ft): 25
Well Diameter (in): 2
Tubing Diameter (in): 1/4
DTW (ft): 14.70
DTB (ft): 29.5
Depth Measurement Location: TOC

per i pump

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 1517 | 150 ~~60~~ | | | | | | | |
| 1528 | ~~100~~ 60 | 15.82 | 4.31 | 423 | 16.37 | 8.08 | 221.6 | 4.09 |
| 1532 | ~~100~~ 100 | 16.40 | 4.46 | 422 | 16.36 | 5.62 | 206.1 | 4.21 |
| 1534 | ~~100~~ 100 | 16.42 | ~~4.1~~ 365 | 421 | 16.37 | 4.93 | 201.2 | 2.16 |
| 1543 | 100 | 16.50 | 6.40 | 416 | 16.57 | 2.86 | 186.9 | 0.54 |
| 1546 | 100 | 16.58 | 7.21 | 414 | 16.61 | 2.53 | 183.2 | 0.52 |
| 1549 | 100 | 16.59 | 7.22 | 422 | 16.15 | 1.41 | 178.7 | 0.44 |
| 1552 | 100 | 16.59 | 7.26 | 414 | 16.27 | 1.75 | 171.9 | 0.58 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES: Sample ID: MW-2-20150421
Sample time: 1600

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# GROUNDWATER SAMPLING LOG

Project Name: UNC COGEN
Date: 4 / 24 / 15
Project Number: GN 5219
Phase/Task:
Location: CHAPEL HILL, NC
Personnel: R. WARRIER

Well ID: MW-3
Screen Interval (ft): 24-29
Pump/Tubing Setting (ft): 26.0
Well Diameter (in):
Tubing Diameter (in): 1/4"
DTW (ft): 15.05
DTB (ft): 29
Depth Measurement Location: TOC

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 10:34 | 350 | 17.58 | | | | | | |
| 10:43 | 231 | 16.89 | | | | | | |
| 10:45 | " | 16.76 | -4.45 | 799 | 17.31 | 3.02 | 71.2 | 0.35 |
| 10:49 | " | 16.72 | -6.35 | 811 | 17.31 | 2.07 | 71.9 | 0.33 |
| 10:53 | " | 16.74 | -7.82 | 818 | 17.38 | 1.57 | 74.6 | 0.35 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 X | 0.2 |
| Cond. / Sp. Cond. | 5% ✓ | 3% |
| Turbidity | 10% or ±10 NTU | none |
| DO | 10% or 0.2 mg/L ✓ | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES
SAMPLE ID: MW-3-20150423
SAMPLE TIME: ~~12~~ 1100 RW
pH reading out of range because of faulty YSI cable. pH stabilization criteria not satisfied.

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# WATER LEVEL LOG

Project Name: UNC Co-Gen
Date: 11/18/15
Project Number: GN5219
Phase/Task:
Weather: 60's Sunny
Location: Chapel Hill, NC
Personnel: Matt Jenny (MJ) / Amber Greene (AG)

| WELL ID | DEPTH TO WATER | TIME | COMMENTS |
|---|---|---|---|
| MW4 | 25.70 | 0858 | |
| MW 2 | 14.84 | 915 | |
| MW-5 | 6.80 | 924 | |
| MW 1 | 28.02 | 929 | |
| MW3 | 14.16 | 935 | |

# METER CALIBRATION REPORT

Geosyntec consultants

Geosyntec Consultants
10220 Old Columbia Road
Columbia, MD 21046
PHONE (410)381-4333 FAX (410) 381-4499

Project Name: UNC CO-GEN
Date: 11/18/15
Page 1 of 1
Project Number:
Primary Activities: GW sampling
Field Personnel: Matt Jenny (MJ) / Amber Greene (AG)
Initial Calibration Completed at: 8:30
Recorded By: MJ
Midday Calibration Completed at:
Weather: 60's Sunny
Final Calibration Check Completed at:

## 1. Specific Conductance Calibration

1413 µS/cm

| | Temp. | Initial | Cal to. |
|---|---|---|---|
| Initial | 17.8 | 1.413 | 1.42 |
| Midday | | | |
| Final | | | |

## 2. pH Calibration

| | | Buffer Solution pH 7.0 | pH 4.0 | pH 10.0 |
|---|---|---|---|---|
| Initial | temperature (°C) | 17.9 | 17.9 | 17.9 |
| | instrument reading | 7.05 | 4.05 | 10.05 |
| | should read/calibrated | 7.0/7.01 | 4.0/3.97 | 10.0/10.00 |
| Midday | temperature (°C) | | | |
| | instrument reading | | | |
| | should read/calibrated | | | |
| Final | temperature (°C) | | | |
| | instrument reading | | | |

## 4. Dissolved Oxygen Calibration

| | | Saturation 100% | 0% |
|---|---|---|---|
| Initial | Barometer | 760 | |
| | temperature (°C) | 17°C | |
| | instrument reading | 99.4% 9.79 mg/L | |
| | calibrated to | 76% | |
| Midday | Barometer | | |
| | temperature (°C) | | |
| | instrument reading | | |
| | calibrated to | | |
| Final | Barometer | | |
| | temperature (°C) | | |
| | instrument reading | | |

## 3. ORP Calibration

+240 mv Zobell

| | Temp. | Initial | Cal to. |
|---|---|---|---|
| Initial | 17° | 240 | 240.1 |
| Midday | | | |
| Final | | | |

## 5. Turbidity

| | 5.44 ~~1~~ NTU ~~Initial~~ | 61.9 ~~1~~ NTU ~~Final~~ | 564 ~~10~~ NTU ~~Initial~~ | 10 ~~NTU~~ Final |
|---|---|---|---|---|
| Initial | 4.71 | 61.1 | 564 | |
| Midday | | | | |
| Final | | | | |

pH 7 Calibration Solution – Lot Number: 4A0415 Expiration Date: 4/31/16
pH 4 Calibration Solution – Lot Number: 4AA619 Expiration Date: 1/31/16
pH 10 Calibration Solution – Lot Number: 4A0999 Expiration Date: 4/31/16
Specific Conductance Calibration Solution – Lot Number: 5GH1047 Expiration Date: 8/30/16
ORP Calibration Solution – Lot Number: 6138 Expiration Date 5/31/2018
5.44 ~~1~~ NTU Turbidity Calibration Solution – Lot Number: A4176 Expiration Date:
61.9 ~~10~~ NTU Turbidity Calibration Solution – Lot Number: A4176 Expiration Date:
Multiparameter Probe – Model: YSI ProPlus PES #: SN: 12E100167
Turbidity Meter - Model: HACH 2100Q PES #: SN: 13030C024336
*Comments: (rental, condition, problems):*

# METER CALIBRATION REPORT

Geosyntec consultants

Geosyntec Consultants
10220 Old Columbia Road
Columbia, MD 21046
PHONE (410)381-4333 FAX (410) 381-4499

Project Name: UNC Co-GEN
Project Number:
Field Personnel: Amber Greene (AG)/Eric Nesbit (EN)
Recorded By: AG
Weather: 50s cloudy

Date: 11/19/15
Page 1 of 1
Primary Activities:
Initial Calibration Completed at: 2120
Midday Calibration Completed at:
Final Calibration Check Completed at:

| 1. Specific Conductance Calibration | 1413 µS / cm | | |
|---|---|---|---|
| | Temp. | Initial | Cal to. |
| Initial | 21.1 | 1239 | 1.41 |
| Midday | | | |
| Final | | | |

| 2. pH Calibration | | Buffer Solution | | |
|---|---|---|---|---|
| | | pH 7.0 | pH 4.0 | pH 10.0 |
| Initial | temperature (°C) | 21.5 | 21.5 | 21.5 |
| | instrument reading | 6.99 | 3.98 | 10.06 |
| | should read/calibrated | 7.00 | 4.00 | 10.00 |
| Midday | temperature (°C) | | | |
| | instrument reading | | | |
| | should read/calibrated | | | |
| Final | temperature (°C) | | | |
| | instrument reading | | | |

| 4. Dissolved Oxygen Calibration | | Saturation | |
|---|---|---|---|
| | | 100% | 0% |
| Initial | Barometer | 752.3 | |
| | temperature (°C) | 20.3 | |
| | instrument reading | 9.26 | |
| | calibrated to | 9.039 / | 8.142 |
| Midday | Barometer | | |
| | temperature (°C) | | |
| | instrument reading | | |
| | calibrated to | | |
| Final | Barometer | | |
| | temperature (°C) | | |
| | instrument reading | | |

| 3. ORP Calibration | +240 mv Zobell | | |
|---|---|---|---|
| | Temp. | Initial | Cal to. |
| Initial | 21.1 | 237.6 | 239.9 |
| Midday | | | |
| Final | | | |

| 5. Turbidity | 1 NTU Initial | 1 NTU Final | 10 NTU Initial | 10 NTU Final |
|---|---|---|---|---|
| Initial | | | | |
| Midday | | | | |
| Final | | | | |

| | | | |
|---|---|---|---|
| pH 7 Calibration Solution – Lot Number: | 4AD415 | Expiration Date: | 4/31/2016 |
| pH 4 Calibration Solution – Lot Number: | 4AA619 | Expiration Date: | 1/31/16 |
| pH 10 Calibration Solution – Lot Number: | ~~4AA619~~ AG 4AD999 | Expiration Date: | ~~11/31/16~~ AG 4/31/16 |
| Specific Conductance Calibration Solution – Lot Number: | 5GH1047 | Expiration Date: | 8/30/16 |
| ORP Calibration Solution – Lot Number: | 6138 | Expiration Date | 5/31/2018 |
| 1 NTU Turbidity Calibration Solution – Lot Number: | | Expiration Date: | |
| 10 NTU Turbidity Calibration Solution – Lot Number: | | Expiration Date: | |
| Multiparameter Probe – Model: | PES #: | | SN: |
| Turbidity Meter - Model: | PES #: | | SN: |

*Comments: (rental, condition, problems):*

Geosyntec consultants

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# GROUNDWATER SAMPLING LOG

Project Name: UNC CoGen
Date: 11 / 18 / 15
Project Number: GN5219
Phase/Task:
Location: Chapel Hill, NC
Personnel: MJ/AG

Well ID: MW1
Bladder
Screen Interval (ft): 29.5 - 39.5
Pump/Tubing Setting (ft): 35
Well Diameter (in): 2
Tubing Diameter (in): 1/4
DTW (ft): 27.90
DTB (ft): 39.26
Depth Measurement Location: TOC

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance mS (~~µS~~/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 1030 | 225 | 28.06 | 6.08 | 0.240 | 19.8 | 191 | 69.2 | 6.68 |
| 1045 | 350 | 28.15 | 6.06 | 0.239 | 19.8 | 108 | 67.8 | 6.32 |
| 1053 | 315 | 28.13 | 6.01 | 0.235 | 19.8 | 43.6 | 64.4 | 6.42 |
| 1102 | 100 | 28.05 | 6.02 | 0.236 | 19.8 | 349 | 63.0 | 6.63 |
| 1110 | 300 | 28.10 | 5.99 | 0.234 | 19.8 | 73.5 | 57.0 | 6.25 |
| 1115 | 300 | 28.08 | 5.98 | 0.233 | 19.8 | 30.5 | 55.4 | 6.27 |
| 1120 | 300 | 28.08 | 5.97 | 0.232 | 19.8 | 18.5 | 54.2 | 6.23 |
| 1125 | 300 | 28.09 | 5.96 | 0.231 | 19.8 | 14.0 | 53.0 | 6.20 |
| 1130 | 300 | 28.10 | 5.95 | 0.231 | 19.8 | 10.4 | 52.0 | 6.20 |
| 1135 | 300 | 28.10 | 5.95 | 0.230 | 19.8 | 6.91 | 57.0 | 6.33 |
| 1138 | 300 | 28.10 | 5.95 | 0.230 | 19.8 | 5.10 | 53.9 | 6.23 |
| 1143 | 300 | 28.10 | 5.94 | 0.230 | 19.8 | 5.35 | 52.4 | 6.14 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES
Fill time 5.0 sec
Discharge time 4.0 sec
sample MW-1-20151118 @ 1145

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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## GROUNDWATER SAMPLING LOG

Project Name: UNC Cogen
Date: 11 / 20 / 15
Project Number: GN5219
Phase/Task:
Location: CH
Personnel: AG/EN

Well ID: MW 2
Screen Interval (ft): 19.5 - 29.5
Pump/Tubing Setting (ft):
Well Diameter (in): 2
Tubing Diameter (in): 1/4
DTW (ft): 13.9
DTB (ft): 29.5
Depth Measurement Location: TOC

per. 1

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 0823 | — | — | — | — | — | — | — | — |
| 0831 | 390 | 16.5 | 6.49 | 383 | 17.8 | 0.19 | 123.3 | 0.37 |
| 0836 | 240 | 16.8 | 6.50 | 383 | 17.4 | 0.03 | 112.3 | 3.1 |
| 0846 | 240 | 17.0 | 6.49 | 380 | 17.6 | 0.01 | 97.0 | 2.4 |
| 0854 | 240 | 17.0 | 6.50 | 382 | 17.6 | 0.03 | 83.3 | ~~0.22~~ 1.6 0.25 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

**NOTES** Turbidity reading "underrange" recorded as 0.01

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = 0.16 gallons 2.2

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

36 mL / 0.5 m

53

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# GROUNDWATER SAMPLING LOG

Project Name: UNC Cogen
Date: 11 / 20 / 15
Project Number: GNS219
Phase/Task:
Location: CH
Personnel: AG/EN

Well ID: MW3
Screen Interval (ft): 24-29
Pump/Tubing Setting (ft): 25
Well Diameter (in): 2
Tubing Diameter (in): 1/4
DTW (ft): 14.4
DTB (ft): 29
Depth Measurement Location: TOC

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 0943 | 240 | | | | | | | |
| 0957 | 240 | 15.8 | 5.93 | 840 AG | 18.0 | 2.01 | 83.9 | 0.26 |
| 1012 | 240 | 15.9 | 6.87 | 900 AG | 18.1 | 0.62 | 79.3 | 0.45 |
| 1023 | 240 | 15.9 | 6.85 | 920 AG | 18.1 | <0.01 | 73.3 | 0.17 |
| 1042 | 240 | 16.0 | 5.83 | 96 | 18.0 | <0.01 | 66.1 | 0.20 |
| 1051 | 240 | 16.0 | 5.83 | 97 | 18.0 | <0.01 | 63.5 | 0.14 |
| 1056 | 240 | | 5.83 | 97 | 18.1 | | 62.3 | 0.14 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

**NOTES**
turbidity reading "under range" recorded as <0.01

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( feet - feet) X gallons/foot = gallons 2.3

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# GROUNDWATER SAMPLING LOG

Project Name: UNC COGEN
Date: 11 / 18 / 15
Project Number: GN5219
Phase/Task:
Location: Chapel Hill, NC
Personnel: MJ / AG

Well ID: MW-4
Screen Interval (ft): 28-38'
Pump/Tubing Setting (ft): 33'
Well Diameter (in): 2"
Tubing Diameter (in): 1/4"
Bladder pump
DTW (ft): ~~[illegible]~~ 25.63' MJ
DTB (ft): 37.80
Depth Measurement Location: TOC

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 1440 → start pump | | | | | | | | |
| 1455 | 230 | 25.81 | 5.65 | 0.211 | 17.8 | 3.6 | 58.2 | 4.90 |
| 1510 | 280 | 25.83 | 5.66 | 0.211 | 17.8 | 1.29 | 50.5 | 5.0 |
| 1516 | 280 | 25.83 | 5.65 | 0.207 | 17.7 | <1 | 55.7 | 5.10 |
| 1525 | 280 | 25.80 | 5.65 | 0.204 | 17.7 | <1 | 50.8 | 5.05 |
| 1535 | 280 | 25.82 | 5.66 | 0.199 | 17.7 | <1 | 48.1 | 5.10 |
| 1540 | 280 | 25.84 | 5.66 | 0.198 | 17.7 | <1 | 47.4 | 5.00 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

NOTES
Discharge time: 4 sec
Fill time = 11 sec
Some turbidity measurements were "under range"
∴ assumed <1 NTU sample MW-4-20151118 @1540

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( ~~[illegible]~~ feet - 12.17 feet) X 0.16 gallons/foot = 1.93 gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

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# GROUNDWATER SAMPLING LOG

Project Name: UNC COGEN
Date: 11 / 18 / 15
Project Number: GN5219
Phase/Task:
Location: Chapel Hill, NC
Personnel: MJ/AC

Well ID: MW-5
Screen Interval (ft): ~~[illegible]~~ 5-20' MJ
Pump/Tubing Setting (ft): 12.5'
Well Diameter (in): 2"
Tubing Diameter (in): 1/4"
Peristaltic
DTW (ft): 6.76'
DTB (ft): 23.16'
Depth Measurement Location: TOC

| Time | Purge Rate (mL/min) | DTW (ft) | pH (S.U.) | Specific Conductance (µS/cm) | Temp. (°C) | Turbidity (NTU) | ORP (mV) | DO (mg/L) |
|---|---|---|---|---|---|---|---|---|
| 1302 | | 7.07 | → | Start pump | | | | |
| 1310 | 600 | 7.06 | 5.76 | .503 | 17.0 | 32.6 | 49.0 | 0.53 |
| 1320 | 470 | 7.02 | 5.77 | 0.506 | 17.0 | <1 | 39.3 | 0.45 |
| 1330 | 430 | 7.02 | 5.76 | 0.504 | 17.0 | <1 | 34.6 | 0.62 |
| 1340 | 400 | 7.01 | 5.76 | 0.502 | 17.0 | 57.5 | 29.2 | 0.50 |
| 1345 | 400 | 7.01 | 5.76 | 0.502 | 17.0 | <1 | 26.3 | 0.44 |
| 1350 | 400 | 7.01 | 5.76 | 0.503 | 17.0 | <1 | 23.8 | 0.44 |
| 1355 | 400 | 7.02 | 5.76 | 0.504 | 17.0 | <1 | 21.9 | 0.42 |

| Stabilization Criteria | EPA Region 4 | ASTM D 6771-02 |
|---|---|---|
| pH | 0.1 | 0.2 |
| Cond. / Sp. Cond. | 5% | 3% |
| Turbidity | 10% or <10 NTU | none |
| DO | 10% or 0.2 mg/L | 10% or 0.2 mg/L |
| ORP | none | 20 mV |

**NOTES**

Turbidity meter qualified some samples as "under range" ∴ assumed <1 NTU

Sample MW-5-20151118 @ 14:00

**WELL VOLUME** = (TOTAL WELL DEPTH - STATIC DEPTH TO WATER) X WELL CAPACITY
= ( 23.16 feet - 6.76 feet) X .16 gallons/foot = 2.6 gallons

**WELL CAPACITY** (gallons/foot): 0.75"= 0.02; **1"**= 0.04; **1.25"**= 0.06; **2"**=0.16; **3"**= 0.37; **4"**= 0.65; **5"**= 1.02; **6"**= 1.47; **12"**= 5.88

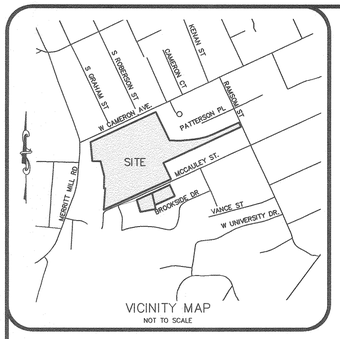
**EQUIPMENT VOLUME** = (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
=( gal/ft X feet) + gallons = gallons

**TUBING INSIDE DIA. CAPACITY** (gal/ft): **1/8"**=0.0006; **3/16"**=0.0014; **1/4"**=0.0026; **5/16"**=0.004; **3/8"**0.006; **1/2"** = 0.010

$\frac{\pi}{4}\left(\frac{1}{2}\right)^2$

# APPENDIX F

# Site Survey Plat




VICINITY MAP
NOT TO SCALE

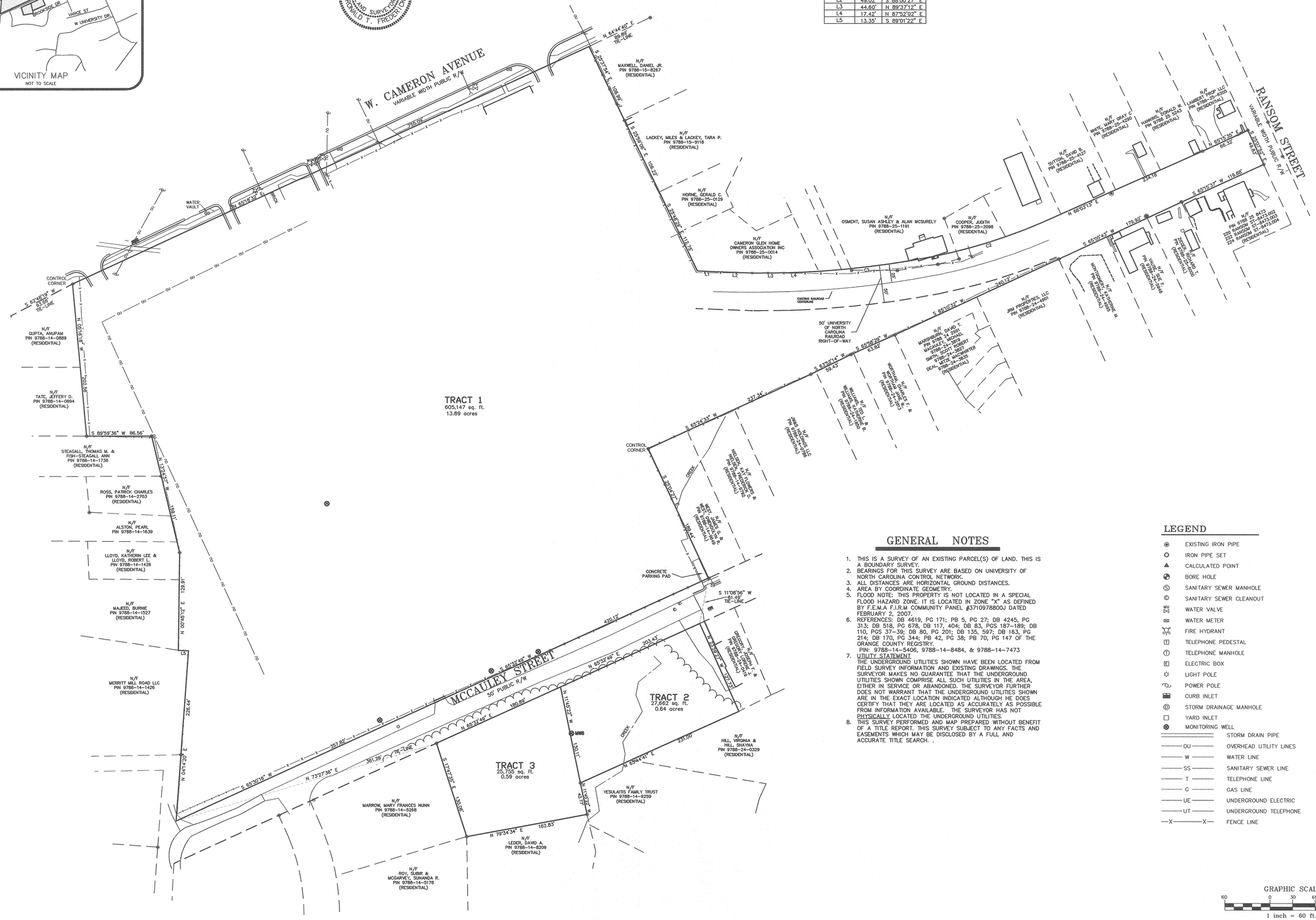
I, RONALD T. FREDERICK, CERTIFY THAT THIS PLAT WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION FROM DEED DESCRIPTION RECORDED IN BOOK AND PAGE (AS SHOWN) ; THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AND DRAWN FROM INFORMATION FOUND IN BOOK AND PAGE (AS SHOWN) ; THAT THE RATIO OF PRECISION AS CALCULATED IS 1: 168,485 ; AND THAT THIS PLAT WAS PREPARED IN ACCORDANCE WITH G.S. 47-30 AS AMENDED. WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER, AND SEAL THIS 17 DAY OF MAY, A.D. 2016

RONALD T. FREDERICK PLS L-4720

NORTH CAROLINA PROFESSIONAL SEAL L-4720 LAND SURVEYOR RONALD T. FREDERICK

| CURVE TABLE | | | | | | |
|---|---|---|---|---|---|---|
| CURVE | RADIUS | LENGTH | CHORD BEARING | CHORD DISTANCE | DELTA | TANGENT |
| C1 | 1207.42' | 178.05' | N 83°14'15" E | 177.89' | 8°26'56" | 89.19 |
| C2 | 726.21' | 150.37' | N 72°37'28" E | 150.10' | 11°51'49" | 75.45 |

| LINE TABLE | | |
|---|---|---|
| LINE | LENGTH | BEARING |
| L1 | 25.78' | S 87°39'56" E |
| L2 | 49.02' | S 88°00'27" E |
| L3 | 44.60' | N 89°37'12" E |
| L4 | 17.42' | N 87°52'02" E |
| L5 | 13.35' | S 89°01'22" E |




## GENERAL NOTES

1. THIS IS A SURVEY OF AN EXISTING PARCEL(S) OF LAND. THIS IS A BOUNDARY SURVEY.
2. BEARINGS FOR THIS SURVEY ARE BASED ON UNIVERSITY OF NORTH CAROLINA CONTROL NETWORK.
3. ALL DISTANCES ARE HORIZONTAL GROUND DISTANCES.
4. AREA BY COORDINATE GEOMETRY.
5. FLOOD NOTE: THIS PROPERTY IS NOT LOCATED IN A SPECIAL FLOOD HAZARD ZONE. IT IS LOCATED IN ZONE "X" AS DEFINED BY F.E.M.A F.I.R.M COMMUNITY PANEL #3710978800J DATED FEBRUARY 2, 2007.
6. REFERENCES: DB 4619, PG 171; PB 5, PG 27; DB 4245, PG 313; DB 518, PG 678, DB 117, 404; DB 83, PGS 187-189; DB 110; PGS 37-39; DB 80, PG 201; DB 135, 597; DB 163, PG 214; DB 170, PG 344; PB 42, PG 38; PB 70, PG 147 OF THE ORANGE COUNTY REGISTRY.
   PIN: 9788-14-5406, 9788-14-8484, & 9788-14-7473
7. UTILITY STATEMENT
   THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.
8. THIS SURVEY PERFORMED AND MAP PREPARED WITHOUT BENEFIT OF A TITLE REPORT. THIS SURVEY SUBJECT TO ANY FACTS AND EASEMENTS WHICH MAY BE DISCLOSED BY A FULL AND ACCURATE TITLE SEARCH. .

## LEGEND

- EXISTING IRON PIPE
- IRON PIPE SET
- CALCULATED POINT
- BORE HOLE
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- WATER VALVE
- WATER METER
- FIRE HYDRANT
- TELEPHONE PEDESTAL
- TELEPHONE MANHOLE
- ELECTRIC BOX
- LIGHT POLE
- POWER POLE
- CURB INLET
- STORM DRAINAGE MANHOLE
- YARD INLET
- MONITORING WELL
- STORM DRAIN PIPE
- OU — OVERHEAD UTILITY LINES
- W — WATER LINE
- SS — SANITARY SEWER LINE
- T — TELEPHONE LINE
- G — GAS LINE
- UE — UNDERGROUND ELECTRIC
- UT — UNDERGROUND TELEPHONE
- X — FENCE LINE

GRAPHIC SCALE
60 0 30 60 120
1 inch = 60 ft.


THE JOHN R. McADAMS COMPANY, INC.
2905 Meridian Parkway
Durham, North Carolina 27713
License No.: C-0293
(800) 733-5646 • McAdamsCo.com


REVISIONS:
1. ADDED MONITORING WELL 5 5-17-2016

SURVEY FOR:
GEOSYNTEC CONSULTANTS OF NC, PC
4601 SIX FORKS ROAD SUITE 340
RALEIGH NC 27609

# UNIVERSITY OF NORTH CAROLINA
## COGENERATION FACILITY
TOWN OF CHAPEL HILL, ORANGE COUNTY, NORTH CAROLINA

BOUNDARY SURVEY

| | |
|---|---|
| PROJECT NO. | UNC-13000 |
| FILENAME: | UNC13000-B3 |
| SURVEYED BY: | RTF |
| DRAWN BY: | RTF |
| SCALE: | 1"=60' |
| DATE: | 04-07-2016 |
| SHEET NO. | 1 OF 1 |

McADAMS

X:\Projects\UNC\UNC-13000 (SPEC-12110) UNC-CH COGEN Facility Warehouse\Survey\Boundary\UNC13000-B3.dwg, 5/17/2016 9:57:09 AM, Frederick, Ron

# APPENDIX G

# Non-Hazardous Waste Manifests

# EVO CORPORATION

**1703 Vargrave Street, Winston-Salem, NC 27107**
**www.evocorp.net**
**NON-HAZARDOUS MATERIALS MANIFEST**

Load # Manifest No. 71930

## GENERATOR INFORMATION

Generator: UNC Chapel Hill Phone: 919-962-6666
Site Address: 575 West Cameron Ave
City/State: Chapel Hill, NC Contact: Larry Daw
10-22-2014

## MATERIAL DESCRIPTION / QUANTITY / WEIGHT

Gross Weight (lbs): Material: Soil
Empty Weight (lbs): Contaminant: Non-Haz PAHs
Net Weight (lbs):

Quantity 5 Tons Drums Pails Sacs (Yards) Other:

## TRANSPORTER INFORMATION

Transporter: Evo Corporation Phone: 336-725-5844
Truck #: 401 Contact: Tony Disher

As the transporter, I certify that the materials described above being shipped under this non-hazardous materials manifest are properly classified, packaged, labeled, secured and are in proper condition for transport in commerce under the applicable regulations governing transportation, and I hereby receive this material for delivery to the facility designate.

Driver Signature: Date: 10/22/14

## FACILITY INFORMATION

101445

Evo Project #:

EVO CORPORATION
1703 Vargrave Street
Winston-Salem, NC 27107

Phone: (336) 725-5844

Contact: Tony Disher

I certify that the carrier has delivered the materials described above to this facility, and I hereby accept this material for treatment and/or disposal in a manner that has been authorized by the State of North Carolina.

Facility Signature: Date:

White/Facility Canary/Invoice Goldenrod/Generator Pink/Carrier

Evo Corporation, 2008

# EVO CORPORATION

**1703 Vargrave Street, Winston-Salem, NC 27107**
**www.evocorp.net**
**NON-HAZARDOUS MATERIALS MANIFEST**

Load # Manifest No. 69036

## GENERATOR INFORMATION

Generator: The University of North Carolina Phone: 919-962-6666
Site Address: 575 W Cameron Ave (Coganeration Facility)
City/State: Chapel Hill, NC 27599 Contact: Larry Daw

## MATERIAL DESCRIPTION / QUANTITY / WEIGHT

Gross Weight (lbs): Material: Soil
Empty Weight (lbs): Contaminant: Non-Haz PAHs
Net Weight (lbs):

Quantity 2 Tons Drums Pails Sacs Yards Other:

## TRANSPORTER INFORMATION

Transporter: Evo Corporation Phone: 336-725-5844
Truck #: 461 Contact: Tony Disher

As the transporter, I certify that the materials described above being shipped under this non-hazardous materials manifest are properly classified, packaged, labeled, secured and are in proper condition for transport in commerce under the applicable regulations governing transportation, and I hereby receive this material for delivery to the facility designate.

Driver Signature: Date: 6/24/15

## FACILITY INFORMATION

Evo Project #: 061539

EVO CORPORATION
1703 Vargrave Street
Winston-Salem, NC 27107

Phone: (336) 725-5844

Contact: Tony Disher

I certify that the carrier has delivered the materials described above to this facility, and I hereby accept this material for treatment and/or disposal in a manner that has been authorized by the State of North Carolina.

Facility Signature: Date:

White/Facility Canary/Invoice Goldenrod/Generator Pink/Carrier

Evo Corporation, 2008

# APPENDIX H

# Verification Samples Laboratory Report

11/1/2013

GeoSyntec Consultants
4601 Six Forks Road Suite 340
Raleigh, NC 27609
Attn: Beau Hodge

Project#: GN5219
Project Name: UNC Cogen

MVL Job #: 7162

Dear Beau:

This report covers the methods and findings of the Coal/Coal Ash analysis that MicroVision Laboratories, Inc. conducted on four (4) soil samples submitted for this testing from your UNC Cogen project. The purpose of this analysis was to detect and document any coal, coal ash, or wood ash that may be present in the submitted soil samples, by use of a combination of microscopy techniques including SEM/EDS, PLM, and macroscopic inspection.

**Methods:**

The samples were dried and examined by eye and under the stereomicroscope for any suspect dark components to the soil. Dark suspect particles were separated from the soil samples and prepared for examination by Polarized Light Microscopy (PLM) and Scanning Electron Microscopy with Energy Dispersive X-Ray Spectroscopy (SEM/EDS).

For the PLM examination, the suspect particle types detected in these samples were ground in a mortar and pestle, mounted on glass slides in immersion oil (n=1.515) and covered with glass cover slips. These sample particles were then examined at various magnifications and digital images were taken.

For the SEM examination, the suspect particle types were mounted on an aluminum analysis stub with double sided adhesive tape, coated with evaporated graphite and examined under the SEM by EDS to obtain elemental data in the form of EDS spectra. Digital images were taken of the sample particles at various magnifications with the SEM.

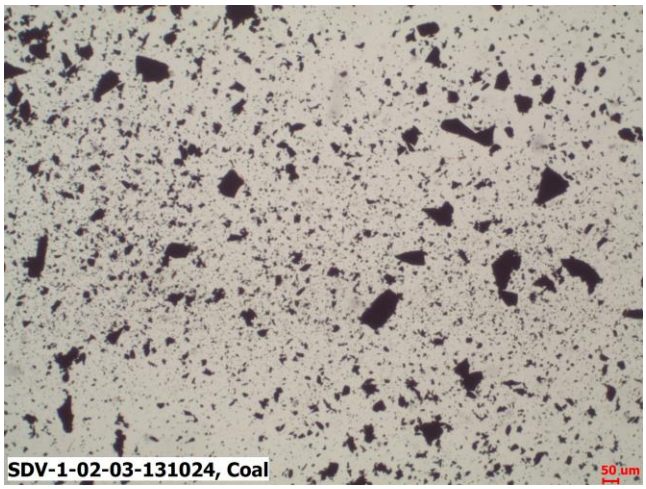
**Findings:**

The following pages display the data for each particle type detected in the samples for this project. Each page contains a PLM image, SEM image, and EDS spectrum for the particle types detected for these samples as well as particle type descriptions and observations.

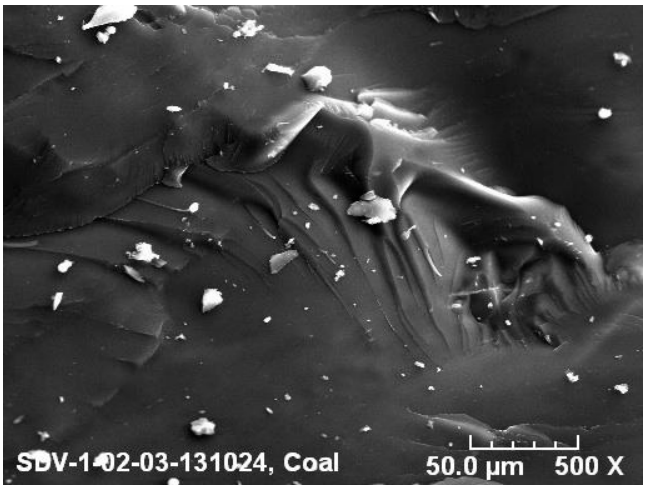
# Sample: SDV-1-02-03-131024

**Number of Suspect Particle Types: Two (2)**

Particle type 1 consisted of twenty (20) shiny, black grains approximately 1mm-4mm in diameter. The PLM examination indicated this particle type to be consistent with coal. The PLM and SEM images of this particle type show the angular edges and typical conchoidal fractures found in coal.

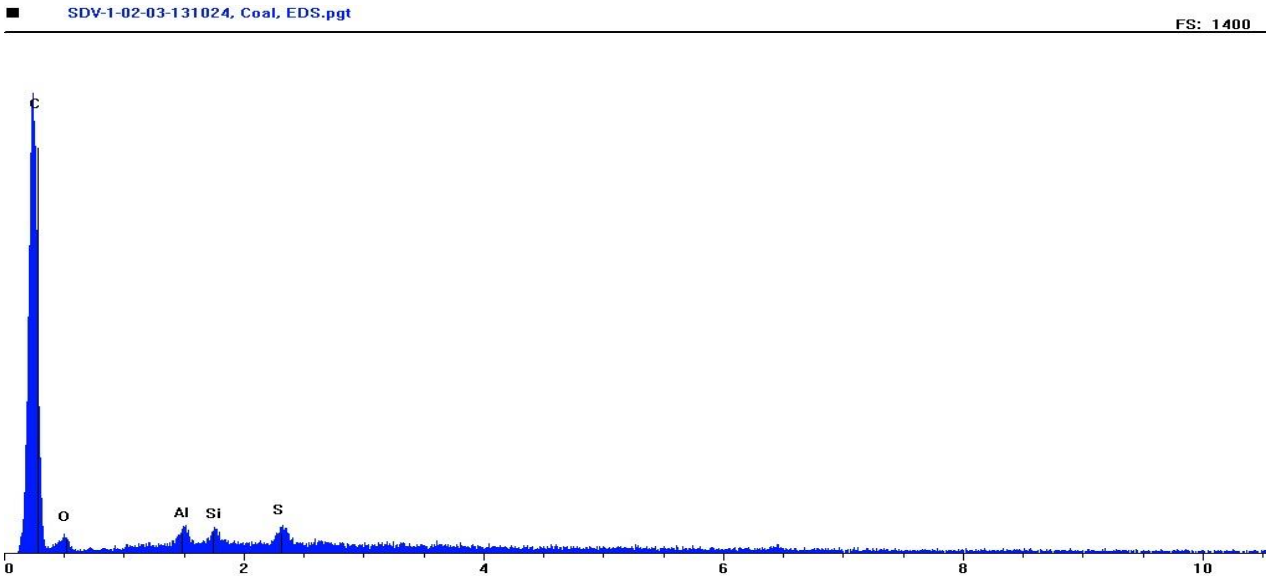



**PLM Image**



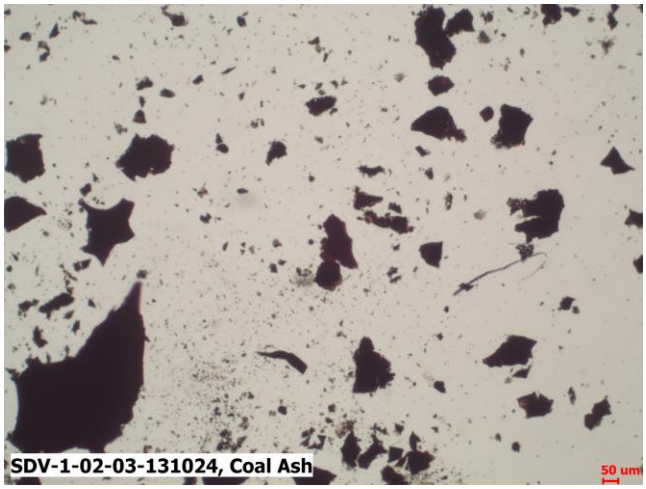

**SEM Image**

The EDS spectrum, shown below, confirms that this particle type is coal. The analysis for this particle shows a strong peak concentration of carbon, with lower peak concentrations of oxygen, aluminum, silicon, and sulfur.

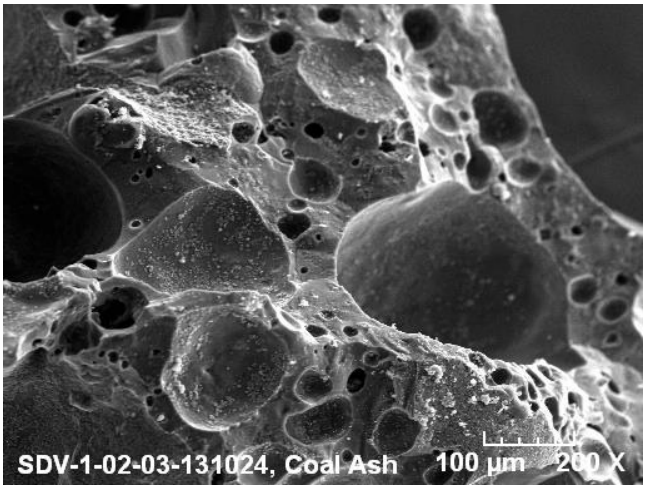



MicroVision Laboratories, Inc. 187 Billerica Road, Chelmsford, MA 01824
Phone: (978) 250-9909 Fax: (978) 250-9901 Email: Sales@MicroVisionLabs.com
www.MicroVisionLabs.com

Particle type 2 consisted of two (2) dark, porous grains approximately 1mm-6mm in diameter. The PLM examination indicated this particle type to be consistent with coal ash. The PLM and SEM images show the spherical gas voids that formed during combustion.

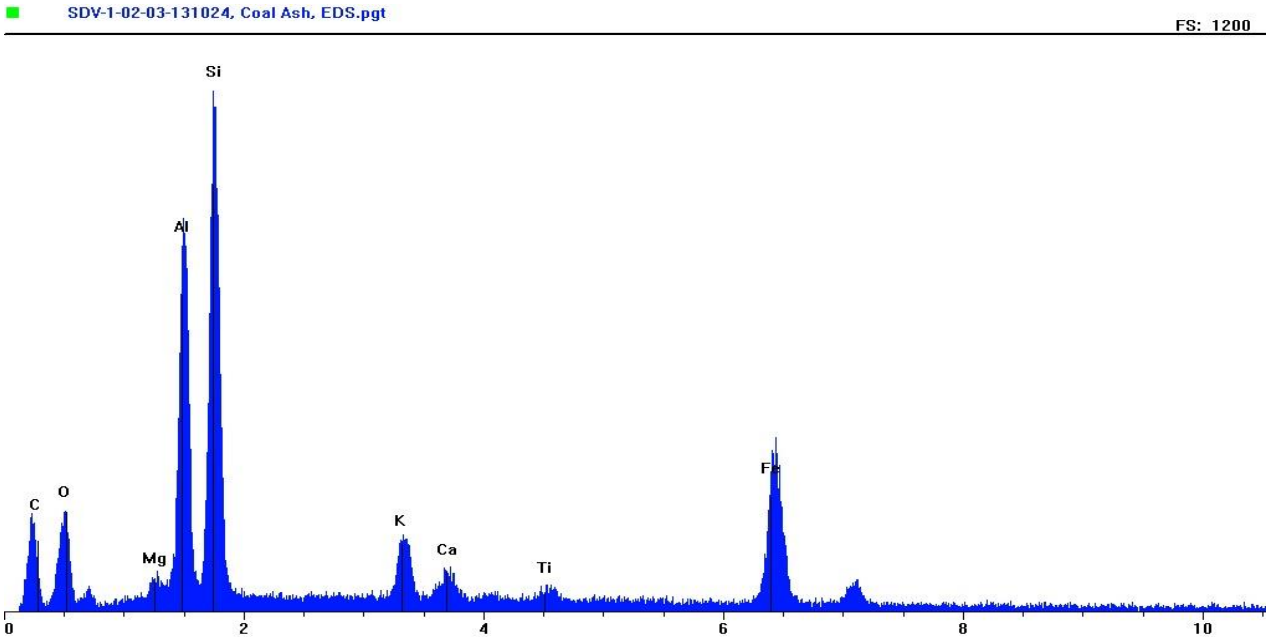



**PLM Image**




**SEM Image**

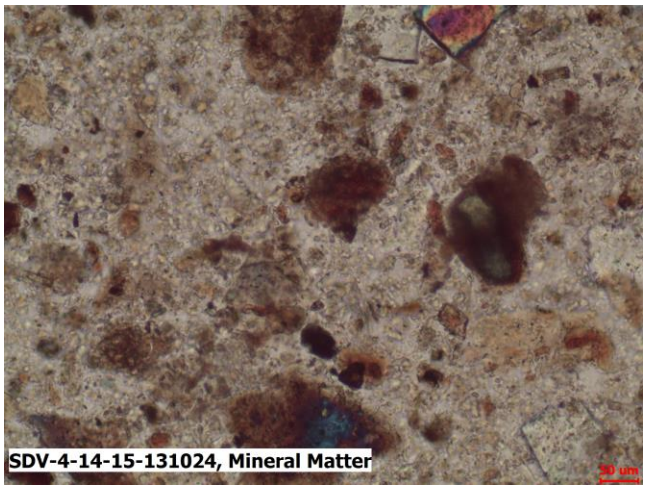
The EDS spectrum, shown below, confirms this particle type is coal ash. The analysis for this particle shows strong to moderate peak concentrations of aluminum and silicon, with lower peak concentrations of carbon, oxygen, magnesium, potassium, calcium, titanium and iron.



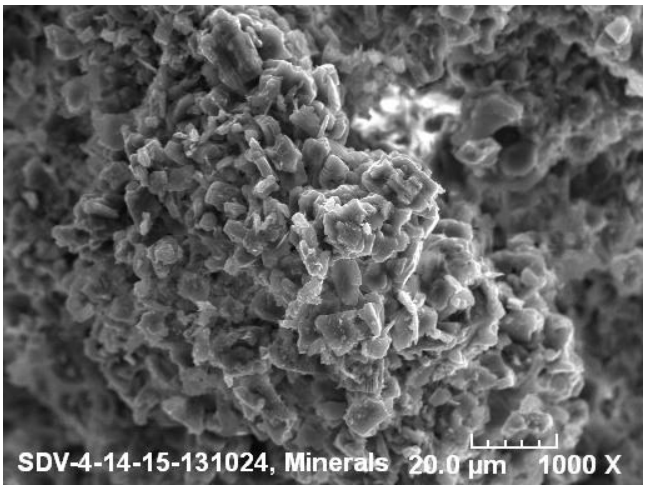
# Sample: SDV-4-14-15-131024

**Number of Suspect Particle Types: One (1)**

Particle type 1 consisted of over one thousand (1000+) shiny, dark grains 1mm-10mm in diameter. The PLM examination indicated this particle type to be consistent with mineral matter. The PLM and SEM images of this particle type are displayed below.



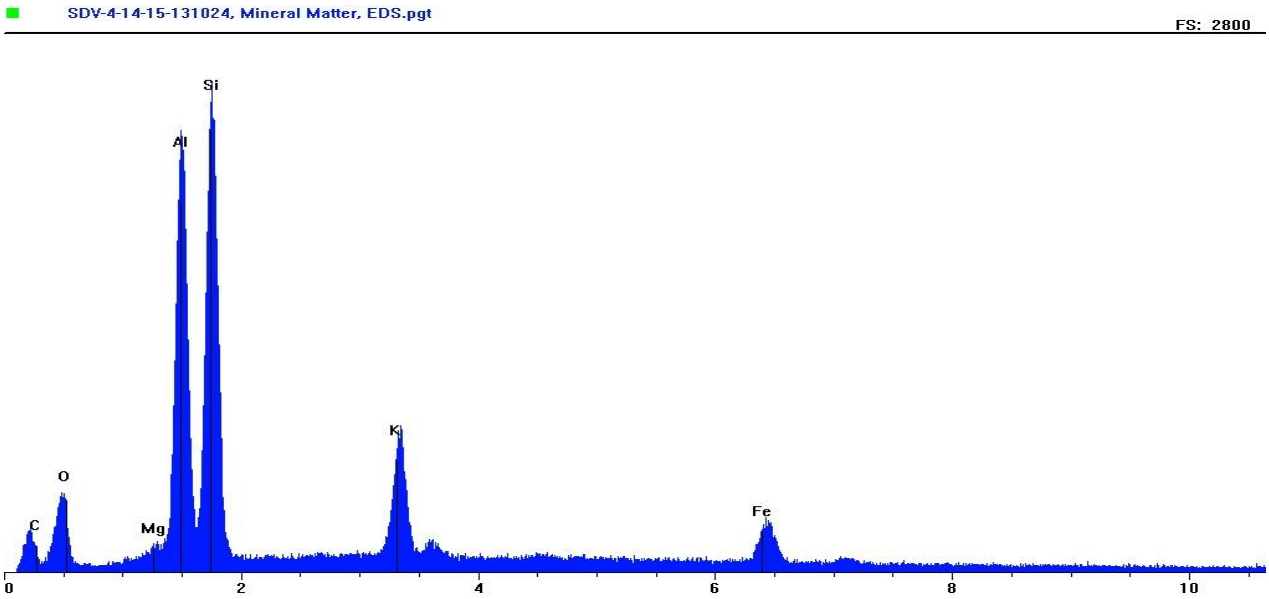

**PLM Image**




**SEM Image**

The EDS spectrum for this particle shows a strong to moderate peak concentrations of aluminum, silicon and potassium, with lower peak concentrations of carbon, oxygen, magnesium and iron.

No coal, coal ash, wood ash, or asphalt particles were detected in this sample.

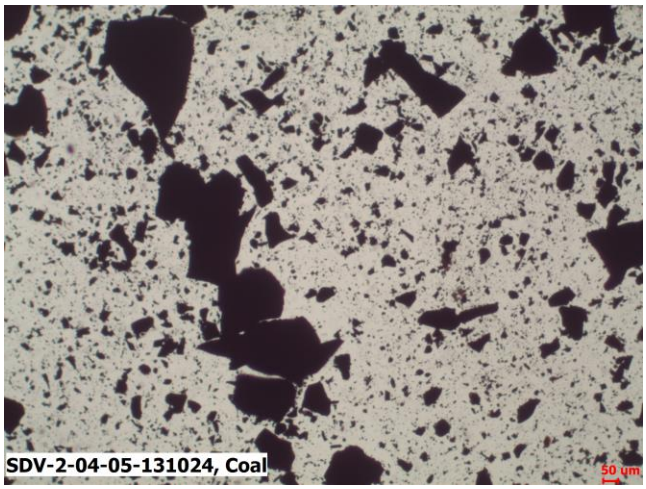



MicroVision Laboratories, Inc. 187 Billerica Road, Chelmsford, MA 01824
Phone: (978) 250-9909 Fax: (978) 250-9901 Email: Sales@MicroVisionLabs.com
www.MicroVisionLabs.com

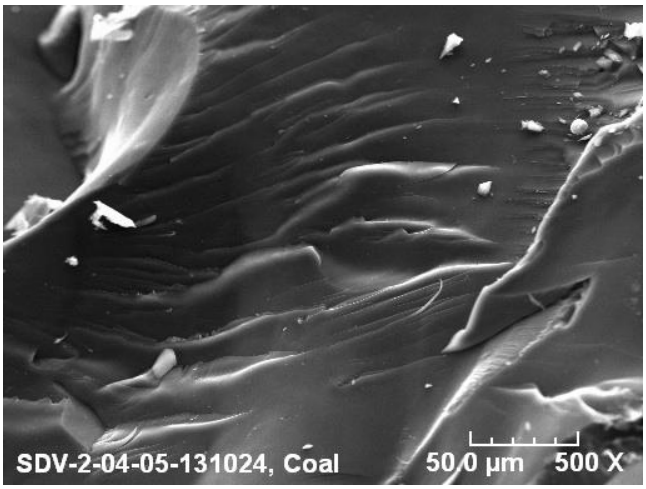
# Sample: SDV-2-04-05-131024

**Number of Suspect Particle Types: Two (2)**

Particle type 1 consisted of eight (8) shiny, black grains approximately 1mm-7mm in diameter. The PLM examination indicated this particle type to be consistent with coal. The PLM and SEM images of this particle type show the angular edges and typical conchoidal fractures found in coal.

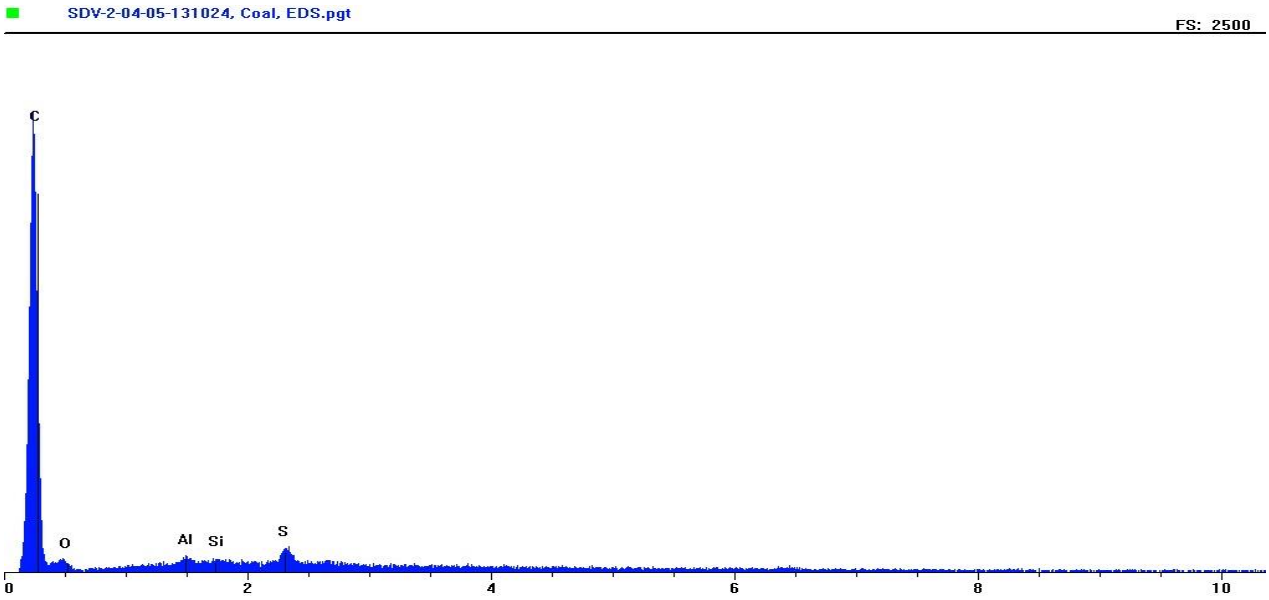



**PLM Image**

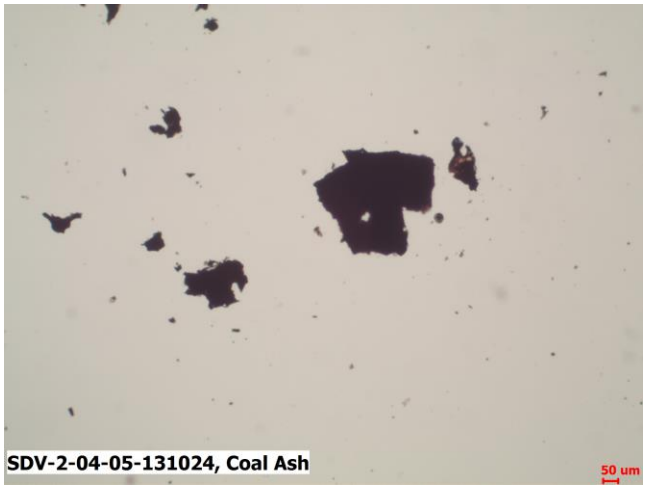



**SEM Image**

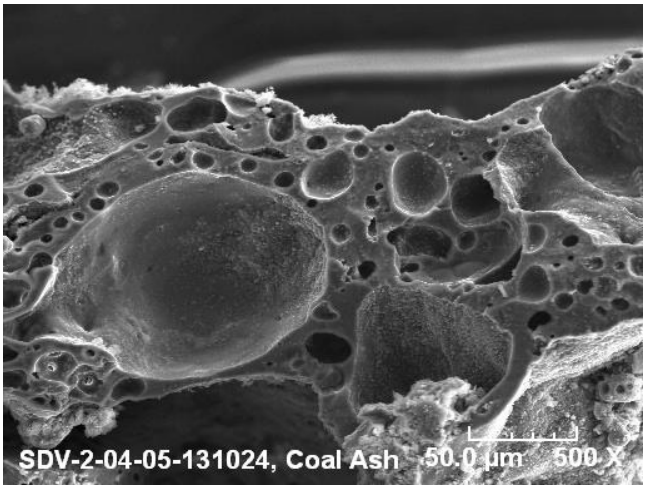
The EDS spectrum, shown below, confirms that this particle type is coal. The analysis for this particle shows a strong peak concentration of carbon, with lower peak concentrations of oxygen, aluminum, silicon and sulfur.



Particle type 2 consisted of one (1) dark, porous grain approximately 1mm in diameter. The PLM examination indicated this particle type to be consistent with coal ash. The PLM and SEM images show the spherical gas voids that formed during combustion.

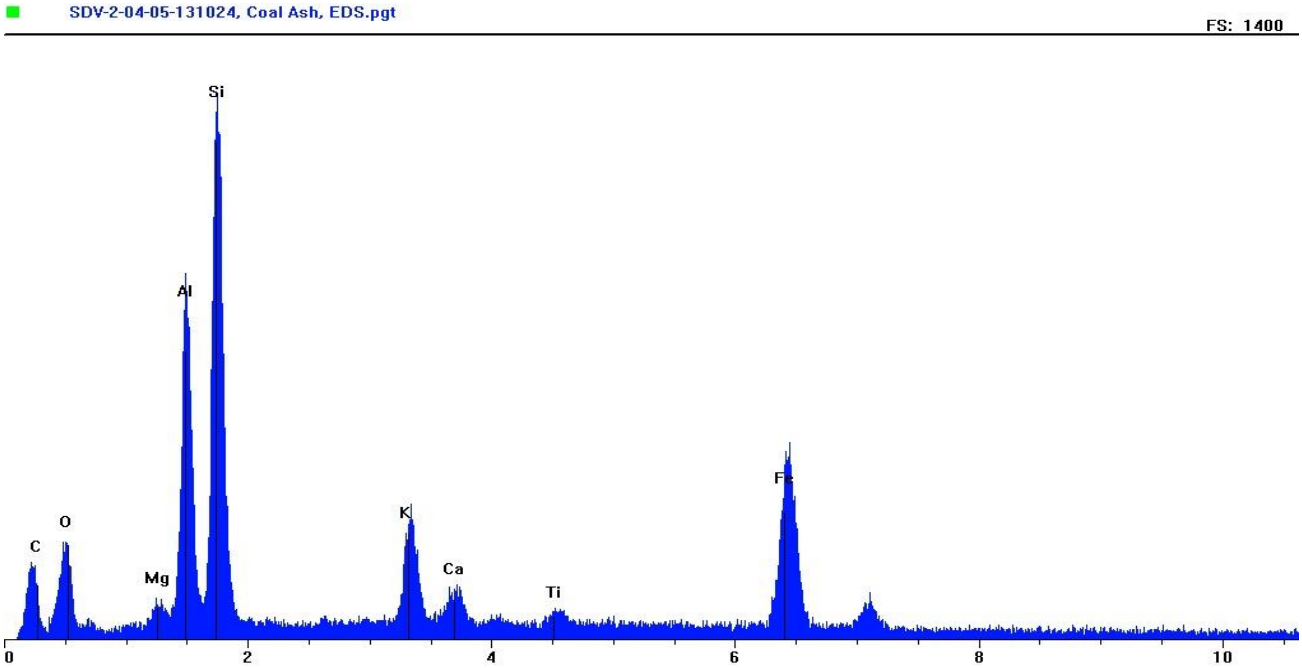



**PLM Image**




**SEM Image**

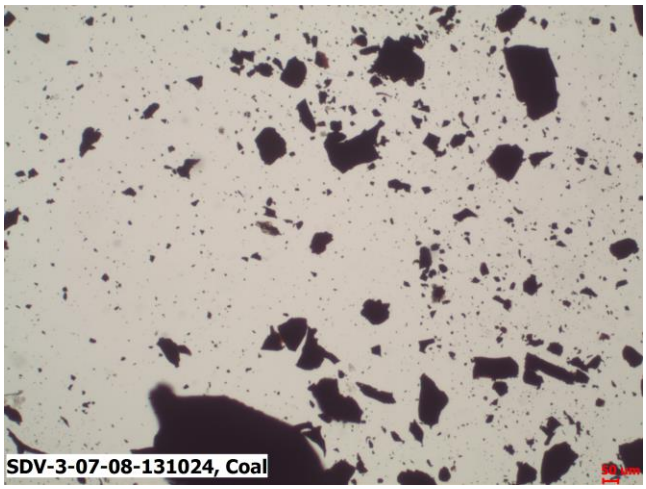
The EDS spectrum, shown below, confirms this particle type is coal ash. The analysis for this particle shows strong to moderate peak concentrations of aluminum, silicon and iron, with lower peak concentrations of carbon, oxygen, magnesium, potassium, calcium and titanium.



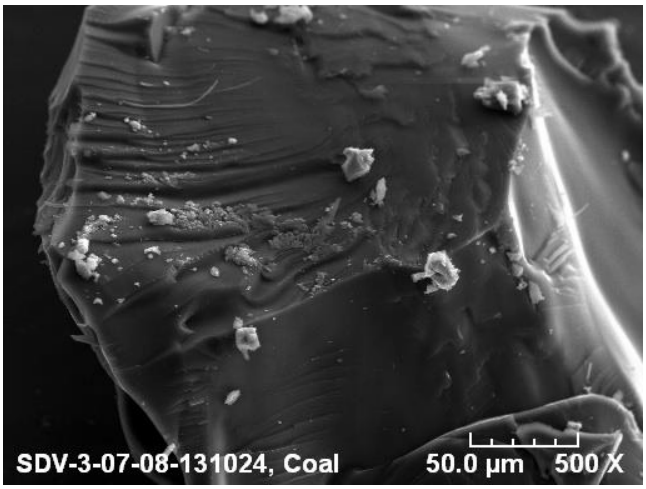
# Sample: SDV-3-07-08-131024

**Number of Suspect Particle Types: Two (2)**

Particle type 1 consisted of fifteen (15) shiny, black grains approximately 1mm-4mm in diameter. The PLM examination indicated this particle type to be consistent with coal. The PLM and SEM images of this particle type show the angular edges and typical conchoidal fractures found in coal.

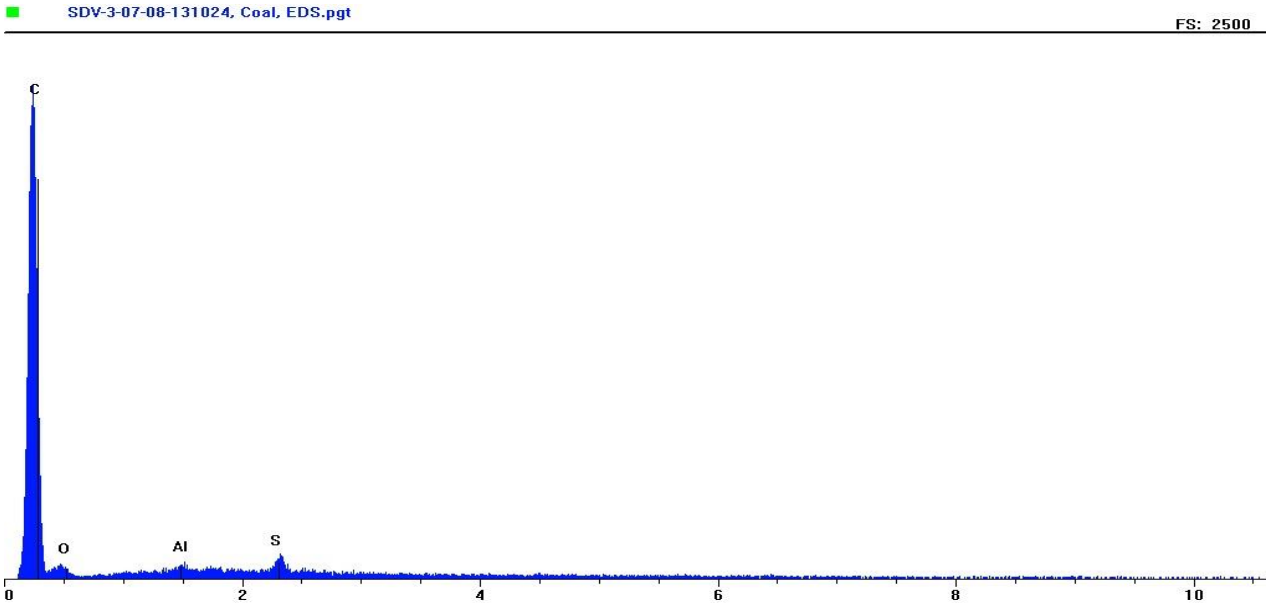



**PLM Image**

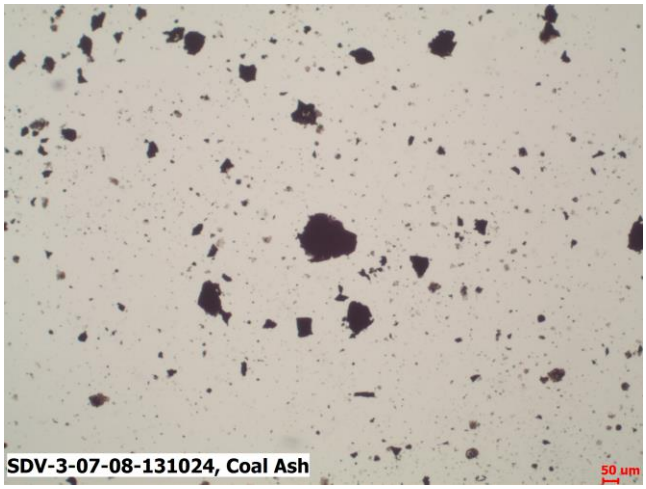



**SEM Image**

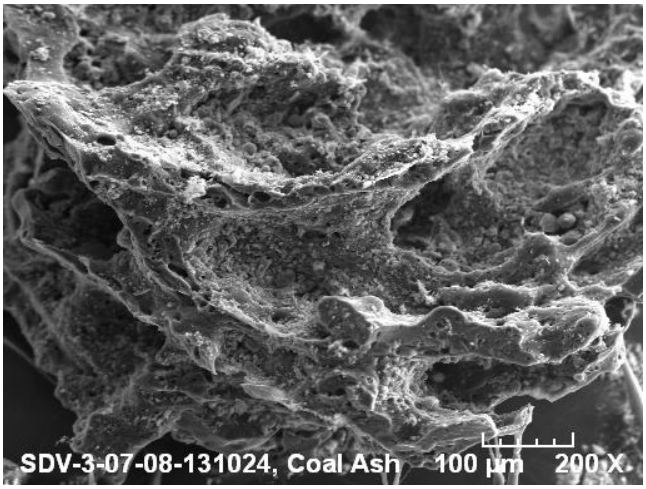
The EDS spectrum, shown below, confirms that this particle type is coal. The analysis for this particle shows a strong peak concentration of carbon, with lower peak concentrations of oxygen, aluminum and sulfur.



Particle type 2 consisted of one (1) dark, porous grain approximately 1mm in diameter. The PLM examination indicated this particle type to be consistent with coal ash. The PLM and SEM images show the spherical gas voids that formed during combustion.

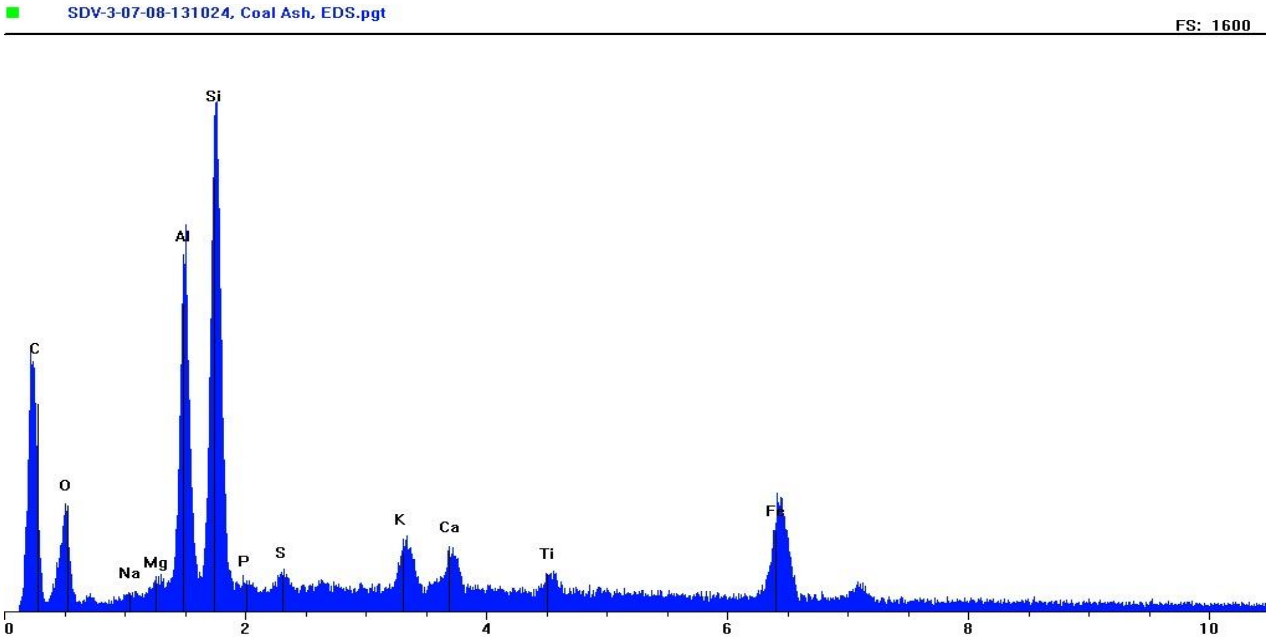



**PLM Image**




**SEM Image**

The EDS spectrum, shown below, confirms this particle type is coal ash. The analysis for this particle shows strong to moderate peak concentrations of carbon, aluminum and silicon, with lower peak concentrations of oxygen, sodium, magnesium, phosphorus, sulfur, potassium, calcium, titanium and iron.



**Results Summary Table:**

| Sample Name | Material Detected |
|---|---|
| **SDV-1-02-03-131024** | **Coal (moderate), Coal Ash (trace)** |
| **SDV-4-14-15-131024** | **Minerals (heavy)** |
| **SDV-2-04-05-131024** | **Coal (light), Coal Ash (trace)** |
| **SDV-3-07-08-131024** | **Coal (moderate), Coal Ash (trace)** |

The concentrations of the particle types detected in these samples are listed in parenthesis in the table above and are based on the number of particles found and the relative difficultly in finding them. The concentration information is listed for informational purposes only and has no bearing on exemption status.

Please let me know if you have any questions about this analysis or if there is anything else I can do for you.

Sincerely,

Tyler Wozmak
Optical Microscopist

Denise Weidler
Analytical Microscopist

MICROVISION LABORATORIES, INC.

# Chain Of Custody

MicroVision Labs Job#: 7162

| Client Information | | Project Information | |
|---|---|---|---|
| Client: | Geosyntec | Project Name: | UNC Cogen |
| Billing Address: | 4601 Six Forks Rd Suite 340 Raleigh NC 27609 | Project Location: | Chapel Hill NC |
| | | Project Number: | GN5219 |
| Phone: | 919 870-0576 | Project Manager: | Beau Hodge |
| Fax: | | PO#: | |
| Email: | mschott@geosyntec.com | | |

| Sample ID | Collected Date | Sampler's Initials | Coal Ash Test | Lead Paint | SEM/EDS | PLM/Light Microscopy | Soot ID | Dust ID | Unknow Mat'l ID | FTIR | Polished Cross Section | Particle Size Analysis | Wildfire | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1) SDV-1-02-03-131024 | 10/24/13 | JM | X | | | | | | | | | | | |
| 2) SDV-4-14-15-131024 | 10/24/13 | JM | X | | | | | | | | | | | |
| 3) SDV-2-04-05-131024 | 10/24/13 | JM | X | | | | | | | | | | | |
| 4) SDV-3-07-08-131024 | 10/24/13 | JM | X | | | | | | | | | | | |
| 5) | | | | | | | | | | | | | | |
| 6) | | | | | | | | | | | | | | |
| 7) | | | | | | | | | | | | | | |
| 8) | | | | | | | | | | | | | | |
| 9) | | | | | | | | | | | | | | |
| 10) | | | | | | | | | | | | | | |
| 11) | | | | | | | | | | | | | | |
| 12) | | | | | | | | | | | | | | |

Requested Analyses

| Relinquished By: | Date/Time | Received By: | Date/Time |
|---|---|---|---|
| [illegible] | 10/24/13 2010 | [illegible] | 10/25/13 11am |

Turn Around Time and Notes: Standard

Hazardous Contaminants: YES / NO If Yes, please list:

Analytical Report Requested: YES / NO

MicroVision Laboratories, Inc.
187 Billerica Road, Chelmsford, MA 01824
Phone 978-250-9909 Fax 978-250-9901 Toll Free 1-877-250-9909
microvisionlabs.com



MicroVision Laboratories, Inc. 187 Billerica Road, Chelmsford, MA 01824
Phone: (978) 250-9909 Fax: (978) 250-9901 Email: Sales@MicroVisionLabs.com
www.MicroVisionLabs.com

# APPENDIX I

# Laboratory Analytical Reports – Background Soil

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-61264-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 5:53:32 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| B | Compound was found in the blank and sample. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-61264-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-61264-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**
The samples were received on 10/15/2014 8:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.3º C.

Except:

Mercury 7471B analysis was not specifically requested on the chain of custody; however, it has been logged per the project. The client was notified and asked to confirm that Mercury 7471B analysis is requested for these samples on 10/16/2014. Per instruction from client on 10/17/2014, only samples SB-31-7-8, SB-30, SB-29, and SB-28, laboratory IDs 280-61264-11, -13, -14, and -15 require Mercury 7471B analysis.

Per instructions from client on 10/17/2014, all analyses for sample SB-31, laboratory ID 280-61264-12, have been cancelled.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 10/17/2014 10:30 AM and 10/18/2014; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the coolers at receipt were 3.6º C and 1.0º C .

**8270D SIM GCMS**
Samples SB-31-7-8 (280-61264-11), SB-30 (280-61264-13), SB-29 (280-61264-14) and SB-28 (280-61264-15) were analyzed for 8270D SIM GCMS in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 10/22/2014 and analyzed on 10/23/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**
Samples BKG 1 (280-61264-1), BKG 2 (280-61264-2), BKG 3 (280-61264-3), BKG 4 (280-61264-4), BKG 5 (280-61264-5), BKG 6 (280-61264-6), BKG 7 (280-61264-7), BKG 8 (280-61264-8), BKG 9 (280-61264-9), BKG 10 (280-61264-10), SB-31-7-8 (280-61264-11), SB-30 (280-61264-13), SB-29 (280-61264-14) and SB-28 (280-61264-15) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 10/15/2014 and 10/31/2014 and analyzed on 10/28/2014, 10/29/2014, 11/01/2014 and 11/04/2014.

Aluminum and Iron failed the recovery criteria high for the MS of sample BKG 1MS (280-61264-1) in batch 280-250252. Aluminum and Iron failed the recovery criteria high for the MSD of sample BKG 1MSD (280-61264-1) in batch 280-250252. Refer to the QC report for details.

## Job ID: 280-61264-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

Due to matrix interference, samples BKG 9 (280-61264-9)[5X], BKG 10 (280-61264-10)[5X] and SB-29 (280-61264-14)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

The low level continuing calibration verification (CCVL 280-250252/28) associated with batch 250252 recovered above the upper control limit for Selenium. The samples associated with this CCVL were below the reporting limit for the affected analytes; therefore, the data have been reported.

The instrument blank for analytical batch 250252 contained Iron greater than one-half the reporting limit (RL). The concentration of Iron in the associated samples was greater than 10x than the instrument blank result; therefore, the samples were not re-analyzed because associated samples were

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY (CVAA)**
Samples SB-31-7-8 (280-61264-11), SB-30 (280-61264-13), SB-29 (280-61264-14) and SB-28 (280-61264-15) were analyzed for total mercury (CVAA) in accordance with EPA SW-846 Method 7471B. The samples were prepared and analyzed on 11/04/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**PERCENT SOLIDS**
Samples BKG 1 (280-61264-1), BKG 2 (280-61264-2), BKG 3 (280-61264-3), BKG 4 (280-61264-4), BKG 5 (280-61264-5), BKG 6 (280-61264-6), BKG 7 (280-61264-7), BKG 8 (280-61264-8), BKG 9 (280-61264-9), BKG 10 (280-61264-10), SB-31-7-8 (280-61264-11), SB-30 (280-61264-13), SB-29 (280-61264-14) and SB-28 (280-61264-15) were analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 10/16/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: BKG 1 — Lab Sample ID: 280-61264-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | | 12 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.3 | J | 2.3 | 0.77 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 45 | | 1.2 | 0.089 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.57 | J | 0.58 | 0.039 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 5.6 | | 1.8 | 0.068 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.9 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 28 | | 2.3 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 13000 | | 18 | 4.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 13 | | 0.93 | 0.32 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 130 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.4 | J | 4.7 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 28 | | 2.3 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 22 | | 3.5 | 0.46 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: BKG 2 — Lab Sample ID: 280-61264-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 22000 | | 9.7 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.6 | J | 1.9 | 0.64 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 34 | | 0.97 | 0.074 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.51 | | 0.48 | 0.032 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 4.8 | | 1.5 | 0.056 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.5 | | 0.97 | 0.097 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 21 | | 1.9 | 0.21 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 14000 | | 15 | 3.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 11 | | 0.77 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 64 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.8 | J | 3.9 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 32 | | 1.9 | 0.091 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 33 | | 2.9 | 0.39 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: BKG 3 — Lab Sample ID: 280-61264-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 35000 | | 11 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.2 | J | 2.1 | 0.70 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 24 | | 1.1 | 0.080 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.37 | J | 0.53 | 0.035 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 8.6 | | 1.6 | 0.061 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.6 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 11 | | 2.1 | 0.23 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 16000 | | 16 | 4.0 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 9.3 | | 0.85 | 0.29 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 65 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.4 | J | 4.2 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 0.99 | J | 1.4 | 0.91 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 31 | | 2.1 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 18 | | 3.2 | 0.42 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: BKG 4 — Lab Sample ID: 280-61264-4

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: BKG 4 (Continued) — Lab Sample ID: 280-61264-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 23000 | | 12 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.9 | J | 2.4 | 0.79 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 18 | | 1.2 | 0.091 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.77 | | 0.60 | 0.039 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 20 | | 1.8 | 0.069 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 5.0 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 14 | | 2.4 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 29000 | | 18 | 4.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 20 | | 0.95 | 0.32 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 160 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 5.0 | | 4.8 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 1.1 | J | 1.6 | 1.0 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 66 | | 2.4 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 27 | | 3.6 | 0.47 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: BKG 5 — Lab Sample ID: 280-61264-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 24000 | | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.5 | J | 2.1 | 0.68 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 22 | | 1.0 | 0.078 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.57 | | 0.51 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 12 | | 1.5 | 0.060 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 11 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 22 | | 2.1 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 15000 | | 15 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 35 | | 0.82 | 0.28 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 150 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 4.0 | J | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 1.2 | J | 1.3 | 0.88 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 44 | | 2.1 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 45 | | 3.1 | 0.41 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: BKG 6 — Lab Sample ID: 280-61264-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 21000 | | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 0.69 | J | 2.0 | 0.67 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 29 | | 1.0 | 0.077 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.22 | J | 0.51 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.053 | J | 0.52 | 0.042 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 21 | | 1.5 | 0.059 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 7.6 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 41 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 16000 | | 15 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 14 | | 0.81 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 330 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 7.5 | | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 28 | | 2.0 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 110 | | 3.0 | 0.40 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: BKG 7 — Lab Sample ID: 280-61264-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 29000 | | 12 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.5 | | 2.4 | 0.78 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 28 | | 1.2 | 0.090 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.39 | J | 0.59 | 0.039 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 10 | | 1.8 | 0.069 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 2.1 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 14 | | 2.4 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 17000 | | 18 | 4.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 12 | | 0.95 | 0.32 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 48 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.8 | J | 4.7 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 1.3 | J | 1.5 | 1.0 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 50 | | 2.4 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 27 | | 3.5 | 0.47 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: BKG 8 — Lab Sample ID: 280-61264-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 30000 | | 9.5 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.3 | | 1.9 | 0.63 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 46 | | 0.95 | 0.073 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 1.8 | | 0.48 | 0.031 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.20 | J | 0.50 | 0.041 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 13 | | 1.4 | 0.055 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 78 | | 0.95 | 0.095 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 50 | | 1.9 | 0.21 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 56000 | | 14 | 3.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 33 | | 0.76 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 1700 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 4.2 | | 3.8 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 1.8 | | 1.2 | 0.82 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 190 | | 1.9 | 0.090 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 84 | | 2.9 | 0.38 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: BKG 9 — Lab Sample ID: 280-61264-9

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 14000 | | 9.4 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.4 | J | 1.9 | 0.62 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 21 | | 0.94 | 0.071 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.34 | J | 0.47 | 0.031 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 20 | | 1.4 | 0.054 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 3.1 | | 0.94 | 0.094 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 45 | | 1.9 | 0.20 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 16000 | | 14 | 3.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 3.8 | | 0.75 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 560 | | 5.1 | 0.51 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Nickel | 3.2 | J | 3.8 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 45 | | 1.9 | 0.088 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 14 | | 2.8 | 0.37 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: BKG 10 — Lab Sample ID: 280-61264-10

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 15000 | | 12 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.8 | J | 2.3 | 0.76 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 18 | | 1.2 | 0.088 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.30 | J | 0.58 | 0.038 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 14 | | 1.7 | 0.067 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.2 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 19 | | 2.3 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 12000 | | 17 | 4.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 5.9 | | 0.92 | 0.31 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 66 | | 5.4 | 0.54 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Nickel | 2.2 | J | 4.6 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 28 | | 2.3 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 11 | | 3.5 | 0.46 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: SB-31-7-8 — Lab Sample ID: 280-61264-11

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 27000 | | 11 | 1.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 0.80 | J | 2.2 | 0.73 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 34 | | 1.1 | 0.084 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.31 | J | 0.56 | 0.037 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 7.3 | | 1.7 | 0.064 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.4 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 13 | | 2.2 | 0.24 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 8400 | | 17 | 4.2 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 5.5 | | 0.89 | 0.30 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 47 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.9 | J | 4.4 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 1.1 | J | 1.4 | 0.95 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 24 | | 2.2 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 20 | | 3.3 | 0.44 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 26 | | 22 | 7.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SB-30 — Lab Sample ID: 280-61264-13

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 6700 | | 5800 | 300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 7400 | | 5800 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 720 | J | 5800 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 6000 | | 5800 | 200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 4900 | J | 5800 | 840 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 15000 | | 5800 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 15000 | | 5800 | 860 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 25000 | | 5800 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 8300 | | 5800 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 8200 | | 5800 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 22000 | | 5800 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 2700 | J | 5800 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 22000 | | 5800 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1100 | J | 5800 | 550 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: SB-30 (Continued) — Lab Sample ID: 280-61264-13

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Indeno[1,2,3-cd]pyrene | 9500 | | 5800 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 4300 | J | 5800 | 380 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 16000 | | 5800 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 23000 | | 5800 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 14000 | | 11 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.6 | J | 2.3 | 0.76 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 56 | | 1.1 | 0.087 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.64 | | 0.57 | 0.038 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 9.0 | | 1.7 | 0.067 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 5.6 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 23 | | 2.3 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 17000 | | 17 | 4.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 21 | | 0.92 | 0.31 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 230 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.1 | J | 4.6 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 1.1 | J | 1.5 | 0.99 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 39 | | 2.3 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 58 | | 3.4 | 0.46 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 36 | | 21 | 6.7 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SB-29 — Lab Sample ID: 280-61264-14

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 17000 | | 6200 | 320 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 21000 | | 6200 | 380 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 3400 | J | 6200 | 210 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 3500 | J | 6200 | 890 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 8100 | | 6200 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 7300 | | 6200 | 920 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 12000 | | 6200 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 4900 | J | 6200 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 3600 | J | 6200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 12000 | | 6200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 15000 | | 6200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1400 | J | 6200 | 580 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 5000 | J | 6200 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 15000 | | 6200 | 410 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 19000 | | 6200 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 16000 | | 6200 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 23000 | | 63 | 9.8 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Arsenic | 5.9 | J | 13 | 4.2 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Barium | 82 | B | 6.3 | 0.48 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Beryllium | 1.2 | J | 3.2 | 0.21 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Chromium | 8.0 | J | 9.5 | 0.37 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Cobalt | 14 | | 6.3 | 0.63 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Copper | 28 | | 12 | 1.3 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Iron | 31000 | | 95 | 24 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Lead | 18 | | 5.0 | 1.7 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Manganese | 570 | | 6.3 | 0.63 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Nickel | 5.4 | J | 24 | 0.73 | mg/Kg | 5 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SB-29 (Continued) — Lab Sample ID: 280-61264-14

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Vanadium | 84 | | 13 | 0.59 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Zinc | 73 | | 19 | 2.5 | mg/Kg | 5 | ☼ | 6010C | Total/NA |
| Mercury | 160 | | 23 | 7.6 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SB-28 — Lab Sample ID: 280-61264-15

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 890 | J | 5300 | 270 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 690 | J | 5300 | 330 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 2500 | J | 5300 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 1400 | J | 5300 | 760 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 2800 | J | 5300 | 950 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 2900 | J | 5300 | 780 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 3800 | J | 5300 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 2100 | J | 5300 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 1300 | J | 5300 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 4600 | J | 5300 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 5500 | | 5300 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 720 | J | 5300 | 500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 1900 | J | 5300 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 530 | J | 5300 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 6500 | | 5300 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 8100 | | 5300 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 9600 | | 9.6 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.2 | J | 1.9 | 0.63 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 31 | | 0.96 | 0.073 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.26 | J | 0.48 | 0.032 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 5.9 | | 1.4 | 0.056 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 2.3 | | 0.96 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 8.5 | | 1.9 | 0.21 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 5100 | | 14 | 3.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 7.1 | | 0.77 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 33 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.8 | J | 3.8 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 9.6 | | 1.9 | 0.090 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 11 | | 2.9 | 0.38 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 30 | | 19 | 6.1 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7471B | Mercury (CVAA) | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-61264-1 | BKG 1 | Solid | 10/13/14 13:40 | 10/15/14 08:55 |
| 280-61264-2 | BKG 2 | Solid | 10/13/14 14:00 | 10/15/14 08:55 |
| 280-61264-3 | BKG 3 | Solid | 10/13/14 15:55 | 10/15/14 08:55 |
| 280-61264-4 | BKG 4 | Solid | 10/13/14 10:55 | 10/15/14 08:55 |
| 280-61264-5 | BKG 5 | Solid | 10/13/14 11:05 | 10/15/14 08:55 |
| 280-61264-6 | BKG 6 | Solid | 10/13/14 11:30 | 10/15/14 08:55 |
| 280-61264-7 | BKG 7 | Solid | 10/13/14 12:00 | 10/15/14 08:55 |
| 280-61264-8 | BKG 8 | Solid | 10/13/14 15:10 | 10/15/14 08:55 |
| 280-61264-9 | BKG 9 | Solid | 10/13/14 15:00 | 10/15/14 08:55 |
| 280-61264-10 | BKG 10 | Solid | 10/13/14 14:45 | 10/15/14 08:55 |
| 280-61264-11 | SB-31-7-8 | Solid | 10/14/14 12:00 | 10/15/14 08:55 |
| 280-61264-13 | SB-30 | Solid | 10/14/14 09:25 | 10/15/14 08:55 |
| 280-61264-14 | SB-29 | Solid | 10/14/14 10:50 | 10/15/14 08:55 |
| 280-61264-15 | SB-28 | Solid | 10/14/14 10:40 | 10/15/14 08:55 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SB-31-7-8** — **Lab Sample ID: 280-61264-11**
**Date Collected: 10/14/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 320 | U | 6100 | 320 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| 2-Methylnaphthalene | 380 | U | 6100 | 380 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Acenaphthene | 200 | U | 6100 | 200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Acenaphthylene | 210 | U | 6100 | 210 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Anthracene | 880 | U | 6100 | 880 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Benzo[a]anthracene | 1100 | U | 6100 | 1100 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Benzo[a]pyrene | 910 | U | 6100 | 910 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Benzo[b]fluoranthene | 1500 | U | 6100 | 1500 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Benzo[g,h,i]perylene | 1300 | U | 6100 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Benzo[k]fluoranthene | 1200 | U | 6100 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Chrysene | 1200 | U | 6100 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Dibenz(a,h)anthracene | 1600 | U | 6100 | 1600 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Fluoranthene | 1200 | U | 6100 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Fluorene | 580 | U | 6100 | 580 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Indeno[1,2,3-cd]pyrene | 1300 | U | 6100 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Naphthalene | 400 | U | 6100 | 400 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Phenanthrene | 1300 | U | 6100 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |
| Pyrene | 1300 | U | 6100 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:16 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *74* | | *39 - 120* | *10/22/14 11:56* | *10/23/14 16:16* | *1* |
| *Nitrobenzene-d5* | *75* | | *42 - 120* | *10/22/14 11:56* | *10/23/14 16:16* | *1* |
| *Terphenyl-d14* | *62* | | *35 - 124* | *10/22/14 11:56* | *10/23/14 16:16* | *1* |

**Client Sample ID: SB-30** — **Lab Sample ID: 280-61264-13**
**Date Collected: 10/14/14 09:25** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | **6700** | | 5800 | 300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **2-Methylnaphthalene** | **7400** | | 5800 | 360 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Acenaphthene** | **720** | **J** | 5800 | 190 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Acenaphthylene** | **6000** | | 5800 | 200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Anthracene** | **4900** | **J** | 5800 | 840 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Benzo[a]anthracene** | **15000** | | 5800 | 1000 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Benzo[a]pyrene** | **15000** | | 5800 | 860 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Benzo[b]fluoranthene** | **25000** | | 5800 | 1400 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Benzo[g,h,i]perylene** | **8300** | | 5800 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Benzo[k]fluoranthene** | **8200** | | 5800 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Chrysene** | **22000** | | 5800 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Dibenz(a,h)anthracene** | **2700** | **J** | 5800 | 1500 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Fluoranthene** | **22000** | | 5800 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Fluorene** | **1100** | **J** | 5800 | 550 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **9500** | | 5800 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Naphthalene** | **4300** | **J** | 5800 | 380 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Phenanthrene** | **16000** | | 5800 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |
| **Pyrene** | **23000** | | 5800 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 16:44 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *76* | | *39 - 120* | *10/22/14 11:56* | *10/23/14 16:44* | *1* |
| *Nitrobenzene-d5* | *72* | | *42 - 120* | *10/22/14 11:56* | *10/23/14 16:44* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SB-30**
**Date Collected: 10/14/14 09:25**
**Date Received: 10/15/14 08:55**

**Lab Sample ID: 280-61264-13**
**Matrix: Solid**
**Percent Solids: 83.7**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| Terphenyl-d14 | 66 | | 35 - 124 | 10/22/14 11:56 | 10/23/14 16:44 | 1 |

**Client Sample ID: SB-29**
**Date Collected: 10/14/14 10:50**
**Date Received: 10/15/14 08:55**

**Lab Sample ID: 280-61264-14**
**Matrix: Solid**
**Percent Solids: 76.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 17000 | | 6200 | 320 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| 2-Methylnaphthalene | 21000 | | 6200 | 380 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Acenaphthene | 200 | U | 6200 | 200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Acenaphthylene | 3400 | J | 6200 | 210 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Anthracene | 3500 | J | 6200 | 890 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Benzo[a]anthracene | 8100 | | 6200 | 1100 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Benzo[a]pyrene | 7300 | | 6200 | 920 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Benzo[b]fluoranthene | 12000 | | 6200 | 1500 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Benzo[g,h,i]perylene | 4900 | J | 6200 | 1400 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Benzo[k]fluoranthene | 3600 | J | 6200 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Chrysene | 12000 | | 6200 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Dibenz(a,h)anthracene | 1600 | U | 6200 | 1600 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Fluoranthene | 15000 | | 6200 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Fluorene | 1400 | J | 6200 | 580 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Indeno[1,2,3-cd]pyrene | 5000 | J | 6200 | 1400 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Naphthalene | 15000 | | 6200 | 410 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Phenanthrene | 19000 | | 6200 | 1400 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Pyrene | 16000 | | 6200 | 1400 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:11 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 64 | | 39 - 120 | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Nitrobenzene-d5 | 61 | | 42 - 120 | 10/22/14 11:56 | 10/23/14 17:11 | 1 |
| Terphenyl-d14 | 49 | | 35 - 124 | 10/22/14 11:56 | 10/23/14 17:11 | 1 |

**Client Sample ID: SB-28**
**Date Collected: 10/14/14 10:40**
**Date Received: 10/15/14 08:55**

**Lab Sample ID: 280-61264-15**
**Matrix: Solid**
**Percent Solids: 93.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 890 | J | 5300 | 270 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| 2-Methylnaphthalene | 690 | J | 5300 | 330 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Acenaphthene | 170 | U | 5300 | 170 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Acenaphthylene | 2500 | J | 5300 | 180 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Anthracene | 1400 | J | 5300 | 760 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Benzo[a]anthracene | 2800 | J | 5300 | 950 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Benzo[a]pyrene | 2900 | J | 5300 | 780 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Benzo[b]fluoranthene | 3800 | J | 5300 | 1300 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Benzo[g,h,i]perylene | 2100 | J | 5300 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Benzo[k]fluoranthene | 1300 | J | 5300 | 1100 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Chrysene | 4600 | J | 5300 | 1100 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5300 | 1400 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Fluoranthene | 5500 | | 5300 | 1100 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Fluorene | 720 | J | 5300 | 500 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Indeno[1,2,3-cd]pyrene | 1900 | J | 5300 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Naphthalene | 530 | J | 5300 | 340 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SB-28** — **Lab Sample ID: 280-61264-15**
**Date Collected: 10/14/14 10:40** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 93.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 6500 | | 5300 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |
| Pyrene | 8100 | | 5300 | 1200 | ng/Kg | ☼ | 10/22/14 11:56 | 10/23/14 17:39 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *71* | | *39 - 120* | *10/22/14 11:56* | *10/23/14 17:39* | *1* |
| *Nitrobenzene-d5* | *66* | | *42 - 120* | *10/22/14 11:56* | *10/23/14 17:39* | *1* |
| *Terphenyl-d14* | *62* | | *35 - 124* | *10/22/14 11:56* | *10/23/14 17:39* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: BKG 1** — **Lab Sample ID: 280-61264-1**
**Date Collected: 10/13/14 13:40** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 77.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | | 12 | 1.8 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Antimony | 0.44 | U | 1.8 | 0.44 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Arsenic | 1.3 | J | 2.3 | 0.77 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Barium | 45 | | 1.2 | 0.089 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Beryllium | 0.57 | J | 0.58 | 0.039 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Cadmium | 0.045 | U | 0.54 | 0.045 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:05 | 1 |
| Chromium | 5.6 | | 1.8 | 0.068 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Cobalt | 1.9 | | 1.2 | 0.12 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Copper | 28 | | 2.3 | 0.25 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 16:59 | 1 |
| Iron | 13000 | | 18 | 4.4 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Lead | 13 | | 0.93 | 0.32 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Manganese | 130 | | 1.1 | 0.11 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:05 | 1 |
| Nickel | 2.4 | J | 4.7 | 0.14 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 16:59 | 1 |
| Selenium | 1.0 | U ^ | 1.5 | 1.0 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Silver | 0.19 | U | 1.2 | 0.19 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Thallium | 0.76 | U | 1.4 | 0.76 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Vanadium | 28 | | 2.3 | 0.11 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |
| Zinc | 22 | | 3.5 | 0.46 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 22:59 | 1 |

**Client Sample ID: BKG 2** — **Lab Sample ID: 280-61264-2**
**Date Collected: 10/13/14 14:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 92.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 22000 | | 9.7 | 1.5 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Antimony | 0.37 | U | 1.5 | 0.37 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Arsenic | 1.6 | J | 1.9 | 0.64 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Barium | 34 | | 0.97 | 0.074 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Beryllium | 0.51 | | 0.48 | 0.032 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:18 | 1 |
| Chromium | 4.8 | | 1.5 | 0.056 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Cobalt | 1.5 | | 0.97 | 0.097 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Copper | 21 | | 1.9 | 0.21 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:10 | 1 |
| Iron | 14000 | | 15 | 3.7 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Lead | 11 | | 0.77 | 0.26 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Manganese | 64 | | 1.0 | 0.10 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:18 | 1 |
| Nickel | 2.8 | J | 3.9 | 0.12 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:10 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: BKG 2** — **Lab Sample ID: 280-61264-2**
**Date Collected: 10/13/14 14:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 92.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Selenium | 0.83 | U | 1.3 | 0.83 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Silver | 0.15 | U | 0.97 | 0.15 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| Thallium | 0.63 | U | 1.2 | 0.63 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| **Vanadium** | **32** | | 1.9 | 0.091 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |
| **Zinc** | **33** | | 2.9 | 0.39 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:22 | 1 |

**Client Sample ID: BKG 3** — **Lab Sample ID: 280-61264-3**
**Date Collected: 10/13/14 15:55** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **35000** | | 11 | 1.6 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| Antimony | 0.40 | U | 1.6 | 0.40 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Arsenic** | **1.2** | **J** | 2.1 | 0.70 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Barium** | **24** | | 1.1 | 0.080 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Beryllium** | **0.37** | **J** | 0.53 | 0.035 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| Cadmium | 0.044 | U | 0.53 | 0.044 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:21 | 1 |
| **Chromium** | **8.6** | | 1.6 | 0.061 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Cobalt** | **1.6** | | 1.1 | 0.11 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Copper** | **11** | | 2.1 | 0.23 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:13 | 1 |
| **Iron** | **16000** | | 16 | 4.0 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Lead** | **9.3** | | 0.85 | 0.29 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Manganese** | **65** | | 1.1 | 0.11 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:21 | 1 |
| **Nickel** | **3.4** | **J** | 4.2 | 0.13 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:13 | 1 |
| **Selenium** | **0.99** | **J** | 1.4 | 0.91 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| Silver | 0.17 | U | 1.1 | 0.17 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| Thallium | 0.69 | U | 1.3 | 0.69 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Vanadium** | **31** | | 2.1 | 0.10 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |
| **Zinc** | **18** | | 3.2 | 0.42 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:25 | 1 |

**Client Sample ID: BKG 4** — **Lab Sample ID: 280-61264-4**
**Date Collected: 10/13/14 10:55** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 69.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **23000** | | 12 | 1.8 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| Antimony | 0.45 | U | 1.8 | 0.45 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| **Arsenic** | **1.9** | **J** | 2.4 | 0.79 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| **Barium** | **18** | | 1.2 | 0.091 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| **Beryllium** | **0.77** | | 0.60 | 0.039 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| Cadmium | 0.049 | U | 0.60 | 0.049 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:24 | 1 |
| **Chromium** | **20** | | 1.8 | 0.069 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| **Cobalt** | **5.0** | | 1.2 | 0.12 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| **Copper** | **14** | | 2.4 | 0.26 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:16 | 1 |
| **Iron** | **29000** | | 18 | 4.5 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| **Lead** | **20** | | 0.95 | 0.32 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| **Manganese** | **160** | | 1.2 | 0.12 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:24 | 1 |
| **Nickel** | **5.0** | | 4.8 | 0.15 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:16 | 1 |
| **Selenium** | **1.1** | **J** | 1.6 | 1.0 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| Silver | 0.19 | U | 1.2 | 0.19 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| Thallium | 0.78 | U | 1.4 | 0.78 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |
| **Vanadium** | **66** | | 2.4 | 0.11 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: BKG 4** — **Lab Sample ID: 280-61264-4**
**Date Collected: 10/13/14 10:55** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 69.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Zinc | 27 | | 3.6 | 0.47 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:28 | 1 |

**Client Sample ID: BKG 5** — **Lab Sample ID: 280-61264-5**
**Date Collected: 10/13/14 11:05** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 82.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 24000 | | 10 | 1.6 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Antimony | 0.39 | U | 1.5 | 0.39 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Arsenic | 1.5 | J | 2.1 | 0.68 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Barium | 22 | | 1.0 | 0.078 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Beryllium | 0.57 | | 0.51 | 0.034 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Cadmium | 0.042 | U | 0.51 | 0.042 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:26 | 1 |
| Chromium | 12 | | 1.5 | 0.060 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Cobalt | 11 | | 1.0 | 0.10 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Copper | 22 | | 2.1 | 0.22 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:29 | 1 |
| Iron | 15000 | | 15 | 3.9 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Lead | 35 | | 0.82 | 0.28 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Manganese | 150 | | 1.0 | 0.10 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:26 | 1 |
| Nickel | 4.0 | J | 4.1 | 0.13 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:29 | 1 |
| Selenium | 1.2 | J | 1.3 | 0.88 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Thallium | 0.67 | U | 1.2 | 0.67 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Vanadium | 44 | | 2.1 | 0.096 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |
| Zinc | 45 | | 3.1 | 0.41 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:31 | 1 |

**Client Sample ID: BKG 6** — **Lab Sample ID: 280-61264-6**
**Date Collected: 10/13/14 11:30** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 82.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 21000 | | 10 | 1.6 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Antimony | 0.39 | U | 1.5 | 0.39 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Arsenic | 0.69 | J | 2.0 | 0.67 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Barium | 29 | | 1.0 | 0.077 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Beryllium | 0.22 | J | 0.51 | 0.034 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Cadmium | 0.053 | J | 0.52 | 0.042 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:40 | 1 |
| Chromium | 21 | | 1.5 | 0.059 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Cobalt | 7.6 | | 1.0 | 0.10 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Copper | 41 | | 2.0 | 0.22 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:31 | 1 |
| Iron | 16000 | | 15 | 3.9 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Lead | 14 | | 0.81 | 0.27 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Manganese | 330 | | 1.0 | 0.10 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:40 | 1 |
| Nickel | 7.5 | | 4.1 | 0.13 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:31 | 1 |
| Selenium | 0.87 | U | 1.3 | 0.87 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Thallium | 0.66 | U | 1.2 | 0.66 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Vanadium | 28 | | 2.0 | 0.096 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |
| Zinc | 110 | | 3.0 | 0.40 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:34 | 1 |

## Method: 6010C - Metals (ICP)

**Client Sample ID: BKG 7** — **Lab Sample ID: 280-61264-7**
**Date Collected: 10/13/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 77.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 29000 | | 12 | 1.8 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Antimony | 0.45 | U | 1.8 | 0.45 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Arsenic | 2.5 | | 2.4 | 0.78 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Barium | 28 | | 1.2 | 0.090 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Beryllium | 0.39 | J | 0.59 | 0.039 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Cadmium | 0.046 | U | 0.56 | 0.046 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:43 | 1 |
| Chromium | 10 | | 1.8 | 0.069 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Cobalt | 2.1 | | 1.2 | 0.12 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Copper | 14 | | 2.4 | 0.26 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:34 | 1 |
| Iron | 17000 | | 18 | 4.5 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Lead | 12 | | 0.95 | 0.32 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Manganese | 48 | | 1.1 | 0.11 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:43 | 1 |
| Nickel | 3.8 | J | 4.7 | 0.15 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:34 | 1 |
| Selenium | 1.3 | J | 1.5 | 1.0 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Silver | 0.19 | U | 1.2 | 0.19 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Thallium | 0.77 | U | 1.4 | 0.77 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Vanadium | 50 | | 2.4 | 0.11 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |
| Zinc | 27 | | 3.5 | 0.47 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:36 | 1 |

**Client Sample ID: BKG 8** — **Lab Sample ID: 280-61264-8**
**Date Collected: 10/13/14 15:10** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 88.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 30000 | | 9.5 | 1.5 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Antimony | 0.36 | U | 1.4 | 0.36 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Arsenic | 2.3 | | 1.9 | 0.63 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Barium | 46 | | 0.95 | 0.073 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Beryllium | 1.8 | | 0.48 | 0.031 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Cadmium | 0.20 | J | 0.50 | 0.041 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:45 | 1 |
| Chromium | 13 | | 1.4 | 0.055 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Cobalt | 78 | | 0.95 | 0.095 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Copper | 50 | | 1.9 | 0.21 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:37 | 1 |
| Iron | 56000 | | 14 | 3.6 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Lead | 33 | | 0.76 | 0.26 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Manganese | 1700 | | 1.0 | 0.10 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:45 | 1 |
| Nickel | 4.2 | | 3.8 | 0.12 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:37 | 1 |
| Selenium | 1.8 | | 1.2 | 0.82 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Silver | 0.15 | U | 0.95 | 0.15 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Thallium | 0.62 | U | 1.1 | 0.62 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Vanadium | 190 | | 1.9 | 0.090 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |
| Zinc | 84 | | 2.9 | 0.38 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:39 | 1 |

**Client Sample ID: BKG 9** — **Lab Sample ID: 280-61264-9**
**Date Collected: 10/13/14 15:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 89.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 14000 | | 9.4 | 1.5 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| Antimony | 0.36 | U | 1.4 | 0.36 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| Arsenic | 1.4 | J | 1.9 | 0.62 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| Barium | 21 | | 0.94 | 0.071 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: BKG 9** — **Lab Sample ID: 280-61264-9**
**Date Collected: 10/13/14 15:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 89.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Beryllium** | **0.34** | **J** | 0.47 | 0.031 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| Cadmium | 0.042 | U | 0.51 | 0.042 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:48 | 1 |
| **Chromium** | **20** | | 1.4 | 0.054 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| **Cobalt** | **3.1** | | 0.94 | 0.094 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| **Copper** | **45** | | 1.9 | 0.20 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:40 | 1 |
| **Iron** | **16000** | | 14 | 3.6 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| **Lead** | **3.8** | | 0.75 | 0.25 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| **Manganese** | **560** | | 5.1 | 0.51 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:19 | 5 |
| **Nickel** | **3.2** | **J** | 3.8 | 0.12 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:40 | 1 |
| Selenium | 0.81 | U | 1.2 | 0.81 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| Silver | 0.15 | U | 0.94 | 0.15 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| Thallium | 0.61 | U | 1.1 | 0.61 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| **Vanadium** | **45** | | 1.9 | 0.088 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |
| **Zinc** | **14** | | 2.8 | 0.37 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:42 | 1 |

**Client Sample ID: BKG 10** — **Lab Sample ID: 280-61264-10**
**Date Collected: 10/13/14 14:45** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **15000** | | 12 | 1.8 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| Antimony | 0.44 | U | 1.7 | 0.44 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Arsenic** | **1.8** | **J** | 2.3 | 0.76 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Barium** | **18** | | 1.2 | 0.088 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Beryllium** | **0.30** | **J** | 0.58 | 0.038 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| Cadmium | 0.22 | U | 2.7 | 0.22 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:21 | 5 |
| **Chromium** | **14** | | 1.7 | 0.067 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Cobalt** | **1.2** | | 1.2 | 0.12 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Copper** | **19** | | 2.3 | 0.25 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:43 | 1 |
| **Iron** | **12000** | | 17 | 4.4 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Lead** | **5.9** | | 0.92 | 0.31 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Manganese** | **66** | | 5.4 | 0.54 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:21 | 5 |
| **Nickel** | **2.2** | **J** | 4.6 | 0.14 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:43 | 1 |
| Selenium | 0.99 | U | 1.5 | 0.99 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| Silver | 0.18 | U | 1.2 | 0.18 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| Thallium | 0.75 | U | 1.4 | 0.75 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Vanadium** | **28** | | 2.3 | 0.11 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |
| **Zinc** | **11** | | 3.5 | 0.46 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:45 | 1 |

**Client Sample ID: SB-31-7-8** — **Lab Sample ID: 280-61264-11**
**Date Collected: 10/14/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **27000** | | 11 | 1.7 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| Antimony | 0.42 | U | 1.7 | 0.42 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| **Arsenic** | **0.80** | **J** | 2.2 | 0.73 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| **Barium** | **34** | | 1.1 | 0.084 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| **Beryllium** | **0.31** | **J** | 0.56 | 0.037 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| Cadmium | 0.044 | U | 0.54 | 0.044 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:54 | 1 |
| **Chromium** | **7.3** | | 1.7 | 0.064 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| **Cobalt** | **1.4** | | 1.1 | 0.11 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SB-31-7-8** — **Lab Sample ID: 280-61264-11**
**Date Collected: 10/14/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Copper | 13 | | 2.2 | 0.24 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:45 | 1 |
| Iron | 8400 | | 17 | 4.2 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| Lead | 5.5 | | 0.89 | 0.30 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| Manganese | 47 | | 1.1 | 0.11 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:54 | 1 |
| Nickel | 2.9 | J | 4.4 | 0.14 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 17:45 | 1 |
| Selenium | 1.1 | J | 1.4 | 0.95 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| Silver | 0.18 | U | 1.1 | 0.18 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| Thallium | 0.72 | U | 1.3 | 0.72 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| Vanadium | 24 | | 2.2 | 0.10 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |
| Zinc | 20 | | 3.3 | 0.44 | mg/Kg | ☼ | 10/15/14 17:28 | 10/28/14 23:47 | 1 |

**Client Sample ID: SB-30** — **Lab Sample ID: 280-61264-13**
**Date Collected: 10/14/14 09:25** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 14000 | | 11 | 1.8 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Antimony | 0.44 | U | 1.7 | 0.44 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Arsenic | 1.6 | J | 2.3 | 0.76 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Barium | 56 | | 1.1 | 0.087 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Beryllium | 0.64 | | 0.57 | 0.038 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Cadmium | 0.046 | U | 0.56 | 0.046 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:57 | 1 |
| Chromium | 9.0 | | 1.7 | 0.067 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Cobalt | 5.6 | | 1.1 | 0.11 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Copper | 23 | | 2.3 | 0.25 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 18:01 | 1 |
| Iron | 17000 | | 17 | 4.4 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Lead | 21 | | 0.92 | 0.31 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Manganese | 230 | | 1.1 | 0.11 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 05:57 | 1 |
| Nickel | 3.1 | J | 4.6 | 0.14 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 18:01 | 1 |
| Selenium | 1.1 | J | 1.5 | 0.99 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Silver | 0.18 | U | 1.1 | 0.18 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Thallium | 0.75 | U | 1.4 | 0.75 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Vanadium | 39 | | 2.3 | 0.11 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |
| Zinc | 58 | | 3.4 | 0.46 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:04 | 1 |

**Client Sample ID: SB-29** — **Lab Sample ID: 280-61264-14**
**Date Collected: 10/14/14 10:50** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 76.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 23000 | | 63 | 9.8 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Antimony | 2.4 | U | 9.5 | 2.4 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Arsenic | 5.9 | J | 13 | 4.2 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Barium | 82 | B | 6.3 | 0.48 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Beryllium | 1.2 | J | 3.2 | 0.21 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Cadmium | 0.26 | U | 3.2 | 0.26 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Chromium | 8.0 | J | 9.5 | 0.37 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Cobalt | 14 | | 6.3 | 0.63 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Copper | 28 | | 12 | 1.3 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 18:04 | 5 |
| Iron | 31000 | | 95 | 24 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Lead | 18 | | 5.0 | 1.7 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Manganese | 570 | | 6.3 | 0.63 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SB-29** — **Lab Sample ID: 280-61264-14**
**Date Collected: 10/14/14 10:50** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 76.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Nickel | 5.4 | J | 24 | 0.73 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 18:04 | 5 |
| Selenium | 5.4 | U | 8.2 | 5.4 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Silver | 1.0 | U | 6.3 | 1.0 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Thallium | 4.1 | U | 7.6 | 4.1 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Vanadium | 84 | | 13 | 0.59 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |
| Zinc | 73 | | 19 | 2.5 | mg/Kg | ☼ | 10/31/14 08:30 | 11/04/14 15:24 | 5 |

**Client Sample ID: SB-28** — **Lab Sample ID: 280-61264-15**
**Date Collected: 10/14/14 10:40** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 93.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 9600 | | 9.6 | 1.5 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Antimony | 0.36 | U | 1.4 | 0.36 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Arsenic | 1.2 | J | 1.9 | 0.63 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Barium | 31 | | 0.96 | 0.073 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Beryllium | 0.26 | J | 0.48 | 0.032 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Cadmium | 0.043 | U | 0.52 | 0.043 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 06:02 | 1 |
| Chromium | 5.9 | | 1.4 | 0.056 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Cobalt | 2.3 | | 0.96 | 0.096 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Copper | 8.5 | | 1.9 | 0.21 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 18:06 | 1 |
| Iron | 5100 | | 14 | 3.6 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Lead | 7.1 | | 0.77 | 0.26 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Manganese | 33 | | 1.0 | 0.10 | mg/Kg | ☼ | 10/31/14 08:30 | 11/01/14 06:02 | 1 |
| Nickel | 1.8 | J | 3.8 | 0.12 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 18:06 | 1 |
| Selenium | 0.82 | U | 1.2 | 0.82 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Silver | 0.15 | U | 0.96 | 0.15 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Thallium | 0.62 | U | 1.2 | 0.62 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Vanadium | 9.6 | | 1.9 | 0.090 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |
| Zinc | 11 | | 2.9 | 0.38 | mg/Kg | ☼ | 10/15/14 17:28 | 10/29/14 00:09 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SB-31-7-8** — **Lab Sample ID: 280-61264-11**
**Date Collected: 10/14/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 26 | | 22 | 7.3 | ug/Kg | ☼ | 11/04/14 07:30 | 11/04/14 13:23 | 1 |

**Client Sample ID: SB-30** — **Lab Sample ID: 280-61264-13**
**Date Collected: 10/14/14 09:25** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 36 | | 21 | 6.7 | ug/Kg | ☼ | 11/04/14 07:30 | 11/04/14 13:25 | 1 |

**Client Sample ID: SB-29** — **Lab Sample ID: 280-61264-14**
**Date Collected: 10/14/14 10:50** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 76.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 160 | | 23 | 7.6 | ug/Kg | ☼ | 11/04/14 07:30 | 11/04/14 13:27 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SB-28** — **Lab Sample ID: 280-61264-15**
**Date Collected: 10/14/14 10:40** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 93.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 30 | | 19 | 6.1 | ug/Kg | ☼ | 11/04/14 07:30 | 11/04/14 13:30 | 1 |

## General Chemistry

**Client Sample ID: BKG 1** — **Lab Sample ID: 280-61264-1**
**Date Collected: 10/13/14 13:40** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 77.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 22 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 78 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 2** — **Lab Sample ID: 280-61264-2**
**Date Collected: 10/13/14 14:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 92.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 7.8 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 92 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 3** — **Lab Sample ID: 280-61264-3**
**Date Collected: 10/13/14 15:55** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 21 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 79 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 4** — **Lab Sample ID: 280-61264-4**
**Date Collected: 10/13/14 10:55** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 69.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 30 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 70 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 5** — **Lab Sample ID: 280-61264-5**
**Date Collected: 10/13/14 11:05** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 82.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 17 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 83 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 6** — **Lab Sample ID: 280-61264-6**
**Date Collected: 10/13/14 11:30** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 82.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 18 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 82 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 7** — **Lab Sample ID: 280-61264-7**
**Date Collected: 10/13/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 77.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 22 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

## General Chemistry (Continued)

**Client Sample ID: BKG 7** — **Lab Sample ID: 280-61264-7**
**Date Collected: 10/13/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 77.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Solids | 78 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 8** — **Lab Sample ID: 280-61264-8**
**Date Collected: 10/13/14 15:10** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 88.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 12 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 88 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 9** — **Lab Sample ID: 280-61264-9**
**Date Collected: 10/13/14 15:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 89.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 10 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 90 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: BKG 10** — **Lab Sample ID: 280-61264-10**
**Date Collected: 10/13/14 14:45** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 17 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 83 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: SB-31-7-8** — **Lab Sample ID: 280-61264-11**
**Date Collected: 10/14/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 20 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 80 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: SB-30** — **Lab Sample ID: 280-61264-13**
**Date Collected: 10/14/14 09:25** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 16 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 84 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: SB-29** — **Lab Sample ID: 280-61264-14**
**Date Collected: 10/14/14 10:50** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 76.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 24 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 76 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

**Client Sample ID: SB-28** — **Lab Sample ID: 280-61264-15**
**Date Collected: 10/14/14 10:40** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 93.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 6.9 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |
| Percent Solids | 93 | | 0.10 | 0.10 | % | | | 10/16/14 09:41 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-61264-11 | SB-31-7-8 | 74 | 75 | 62 |
| 280-61264-13 | SB-30 | 76 | 72 | 66 |
| 280-61264-14 | SB-29 | 64 | 61 | 49 |
| 280-61264-15 | SB-28 | 71 | 66 | 62 |
| LCS 280-249026/2-A | Lab Control Sample | 70 | 69 | 62 |
| MB 280-249026/1-A | Method Blank | 69 | 66 | 57 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-249026/1-A**
**Matrix: Solid**
**Analysis Batch: 249199**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 249026**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 260 | U | 5000 | 260 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| 2-Methylnaphthalene | 310 | U | 5000 | 310 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Acenaphthene | 160 | U | 5000 | 160 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Acenaphthylene | 170 | U | 5000 | 170 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Anthracene | 720 | U | 5000 | 720 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Benzo[a]anthracene | 900 | U | 5000 | 900 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Benzo[a]pyrene | 740 | U | 5000 | 740 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Benzo[b]fluoranthene | 1200 | U | 5000 | 1200 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Benzo[g,h,i]perylene | 1100 | U | 5000 | 1100 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Benzo[k]fluoranthene | 1000 | U | 5000 | 1000 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Chrysene | 1000 | U | 5000 | 1000 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Dibenz(a,h)anthracene | 1300 | U | 5000 | 1300 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Fluoranthene | 1000 | U | 5000 | 1000 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Fluorene | 470 | U | 5000 | 470 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Indeno[1,2,3-cd]pyrene | 1100 | U | 5000 | 1100 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Naphthalene | 320 | U | 5000 | 320 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Phenanthrene | 1100 | U | 5000 | 1100 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |
| Pyrene | 1100 | U | 5000 | 1100 | ng/Kg | | 10/22/14 11:56 | 10/23/14 11:43 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *69* | | *39 - 120* | *10/22/14 11:56* | *10/23/14 11:43* | *1* |
| *Nitrobenzene-d5* | *66* | | *42 - 120* | *10/22/14 11:56* | *10/23/14 11:43* | *1* |
| *Terphenyl-d14* | *57* | | *35 - 124* | *10/22/14 11:56* | *10/23/14 11:43* | *1* |

**Lab Sample ID: LCS 280-249026/2-A**
**Matrix: Solid**
**Analysis Batch: 249199**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 249026**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 28600 | 19500 | | ng/Kg | | 68 | 35 - 120 |
| Acenaphthylene | 28600 | 18800 | | ng/Kg | | 66 | 41 - 120 |
| Anthracene | 28600 | 21000 | | ng/Kg | | 74 | 43 - 120 |
| Benzo[a]anthracene | 28600 | 21100 | | ng/Kg | | 74 | 36 - 120 |
| Benzo[a]pyrene | 28600 | 20600 | | ng/Kg | | 72 | 20 - 120 |
| Benzo[b]fluoranthene | 28600 | 21300 | | ng/Kg | | 75 | 37 - 120 |
| Benzo[g,h,i]perylene | 28600 | 19000 | | ng/Kg | | 66 | 20 - 123 |
| Benzo[k]fluoranthene | 28600 | 20400 | | ng/Kg | | 71 | 46 - 120 |
| Chrysene | 28600 | 22100 | | ng/Kg | | 77 | 34 - 120 |
| Dibenz(a,h)anthracene | 28600 | 18900 | | ng/Kg | | 66 | 20 - 120 |
| Fluoranthene | 28600 | 19200 | | ng/Kg | | 67 | 45 - 120 |
| Fluorene | 28600 | 19900 | | ng/Kg | | 70 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 28600 | 19100 | | ng/Kg | | 67 | 20 - 127 |
| Naphthalene | 28600 | 19700 | | ng/Kg | | 69 | 44 - 120 |
| Phenanthrene | 28600 | 19600 | | ng/Kg | | 69 | 44 - 120 |
| Pyrene | 28600 | 18700 | | ng/Kg | | 66 | 43 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-249026/2-A**
**Matrix: Solid**
**Analysis Batch: 249199**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 249026**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *70* | | *39 - 120* |
| *Nitrobenzene-d5* | *69* | | *42 - 120* |
| *Terphenyl-d14* | *62* | | *35 - 124* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-248098/1-A**
**Matrix: Solid**
**Analysis Batch: 250252**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 248098**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.6 | U | 10 | 1.6 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Barium | 0.076 | U | 1.0 | 0.076 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Iron | 3.8 | U | 15 | 3.8 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Selenium | 0.86 | U ^ | 1.3 | 0.86 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |
| Zinc | 0.40 | U | 3.0 | 0.40 | mg/Kg | | 10/15/14 17:28 | 10/28/14 22:54 | 1 |

**Lab Sample ID: MB 280-248098/1-A**
**Matrix: Solid**
**Analysis Batch: 250451**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 248098**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 10/15/14 17:28 | 10/29/14 16:54 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 10/15/14 17:28 | 10/29/14 16:54 | 1 |

**Lab Sample ID: LCS 280-248098/2-A**
**Matrix: Solid**
**Analysis Batch: 250252**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 248098**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 179 | | mg/Kg | | 89 | 82 - 116 |
| Antimony | 50.0 | 45.6 | | mg/Kg | | 91 | 82 - 110 |
| Arsenic | 100 | 86.5 | | mg/Kg | | 86 | 85 - 110 |
| Barium | 200 | 177 | | mg/Kg | | 89 | 87 - 112 |
| Beryllium | 5.00 | 4.34 | | mg/Kg | | 87 | 84 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-248098/2-A**
**Matrix: Solid**
**Analysis Batch: 250252**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 248098**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chromium | 20.0 | 17.4 | | mg/Kg | | 87 | 84 - 114 |
| Cobalt | 50.0 | 43.7 | | mg/Kg | | 87 | 87 - 110 |
| Iron | 100 | 93.0 | | mg/Kg | | 93 | 87 - 120 |
| Lead | 50.0 | 44.7 | | mg/Kg | | 89 | 86 - 110 |
| Selenium | 200 | 183 | ^ | mg/Kg | | 91 | 83 - 110 |
| Silver | 5.00 | 4.76 | | mg/Kg | | 95 | 87 - 114 |
| Thallium | 200 | 180 | | mg/Kg | | 90 | 84 - 110 |
| Vanadium | 50.0 | 44.3 | | mg/Kg | | 89 | 88 - 110 |
| Zinc | 50.0 | 44.4 | | mg/Kg | | 89 | 76 - 114 |

**Lab Sample ID: LCS 280-248098/2-A**
**Matrix: Solid**
**Analysis Batch: 250451**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 248098**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Copper | 25.0 | 21.9 | | mg/Kg | | 88 | 88 - 110 |
| Nickel | 50.0 | 43.3 | | mg/Kg | | 87 | 87 - 110 |

**Lab Sample ID: 280-61264-1 MS**
**Matrix: Solid**
**Analysis Batch: 250252**

**Client Sample ID: BKG 1**
**Prep Type: Total/NA**
**Prep Batch: 248098**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | | 227 | 36900 | 4 | mg/Kg | ☼ | 9388 | 50 - 200 |
| Antimony | 0.44 | U | 56.8 | 19.2 | | mg/Kg | ☼ | 34 | 20 - 200 |
| Arsenic | 1.3 | J | 114 | 95.0 | | mg/Kg | ☼ | 83 | 76 - 111 |
| Barium | 45 | | 227 | 245 | | mg/Kg | ☼ | 88 | 52 - 159 |
| Beryllium | 0.57 | J | 5.68 | 5.61 | | mg/Kg | ☼ | 89 | 72 - 105 |
| Chromium | 5.6 | | 22.7 | 27.1 | | mg/Kg | ☼ | 95 | 70 - 200 |
| Cobalt | 1.9 | | 56.8 | 52.1 | | mg/Kg | ☼ | 89 | 72 - 106 |
| Iron | 13000 | | 114 | 14500 | 4 | mg/Kg | ☼ | 1325 | 70 - 200 |
| Lead | 13 | | 56.8 | 61.0 | | mg/Kg | ☼ | 85 | 70 - 200 |
| Selenium | 1.0 | U ^ | 227 | 203 | ^ | mg/Kg | ☼ | 90 | 76 - 104 |
| Silver | 0.19 | U | 5.68 | 5.71 | | mg/Kg | ☼ | 101 | 75 - 141 |
| Thallium | 0.76 | U | 227 | 195 | | mg/Kg | ☼ | 86 | 78 - 101 |
| Vanadium | 28 | | 56.8 | 83.8 | | mg/Kg | ☼ | 98 | 50 - 169 |
| Zinc | 22 | | 56.8 | 83.7 | | mg/Kg | ☼ | 109 | 70 - 200 |

**Lab Sample ID: 280-61264-1 MS**
**Matrix: Solid**
**Analysis Batch: 250451**

**Client Sample ID: BKG 1**
**Prep Type: Total/NA**
**Prep Batch: 248098**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Copper | 28 | | 28.4 | 61.7 | | mg/Kg | ☼ | 120 | 37 - 187 |
| Nickel | 2.4 | J | 56.8 | 53.2 | | mg/Kg | ☼ | 89 | 61 - 126 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-61264-1 MSD** — **Client Sample ID: BKG 1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 250252** — **Prep Batch: 248098**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | | 240 | 35800 | 4 | mg/Kg | ☼ | 8450 | 50 - 200 | 3 | 20 |
| Antimony | 0.44 | U | 60.0 | 22.0 | | mg/Kg | ☼ | 37 | 20 - 200 | 14 | 20 |
| Arsenic | 1.3 | J | 120 | 104 | | mg/Kg | ☼ | 86 | 76 - 111 | 9 | 20 |
| Barium | 45 | | 240 | 258 | | mg/Kg | ☼ | 89 | 52 - 159 | 5 | 20 |
| Beryllium | 0.57 | J | 6.00 | 5.95 | | mg/Kg | ☼ | 90 | 72 - 105 | 6 | 20 |
| Chromium | 5.6 | | 24.0 | 28.4 | | mg/Kg | ☼ | 95 | 70 - 200 | 5 | 20 |
| Cobalt | 1.9 | | 60.0 | 55.7 | | mg/Kg | ☼ | 90 | 72 - 106 | 7 | 20 |
| Iron | 13000 | | 120 | 13400 | 4 | mg/Kg | ☼ | 350 | 70 - 200 | 8 | 20 |
| Lead | 13 | | 60.0 | 63.1 | | mg/Kg | ☼ | 84 | 70 - 200 | 3 | 20 |
| Selenium | 1.0 | U ^ | 240 | 219 | ^ | mg/Kg | ☼ | 91 | 76 - 104 | 7 | 20 |
| Silver | 0.19 | U | 6.00 | 6.17 | | mg/Kg | ☼ | 103 | 75 - 141 | 8 | 20 |
| Thallium | 0.76 | U | 240 | 210 | | mg/Kg | ☼ | 88 | 78 - 101 | 7 | 20 |
| Vanadium | 28 | | 60.0 | 84.9 | | mg/Kg | ☼ | 94 | 50 - 169 | 1 | 20 |
| Zinc | 22 | | 60.0 | 85.1 | | mg/Kg | ☼ | 105 | 70 - 200 | 2 | 20 |

**Lab Sample ID: 280-61264-1 MSD** — **Client Sample ID: BKG 1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 250451** — **Prep Batch: 248098**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Copper | 28 | | 30.0 | 62.1 | | mg/Kg | ☼ | 115 | 37 - 187 | 1 | 20 |
| Nickel | 2.4 | J | 60.0 | 56.4 | | mg/Kg | ☼ | 90 | 61 - 126 | 6 | 20 |

**Lab Sample ID: MB 280-250484/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 251424** — **Prep Batch: 250484**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 10/31/14 08:30 | 11/01/14 05:00 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 10/31/14 08:30 | 11/01/14 05:00 | 1 |

**Lab Sample ID: LCS 280-250484/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 251424** — **Prep Batch: 250484**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Cadmium | 10.0 | 8.67 | | mg/Kg | | 87 | 87 - 110 |
| Manganese | 50.0 | 48.9 | | mg/Kg | | 98 | 88 - 110 |

**Lab Sample ID: 280-61264-1 MS** — **Client Sample ID: BKG 1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 251424** — **Prep Batch: 250484**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.045 | U | 10.7 | 8.31 | | mg/Kg | ☼ | 78 | 40 - 130 |
| Manganese | 130 | | 53.5 | 174 | | mg/Kg | ☼ | 89 | 40 - 200 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-61264-1 MSD** — **Client Sample ID: BKG 1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 251424** — **Prep Batch: 250484**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.045 | U | 11.3 | 8.86 | | mg/Kg | ☼ | 79 | 40 - 130 | 7 | 20 |
| Manganese | 130 | | 56.3 | 176 | | mg/Kg | ☼ | 88 | 40 - 200 | 1 | 20 |

## Method: 7471B - Mercury (CVAA)

**Lab Sample ID: MB 280-251102/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 251373** — **Prep Batch: 251102**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.5 | U | 17 | 5.5 | ug/Kg | | 11/04/14 07:30 | 11/04/14 13:18 | 1 |

**Lab Sample ID: LCS 280-251102/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 251373** — **Prep Batch: 251102**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 417 | 416 | | ug/Kg | | 100 | 87 - 111 |

**Lab Sample ID: 280-61264-15 MS** — **Client Sample ID: SB-28**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 251373** — **Prep Batch: 251102**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 30 | | 480 | 497 | | ug/Kg | ☼ | 97 | 87 - 111 |

**Lab Sample ID: 280-61264-15 MSD** — **Client Sample ID: SB-28**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 251373** — **Prep Batch: 251102**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 30 | | 480 | 490 | | ug/Kg | ☼ | 96 | 87 - 111 | 1 | 20 |

## Method: Moisture - Percent Moisture

**Lab Sample ID: 280-61264-15 DU** — **Client Sample ID: SB-28**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 248188**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 6.9 | | 6.3 | | % | | 9 | 20 |
| Percent Solids | 93 | | 94 | | % | | 0.6 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## GC/MS Semi VOA

### Prep Batch: 249026

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 3546 | |
| 280-61264-13 | SB-30 | Total/NA | Solid | 3546 | |
| 280-61264-14 | SB-29 | Total/NA | Solid | 3546 | |
| 280-61264-15 | SB-28 | Total/NA | Solid | 3546 | |
| LCS 280-249026/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-249026/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Analysis Batch: 249199

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 8270D SIM | 249026 |
| 280-61264-13 | SB-30 | Total/NA | Solid | 8270D SIM | 249026 |
| 280-61264-14 | SB-29 | Total/NA | Solid | 8270D SIM | 249026 |
| 280-61264-15 | SB-28 | Total/NA | Solid | 8270D SIM | 249026 |
| LCS 280-249026/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 249026 |
| MB 280-249026/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 249026 |

## Metals

### Prep Batch: 248098

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-1 | BKG 1 | Total/NA | Solid | 3050B | |
| 280-61264-1 MS | BKG 1 | Total/NA | Solid | 3050B | |
| 280-61264-1 MSD | BKG 1 | Total/NA | Solid | 3050B | |
| 280-61264-2 | BKG 2 | Total/NA | Solid | 3050B | |
| 280-61264-3 | BKG 3 | Total/NA | Solid | 3050B | |
| 280-61264-4 | BKG 4 | Total/NA | Solid | 3050B | |
| 280-61264-5 | BKG 5 | Total/NA | Solid | 3050B | |
| 280-61264-6 | BKG 6 | Total/NA | Solid | 3050B | |
| 280-61264-7 | BKG 7 | Total/NA | Solid | 3050B | |
| 280-61264-8 | BKG 8 | Total/NA | Solid | 3050B | |
| 280-61264-9 | BKG 9 | Total/NA | Solid | 3050B | |
| 280-61264-10 | BKG 10 | Total/NA | Solid | 3050B | |
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 3050B | |
| 280-61264-13 | SB-30 | Total/NA | Solid | 3050B | |
| 280-61264-14 | SB-29 | Total/NA | Solid | 3050B | |
| 280-61264-15 | SB-28 | Total/NA | Solid | 3050B | |
| LCS 280-248098/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-248098/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Analysis Batch: 250252

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-1 | BKG 1 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-1 MS | BKG 1 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-1 MSD | BKG 1 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-2 | BKG 2 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-3 | BKG 3 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-4 | BKG 4 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-5 | BKG 5 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-6 | BKG 6 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-7 | BKG 7 | Total/NA | Solid | 6010C | 248098 |

## Metals (Continued)

### Analysis Batch: 250252 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-8 | BKG 8 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-9 | BKG 9 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-10 | BKG 10 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-13 | SB-30 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-15 | SB-28 | Total/NA | Solid | 6010C | 248098 |
| LCS 280-248098/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 248098 |
| MB 280-248098/1-A | Method Blank | Total/NA | Solid | 6010C | 248098 |

### Analysis Batch: 250451

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-1 | BKG 1 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-1 MS | BKG 1 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-1 MSD | BKG 1 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-2 | BKG 2 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-3 | BKG 3 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-4 | BKG 4 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-5 | BKG 5 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-6 | BKG 6 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-7 | BKG 7 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-8 | BKG 8 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-9 | BKG 9 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-10 | BKG 10 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-13 | SB-30 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-14 | SB-29 | Total/NA | Solid | 6010C | 248098 |
| 280-61264-15 | SB-28 | Total/NA | Solid | 6010C | 248098 |
| LCS 280-248098/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 248098 |
| MB 280-248098/1-A | Method Blank | Total/NA | Solid | 6010C | 248098 |

### Prep Batch: 250484

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-1 | BKG 1 | Total/NA | Solid | 3050B | |
| 280-61264-1 MS | BKG 1 | Total/NA | Solid | 3050B | |
| 280-61264-1 MSD | BKG 1 | Total/NA | Solid | 3050B | |
| 280-61264-2 | BKG 2 | Total/NA | Solid | 3050B | |
| 280-61264-3 | BKG 3 | Total/NA | Solid | 3050B | |
| 280-61264-4 | BKG 4 | Total/NA | Solid | 3050B | |
| 280-61264-5 | BKG 5 | Total/NA | Solid | 3050B | |
| 280-61264-6 | BKG 6 | Total/NA | Solid | 3050B | |
| 280-61264-7 | BKG 7 | Total/NA | Solid | 3050B | |
| 280-61264-8 | BKG 8 | Total/NA | Solid | 3050B | |
| 280-61264-9 | BKG 9 | Total/NA | Solid | 3050B | |
| 280-61264-10 | BKG 10 | Total/NA | Solid | 3050B | |
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 3050B | |
| 280-61264-13 | SB-30 | Total/NA | Solid | 3050B | |
| 280-61264-14 | SB-29 | Total/NA | Solid | 3050B | |
| 280-61264-15 | SB-28 | Total/NA | Solid | 3050B | |
| LCS 280-250484/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-250484/1-A | Method Blank | Total/NA | Solid | 3050B | |

## Metals (Continued)

### Prep Batch: 251102

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 7471B | |
| 280-61264-13 | SB-30 | Total/NA | Solid | 7471B | |
| 280-61264-14 | SB-29 | Total/NA | Solid | 7471B | |
| 280-61264-15 | SB-28 | Total/NA | Solid | 7471B | |
| 280-61264-15 MS | SB-28 | Total/NA | Solid | 7471B | |
| 280-61264-15 MSD | SB-28 | Total/NA | Solid | 7471B | |
| LCS 280-251102/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| MB 280-251102/1-A | Method Blank | Total/NA | Solid | 7471B | |

### Analysis Batch: 251373

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 7471B | 251102 |
| 280-61264-13 | SB-30 | Total/NA | Solid | 7471B | 251102 |
| 280-61264-14 | SB-29 | Total/NA | Solid | 7471B | 251102 |
| 280-61264-15 | SB-28 | Total/NA | Solid | 7471B | 251102 |
| 280-61264-15 MS | SB-28 | Total/NA | Solid | 7471B | 251102 |
| 280-61264-15 MSD | SB-28 | Total/NA | Solid | 7471B | 251102 |
| LCS 280-251102/2-A | Lab Control Sample | Total/NA | Solid | 7471B | 251102 |
| MB 280-251102/1-A | Method Blank | Total/NA | Solid | 7471B | 251102 |

### Analysis Batch: 251399

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-9 | BKG 9 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-10 | BKG 10 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-14 | SB-29 | Total/NA | Solid | 6010C | 250484 |

### Analysis Batch: 251424

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-1 | BKG 1 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-1 MS | BKG 1 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-1 MSD | BKG 1 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-2 | BKG 2 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-3 | BKG 3 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-4 | BKG 4 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-5 | BKG 5 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-6 | BKG 6 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-7 | BKG 7 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-8 | BKG 8 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-9 | BKG 9 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-13 | SB-30 | Total/NA | Solid | 6010C | 250484 |
| 280-61264-15 | SB-28 | Total/NA | Solid | 6010C | 250484 |
| LCS 280-250484/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 250484 |
| MB 280-250484/1-A | Method Blank | Total/NA | Solid | 6010C | 250484 |

## General Chemistry

### Analysis Batch: 248188

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-1 | BKG 1 | Total/NA | Solid | Moisture | |

## General Chemistry (Continued)

### Analysis Batch: 248188 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-61264-2 | BKG 2 | Total/NA | Solid | Moisture | |
| 280-61264-3 | BKG 3 | Total/NA | Solid | Moisture | |
| 280-61264-4 | BKG 4 | Total/NA | Solid | Moisture | |
| 280-61264-5 | BKG 5 | Total/NA | Solid | Moisture | |
| 280-61264-6 | BKG 6 | Total/NA | Solid | Moisture | |
| 280-61264-7 | BKG 7 | Total/NA | Solid | Moisture | |
| 280-61264-8 | BKG 8 | Total/NA | Solid | Moisture | |
| 280-61264-9 | BKG 9 | Total/NA | Solid | Moisture | |
| 280-61264-10 | BKG 10 | Total/NA | Solid | Moisture | |
| 280-61264-11 | SB-31-7-8 | Total/NA | Solid | Moisture | |
| 280-61264-13 | SB-30 | Total/NA | Solid | Moisture | |
| 280-61264-14 | SB-29 | Total/NA | Solid | Moisture | |
| 280-61264-15 | SB-28 | Total/NA | Solid | Moisture | |
| 280-61264-15 DU | SB-28 | Total/NA | Solid | Moisture | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: BKG 1 — Lab Sample ID: 280-61264-1

**Date Collected: 10/13/14 13:40**
**Date Received: 10/15/14 08:55**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: BKG 1 — Lab Sample ID: 280-61264-1

**Date Collected: 10/13/14 13:40**
**Date Received: 10/15/14 08:55**
**Matrix: Solid**
**Percent Solids: 77.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.10 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.10 g | 100 mL | 250252 | 10/28/14 22:59 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.10 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.10 g | 100 mL | 250451 | 10/29/14 16:59 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.18 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.18 g | 100 mL | 251424 | 11/01/14 05:05 | LLB | TAL DEN |

## Client Sample ID: BKG 2 — Lab Sample ID: 280-61264-2

**Date Collected: 10/13/14 14:00**
**Date Received: 10/15/14 08:55**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: BKG 2 — Lab Sample ID: 280-61264-2

**Date Collected: 10/13/14 14:00**
**Date Received: 10/15/14 08:55**
**Matrix: Solid**
**Percent Solids: 92.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.12 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.12 g | 100 mL | 250252 | 10/28/14 23:22 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.12 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.12 g | 100 mL | 250451 | 10/29/14 17:10 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.08 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.08 g | 100 mL | 251424 | 11/01/14 05:18 | LLB | TAL DEN |

## Client Sample ID: BKG 3 — Lab Sample ID: 280-61264-3

**Date Collected: 10/13/14 15:55**
**Date Received: 10/15/14 08:55**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: BKG 3 — Lab Sample ID: 280-61264-3

**Date Collected: 10/13/14 15:55** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.19 g | 100 mL | 250252 | 10/28/14 23:25 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.19 g | 100 mL | 250451 | 10/29/14 17:13 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.18 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.18 g | 100 mL | 251424 | 11/01/14 05:21 | LLB | TAL DEN |

## Client Sample ID: BKG 4 — Lab Sample ID: 280-61264-4

**Date Collected: 10/13/14 10:55** — **Matrix: Solid**
**Date Received: 10/15/14 08:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: BKG 4 — Lab Sample ID: 280-61264-4

**Date Collected: 10/13/14 10:55** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 69.8**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.20 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.20 g | 100 mL | 250252 | 10/28/14 23:28 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.20 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.20 g | 100 mL | 250451 | 10/29/14 17:16 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.20 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.20 g | 100 mL | 251424 | 11/01/14 05:24 | LLB | TAL DEN |

## Client Sample ID: BKG 5 — Lab Sample ID: 280-61264-5

**Date Collected: 10/13/14 11:05** — **Matrix: Solid**
**Date Received: 10/15/14 08:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: BKG 5 — Lab Sample ID: 280-61264-5

**Date Collected: 10/13/14 11:05** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 82.6**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.18 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.18 g | 100 mL | 250252 | 10/28/14 23:31 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.18 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.18 g | 100 mL | 250451 | 10/29/14 17:29 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.18 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |

## Client Sample ID: BKG 5
**Lab Sample ID: 280-61264-5**
**Date Collected: 10/13/14 11:05**
**Matrix: Solid**
**Date Received: 10/15/14 08:55**
**Percent Solids: 82.6**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 6010C | | 1 | 1.18 g | 100 mL | 251424 | 11/01/14 05:26 | LLB | TAL DEN |

## Client Sample ID: BKG 6
**Lab Sample ID: 280-61264-6**
**Date Collected: 10/13/14 11:30**
**Matrix: Solid**
**Date Received: 10/15/14 08:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: BKG 6
**Lab Sample ID: 280-61264-6**
**Date Collected: 10/13/14 11:30**
**Matrix: Solid**
**Date Received: 10/15/14 08:55**
**Percent Solids: 82.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.20 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.20 g | 100 mL | 250252 | 10/28/14 23:34 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.20 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.20 g | 100 mL | 250451 | 10/29/14 17:31 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.18 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.18 g | 100 mL | 251424 | 11/01/14 05:40 | LLB | TAL DEN |

## Client Sample ID: BKG 7
**Lab Sample ID: 280-61264-7**
**Date Collected: 10/13/14 12:00**
**Matrix: Solid**
**Date Received: 10/15/14 08:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: BKG 7
**Lab Sample ID: 280-61264-7**
**Date Collected: 10/13/14 12:00**
**Matrix: Solid**
**Date Received: 10/15/14 08:55**
**Percent Solids: 77.7**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.09 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.09 g | 100 mL | 250252 | 10/28/14 23:36 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.09 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.09 g | 100 mL | 250451 | 10/29/14 17:34 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.15 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.15 g | 100 mL | 251424 | 11/01/14 05:43 | LLB | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: BKG 8
**Date Collected: 10/13/14 15:10**
**Date Received: 10/15/14 08:55**

**Lab Sample ID: 280-61264-8**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: BKG 8
**Date Collected: 10/13/14 15:10**
**Date Received: 10/15/14 08:55**

**Lab Sample ID: 280-61264-8**
**Matrix: Solid**
**Percent Solids: 88.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.19 g | 100 mL | 250252 | 10/28/14 23:39 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.19 g | 100 mL | 250451 | 10/29/14 17:37 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.13 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.13 g | 100 mL | 251424 | 11/01/14 05:45 | LLB | TAL DEN |

## Client Sample ID: BKG 9
**Date Collected: 10/13/14 15:00**
**Date Received: 10/15/14 08:55**

**Lab Sample ID: 280-61264-9**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: BKG 9
**Date Collected: 10/13/14 15:00**
**Date Received: 10/15/14 08:55**

**Lab Sample ID: 280-61264-9**
**Matrix: Solid**
**Percent Solids: 89.6**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.19 g | 100 mL | 250252 | 10/28/14 23:42 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.19 g | 100 mL | 250451 | 10/29/14 17:40 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.10 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.10 g | 100 mL | 251424 | 11/01/14 05:48 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.10 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 5 | 1.10 g | 100 mL | 251399 | 11/04/14 15:19 | SJS | TAL DEN |

## Client Sample ID: BKG 10
**Date Collected: 10/13/14 14:45**
**Date Received: 10/15/14 08:55**

**Lab Sample ID: 280-61264-10**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: BKG 10 — Lab Sample ID: 280-61264-10

**Date Collected: 10/13/14 14:45** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.04 g | 100 mL | 250252 | 10/28/14 23:45 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.04 g | 100 mL | 250451 | 10/29/14 17:43 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.12 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 5 | 1.12 g | 100 mL | 251399 | 11/04/14 15:21 | SJS | TAL DEN |

## Client Sample ID: SB-31-7-8 — Lab Sample ID: 280-61264-11

**Date Collected: 10/14/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: SB-31-7-8 — Lab Sample ID: 280-61264-11

**Date Collected: 10/14/14 12:00** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 79.7**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.7 g | 1 mL | 249026 | 10/22/14 11:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.7 g | 1 mL | 249199 | 10/23/14 16:16 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.13 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.13 g | 100 mL | 250252 | 10/28/14 23:47 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.13 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.13 g | 100 mL | 250451 | 10/29/14 17:45 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.16 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.16 g | 100 mL | 251424 | 11/01/14 05:54 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.57 g | 50 mL | 251102 | 11/04/14 07:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.57 g | 50 mL | 251373 | 11/04/14 13:23 | CGG | TAL DEN |

## Client Sample ID: SB-30 — Lab Sample ID: 280-61264-13

**Date Collected: 10/14/14 09:25** — **Matrix: Solid**
**Date Received: 10/15/14 08:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: SB-30 — Lab Sample ID: 280-61264-13

**Date Collected: 10/14/14 09:25** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.7**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.9 g | 1 mL | 249026 | 10/22/14 11:56 | BMS | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: SB-30 — Lab Sample ID: 280-61264-13

**Date Collected: 10/14/14 09:25** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 83.7**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8270D SIM | | 1 | 30.9 g | 1 mL | 249199 | 10/23/14 16:44 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.04 g | 100 mL | 250252 | 10/29/14 00:04 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.04 g | 100 mL | 250451 | 10/29/14 18:01 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.07 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.07 g | 100 mL | 251424 | 11/01/14 05:57 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.59 g | 50 mL | 251102 | 11/04/14 07:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.59 g | 50 mL | 251373 | 11/04/14 13:25 | CGG | TAL DEN |

## Client Sample ID: SB-29 — Lab Sample ID: 280-61264-14

**Date Collected: 10/14/14 10:50** — **Matrix: Solid**
**Date Received: 10/15/14 08:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

## Client Sample ID: SB-29 — Lab Sample ID: 280-61264-14

**Date Collected: 10/14/14 10:50** — **Matrix: Solid**
**Date Received: 10/15/14 08:55** — **Percent Solids: 76.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.7 g | 1 mL | 249026 | 10/22/14 11:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.7 g | 1 mL | 249199 | 10/23/14 17:11 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 5 | 1.11 g | 100 mL | 250451 | 10/29/14 18:04 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 5 | 1.04 g | 100 mL | 251399 | 11/04/14 15:24 | SJS | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.57 g | 50 mL | 251102 | 11/04/14 07:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.57 g | 50 mL | 251373 | 11/04/14 13:27 | CGG | TAL DEN |

## Client Sample ID: SB-28 — Lab Sample ID: 280-61264-15

**Date Collected: 10/14/14 10:40** — **Matrix: Solid**
**Date Received: 10/15/14 08:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 248188 | 10/16/14 09:41 | OB1 | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Client Sample ID: SB-28

**Date Collected: 10/14/14 10:40**
**Date Received: 10/15/14 08:55**

## Lab Sample ID: 280-61264-15

**Matrix: Solid**
**Percent Solids: 93.1**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.5 g | 1 mL | 249026 | 10/22/14 11:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.5 g | 1 mL | 249199 | 10/23/14 17:39 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.12 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.12 g | 100 mL | 250252 | 10/29/14 00:09 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.12 g | 100 mL | 248098 | 10/15/14 17:28 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.12 g | 100 mL | 250451 | 10/29/14 18:06 | SJS | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.03 g | 100 mL | 250484 | 10/31/14 08:30 | CGG | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.03 g | 100 mL | 251424 | 11/01/14 06:02 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.58 g | 50 mL | 251102 | 11/04/14 07:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.58 g | 50 mL | 251373 | 11/04/14 13:30 | CGG | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-61264-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

**H4J200403 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 22**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

REVISED

PROJECT NO. 280-61264-1

UNC Cogen

Lot #: H4J200403

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry
Project Manager

November 13, 2014

# ANALYTICAL METHODS SUMMARY

**H4J200403**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |
| Percent Moisture | MCAWW 160.3 MOD |

**References:**

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H4J200403**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M5AL6 | 001 | SB-31-7-8 | 10/14/14 | 12:00 |
| M5AL7 | 002 | SB-31 | 10/14/14 | 09:50 |
| M5AL8 | 003 | SB-30 | 10/14/14 | 09:25 |
| M5AL9 | 004 | SB-29 | 10/14/14 | 10:50 |
| M5AMA | 005 | SB-28 | 10/14/14 | 10:40 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H4J200403
## Revised

This report was revised to remove a sample that was reported by mistake after being cancelled by the client.

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation was included with the original report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

For solid and sediments samples, when percent moisture is included in the report header field, the sample results are reported on a dry weight basis. When percent moisture is not contained in the header field, sample results are reported on an as received or wet weight basis.

The following flags are used to qualify results for chlorinated dioxin and furan results:

> **J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:
>
> **Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.
>
> Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

# PROJECT NARRATIVE
## H4J200403

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:
**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of ≥2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These criteria include the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- Polychlorinated dibenzofuran purity. No peak can be identified as a polychlorinated dibenzofuran if a polychlorinated diphenyl ether peak maximizes within +/- 2 seconds of the furan candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

# PROJECT NARRATIVE
## H4J200403

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

# PROJECT NARRATIVE
## H4J200403

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: SB-31-7-8**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J200403 - 001 | **Work Order #....:** | M5AL61AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/14/14 | **Date Received....:** | 10/17/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture** | 27 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 10.5 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.3 | 0.18 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.28** | **J** | **6.5** | **0.047** | **pg/g** |
| 1,2,3,4,7,8-HxCDD | ND | | 6.5 | 0.049 | pg/g |
| **1,2,3,6,7,8-HxCDD** | **0.15** | **Q J** | **6.5** | **0.051** | **pg/g** |
| 1,2,3,7,8,9-HxCDD | ND | | 6.5 | 0.047 | pg/g |
| **1,2,3,4,6,7,8-HpCDD** | **6.2** | **B J** | **6.5** | **0.12** | **pg/g** |
| **OCDD** | **1100** | **B** | **13** | **0.29** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.3 | 0.041 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 6.5 | 0.048 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 6.5 | 0.046 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 6.5 | 0.030 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 6.5 | 0.030 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 6.5 | 0.034 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 6.5 | 0.047 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.099** | **Q B J** | **6.5** | **0.017** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.17** | **B J** | **6.5** | **0.027** | **pg/g** |
| **OCDF** | **0.50** | **Q B J** | **13** | **0.022** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 60 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 72 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 70 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 72 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 76 | 40 - 135 |
| 13C-OCDD | 72 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 57 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 75 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 69 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 71 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 66 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 68 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 60 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 72 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 63 | 40 - 135 |
| 13C-OCDF | 60 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB-31-7-8**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J200403 - 001 | **Work Order #....:** | M5AL61AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/14/14 | **Date Received....:** | 10/17/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture** | 27 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 10.5 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SB-30**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J200403 - 003 | **Work Order #....:** | M5AL81AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/14/14 | **Date Received....:** | 10/17/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture** | 15 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.12 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.8 | 0.034 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.8 | 0.033 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.8 | 0.035 | pg/g |
| 1,2,3,7,8,9-HxCDD | ND | | 5.8 | 0.032 | pg/g |
| **1,2,3,4,6,7,8-HpCDD** | **1.9** | **B J** | **5.8** | **0.050** | **pg/g** |
| **OCDD** | **83** | **B** | **12** | **0.076** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.039 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.8 | 0.035 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.8 | 0.036 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.8 | 0.026 | pg/g |
| **1,2,3,6,7,8-HxCDF** | **0.11** | **Q J** | **5.8** | **0.023** | **pg/g** |
| 2,3,4,6,7,8-HxCDF | ND | | 5.8 | 0.025 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.8 | 0.034 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **2.0** | **B J** | **5.8** | **0.022** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.8 | 0.038 | pg/g |
| **OCDF** | **2.2** | **B J** | **12** | **0.018** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 56 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 70 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 66 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 70 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 72 | 40 - 135 |
| 13C-OCDD | 63 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 52 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 66 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 65 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 62 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 63 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 68 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 62 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 60 | 40 - 135 |
| 13C-OCDF | 51 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB-30**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J200403 - 003 | **Work Order #....:** | M5AL81AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/14/14 | **Date Received....:** | 10/17/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture** | 15 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SB-29**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J200403 - 004 | **Work Order #....:** | M5AL91AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/14/14 | **Date Received....:** | 10/17/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture** | 24 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 9.7 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.4 | 0.21 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.36** | **J** | **6.8** | **0.048** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **1.7** | **J** | **6.8** | **0.12** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **2.5** | **J** | **6.8** | **0.12** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **1.0** | **Q B J** | **6.8** | **0.11** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **62** | **B** | **6.8** | **0.15** | **pg/g** |
| **OCDD** | **750** | **B** | **14** | **0.28** | **pg/g** |
| **2,3,7,8-TCDF** | **0.10** | **Q J** | **1.4** | **0.037** | **pg/g** |
| 1,2,3,7,8-PeCDF | ND | | 6.8 | 0.049 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 6.8 | 0.043 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.70** | **Q J** | **6.8** | **0.049** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **1.1** | **Q J** | **6.8** | **0.046** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.14** | **Q B J** | **6.8** | **0.050** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 6.8 | 0.063 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **12** | **B** | **6.8** | **0.079** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **1.2** | **B J** | **6.8** | **0.12** | **pg/g** |
| **OCDF** | **36** | **B** | **14** | **0.081** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 61 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 65 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 73 | 40 - 135 |
| 13C-OCDD | 69 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 55 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 68 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 70 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 61 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 63 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 61 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 67 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 61 | 40 - 135 |
| 13C-OCDF | 55 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB-29**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J200403 - 004 | **Work Order #....:** | M5AL91AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/14/14 | **Date Received....:** | 10/17/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture** | 24 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 9.7 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SB-28**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J200403 - 005 | **Work Order #....:** | M5AMA1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/14/14 | **Date Received....:** | 10/17/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture** | 10 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 9.5 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.12 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.099** | **J** | **5.9** | **0.036** | **pg/g** |
| 1,2,3,4,7,8-HxCDD | ND | | 5.9 | 0.037 | pg/g |
| **1,2,3,6,7,8-HxCDD** | **0.16** | **Q J** | **5.9** | **0.039** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.077** | **Q B J** | **5.9** | **0.036** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **5.6** | **B J** | **5.9** | **0.10** | **pg/g** |
| **OCDD** | **330** | **B** | **12** | **0.19** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.035 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.9 | 0.042 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.9 | 0.040 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.074** | **Q J** | **5.9** | **0.021** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.12** | **Q J** | **5.9** | **0.022** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.14** | **B J** | **5.9** | **0.023** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 5.9 | 0.029 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **1.5** | **B J** | **5.9** | **0.026** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.9 | 0.039 | pg/g |
| **OCDF** | **2.4** | **B J** | **12** | **0.024** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 63 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 72 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 66 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 66 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 68 | 40 - 135 |
| 13C-OCDD | 67 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 57 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 66 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 67 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 62 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 63 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 66 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 64 | 40 - 135 |
| 13C-OCDF | 56 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB-28**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J200403 - 005 | **Work Order #....:** | M5AMA1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/14/14 | **Date Received....:** | 10/17/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture** | 10 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 9.5 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J210000 - 014B | **Work Order #....:** | M5A191AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.0 | 0.15 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.0 | 0.044 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.0 | 0.044 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.0 | 0.046 | pg/g |
| **1,2,3,7,8,9-HxCDD** | **0.18** | **J** | **5.0** | **0.042** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **0.23** | **Q J** | **5.0** | **0.041** | **pg/g** |
| **OCDD** | **1.3** | **J** | **10** | **0.036** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.0 | 0.040 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.0 | 0.039 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.0 | 0.036 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.0 | 0.032 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 5.0 | 0.031 | pg/g |
| **2,3,4,6,7,8-HxCDF** | **0.11** | **Q J** | **5.0** | **0.031** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 5.0 | 0.045 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.18** | **Q J** | **5.0** | **0.014** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.042** | **Q J** | **5.0** | **0.023** | **pg/g** |
| **OCDF** | **0.72** | **J** | **10** | **0.021** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 55 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 64 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 62 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 67 | 40 - 135 |
| 13C-OCDD | 65 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 53 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 59 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 62 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 62 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 63 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 58 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 64 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 59 | 40 - 135 |
| 13C-OCDF | 51 | 40 - 135 |

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4J210000 - 014B | **Work Order #....:** | M5A191AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 10/21/14 | **Analysis Date....:** | 11/04/14 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 4294014 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H4J200403 | **Work Order # ...:** | M5A191AC-LCS | **Matrix .....:** | SOLID |
| **LCS Lot-Sample# :** | H4J210000 - 014 | | | | |
| **Prep Date .....:** | 10/21/14 | **Analysis Date ..:** | 11/03/14 | | |
| **Prep Batch # ...:** | 4294014 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 10 g | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **20.0** | **18.3** | **pg/g** | **92** | | **(79 - 129)** |
| **1,2,3,7,8-PeCDD** | **100** | **99.1** | **pg/g** | **99** | | **(79 - 129)** |
| **1,2,3,4,7,8-HxCDD** | **100** | **94.2** | **pg/g** | **94** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **100** | **91.9** | **pg/g** | **92** | | **(74 - 124)** |
| **1,2,3,7,8,9-HxCDD** | **100** | **108** | **pg/g** | **108** | **B** | **(70 - 124)** |
| **1,2,3,4,6,7,8-HpCDD** | **100** | **96.2** | **pg/g** | **96** | **B** | **(73 - 123)** |
| **OCDD** | **200** | **186** | **pg/g** | **93** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **20.0** | **21.8** | **pg/g** | **109** | | **(75 - 125)** |
| **1,2,3,7,8-PeCDF** | **100** | **91.0** | **pg/g** | **91** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **100** | **95.8** | **pg/g** | **96** | | **(75 - 125)** |
| **1,2,3,4,7,8-HxCDF** | **100** | **94.3** | **pg/g** | **94** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **100** | **93.8** | **pg/g** | **94** | | **(76 - 126)** |
| **2,3,4,6,7,8-HxCDF** | **100** | **94.7** | **pg/g** | **95** | **B** | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **100** | **97.8** | **pg/g** | **98** | | **(77 - 127)** |
| **1,2,3,4,6,7,8-HpCDF** | **100** | **86.4** | **pg/g** | **86** | **B** | **(77 - 127)** |
| **1,2,3,4,7,8,9-HpCDF** | **100** | **95.7** | **pg/g** | **96** | **B** | **(73 - 123)** |
| **OCDF** | **200** | **186** | **pg/g** | **93** | **B** | **(49 - 128)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 64 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 78 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 69 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 69 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 87 | (40 - 135) |
| 13C-OCDD | 79 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 55 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 74 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 74 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 68 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 65 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 67 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 67 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 72 | (40 - 135) |
| 13C-OCDF | 69 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

HYJ200403

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-270473.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-61264-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 10/31/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | SUB (% Moisture (TA Knoxville))/ % Moisture (TA Knoxville) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SB-31-7-8 (280-61264-11) | 10/14/14 | 12:00 Eastern | | Solid | | | X | X | 1 | |
| SB-31 (280-61264-12) | 10/14/14 | 09:50 Eastern | | Solid | | | X | X | 1 | |
| SB-30 (280-61264-13) | 10/14/14 | 09:25 Eastern | | Solid | | | X | X | 1 | |
| SB-29 (280-61264-14) | 10/14/14 | 10:50 Eastern | | Solid | | | X | X | 1 | |
| SB-28 (280-61264-15) | 10/14/14 | 10:40 Eastern | | Solid | | | X | X | 1 | |

RT CT
REC. @ 3.7°C 3.6°C
CUSTODY SEAL INTACT
1 COOLER RH 10-17-14
FED EX #613992182760

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 10/16/14 1500 | Company TAD | Received by: Ryan Henry | Date/Time: 10/17/14 1030 | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H4J200403

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| | | | |
|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | |
| Company: TestAmerica Laboratories, Inc. | | | |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 10/31/2014 | | |
| City: Knoxville | TAT Requested (days): | | |
| State, Zip: TN, 37921 | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | |
| Email: | WO #: | | |
| Project Name: UNC Cogen | Project #: 28010940 | | |
| Site: | SSOW#: | | |

COC No: 280-270715.1
Page: Page 1 of 1
Job #: 280-61264-1

**Analysis Requested**

**Preservation Codes:**
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | SUB (% Moisture (TA Knoxville))/ % Moisture (TA Knoxville) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SB-30 (280-61264-13) | 10/14/14 | 09:25 Eastern | | Solid | | | X | X | 1 | RT: 1.1°C CT: 1.0°C |
| SB-29 (280-61264-14) | 10/14/14 | 10:50 Eastern | | Solid | | | X | X | 1 | Custody seal intact |
| | | | | | | | | | | 1 Cooler, 5C57 |
| | | | | | | | | | | Fedex PO |
| | | | | | | | | | | tr# 6139 9218 3457 |
| | | | | | | | | | | KW 10/18/14 |

***Possible Hazard Identification***
*Unconfirmed*

***Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)***
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
| Relinquished by: | Date/Time: 10/17/14 16:40 | Company: TA-Denver | Received by: | Date/Time: 10/18/14 0930 | Company: TA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** HMJ2000403

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : SC57<br>Correction factor: -0.1 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: Ryan Henry Date: 10/17/14

QA026R28.doc, 042414

280-61264 Chain of Custody

Temperature on Receipt 1.3 IR6 0.0 Transferred by 10/15/14

Drinking Water? Yes ☐ No ☒

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

| | | | |
|---|---|---|---|
| Client: Geosyntec | Project Manager: Beau Hodge | Date: 10/14/14 | Chain of Custody Number: 281269 |
| Address: 2501 Blue Ridge Rd Suite 430 | Telephone Number (Area Code)/Fax Number: 919 870 0576 | Lab Number | Page 1 of 2 |
| City: Raleigh; State: NC; Zip Code: 27607 | Site Contact: Beau Hodge | Lab Contact: Patrick M | |
| Project Name and Location (State): UNC Cogen | Carrier/Waybill Number | | |
| Contract/Purchase Order/Quote No.: ? | | | |

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Air | Aqueous | Sed. | Soil | Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | Total Metal 6010 | PAH 8270 SIM | P/P 8290 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BKg 1 | 10/13/14 | 1340 | | | | X | X | | | | | | X | | |
| BKg 2 | | 1400 | | | | X | X | | | | | | X | | |
| BKg 3 | | 1555 | | | | X | X | | | | | | X | | |
| BKg 4 | | 1055 | | | | X | X | | | | | | X | | |
| BKg 5 | | 1105 | | | | X | X | | | | | | X | | |
| BKg 6 | | 1130 | | | | X | X | | | | | | X | | |
| ~~B1~~ BKg 7 | | 1200 | | | | X | X | | | | | | X | | |
| BKg 8 | | 1510 | | | | X | X | | | | | | X | | |
| BKg 9 Time = 1500 | | ~~1555~~ 1500 | | | | X | X | | | | | | X | | |
| BKg 10 | | 1445 | | | | X | X | | | | | | X | | |
| SB-31-7-8 | 10/14/14 | 1200 | | | | X | X | | | | | | X | X | X |
| SB-31 | | 0950 | | | | X | X | | | | | | X | X | X |

Analysis (Attach list if more space is needed)

Special Instructions/Conditions of Receipt: Metals include Hazardous substance list plus Al, Ba, Co, Fe, V

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other standard

QC Requirements (Specify)

| | Date | Time | | Date | Time |
|---|---|---|---|---|---|
| 1. Relinquished By: [signature] | 10/14/14 | 1545 | 1. Received By: [signature] | 10/15/14 | 8:55 |
| 2. Relinquished By | | | 2. Received By | | |
| 3. Relinquished By | | | 3. Received By | | |

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Chain of Custody Record

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☒

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124 (1007)

| | | | |
|---|---|---|---|
| Client: Geosyntec | Project Manager: Beau Hodge | Date: 10/14/14 | Chain of Custody Number: 281270 |
| Address: 2501 Blue Ridge Rd Suite 430 | Telephone Number (Area Code)/Fax Number: 919 870 0576 | Lab Number | Page 2 of 2 |
| City: Raleigh; State: NC; Zip Code: 27607 | Site Contact: Beau Hodge | Lab Contact: Patrick M | |
| Project Name and Location (State): UNC Cogen | Carrier/Waybill Number | | |
| Contract/Purchase Order/Quote No.: ? | | | |

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Air | Aqueous | Sed. | Soil | Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | Total Metals Gold | PAH 8270 SIM | D/F 8290 | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-30 | 10/14/14 | 0925 | | | | X | X | | | | | | X | X | X | |
| SB-29 | | 1050 | | | | X | X | | | | | | X | X | X | |
| SB-28 | | 1040 | | | | X | X | | | | | | X | X | X | |

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☒ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other standard

QC Requirements (Specify)

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By: [signature] | Date: 10/14/14 | Time: 1545 | 1. Received By: [signature] | Date: 10/15/14 | Time: 8:55 |
| 2. Relinquished By | Date | Time | 2. Received By | Date | Time |
| 3. Relinquished By | Date | Time | 3. Received By | Date | Time |

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-61264-1

**Login Number: 61264**
**List Number: 1**
**Creator: Dedio, Michael T**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Not requested on COC. |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# APPENDIX J

# Laboratory Analytical Reports – Subsurface Soil

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-48439-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 6:21:12 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| U | Indicates the analyte was analyzed for but not detected. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| F | MS/MSD Recovery and/or RPD exceeds the control limits |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-48439-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-48439-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**

The samples were received on 10/25/2013 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.6º C. Per client request, the samples were placed on hold upon receipt. On October 30, 2013, the client instructed the laboratory to proceed with the analysis on samples SDS-01-19-20-131023, SDS-03-13-14-131023, SDS-06-06-07-131024, SDS-09-02-03-131024 and SDS-11-08-09-131024 and cancel the analysis on the remaining samples.
Sample SDS-08-15-16-131024 lists a collection time 1515 on the COC and 1530 on the container labels. The collection time was logged per the container labels. This sample was later cancelled by the client.
Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrooke Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 11/2/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2º C.

**8270D SIM GCMS**

Samples SDS-01-19-20-131023 (280-48439-1), SDS-03-13-14-131023 (280-48439-2), SDS-06-06-07-131024 (280-48439-5), SDS-09-02-03-131024 (280-48439-8) and SDS-11-08-09-131024 (280-48439-10) were analyzed for 8270D SIM GCMS in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 11/05/2013 and analyzed on 11/13/2013, 11/14/2013 and 11/15/2013.

Due to target analyte concentration, sample SDS-09-02-03-131024 (280-48439-8)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

MS/MSD analyses were not requested.

No difficulties were encountered during the 8270D SIM analysis.

All quality control parameters were within the acceptance limits.

**TOTAL METALS (ICP)**

Samples SDS-01-19-20-131023 (280-48439-1), SDS-03-13-14-131023 (280-48439-2), SDS-06-06-07-131024 (280-48439-5), SDS-09-02-03-131024 (280-48439-8) and SDS-11-08-09-131024 (280-48439-10) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/05/2013 and analyzed on 11/07/2013.

Aluminum, Iron and Zinc were detected in method blank MB 280-199346/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above

## Job ID: 280-48439-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Manganese failed the recovery criteria low for the MS of sample SDS-01-19-20-131023MS (280-48439-1) in batch 280-199914. Aluminum and Iron failed the recovery criteria high. Several analytes failed the recovery criteria high for the MSD of sample SDS-01-19-20-131023MSD (280-48439-1) in batch 280-199914. Chromium, Manganese, Vanadium and Iron exceeded the RPD limit. Refer to the QC report for details.

The serial dilution performed on sample SDS-01-19-20-131023 (280-48439-1) associated with analysis batch 280-199914 was outside control limits for Zinc.

No other difficulties were encountered during the metals analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL MERCURY (CVAA)**

Samples SDS-01-19-20-131023 (280-48439-1), SDS-03-13-14-131023 (280-48439-2), SDS-06-06-07-131024 (280-48439-5), SDS-09-02-03-131024 (280-48439-8) and SDS-11-08-09-131024 (280-48439-10) were analyzed for total mercury (CVAA) in accordance with EPA SW-846 Method 7471B. The samples were prepared and analyzed on 11/07/2013.

No difficulties were encountered during the mercury analysis.

All quality control parameters were within the acceptance limits.

**PERCENT SOLIDS**

Samples SDS-01-19-20-131023 (280-48439-1), SDS-03-13-14-131023 (280-48439-2), SDS-06-06-07-131024 (280-48439-5), SDS-09-02-03-131024 (280-48439-8) and SDS-11-08-09-131024 (280-48439-10) were analyzed for percent solids in accordance with EPA SW846 3550C. The samples were analyzed on 11/01/2013.

No difficulties were encountered during the % solids analysis.

All quality control parameters were within the acceptance limits.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## Client Sample ID: SDS-01-19-20-131023 — Lab Sample ID: 280-48439-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 19000 | | 6600 | 410 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 3400 | J | 6600 | 210 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 2200 | J | 6600 | 230 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 1600 | J | 6600 | 960 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 3400 | J | 6600 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 4400 | J | 6600 | 620 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 21000 | | 6600 | 430 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 8100 | | 6600 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 4000 | J | 6600 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene | 20000 | | 6600 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 14000 | B | 12 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 14 | | 2.3 | 0.76 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 68 | | 1.2 | 0.088 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 1.1 | | 0.58 | 0.038 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 14 | | 1.7 | 0.067 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 6.6 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 24 | | 2.3 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 28000 | B | 17 | 4.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 17 | | 0.92 | 0.31 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 530 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 7.1 | | 4.6 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 2.7 | | 1.5 | 0.99 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 32 | | 2.3 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 72 | B | 3.5 | 0.46 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 220 | | 24 | 7.9 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-03-13-14-131023 — Lab Sample ID: 280-48439-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | B | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.5 | J | 2.1 | 0.68 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 17 | | 1.0 | 0.079 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.33 | J | 0.52 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 7.4 | | 1.6 | 0.060 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 4.9 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 8.4 | | 2.1 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 17000 | B | 16 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 9.9 | | 0.83 | 0.28 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 90 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.6 | J | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 27 | | 2.1 | 0.097 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 19 | B | 3.1 | 0.41 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 13 | J | 21 | 6.7 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-06-06-07-131024 — Lab Sample ID: 280-48439-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 9300 | B | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.4 | J | 2.1 | 0.68 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 14 | | 1.0 | 0.078 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SDS-06-06-07-131024 (Continued) — Lab Sample ID: 280-48439-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Beryllium | 0.13 | J | 0.51 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 9.8 | | 1.5 | 0.060 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.0 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 11 | | 2.1 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 11000 | B | 15 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 6.6 | | 0.82 | 0.28 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 31 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.1 | J | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 28 | | 2.1 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 8.1 | B | 3.1 | 0.41 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 21 | | 20 | 6.5 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-09-02-03-131024 — Lab Sample ID: 280-48439-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 69000 | | 6100 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 16000 | | 6100 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 130000 | | 6100 | 210 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 99000 | | 6100 | 870 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 120000 | | 6100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 140000 | | 6100 | 900 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 130000 | | 6100 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 69000 | | 6100 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 150000 | | 6100 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 36000 | | 6100 | 1600 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 190000 | | 6100 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 30000 | | 6100 | 570 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 96000 | | 6100 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 39000 | | 6100 | 390 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 170000 | | 6100 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 190000 | | 6100 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene | 55000 | | 6100 | 310 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene - DL | 180000 | | 12000 | 2900 | ng/Kg | 2 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 16000 | B | 13 | 2.0 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 21 | | 2.5 | 0.83 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 440 | | 1.3 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 1.6 | | 0.63 | 0.042 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.14 | J | 0.63 | 0.052 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 29 | | 1.9 | 0.073 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 6.7 | | 1.3 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 49 | | 2.5 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 19000 | B | 19 | 4.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 22 | | 1.0 | 0.34 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 220 | | 1.3 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 11 | | 5.0 | 0.16 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 47 | | 2.5 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 70 | B | 3.8 | 0.50 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 140 | | 24 | 7.7 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-11-08-09-131024 — Lab Sample ID: 280-48439-10

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## Client Sample ID: SDS-11-08-09-131024 (Continued) — Lab Sample ID: 280-48439-10

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthylene | 1200 | J | 5100 | 170 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 1100 | J | 5100 | 920 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 1700 | J | 5100 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 1700 | J | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 1600 | J | 5100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 1600 | J | 5100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 1900 | J | 5100 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 1800 | J | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 14000 | B | 11 | 1.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 0.73 | J | 2.2 | 0.73 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 18 | | 1.1 | 0.084 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.45 | J | 0.55 | 0.036 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 8.3 | | 1.6 | 0.064 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 7.3 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 6.9 | | 2.2 | 0.24 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 14000 | B | 16 | 4.2 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 13 | | 0.88 | 0.30 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 410 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.7 | J | 4.4 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 30 | | 2.2 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 36 | B | 3.3 | 0.44 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 32 | | 21 | 6.7 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7471B | Mercury (CVAA) | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Solid | 10/23/13 14:00 | 10/25/13 09:00 |
| 280-48439-2 | SDS-03-13-14-131023 | Solid | 10/23/13 14:25 | 10/25/13 09:00 |
| 280-48439-5 | SDS-06-06-07-131024 | Solid | 10/24/13 11:35 | 10/25/13 09:00 |
| 280-48439-8 | SDS-09-02-03-131024 | Solid | 10/24/13 16:00 | 10/25/13 09:00 |
| 280-48439-10 | SDS-11-08-09-131024 | Solid | 10/24/13 17:20 | 10/25/13 09:00 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SDS-01-19-20-131023**
**Date Collected: 10/23/13 14:00**
**Date Received: 10/25/13 09:00**

**Lab Sample ID: 280-48439-1**
**Matrix: Solid**
**Percent Solids: 73.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **2-Methylnaphthalene** | **19000** | | 6600 | 410 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **Acenaphthene** | **3400** | **J** | 6600 | 210 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **Acenaphthylene** | **2200** | **J** | 6600 | 230 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **Anthracene** | **1600** | **J** | 6600 | 960 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| Benzo[a]anthracene | 1200 | U | 6600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| Benzo[a]pyrene | 980 | U | 6600 | 980 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| Benzo[b]fluoranthene | 1600 | U | 6600 | 1600 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| Benzo[g,h,i]perylene | 1500 | U | 6600 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| Benzo[k]fluoranthene | 1300 | U | 6600 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| Chrysene | 1300 | U | 6600 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| Dibenz(a,h)anthracene | 1700 | U | 6600 | 1700 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **Fluoranthene** | **3400** | **J** | 6600 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **Fluorene** | **4400** | **J** | 6600 | 620 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| Indeno[1,2,3-cd]pyrene | 1500 | U | 6600 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **Naphthalene** | **21000** | | 6600 | 430 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **Phenanthrene** | **8100** | | 6600 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **Pyrene** | **4000** | **J** | 6600 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |
| **1-Methylnaphthalene** | **20000** | | 6600 | 340 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 14:54 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *62* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 14:54* | *1* |
| *Nitrobenzene-d5* | *45* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 14:54* | *1* |
| *Terphenyl-d14* | *41* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 14:54* | *1* |

**Client Sample ID: SDS-03-13-14-131023**
**Date Collected: 10/23/13 14:25**
**Date Received: 10/25/13 09:00**

**Lab Sample ID: 280-48439-2**
**Matrix: Solid**
**Percent Solids: 86.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 330 | U | 5400 | 330 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Acenaphthene | 170 | U | 5400 | 170 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Acenaphthylene | 180 | U | 5400 | 180 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Anthracene | 780 | U | 5400 | 780 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Benzo[a]anthracene | 970 | U | 5400 | 970 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Benzo[a]pyrene | 800 | U | 5400 | 800 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Benzo[b]fluoranthene | 1300 | U | 5400 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Benzo[g,h,i]perylene | 1200 | U | 5400 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Benzo[k]fluoranthene | 1100 | U | 5400 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Chrysene | 1100 | U | 5400 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5400 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Fluoranthene | 1100 | U | 5400 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Fluorene | 510 | U | 5400 | 510 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Indeno[1,2,3-cd]pyrene | 1200 | U | 5400 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Naphthalene | 350 | U | 5400 | 350 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Phenanthrene | 1200 | U | 5400 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| Pyrene | 1200 | U | 5400 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |
| 1-Methylnaphthalene | 280 | U | 5400 | 280 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:01 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | | *39 - 120* | *11/05/13 19:00* | *11/13/13 19:01* | *1* |
| *Nitrobenzene-d5* | *83* | | *42 - 120* | *11/05/13 19:00* | *11/13/13 19:01* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SDS-03-13-14-131023**
**Date Collected: 10/23/13 14:25**
**Date Received: 10/25/13 09:00**

**Lab Sample ID: 280-48439-2**
**Matrix: Solid**
**Percent Solids: 86.9**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *86* | | *35 - 124* | *11/05/13 19:00* | *11/13/13 19:01* | *1* |

**Client Sample ID: SDS-06-06-07-131024**
**Date Collected: 10/24/13 11:35**
**Date Received: 10/25/13 09:00**

**Lab Sample ID: 280-48439-5**
**Matrix: Solid**
**Percent Solids: 87.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 320 | U | 5200 | 320 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Acenaphthene | 170 | U | 5200 | 170 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Acenaphthylene | 180 | U | 5200 | 180 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Anthracene | 750 | U | 5200 | 750 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Benzo[a]anthracene | 940 | U | 5200 | 940 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Benzo[a]pyrene | 770 | U | 5200 | 770 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Benzo[b]fluoranthene | 1300 | U | 5200 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Benzo[g,h,i]perylene | 1100 | U | 5200 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Benzo[k]fluoranthene | 1000 | U | 5200 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Chrysene | 1000 | U | 5200 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5200 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Fluoranthene | 1000 | U | 5200 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Fluorene | 490 | U | 5200 | 490 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Indeno[1,2,3-cd]pyrene | 1100 | U | 5200 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Naphthalene | 340 | U | 5200 | 340 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Phenanthrene | 1100 | U | 5200 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| Pyrene | 1100 | U | 5200 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |
| 1-Methylnaphthalene | 270 | U | 5200 | 270 | ng/Kg | ☼ | 11/05/13 19:00 | 11/13/13 19:29 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *83* | | *39 - 120* | *11/05/13 19:00* | *11/13/13 19:29* | *1* |
| *Nitrobenzene-d5* | *86* | | *42 - 120* | *11/05/13 19:00* | *11/13/13 19:29* | *1* |
| *Terphenyl-d14* | *84* | | *35 - 124* | *11/05/13 19:00* | *11/13/13 19:29* | *1* |

**Client Sample ID: SDS-09-02-03-131024**
**Date Collected: 10/24/13 16:00**
**Date Received: 10/25/13 09:00**

**Lab Sample ID: 280-48439-8**
**Matrix: Solid**
**Percent Solids: 78.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **2-Methylnaphthalene** | **69000** | | 6100 | 370 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Acenaphthene** | **16000** | | 6100 | 190 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Acenaphthylene** | **130000** | | 6100 | 210 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Anthracene** | **99000** | | 6100 | 870 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Benzo[a]anthracene** | **120000** | | 6100 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Benzo[a]pyrene** | **140000** | | 6100 | 900 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Benzo[g,h,i]perylene** | **130000** | | 6100 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Benzo[k]fluoranthene** | **69000** | | 6100 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Chrysene** | **150000** | | 6100 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Dibenz(a,h)anthracene** | **36000** | | 6100 | 1600 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Fluoranthene** | **190000** | | 6100 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Fluorene** | **30000** | | 6100 | 570 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **96000** | | 6100 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Naphthalene** | **39000** | | 6100 | 390 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Phenanthrene** | **170000** | | 6100 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |
| **Pyrene** | **190000** | | 6100 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SDS-09-02-03-131024** — **Lab Sample ID: 280-48439-8**
**Date Collected: 10/24/13 16:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 78.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | **55000** | | 6100 | 310 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:21 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *80* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 15:21* | *1* |
| *Nitrobenzene-d5* | *73* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 15:21* | *1* |
| *Terphenyl-d14* | *78* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 15:21* | *1* |

**Client Sample ID: SDS-11-08-09-131024** — **Lab Sample ID: 280-48439-10**
**Date Collected: 10/24/13 17:20** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 88.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 320 | U | 5100 | 320 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| Acenaphthene | 160 | U | 5100 | 160 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| **Acenaphthylene** | **1200** | **J** | 5100 | 170 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| Anthracene | 740 | U | 5100 | 740 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| **Benzo[a]anthracene** | **1100** | **J** | 5100 | 920 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| Benzo[a]pyrene | 760 | U | 5100 | 760 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| **Benzo[b]fluoranthene** | **1700** | **J** | 5100 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| **Benzo[g,h,i]perylene** | **1700** | **J** | 5100 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| **Benzo[k]fluoranthene** | **1600** | **J** | 5100 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| **Chrysene** | **1600** | **J** | 5100 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| **Dibenz(a,h)anthracene** | **1900** | **J** | 5100 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| Fluoranthene | 1000 | U | 5100 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| Fluorene | 480 | U | 5100 | 480 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **1800** | **J** | 5100 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| Naphthalene | 330 | U | 5100 | 330 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| Phenanthrene | 1100 | U | 5100 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| Pyrene | 1100 | U | 5100 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |
| 1-Methylnaphthalene | 270 | U | 5100 | 270 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 15:48 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *82* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 15:48* | *1* |
| *Nitrobenzene-d5* | *76* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 15:48* | *1* |
| *Terphenyl-d14* | *94* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 15:48* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

**Client Sample ID: SDS-09-02-03-131024** — **Lab Sample ID: 280-48439-8**
**Date Collected: 10/24/13 16:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 78.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Benzo[b]fluoranthene** | **180000** | | 12000 | 2900 | ng/Kg | ☼ | 11/05/13 19:00 | 11/15/13 13:50 | 2 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *74* | | *39 - 120* | *11/05/13 19:00* | *11/15/13 13:50* | *2* |
| *Nitrobenzene-d5* | *45* | | *42 - 120* | *11/05/13 19:00* | *11/15/13 13:50* | *2* |
| *Terphenyl-d14* | *74* | | *35 - 124* | *11/05/13 19:00* | *11/15/13 13:50* | *2* |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## Method: 6010C - Metals (ICP)

**Client Sample ID: SDS-01-19-20-131023** — **Lab Sample ID: 280-48439-1**
**Date Collected: 10/23/13 14:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 73.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 14000 | B | 12 | 1.8 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Antimony | 0.44 | U | 1.7 | 0.44 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Arsenic | 14 | | 2.3 | 0.76 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Barium | 68 | | 1.2 | 0.088 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Beryllium | 1.1 | | 0.58 | 0.038 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Cadmium | 0.047 | U | 0.58 | 0.047 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Chromium | 14 | | 1.7 | 0.067 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Cobalt | 6.6 | | 1.2 | 0.12 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Copper | 24 | | 2.3 | 0.25 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Iron | 28000 | B | 17 | 4.4 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 17:33 | 1 |
| Lead | 17 | | 0.92 | 0.31 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Manganese | 530 | | 1.2 | 0.12 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Nickel | 7.1 | | 4.6 | 0.14 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 17:33 | 1 |
| Selenium | 2.7 | | 1.5 | 0.99 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Silver | 0.18 | U | 1.2 | 0.18 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Thallium | 0.75 | U | 1.4 | 0.75 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Vanadium | 32 | | 2.3 | 0.11 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:26 | 1 |
| Zinc | 72 | B | 3.5 | 0.46 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 17:33 | 1 |

**Client Sample ID: SDS-03-13-14-131023** — **Lab Sample ID: 280-48439-2**
**Date Collected: 10/23/13 14:25** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 86.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | B | 10 | 1.6 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Antimony | 0.39 | U | 1.6 | 0.39 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Arsenic | 1.5 | J | 2.1 | 0.68 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Barium | 17 | | 1.0 | 0.079 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Beryllium | 0.33 | J | 0.52 | 0.034 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Cadmium | 0.043 | U | 0.52 | 0.043 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Chromium | 7.4 | | 1.6 | 0.060 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Cobalt | 4.9 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Copper | 8.4 | | 2.1 | 0.22 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Iron | 17000 | B | 16 | 3.9 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 17:54 | 1 |
| Lead | 9.9 | | 0.83 | 0.28 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Manganese | 90 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Nickel | 2.6 | J | 4.1 | 0.13 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 17:54 | 1 |
| Selenium | 0.89 | U | 1.3 | 0.89 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Silver | 0.17 | U | 1.0 | 0.17 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Thallium | 0.67 | U | 1.2 | 0.67 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Vanadium | 27 | | 2.1 | 0.097 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:46 | 1 |
| Zinc | 19 | B | 3.1 | 0.41 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 17:54 | 1 |

**Client Sample ID: SDS-06-06-07-131024** — **Lab Sample ID: 280-48439-5**
**Date Collected: 10/24/13 11:35** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 87.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 9300 | B | 10 | 1.6 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Antimony | 0.39 | U | 1.5 | 0.39 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Arsenic | 1.4 | J | 2.1 | 0.68 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Barium | 14 | | 1.0 | 0.078 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-06-06-07-131024** — **Lab Sample ID: 280-48439-5**
**Date Collected: 10/24/13 11:35** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 87.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Beryllium | 0.13 | J | 0.51 | 0.034 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Cadmium | 0.042 | U | 0.51 | 0.042 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Chromium | 9.8 | | 1.5 | 0.060 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Cobalt | 1.0 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Copper | 11 | | 2.1 | 0.22 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Iron | 11000 | B | 15 | 3.9 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:01 | 1 |
| Lead | 6.6 | | 0.82 | 0.28 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Manganese | 31 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Nickel | 1.1 | J | 4.1 | 0.13 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:01 | 1 |
| Selenium | 0.88 | U | 1.3 | 0.88 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Thallium | 0.67 | U | 1.2 | 0.67 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Vanadium | 28 | | 2.1 | 0.096 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 00:53 | 1 |
| Zinc | 8.1 | B | 3.1 | 0.41 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:01 | 1 |

**Client Sample ID: SDS-09-02-03-131024** — **Lab Sample ID: 280-48439-8**
**Date Collected: 10/24/13 16:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 78.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | B | 13 | 2.0 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Antimony | 0.48 | U | 1.9 | 0.48 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Arsenic | 21 | | 2.5 | 0.83 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Barium | 440 | | 1.3 | 0.096 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Beryllium | 1.6 | | 0.63 | 0.042 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Cadmium | 0.14 | J | 0.63 | 0.052 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Chromium | 29 | | 1.9 | 0.073 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Cobalt | 6.7 | | 1.3 | 0.13 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Copper | 49 | | 2.5 | 0.27 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Iron | 19000 | B | 19 | 4.8 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:08 | 1 |
| Lead | 22 | | 1.0 | 0.34 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Manganese | 220 | | 1.3 | 0.13 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Nickel | 11 | | 5.0 | 0.16 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:08 | 1 |
| Selenium | 1.1 | U | 1.6 | 1.1 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Silver | 0.20 | U | 1.3 | 0.20 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Thallium | 0.82 | U | 1.5 | 0.82 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Vanadium | 47 | | 2.5 | 0.12 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:01 | 1 |
| Zinc | 70 | B | 3.8 | 0.50 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:08 | 1 |

**Client Sample ID: SDS-11-08-09-131024** — **Lab Sample ID: 280-48439-10**
**Date Collected: 10/24/13 17:20** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 88.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 14000 | B | 11 | 1.7 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Antimony | 0.42 | U | 1.6 | 0.42 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Arsenic | 0.73 | J | 2.2 | 0.73 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Barium | 18 | | 1.1 | 0.084 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Beryllium | 0.45 | J | 0.55 | 0.036 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Cadmium | 0.045 | U | 0.55 | 0.045 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Chromium | 8.3 | | 1.6 | 0.064 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Cobalt | 7.3 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-11-08-09-131024** — **Lab Sample ID: 280-48439-10**
**Date Collected: 10/24/13 17:20** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 88.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Copper | 6.9 | | 2.2 | 0.24 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Iron | 14000 | B | 16 | 4.2 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:21 | 1 |
| Lead | 13 | | 0.88 | 0.30 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Manganese | 410 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Nickel | 2.7 | J | 4.4 | 0.14 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:21 | 1 |
| Selenium | 0.95 | U | 1.4 | 0.95 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Silver | 0.18 | U | 1.1 | 0.18 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Thallium | 0.71 | U | 1.3 | 0.71 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Vanadium | 30 | | 2.2 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:14 | 1 |
| Zinc | 36 | B | 3.3 | 0.44 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:21 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SDS-01-19-20-131023** — **Lab Sample ID: 280-48439-1**
**Date Collected: 10/23/13 14:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 73.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 220 | | 24 | 7.9 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 19:29 | 1 |

**Client Sample ID: SDS-03-13-14-131023** — **Lab Sample ID: 280-48439-2**
**Date Collected: 10/23/13 14:25** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 86.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 13 | J | 21 | 6.7 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 19:41 | 1 |

**Client Sample ID: SDS-06-06-07-131024** — **Lab Sample ID: 280-48439-5**
**Date Collected: 10/24/13 11:35** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 87.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 21 | | 20 | 6.5 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 19:48 | 1 |

**Client Sample ID: SDS-09-02-03-131024** — **Lab Sample ID: 280-48439-8**
**Date Collected: 10/24/13 16:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 78.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 140 | | 24 | 7.7 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 19:55 | 1 |

**Client Sample ID: SDS-11-08-09-131024** — **Lab Sample ID: 280-48439-10**
**Date Collected: 10/24/13 17:20** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 88.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 32 | | 21 | 6.7 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 19:59 | 1 |

## General Chemistry

**Client Sample ID: SDS-01-19-20-131023** — **Lab Sample ID: 280-48439-1**
**Date Collected: 10/23/13 14:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 73.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 27 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |
| Percent Solids | 73 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

**Client Sample ID: SDS-03-13-14-131023** — **Lab Sample ID: 280-48439-2**
**Date Collected: 10/23/13 14:25** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 86.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 13 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |
| Percent Solids | 87 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |

**Client Sample ID: SDS-06-06-07-131024** — **Lab Sample ID: 280-48439-5**
**Date Collected: 10/24/13 11:35** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 87.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 12 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |
| Percent Solids | 88 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |

**Client Sample ID: SDS-09-02-03-131024** — **Lab Sample ID: 280-48439-8**
**Date Collected: 10/24/13 16:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 78.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 22 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |
| Percent Solids | 78 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |

**Client Sample ID: SDS-11-08-09-131024** — **Lab Sample ID: 280-48439-10**
**Date Collected: 10/24/13 17:20** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 88.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 12 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |
| Percent Solids | 88 | | 0.10 | 0.10 | % | | | 11/01/13 13:57 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-48439-1 | SDS-01-19-20-131023 | 62 | 45 | 41 |
| 280-48439-2 | SDS-03-13-14-131023 | 81 | 83 | 86 |
| 280-48439-5 | SDS-06-06-07-131024 | 83 | 86 | 84 |
| 280-48439-8 | SDS-09-02-03-131024 | 80 | 73 | 78 |
| 280-48439-8 - DL | SDS-09-02-03-131024 | 74 | 45 | 74 |
| 280-48439-10 | SDS-11-08-09-131024 | 82 | 76 | 94 |
| LCS 280-199407/2-A | Lab Control Sample | 90 | 88 | 93 |
| MB 280-199407/1-A | Method Blank | 88 | 89 | 89 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-199407/1-A**
**Matrix: Solid**
**Analysis Batch: 200677**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 199407**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 280 | U | 4600 | 280 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Acenaphthene | 150 | U | 4600 | 150 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Acenaphthylene | 160 | U | 4600 | 160 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Anthracene | 660 | U | 4600 | 660 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[a]anthracene | 830 | U | 4600 | 830 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[a]pyrene | 680 | U | 4600 | 680 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[b]fluoranthene | 1100 | U | 4600 | 1100 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[g,h,i]perylene | 1000 | U | 4600 | 1000 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[k]fluoranthene | 920 | U | 4600 | 920 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Chrysene | 920 | U | 4600 | 920 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Dibenz(a,h)anthracene | 1200 | U | 4600 | 1200 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Fluoranthene | 920 | U | 4600 | 920 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Fluorene | 430 | U | 4600 | 430 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Indeno[1,2,3-cd]pyrene | 1000 | U | 4600 | 1000 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Naphthalene | 300 | U | 4600 | 300 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Phenanthrene | 1000 | U | 4600 | 1000 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Pyrene | 1000 | U | 4600 | 1000 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| 1-Methylnaphthalene | 240 | U | 4600 | 240 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *39 - 120* | *11/05/13 19:00* | *11/13/13 10:00* | *1* |
| *Nitrobenzene-d5* | *89* | | *42 - 120* | *11/05/13 19:00* | *11/13/13 10:00* | *1* |
| *Terphenyl-d14* | *89* | | *35 - 124* | *11/05/13 19:00* | *11/13/13 10:00* | *1* |

**Lab Sample ID: LCS 280-199407/2-A**
**Matrix: Solid**
**Analysis Batch: 200677**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 199407**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 27800 | 24600 | | ng/Kg | | 89 | 35 - 120 |
| Acenaphthylene | 27800 | 23800 | | ng/Kg | | 86 | 41 - 120 |
| Anthracene | 27800 | 25300 | | ng/Kg | | 91 | 43 - 120 |
| Benzo[a]anthracene | 27800 | 25600 | | ng/Kg | | 92 | 36 - 120 |
| Benzo[a]pyrene | 27800 | 23800 | | ng/Kg | | 86 | 20 - 120 |
| Benzo[b]fluoranthene | 27800 | 24800 | | ng/Kg | | 89 | 37 - 120 |
| Benzo[g,h,i]perylene | 27800 | 25400 | | ng/Kg | | 91 | 20 - 123 |
| Benzo[k]fluoranthene | 27800 | 24800 | | ng/Kg | | 89 | 46 - 120 |
| Chrysene | 27800 | 28300 | | ng/Kg | | 102 | 34 - 120 |
| Dibenz(a,h)anthracene | 27800 | 24900 | | ng/Kg | | 90 | 20 - 120 |
| Fluoranthene | 27800 | 24400 | | ng/Kg | | 88 | 45 - 120 |
| Fluorene | 27800 | 24200 | | ng/Kg | | 87 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 27800 | 25100 | | ng/Kg | | 90 | 20 - 127 |
| Naphthalene | 27800 | 28000 | | ng/Kg | | 101 | 44 - 120 |
| Phenanthrene | 27800 | 25700 | | ng/Kg | | 93 | 44 - 120 |
| Pyrene | 27800 | 24300 | | ng/Kg | | 87 | 43 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-199407/2-A**
**Matrix: Solid**
**Analysis Batch: 200677**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 199407**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *90* | | *39 - 120* |
| *Nitrobenzene-d5* | *88* | | *42 - 120* |
| *Terphenyl-d14* | *93* | | *35 - 124* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-199346/1-A**
**Matrix: Solid**
**Analysis Batch: 199685**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 199346**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 2.75 | J | 10 | 1.6 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Barium | 0.076 | U | 1.0 | 0.076 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |

**Lab Sample ID: MB 280-199346/1-A**
**Matrix: Solid**
**Analysis Batch: 199914**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 199346**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 10.1 | J | 15 | 3.8 | mg/Kg | | 11/05/13 12:18 | 11/07/13 17:29 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 11/05/13 12:18 | 11/07/13 17:29 | 1 |
| Zinc | 0.634 | J | 3.0 | 0.40 | mg/Kg | | 11/05/13 12:18 | 11/07/13 17:29 | 1 |

**Lab Sample ID: LCS 280-199346/2-A**
**Matrix: Solid**
**Analysis Batch: 199685**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 199346**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 186 | | mg/Kg | | 93 | 82 - 116 |
| Antimony | 50.0 | 45.1 | | mg/Kg | | 90 | 82 - 110 |
| Arsenic | 100 | 97.9 | | mg/Kg | | 98 | 85 - 110 |
| Barium | 200 | 194 | | mg/Kg | | 97 | 87 - 112 |
| Beryllium | 5.00 | 4.62 | | mg/Kg | | 92 | 84 - 114 |
| Cadmium | 10.0 | 10.2 | | mg/Kg | | 102 | 87 - 110 |
| Chromium | 20.0 | 19.5 | | mg/Kg | | 98 | 84 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-199346/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199685** — **Prep Batch: 199346**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Cobalt | 50.0 | 47.8 | | mg/Kg | | 96 | 87 - 110 |
| Copper | 25.0 | 24.6 | | mg/Kg | | 98 | 88 - 110 |
| Lead | 50.0 | 48.4 | | mg/Kg | | 97 | 86 - 110 |
| Manganese | 50.0 | 47.3 | | mg/Kg | | 95 | 88 - 110 |
| Selenium | 200 | 194 | | mg/Kg | | 97 | 83 - 110 |
| Silver | 5.00 | 4.95 | | mg/Kg | | 99 | 87 - 114 |
| Thallium | 200 | 189 | | mg/Kg | | 94 | 84 - 110 |
| Vanadium | 50.0 | 48.5 | | mg/Kg | | 97 | 88 - 110 |

**Lab Sample ID: LCS 280-199346/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199914** — **Prep Batch: 199346**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 100 | 94.2 | | mg/Kg | | 94 | 87 - 120 |
| Nickel | 50.0 | 46.9 | | mg/Kg | | 94 | 87 - 110 |
| Zinc | 50.0 | 46.0 | | mg/Kg | | 92 | 76 - 114 |

**Lab Sample ID: 280-48439-1 MS** — **Client Sample ID: SDS-01-19-20-131023**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199685** — **Prep Batch: 199346**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 14000 | B | 245 | 28900 | 4 | mg/Kg | ☼ | 6116 | 50 - 200 |
| Antimony | 0.44 | U | 61.4 | 13.9 | | mg/Kg | ☼ | 23 | 20 - 200 |
| Arsenic | 14 | | 123 | 124 | | mg/Kg | ☼ | 90 | 76 - 111 |
| Barium | 68 | | 245 | 301 | | mg/Kg | ☼ | 95 | 52 - 159 |
| Beryllium | 1.1 | | 6.14 | 6.48 | | mg/Kg | ☼ | 88 | 72 - 105 |
| Cadmium | 0.047 | U | 12.3 | 11.8 | | mg/Kg | ☼ | 96 | 40 - 130 |
| Chromium | 14 | | 24.5 | 37.5 | | mg/Kg | ☼ | 98 | 70 - 200 |
| Cobalt | 6.6 | | 61.4 | 60.8 | | mg/Kg | ☼ | 88 | 72 - 106 |
| Copper | 24 | | 30.7 | 55.4 | | mg/Kg | ☼ | 103 | 37 - 187 |
| Lead | 17 | | 61.4 | 69.4 | | mg/Kg | ☼ | 86 | 70 - 200 |
| Manganese | 530 | | 61.4 | 427 | 4 | mg/Kg | ☼ | -162 | 40 - 200 |
| Selenium | 2.7 | | 245 | 213 | | mg/Kg | ☼ | 86 | 76 - 104 |
| Silver | 0.18 | U | 6.14 | 6.03 | | mg/Kg | ☼ | 98 | 75 - 141 |
| Thallium | 0.75 | U | 245 | 200 | | mg/Kg | ☼ | 81 | 78 - 101 |
| Vanadium | 32 | | 61.4 | 90.6 | | mg/Kg | ☼ | 96 | 50 - 169 |

**Lab Sample ID: 280-48439-1 MS** — **Client Sample ID: SDS-01-19-20-131023**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199914** — **Prep Batch: 199346**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 28000 | B | 123 | 28600 | 4 | mg/Kg | ☼ | 841 | 70 - 200 |
| Nickel | 7.1 | | 61.4 | 62.2 | | mg/Kg | ☼ | 90 | 61 - 126 |
| Zinc | 72 | B | 61.4 | 129 | | mg/Kg | ☼ | 94 | 70 - 200 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-48439-1 MSD** — **Client Sample ID: SDS-01-19-20-131023**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199685** — **Prep Batch: 199346**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 14000 | B | 248 | 31100 | 4 | mg/Kg | ☼ | 6965 | 50 - 200 | 7 | 20 |
| Antimony | 0.44 | U | 61.9 | 14.4 | | mg/Kg | ☼ | 23 | 20 - 200 | 4 | 20 |
| Arsenic | 14 | | 124 | 125 | | mg/Kg | ☼ | 90 | 76 - 111 | 1 | 20 |
| Barium | 68 | | 248 | 312 | | mg/Kg | ☼ | 99 | 52 - 159 | 3 | 20 |
| Beryllium | 1.1 | | 6.19 | 6.87 | | mg/Kg | ☼ | 94 | 72 - 105 | 6 | 20 |
| Cadmium | 0.047 | U | 12.4 | 11.8 | | mg/Kg | ☼ | 95 | 40 - 130 | 1 | 20 |
| Chromium | 14 | | 24.8 | 84.1 | F | mg/Kg | ☼ | 285 | 70 - 200 | 77 | 20 |
| Cobalt | 6.6 | | 61.9 | 61.4 | | mg/Kg | ☼ | 89 | 72 - 106 | 1 | 20 |
| Copper | 24 | | 31.0 | 60.3 | | mg/Kg | ☼ | 118 | 37 - 187 | 8 | 20 |
| Lead | 17 | | 61.9 | 80.8 | | mg/Kg | ☼ | 104 | 70 - 200 | 15 | 20 |
| Manganese | 530 | | 61.9 | 738 | 4 F | mg/Kg | ☼ | 342 | 40 - 200 | 53 | 20 |
| Selenium | 2.7 | | 248 | 209 | | mg/Kg | ☼ | 83 | 76 - 104 | 2 | 20 |
| Silver | 0.18 | U | 6.19 | 6.05 | | mg/Kg | ☼ | 98 | 75 - 141 | 0 | 20 |
| Thallium | 0.75 | U | 248 | 198 | | mg/Kg | ☼ | 80 | 78 - 101 | 1 | 20 |
| Vanadium | 32 | | 61.9 | 152 | F | mg/Kg | ☼ | 195 | 50 - 169 | 51 | 20 |

**Lab Sample ID: 280-48439-1 MSD** — **Client Sample ID: SDS-01-19-20-131023**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199914** — **Prep Batch: 199346**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 28000 | B | 124 | 40600 | 4 F | mg/Kg | ☼ | 10479 | 70 - 200 | 35 | 20 |
| Nickel | 7.1 | | 61.9 | 62.0 | | mg/Kg | ☼ | 89 | 61 - 126 | 0 | 20 |
| Zinc | 72 | B | 61.9 | 131 | | mg/Kg | ☼ | 95 | 70 - 200 | 1 | 20 |

## Method: 7471B - Mercury (CVAA)

**Lab Sample ID: MB 280-198924/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200005** — **Prep Batch: 198924**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.5 | U | 17 | 5.5 | ug/Kg | | 11/07/13 13:20 | 11/07/13 19:25 | 1 |

**Lab Sample ID: LCS 280-198924/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200005** — **Prep Batch: 198924**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 417 | 455 | | ug/Kg | | 109 | 87 - 111 |

**Lab Sample ID: 280-48439-1 MS** — **Client Sample ID: SDS-01-19-20-131023**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200005** — **Prep Batch: 198924**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 220 | | 668 | 921 | | ug/Kg | ☼ | 105 | 87 - 111 |

## Method: 7471B - Mercury (CVAA) (Continued)

**Lab Sample ID: 280-48439-1 MSD** — **Client Sample ID: SDS-01-19-20-131023**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200005** — **Prep Batch: 198924**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 220 | | 597 | 836 | | ug/Kg | ☼ | 103 | 87 - 111 | 10 | 20 |

## Method: Moisture - Percent Moisture

**Lab Sample ID: 280-48439-1 DU** — **Client Sample ID: SDS-01-19-20-131023**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 198947**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 27 | | | 29 | | % | | | | 8 | 20 |
| Percent Solids | 73 | | | 71 | | % | | | | 3 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## GC/MS Semi VOA

### Prep Batch: 199407

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Total/NA | Solid | 3546 | |
| 280-48439-2 | SDS-03-13-14-131023 | Total/NA | Solid | 3546 | |
| 280-48439-5 | SDS-06-06-07-131024 | Total/NA | Solid | 3546 | |
| 280-48439-8 | SDS-09-02-03-131024 | Total/NA | Solid | 3546 | |
| 280-48439-8 - DL | SDS-09-02-03-131024 | Total/NA | Solid | 3546 | |
| 280-48439-10 | SDS-11-08-09-131024 | Total/NA | Solid | 3546 | |
| LCS 280-199407/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-199407/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Analysis Batch: 200677

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-2 | SDS-03-13-14-131023 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48439-5 | SDS-06-06-07-131024 | Total/NA | Solid | 8270D SIM | 199407 |
| LCS 280-199407/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 199407 |
| MB 280-199407/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 199407 |

### Analysis Batch: 201027

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48439-8 | SDS-09-02-03-131024 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48439-10 | SDS-11-08-09-131024 | Total/NA | Solid | 8270D SIM | 199407 |

### Analysis Batch: 201287

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-8 - DL | SDS-09-02-03-131024 | Total/NA | Solid | 8270D SIM | 199407 |

## Metals

### Prep Batch: 198924

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Total/NA | Solid | 7471B | |
| 280-48439-1 MS | SDS-01-19-20-131023 | Total/NA | Solid | 7471B | |
| 280-48439-1 MSD | SDS-01-19-20-131023 | Total/NA | Solid | 7471B | |
| 280-48439-2 | SDS-03-13-14-131023 | Total/NA | Solid | 7471B | |
| 280-48439-5 | SDS-06-06-07-131024 | Total/NA | Solid | 7471B | |
| 280-48439-8 | SDS-09-02-03-131024 | Total/NA | Solid | 7471B | |
| 280-48439-10 | SDS-11-08-09-131024 | Total/NA | Solid | 7471B | |
| LCS 280-198924/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| MB 280-198924/1-A | Method Blank | Total/NA | Solid | 7471B | |

### Prep Batch: 199346

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Total/NA | Solid | 3050B | |
| 280-48439-1 MS | SDS-01-19-20-131023 | Total/NA | Solid | 3050B | |
| 280-48439-1 MSD | SDS-01-19-20-131023 | Total/NA | Solid | 3050B | |
| 280-48439-2 | SDS-03-13-14-131023 | Total/NA | Solid | 3050B | |
| 280-48439-5 | SDS-06-06-07-131024 | Total/NA | Solid | 3050B | |
| 280-48439-8 | SDS-09-02-03-131024 | Total/NA | Solid | 3050B | |
| 280-48439-10 | SDS-11-08-09-131024 | Total/NA | Solid | 3050B | |
| LCS 280-199346/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |

## Metals (Continued)

### Prep Batch: 199346 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 280-199346/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Analysis Batch: 199685

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-1 MS | SDS-01-19-20-131023 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-1 MSD | SDS-01-19-20-131023 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-2 | SDS-03-13-14-131023 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-5 | SDS-06-06-07-131024 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-8 | SDS-09-02-03-131024 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-10 | SDS-11-08-09-131024 | Total/NA | Solid | 6010C | 199346 |
| LCS 280-199346/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 199346 |
| MB 280-199346/1-A | Method Blank | Total/NA | Solid | 6010C | 199346 |

### Analysis Batch: 199914

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-1 MS | SDS-01-19-20-131023 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-1 MSD | SDS-01-19-20-131023 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-2 | SDS-03-13-14-131023 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-5 | SDS-06-06-07-131024 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-8 | SDS-09-02-03-131024 | Total/NA | Solid | 6010C | 199346 |
| 280-48439-10 | SDS-11-08-09-131024 | Total/NA | Solid | 6010C | 199346 |
| LCS 280-199346/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 199346 |
| MB 280-199346/1-A | Method Blank | Total/NA | Solid | 6010C | 199346 |

### Analysis Batch: 200005

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Total/NA | Solid | 7471B | 198924 |
| 280-48439-1 MS | SDS-01-19-20-131023 | Total/NA | Solid | 7471B | 198924 |
| 280-48439-1 MSD | SDS-01-19-20-131023 | Total/NA | Solid | 7471B | 198924 |
| 280-48439-2 | SDS-03-13-14-131023 | Total/NA | Solid | 7471B | 198924 |
| 280-48439-5 | SDS-06-06-07-131024 | Total/NA | Solid | 7471B | 198924 |
| 280-48439-8 | SDS-09-02-03-131024 | Total/NA | Solid | 7471B | 198924 |
| 280-48439-10 | SDS-11-08-09-131024 | Total/NA | Solid | 7471B | 198924 |
| LCS 280-198924/2-A | Lab Control Sample | Total/NA | Solid | 7471B | 198924 |
| MB 280-198924/1-A | Method Blank | Total/NA | Solid | 7471B | 198924 |

## General Chemistry

### Analysis Batch: 198947

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48439-1 | SDS-01-19-20-131023 | Total/NA | Solid | Moisture | |
| 280-48439-1 DU | SDS-01-19-20-131023 | Total/NA | Solid | Moisture | |
| 280-48439-2 | SDS-03-13-14-131023 | Total/NA | Solid | Moisture | |
| 280-48439-5 | SDS-06-06-07-131024 | Total/NA | Solid | Moisture | |
| 280-48439-8 | SDS-09-02-03-131024 | Total/NA | Solid | Moisture | |
| 280-48439-10 | SDS-11-08-09-131024 | Total/NA | Solid | Moisture | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## Client Sample ID: SDS-01-19-20-131023 — Lab Sample ID: 280-48439-1

**Date Collected: 10/23/13 14:00**
**Date Received: 10/25/13 09:00**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198947 | 11/01/13 13:57 | BAN | TAL DEN |

## Client Sample ID: SDS-01-19-20-131023 — Lab Sample ID: 280-48439-1

**Date Collected: 10/23/13 14:00**
**Date Received: 10/25/13 09:00**
**Matrix: Solid**
**Percent Solids: 73.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.8 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.8 g | 1000 uL | 201027 | 11/14/13 14:54 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.18 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.18 g | 100 mL | 199685 | 11/07/13 00:26 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.18 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.18 g | 100 mL | 199914 | 11/07/13 17:33 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .57 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .57 g | 50 mL | 200005 | 11/07/13 19:29 | JM | TAL DEN |

## Client Sample ID: SDS-03-13-14-131023 — Lab Sample ID: 280-48439-2

**Date Collected: 10/23/13 14:25**
**Date Received: 10/25/13 09:00**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198947 | 11/01/13 13:57 | BAN | TAL DEN |

## Client Sample ID: SDS-03-13-14-131023 — Lab Sample ID: 280-48439-2

**Date Collected: 10/23/13 14:25**
**Date Received: 10/25/13 09:00**
**Matrix: Solid**
**Percent Solids: 86.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 32.0 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 32.0 g | 1000 uL | 200677 | 11/13/13 19:01 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199685 | 11/07/13 00:46 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199914 | 11/07/13 17:54 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .57 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .57 g | 50 mL | 200005 | 11/07/13 19:41 | JM | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## Client Sample ID: SDS-06-06-07-131024 — Lab Sample ID: 280-48439-5

**Date Collected: 10/24/13 11:35** — **Matrix: Solid**
**Date Received: 10/25/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198947 | 11/01/13 13:57 | BAN | TAL DEN |

## Client Sample ID: SDS-06-06-07-131024 — Lab Sample ID: 280-48439-5

**Date Collected: 10/24/13 11:35** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 87.8**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 32.8 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 32.8 g | 1000 uL | 200677 | 11/13/13 19:29 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199685 | 11/07/13 00:53 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199914 | 11/07/13 18:01 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .58 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .58 g | 50 mL | 200005 | 11/07/13 19:48 | JM | TAL DEN |

## Client Sample ID: SDS-09-02-03-131024 — Lab Sample ID: 280-48439-8

**Date Collected: 10/24/13 16:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198947 | 11/01/13 13:57 | BAN | TAL DEN |

## Client Sample ID: SDS-09-02-03-131024 — Lab Sample ID: 280-48439-8

**Date Collected: 10/24/13 16:00** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 78.5**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.6 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.6 g | 1000 uL | 201027 | 11/14/13 15:21 | KGV | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 31.6 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 2 | 31.6 g | 1000 uL | 201287 | 11/15/13 13:50 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.01 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.01 g | 100 mL | 199685 | 11/07/13 01:01 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.01 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.01 g | 100 mL | 199914 | 11/07/13 18:08 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .55 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .55 g | 50 mL | 200005 | 11/07/13 19:55 | JM | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## Client Sample ID: SDS-11-08-09-131024 — Lab Sample ID: 280-48439-10

**Date Collected: 10/24/13 17:20** — **Matrix: Solid**
**Date Received: 10/25/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198947 | 11/01/13 13:57 | BAN | TAL DEN |

## Client Sample ID: SDS-11-08-09-131024 — Lab Sample ID: 280-48439-10

**Date Collected: 10/24/13 17:20** — **Matrix: Solid**
**Date Received: 10/25/13 09:00** — **Percent Solids: 88.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 33.1 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 33.1 g | 1000 uL | 201027 | 11/14/13 15:48 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.03 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.03 g | 100 mL | 199685 | 11/07/13 01:14 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.03 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.03 g | 100 mL | 199914 | 11/07/13 18:21 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .56 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .56 g | 50 mL | 200005 | 11/07/13 19:59 | JM | TAL DEN |

**Laboratory References:**
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48439-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Colorado | State Program | 8 | N/A | 09-30-14 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Maryland | State Program | 3 | 268 | 03-31-14 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

**H3K020409 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 28**

**Total Number of Pages ..... 30**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-48439-1

UNC Cogen

Lot #: H3K020409

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

November 19, 2013

# ANALYTICAL METHODS SUMMARY

**H3K020409**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |
| Percent Moisture | MCAWW 160.3 MOD |

**References:**

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H3K020409**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M2ETK | 001 | SDS-01-19-20-131023 | 10/23/13 | 14:00 |
| M2ETL | 002 | SDS-03-13-14-131023 | 10/23/13 | 14:25 |
| M2ETP | 005 | SDS-06-06-07-131024 | 10/24/13 | 11:35 |
| M2ETT | 008 | SDS-09-02-03-131024 | 10/24/13 | 16:00 |
| M2ETW | 010 | SDS-11-08-09-131024 | 10/24/13 | 17:20 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H3K020409

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

The sample IDs listed on the chain of custody documentation did not match the IDs listed on the sample container label for several samples.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

For solid and sediments samples, when percent moisture is included in the report header field, the sample results are reported on a dry weight basis. When percent moisture is not contained in the header field, sample results are reported on an as received or wet weight basis.

The percent recovery for OCDF was 27% on SDS-01-19-20-131023 Matrix Spike Duplicate. The lower acceptance criterion is 45%. The recovery in the laboratory control sample met its acceptance criterion indicating sample matrix effects.

The relative percent difference (RPD) for OCDF on SDS-01-19-20-131023 Matrix Spike / Matrix Spike Duplicate was 55%. The method states that the RPD should be within 15 percent. The RPD of the labeled internal standards were within 15 percent.

The percent difference (%D from the ICAL) for OCDF on closing standard 131113s2 was -22%. When the %D falls between 20 and 25%, the method requires the use of the average (of the bracketing) response factors for all samples on the shift. This adjustment was performed as specified by the method.

Sample SDS-09-02-03-131024 was reported at a 5-fold dilution due to high levels of native analytes in the sample.

Sample SDS-09-02-03-131024 exhibited native OCDD above the upper calibration level. The method does not require further action be taken; therefore, the results were reported as is with an “E” qualifier.

The following flags are used to qualify results for chlorinated dioxin and furan results:

> **J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is “the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point”. The ML was introduced in

# PROJECT NARRATIVE
## H3K020409

EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a

positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |

# PROJECT NARRATIVE
## H3K020409

W = amount of sample extracted (grams or liters)
S = percent solids (optional, if results are requested to be reported on dry weight basis)

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:
As = Sum of areas of the target peaks
Qis = ng of internal standard added to sample
Ais = Sum of areas of the internal standard peaks
RRF = mean relative response factor of compound obtained during initial calibration
W = amount of sample extracted (grams or liters)
S = percent solids (optional, if results are requested to be reported on dry weight basis)

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:
1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and

# PROJECT NARRATIVE
## H3K020409

Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.

3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: SDS-01-19-20-131023**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020409 - 001 | **Work Order #....:** | M2ETK1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/23/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/13/13 | **Percent Moisture** | 26 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 9.7 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.4 | 0.0067 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.062** | **Q J** | **6.9** | **0.0091** | **pg/g** |
| 1,2,3,4,7,8-HxCDD | ND | | 6.9 | 0.018 | pg/g |
| **1,2,3,6,7,8-HxCDD** | **0.065** | **Q J** | **6.9** | **0.018** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.044** | **Q J** | **6.9** | **0.016** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **2.2** | **J** | **6.9** | **0.037** | **pg/g** |
| **OCDD** | **360** | **B** | **14** | **0.094** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.4 | 0.0084 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 6.9 | 0.015 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 6.9 | 0.014 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.027** | **Q J** | **6.9** | **0.015** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.074** | **Q J** | **6.9** | **0.015** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.043** | **Q J** | **6.9** | **0.013** | **pg/g** |
| **1,2,3,7,8,9-HxCDF** | **0.049** | **Q J** | **6.9** | **0.018** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDF** | **0.18** | **Q B J** | **6.9** | **0.024** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.20** | **Q J** | **6.9** | **0.036** | **pg/g** |
| **OCDF** | **0.29** | **Q B J** | **14** | **0.034** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 81 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 98 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 74 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 78 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 75 | 40 - 135 |
| 13C-OCDD | 84 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 90 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 91 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 65 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 62 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 54 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-01-19-20-131023**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020409 - 001 | **Work Order #....:** | M2ETK1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/23/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/13/13 | **Percent Moisture** | 26 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 9.7 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: SDS-03-13-14-131023

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| Lot - Sample #....: | H3K020409 - 002 | Work Order #....: | M2ETL1AC | Matrix....: | SOLID |
| Date Sampled....: | 10/23/13 | Date Received....: | 11/02/13 | Dilution Factor: | 1 |
| Prep Date....: | 11/05/13 | Analysis Date....: | 11/13/13 | Percent Moisture | 14 |
| Prep Batch # ....: | 3309012 | | | | |
| Initial Wgt/Vol : | 10 g | Instrument ID....: | D2A | Method: | SW846 8290 |
| Analyst ID....: | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.0040 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.0065** | **Q J** | **5.8** | **0.0036** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **0.032** | **J** | **5.8** | **0.0062** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **0.028** | **Q J** | **5.8** | **0.0066** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.14** | **C J** | **5.8** | **0.0058** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **2.2** | **J** | **5.8** | **0.012** | **pg/g** |
| **OCDD** | **150** | **B** | **12** | **0.016** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.0026 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.8 | 0.0037 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.8 | 0.0027 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.0064** | **J** | **5.8** | **0.0033** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.019** | **Q J** | **5.8** | **0.0032** | **pg/g** |
| 2,3,4,6,7,8-HxCDF | ND | | 5.8 | 0.0028 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.8 | 0.0067 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.11** | **Q B J** | **5.8** | **0.0069** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.8 | 0.012 | pg/g |
| **OCDF** | **0.26** | **Q S B J** | **12** | **0.012** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 66 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 83 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 78 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 70 | 40 - 135 |
| 13C-OCDD | 81 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 66 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 74 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 69 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 67 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 51 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 65 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 60 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-03-13-14-131023**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020409 - 002 | **Work Order #....:** | M2ETL1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/23/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/13/13 | **Percent Moisture** | 14 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| C | Co-eluting isomer. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |
| S | Ion suppression. |

TestAmerica Denver

Sample ID: SDS-06-06-07-131024

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020409 - 005 | **Work Order #....:** | M2ETP1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/24/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/13/13 | **Percent Moisture** | 11 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 9.9 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.0086 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.7 | 0.0055 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.7 | 0.014 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.7 | 0.016 | pg/g |
| **1,2,3,7,8,9-HxCDD** | **0.049** | **Q J** | **5.7** | **0.014** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **1.1** | **Q J** | **5.7** | **0.036** | **pg/g** |
| **OCDD** | **280** | **B** | **11** | **0.11** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.1 | 0.0057 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.7 | 0.0070 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.7 | 0.0059 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.050** | **Q J** | **5.7** | **0.011** | **pg/g** |
| 1,2,3,6,7,8-HxCDF | ND | | 5.7 | 0.011 | pg/g |
| **2,3,4,6,7,8-HxCDF** | **0.031** | **Q J** | **5.7** | **0.010** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 5.7 | 0.016 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | ND | | 5.7 | 0.015 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.7 | 0.021 | pg/g |
| **OCDF** | **0.071** | **Q B J** | **11** | **0.024** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 60 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 80 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 72 | 40 - 135 |
| 13C-OCDD | 91 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 63 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 66 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 70 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 69 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 67 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-06-06-07-131024**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020409 - 005 | **Work Order #....:** | M2ETP1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/24/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/13/13 | **Percent Moisture** | 11 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 9.9 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: SDS-09-02-03-131024

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| Lot - Sample #....: | H3K020409 - 008 | Work Order #....: | M2ETT1AC | Matrix....: | SOLID |
| Date Sampled....: | 10/24/13 | Date Received....: | 11/02/13 | Dilution Factor: | 5 |
| Prep Date....: | 11/05/13 | Analysis Date....: | 11/13/13 | Percent Moisture | 20 |
| Prep Batch # ....: | 3309012 | | | | |
| Initial Wgt/Vol : | 10.3 g | Instrument ID....: | D2A | Method: | SW846 8290 |
| Analyst ID....: | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 2.1 | Q J | 6.1 | 0.27 | pg/g |
| 1,2,3,7,8-PeCDD | 11 | J | 30 | 0.14 | pg/g |
| 1,2,3,4,7,8-HxCDD | 230 | | 30 | 0.27 | pg/g |
| 1,2,3,6,7,8-HxCDD | 130 | | 30 | 0.25 | pg/g |
| 1,2,3,7,8,9-HxCDD | 36 | C | 30 | 0.24 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | 4100 | | 30 | 0.58 | pg/g |
| OCDD | 56000 | B E | 61 | 0.66 | pg/g |
| 2,3,7,8-TCDF | 0.13 | Q J | 6.1 | 0.088 | pg/g |
| 1,2,3,7,8-PeCDF | 0.37 | Q J | 30 | 0.21 | pg/g |
| 2,3,4,7,8-PeCDF | 0.31 | Q J | 30 | 0.19 | pg/g |
| 1,2,3,4,7,8-HxCDF | 24 | Q J | 30 | 0.26 | pg/g |
| 1,2,3,6,7,8-HxCDF | 71 | Q | 30 | 0.26 | pg/g |
| 2,3,4,6,7,8-HxCDF | 5.7 | Q J | 30 | 0.25 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 30 | 0.36 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | 420 | B | 30 | 0.42 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | 44 | | 30 | 0.69 | pg/g |
| OCDF | 710 | Q B | 61 | 0.11 | pg/g |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 71 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 100 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 68 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 82 | 40 - 135 |
| 13C-OCDD | 109 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 75 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 87 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 90 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 71 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 72 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 70 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 62 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-09-02-03-131024**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020409 - 008 | **Work Order #....:** | M2ETT1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/24/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 5 |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/13/13 | **Percent Moisture** | 20 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 10.3 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| C | Co-eluting isomer. |
| E | Estimated result. Result concentration exceeds the calibration range. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

TestAmerica Denver

Sample ID: SDS-11-08-09-131024

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| Lot - Sample #....: | H3K020409 - 010 | Work Order #....: | M2ETW1AC | Matrix....: | SOLID |
| Date Sampled....: | 10/24/13 | Date Received....: | 11/02/13 | Dilution Factor: | 1 |
| Prep Date....: | 11/05/13 | Analysis Date....: | 11/13/13 | Percent Moisture | 11 |
| Prep Batch # ....: | 3309012 | | | | |
| Initial Wgt/Vol : | 10 g | Instrument ID....: | D2A | Method: | SW846 8290 |
| Analyst ID....: | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.016 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.6 | 0.023 | pg/g |
| **1,2,3,4,7,8-HxCDD** | **0.87** | **Q J** | **5.6** | **0.042** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **1.5** | **Q J** | **5.6** | **0.040** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.78** | **C J** | **5.6** | **0.037** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **64** | | **5.6** | **0.091** | **pg/g** |
| **OCDD** | **1500** | **B** | **11** | **0.16** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.1 | 0.011 | pg/g |
| **1,2,3,7,8-PeCDF** | **0.091** | **J** | **5.6** | **0.026** | **pg/g** |
| 2,3,4,7,8-PeCDF | ND | | 5.6 | 0.025 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **1.0** | **Q J** | **5.6** | **0.046** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **1.1** | **Q J** | **5.6** | **0.041** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.22** | **Q J** | **5.6** | **0.044** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 5.6 | 0.055 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **9.1** | **B** | **5.6** | **0.070** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **1.5** | **J** | **5.6** | **0.093** | **pg/g** |
| **OCDF** | **21** | **B** | **11** | **0.037** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 75 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 75 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 90 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 79 | 40 - 135 |
| 13C-OCDD | 99 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 77 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 81 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 79 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 72 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 78 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 83 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 71 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 65 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-11-08-09-131024**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020409 - 010 | **Work Order #....:** | M2ETW1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/24/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/13/13 | **Percent Moisture** | 11 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K050000 - 012B | **Work Order #....:** | M2E851AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/12/13 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.0 | 0.016 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.0 | 0.0081 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.0 | 0.0089 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.0 | 0.0096 | pg/g |
| 1,2,3,7,8,9-HxCDD | ND | | 5.0 | 0.0083 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | ND | | 5.0 | 0.021 | pg/g |
| **OCDD** | **0.59** | **J** | **10** | **0.012** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.0 | 0.014 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.0 | 0.012 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.0 | 0.012 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.0 | 0.013 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 5.0 | 0.011 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 5.0 | 0.012 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.0 | 0.019 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.030** | **Q J** | **5.0** | **0.0060** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.0 | 0.0085 | pg/g |
| **OCDF** | **0.25** | **Q J** | **10** | **0.0078** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 64 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 67 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 84 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 67 | 40 - 135 |
| 13C-OCDD | 77 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 62 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 68 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 69 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 68 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 63 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 66 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 59 | 40 - 135 |

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K050000 - 012B | **Work Order #....:** | M2E851AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/05/13 | **Analysis Date....:** | 11/12/13 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 3309012 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H3K020409 | **Work Order # ...:** | M2E851AC-LCS | **Matrix .....:** | SOLID |
| **LCS Lot-Sample# :** | H3K050000 - 012 | | | | |
| **Prep Date .....:** | 11/05/13 | **Analysis Date ..:** | 11/12/13 | | |
| **Prep Batch # ...:** | 3309012 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Melissa A. Davidson | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 10 g | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **20.0** | **19.9** | **pg/g** | **99** | | **(79 - 129)** |
| **1,2,3,7,8-PeCDD** | **100** | **96.6** | **pg/g** | **97** | | **(79 - 129)** |
| **1,2,3,4,7,8-HxCDD** | **100** | **95.4** | **pg/g** | **95** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **100** | **98.9** | **pg/g** | **99** | | **(74 - 124)** |
| **1,2,3,7,8,9-HxCDD** | **100** | **88.1** | **pg/g** | **88** | | **(70 - 124)** |
| **1,2,3,4,6,7,8-HpCDD** | **100** | **96.1** | **pg/g** | **96** | | **(73 - 123)** |
| **OCDD** | **200** | **189** | **pg/g** | **94** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **20.0** | **23.6** | **pg/g** | **118** | | **(75 - 125)** |
| **1,2,3,7,8-PeCDF** | **100** | **92.2** | **pg/g** | **92** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **100** | **100** | **pg/g** | **100** | | **(75 - 125)** |
| **1,2,3,4,7,8-HxCDF** | **100** | **103** | **pg/g** | **103** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **100** | **103** | **pg/g** | **103** | | **(76 - 126)** |
| **2,3,4,6,7,8-HxCDF** | **100** | **101** | **pg/g** | **101** | | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **100** | **98.7** | **pg/g** | **99** | | **(77 - 127)** |
| **1,2,3,4,6,7,8-HpCDF** | **100** | **110** | **pg/g** | **110** | **B** | **(77 - 127)** |
| **1,2,3,4,7,8,9-HpCDF** | **100** | **101** | **pg/g** | **101** | | **(73 - 123)** |
| **OCDF** | **200** | **172** | **pg/g** | **86** | **B** | **(49 - 128)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 61 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 75 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 75 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 76 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 65 | (40 - 135) |
| 13C-OCDD | 80 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 55 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 74 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 66 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 61 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 65 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 73 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 69 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 63 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 63 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

## MATRIX/MATRIX SPIKE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H3K020409 | **Work Order # ...:** | M2ETK1AD-MS | **Matrix .....:** | SOLID |
| **OS Lot-Sample# :** | H3K020409 - 001 | | M2ETK1AE-MSD | | |
| **Prep Date .....:** | 11/05/13 | **Analysis Date ..:** | 11/13/13 | | |
| **Prep Batch # ...:** | 3309012 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 9.7 g | | | | |

| PARAMETER | SAMPLE AMOUNT | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | RECOVERY LIMITS | RPD | RPD LIMITS |
|---|---|---|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | 28.0 | 29.1 | pg/g | 104 | (79 - 129) | | |
| | ND | 28.0 | 29.1 | pg/g | 104 | (79 - 129) | 0.040 | (0 - 15) |
| 1,2,3,7,8-PeCDD | 0.062 | 140 | 128 | pg/g | 92 | (79 - 129) | | |
| | 0.062 | 140 | 133 | pg/g | 95 | (79 - 129) | 3.4 | (0 - 15) |
| 1,2,3,4,7,8-HxCDD | ND | 140 | 145 | pg/g | 104 | (73 - 123) | | |
| | ND | 140 | 131 | pg/g | 94 | (73 - 123) | 10 | (0 - 15) |
| 1,2,3,6,7,8-HxCDD | 0.065 | 140 | 135 | pg/g | 96 | (73 - 127) | | |
| | 0.065 | 140 | 133 | pg/g | 95 | (73 - 127) | 1.1 | (0 - 15) |
| 1,2,3,7,8,9-HxCDD | 0.044 | 140 | 144 | pg/g | 103 | (65 - 141) | | |
| | 0.044 | 140 | 137 | pg/g | 98 | (65 - 141) | 4.7 | (0 - 15) |
| 1,2,3,4,6,7,8-HpCDD | 2.2 | 140 | 138 | pg/g | 97 | (54 - 138) | | |
| | 2.2 | 140 | 127 | pg/g | 89 | (54 - 138) | 8.4 | (0 - 15) |
| OCDD | 360 | 280 | 683 | pg/g | 116 B | (31 - 154) | | |
| | 360 | 280 | 721 | pg/g | 130 B | (31 - 154) | 5.5 | (0 - 15) |
| 2,3,7,8-TCDF | ND | 28.0 | 30.3 | pg/g | 108 | (75 - 125) | | |
| | ND | 28.0 | 31.8 | pg/g | 114 | (75 - 125) | 4.9 | (0 - 15) |
| 1,2,3,7,8-PeCDF | ND | 140 | 127 | pg/g | 91 | (74 - 124) | | |
| | ND | 140 | 132 | pg/g | 94 | (74 - 124) | 3.8 | (0 - 15) |
| 2,3,4,7,8-PeCDF | ND | 140 | 134 | pg/g | 96 | (75 - 125) | | |
| | ND | 140 | 143 | pg/g | 102 | (75 - 125) | 6.0 | (0 - 15) |
| 1,2,3,4,7,8-HxCDF | 0.027 | 140 | 137 | pg/g | 98 | (75 - 125) | | |
| | 0.027 | 140 | 133 | pg/g | 95 | (75 - 125) | 3.5 | (0 - 15) |
| 1,2,3,6,7,8-HxCDF | 0.074 | 140 | 143 | pg/g | 102 | (73 - 131) | | |
| | 0.074 | 140 | 134 | pg/g | 96 | (73 - 131) | 6.3 | (0 - 15) |
| 2,3,4,6,7,8-HxCDF | 0.043 | 140 | 144 | pg/g | 103 | (76 - 129) | | |
| | 0.043 | 140 | 138 | pg/g | 99 | (76 - 129) | 4.0 | (0 - 15) |
| 1,2,3,7,8,9-HxCDF | 0.049 | 140 | 138 | pg/g | 98 | (77 - 127) | | |
| | 0.049 | 140 | 135 | pg/g | 96 | (77 - 127) | 2.1 | (0 - 15) |
| 1,2,3,4,6,7,8-HpCDF | 0.18 | 140 | 126 | pg/g | 90 B | (72 - 134) | | |
| | 0.18 | 140 | 134 | pg/g | 95 B | (72 - 134) | 6.1 | (0 - 15) |
| 1,2,3,4,7,8,9-HpCDF | 0.20 | 140 | 140 | pg/g | 100 | (73 - 124) | | |
| | 0.20 | 140 | 133 | pg/g | 95 | (73 - 124) | 4.8 | (0 - 15) |
| OCDF | 0.29 | 280 | 132 | pg/g | 47 B Q | (45 - 135) | | |
| | 0.29 | 280 | 75.0 | pg/g | 27 a p B Q | (45 - 135) | 55 | (0 - 15) |

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## MATRIX/MATRIX SPIKE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H3K020409 | **Work Order # ...:** | M2ETK1AD-MS | **Matrix .....:** | SOLID |
| **OS Lot-Sample# :** | H3K020409 - 001 | | M2ETK1AE-MSD | | |
| **Prep Date .....:** | 11/05/13 | **Analysis Date ..:** | 11/13/13 | | |
| **Prep Batch # ...:** | 3309012 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 9.7 g | | | | |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 78 | (40 - 135) |
| | 81 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 95 | (40 - 135) |
| | 96 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 71 | (40 - 135) |
| | 76 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 74 | (40 - 135) |
| | 75 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 76 | (40 - 135) |
| | 79 | (40 - 135) |
| 13C-OCDD | 88 | (40 - 135) |
| | 81 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 77 | (40 - 135) |
| | 80 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 88 | (40 - 135) |
| | 90 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 90 | (40 - 135) |
| | 89 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 68 | (40 - 135) |
| | 67 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 66 | (40 - 135) |
| | 64 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 79 | (40 - 135) |
| | 77 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 74 | (40 - 135) |
| | 71 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | (40 - 135) |
| | 60 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 58 | (40 - 135) |
| | 50 | (40 - 135) |

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## MATRIX/MATRIX SPIKE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H3K020409 | **Work Order # ...:** | M2ETK1AD-MS | **Matrix .....:** | SOLID |
| **OS Lot-Sample# :** | H3K020409 - 001 | | M2ETK1AE-MSD | | |
| **Prep Date .....:** | 11/05/13 | **Analysis Date ..:** | 11/13/13 | | |
| **Prep Batch # ...:** | 3309012 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 9.7 g | | | | |

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

p Relative percent difference (RPD) is outside stated control limits.

Q Estimated maximum possible concentration (EMPC).

SOG_Stnd_msmsd_rev1.rpt 11/14/2013

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H3K020409

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-215023.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving- Terry Wasmund | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-48439-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 11/12/2013 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=Comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUBCONTRACT/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| SDS-01-19-20-131023 (280-48439-1) | 10/23/13 | 14:00 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-03-13-14-131023 (280-48439-2) | 10/23/13 | 14:25 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-04-04-05-131023 (280-48439-3) | 10/23/13 | 15:10 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-05-05-07-131023 (280-48439-4) | 10/23/13 | 16:30 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-06-06-07-131024 (280-48439-5) | 10/24/13 | 11:35 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-07-10-11-131024 (280-48439-6) | 10/24/13 | 13:30 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-08-15-16-131024 (280-48439-7) | 10/24/13 | 15:15 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-09-02-03-131024 (280-48439-8) | 10/24/13 | 16:00 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-10-08-09-131024 (280-48439-9) | 10/24/13 | 16:20 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |
| SDS-11-08-09-131024 (280-48439-10) | 10/24/13 | 17:20 Eastern | | Solid | | | X | | Hold Samples/extracts for 60 sdays |

CUSTODY SEALS INTACT
RECEIVED AT 0.2°C
BKD 11-2-13
1 COOLER FAX #
SDG# 6174 5955

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 11/1/13 1330 | Company | Received by: | Date/Time: 11-2-13 10:00 | Company TA KNOX |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H3K020409

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | | / | | ☑ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) | / | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | / | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | / | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | / | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | / | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | / | | / | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | / | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) | / | | / | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | / | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | / | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | / | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | / | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | / | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | / | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | / | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | / | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | / | / | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | / | | ☐ **19a** Other |

**Comments/Actions Taken**

1A SDS-11-08-09-131024, TALS LABEL
LIST SDS-08-15-16-131024

1A, SDS-08-15-16-131024, TALS LABEL
LIST SDS-09-02-03-131024

1A, SDS-09-02-03-131024, TALS LABEL
LIST SDS-10-08-09-131024

1A, SDS-10-08-09-131024, TALS LABEL
LIST SDS-11-08-09-131024

LOGGED AND LABELED PER CLIENT LABEL

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: _____ PM Instructions: _____

Sample Receiving Associate: [signature] Date: 11-2-13

QA026R25.doc, 071813

**Chain of Custody R**

280-48439 Chain of Custody

Sampler ID _____

Temperature on Receipt 3.6 IR3 10/25/13

Drinking Water? Yes ☐ No ☐ ☒

**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

| | | | |
|---|---|---|---|
| Client: Geosyntec | Project Manager: Beau Hodge | Date: 10-24-13 | Chain of Custody Number: 175584 |
| Address: 4601 Six Forks Rd Suite 340 | Telephone Number (Area Code)/Fax Number: 919 870-0576 | Lab Number: Denver/Knox | Page 1 of 1 |
| City: Raleigh; State: NC; Zip Code: 27609 | Site Contact: | Lab Contact: Patrick M. | |
| Project Name and Location (State): UNC Cosen | Carrier/Waybill Number: | | |
| Contract/Purchase Order/Quote No.: | | | |

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Air | Aqueous | Sed. | Soil | Unpres | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | 6010C | 7470A | 8270D SIM | 8290 | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDS-01-19-20-131023 | 10/23/13 | 1400 | | | | X | | | | | | | X | X | X | X | ☒ Refer to QAPP |
| SDS-03-13-14-131023 | 10/23/13 | 1425 | | | | X | | | | | | | X | X | X | X | for analyte lists |
| SDS-04-04-05-131023 | 10/23/13 | 1510 | | | | X | | | | | | | X | X | X | X | for each method |
| SDS-05-05-07-131023 | 10/23/13 | 1630 | | | | X | | | | | | | X | X | X | X | |
| SDS-06-06-07-131024 | 10/24/13 | 1135 | | | | X | | | | | | | X | X | X | X | |
| SDS-07-10-11-131024 | 10/24/13 | 1330 | | | | X | | | | | | | X | X | X | X | |
| SDS-08-15-16-131024 | 10/24/13 | 1515 | | | | X | | | | | | | X | X | X | X | |
| SDS-09-02-03-131024 | 10/24/13 | 1600 | | | | X | | | | | | | X | X | X | X | |
| SDS-10-08-09-131024 | 10/24/13 | 1620 | | | | X | | | | | | | X | X | X | X | |
| SDS-11-08-09-131024 | 10/24/13 | 1720 | | | | X | | | | | | | X | X | X | X | |
| NFETP | | | | | | | | | | | | | | | | | |

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Standard

QC Requirements (Specify):

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By: [signature] | Date: 10/24/13 | Time: 1920 | 1. Received By: Stephanie O'Toole | Date: 10-25-13 | Time: 900 |
| 2. Relinquished By | Date | Time | 2. Received By | Date | Time |
| 3. Relinquished By | Date | Time | 3. Received By | Date | Time |

Comments

**DISTRIBUTION:** WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-48439-1

**Login Number: 48439**
**List Number: 1**
**Creator: O'Tormey, Stephanie R**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Field on COC is blank. |
| There are no discrepancies between the containers received and the COC. | False | Collection time on containers does not match the COC. Logged in per COC. |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-48532-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 6:19:17 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |
| X | Surrogate is outside control limits |
| B | Compound was found in the blank and sample. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| B | Compound was found in the blank and sample. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| * | LCS or LCSD is outside acceptance limits. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-48532-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-48532-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**

The samples were received on 10/29/2013 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.9º C, 1.3º C and 1.8º C. Per client request, the samples were placed on hold upon receipt. On October 30, 2013, the client instructed the laboratory to proceed with the analysis on samples SDS-13-03-04-131025 (280-48532-1), SDS-14-03-04-131025 (280-48532-2), SDS-12-02-03-131025 (280-48532-3), SDS-9-12-02-03-131025 (280-48532-4), SDS-15-07-08-131025 (280-48532-5), SDS-16-09-10-131025 (280-48532-6), SDS-18-19-23-131025 (280-48532-8), SDS-22-11-12-131028 (280-48532-12), SDS-24-11-12-131028 (280-48532-14), SDS-25-04-05-131028 (280-48532-15) and EB-100-131028 (280-48532-17) and cancel the analysis on the remaining samples.

Except:

Sample ID SDS-14-03-04-131025 on the COC is listed as ID SDS-14-02-04-131025 (collection date and time match). The sample ID was logged per the COC.

Sample ID EB-100-131028 is listed as a soil sample with 2 containers on the COC, however the sample is aqueous with four unpreserved liter ambers and one 500mL HNO3 preserved poly.

On October 31, 2013, the client canceled SPLP 8290 analysis on sample SDS-18-19-23-131025 (280-48532-8).

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 Middlebrooke Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 11/2/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2º C.

**SPLP SEMIVOLATILE ORGANIC COMPOUNDS (GC/MS SIM)**

Sample SDS-18-19-23-131025 (280-48532-8) was analyzed for SPLP Semivolatile Organic Compounds (GC/MS SIM) in accordance with SW 846 1312/8270 SIM. The samples were leached on 11/06/2013, prepared on 11/08/2013 and analyzed on 11/19/2013.

2-Methylnaphthalene, Acenaphthene, Naphthalene and Phenanthrene were detected in method blank LB 280-199618/1-D at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

MS/MSD analyses were not requested.

## Job ID: 280-48532-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

No other difficulties were encountered during the 8270D SIM analysis.

All other quality control parameters were within the acceptance limits.

**8270D SIM GCMS - Solid**
Samples SDS-13-03-04-131025 (280-48532-1), SDS-14-03-04-131025 (280-48532-2), SDS-12-02-03-131025 (280-48532-3), SDS-9-12-02-03-131025 (280-48532-4), SDS-15-07-08-131025 (280-48532-5), SDS-16-09-10-131025 (280-48532-6), SDS-18-19-23-131025 (280-48532-8), SDS-22-11-12-131028 (280-48532-12), SDS-24-11-12-131028 (280-48532-14) and SDS-25-04-05-131028 (280-48532-15) were analyzed for 8270D SIM GCMS in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 11/05/2013 and analyzed on 11/14/2013.

2-Fluorobiphenyl, Nitrobenzene-d5 and Terphenyl-d14 failed the surrogate recovery criteria low for SDS-18-19-23-131025 (280-48532-8). Refer to the QC report for details. Evidence of matrix interferences was not obvious. The sample was sent back for re-extraction outside HT. The re-extraction results confirm the original analysis. The original data is reported.

No other difficulties were encountered during the 8270D SIM analysis.

All other quality control parameters were within the acceptance limits.

**8270D SIM GCMS - Aqueous**
Sample EB-100-131028 (280-48532-17) was analyzed for 8270D SIM GCMS in accordance with SW-846 8270D_SIM. The samples were prepared on 11/04/2013 and analyzed on 11/08/2013.

MS/MSD analyses were not requested.

No difficulties were encountered during the 8270D SIM analysis.

All quality control parameters were within the acceptance limits.

**SPLP METALS (ICP)**
Sample SDS-18-19-23-131025 (280-48532-8) was analyzed for SPLP Metals (ICP) in accordance with SW 846 1312/6010C. The samples were leached on 11/06/2013, prepared on 11/14/2013 and analyzed on 11/15/2013.

Barium, Copper, Manganese and Zinc were detected in method blank LB 280-199618/1-C at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Nickel failed the recovery criteria high for LCS 280-199618/2-C. Refer to the QC report for details. This analyte was biased high in the LCS and was not detected in the associated sample; therefore, the data have been reported.

MS/MSD analyses were not requested.

No other difficulties were encountered during the SPLP Metals (ICP) analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL METALS (ICP) - Solid**
Samples SDS-13-03-04-131025 (280-48532-1), SDS-14-03-04-131025 (280-48532-2), SDS-12-02-03-131025 (280-48532-3), SDS-9-12-02-03-131025 (280-48532-4), SDS-15-07-08-131025 (280-48532-5), SDS-16-09-10-131025 (280-48532-6), SDS-18-19-23-131025 (280-48532-8), SDS-22-11-12-131028 (280-48532-12), SDS-24-11-12-131028 (280-48532-14) and SDS-25-04-05-131028 (280-48532-15) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/01/2013 and analyzed on 11/05/2013.

Zinc was detected in method blank MB 280-198988/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL,

## Job ID: 280-48532-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

the result has been flagged. Refer to the QC report for details.

Aluminum and Iron failed the recovery criteria high for the MS of sample SDS-12-02-03-131025MS (280-48532-3) in batch 280-199470. Aluminum and Iron failed the recovery criteria high for the MSD of sample SDS-12-02-03-131025MSD (280-48532-3) in batch 280-199470. Refer to the QC report for details.

The Post Digestion Spike performed on sample SDS-12-02-03-131025 (280-48532-3) failed the recovery criteria low for Barium and Manganese. Refer to the QC report for details. The Serial Dilution was in control.

No other difficulties were encountered during the metals analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL METALS (ICP) - Aqueous**
Sample EB-100-131028 (280-48532-17) was analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/08/2013 and analyzed on 11/09/2013.

MS/MSD analyses were not requested.

No difficulties were encountered during the metals analysis.

All quality control parameters were within the acceptance limits.

**SPLP MERCURY**
Sample SDS-18-19-23-131025 (280-48532-8) was analyzed for SPLP mercury in accordance with EPA SW-846 Methods 1312/7470A. The samples were leached on 11/06/2013, and prepared and analyzed on 11/08/2013.

MS/MSD analyses were not requested.

No difficulties were encountered during the SPLP mercury analysis.

All quality control parameters were within the acceptance limits.

**TOTAL MERCURY - Aqueous**
Sample EB-100-131028 (280-48532-17) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 11/06/2013.

MS/MSD analyses were not requested.

No difficulties were encountered during the mercury analysis.

All quality control parameters were within the acceptance limits.

**TOTAL MERCURY (CVAA) - Solid**
Samples SDS-13-03-04-131025 (280-48532-1), SDS-14-03-04-131025 (280-48532-2), SDS-12-02-03-131025 (280-48532-3), SDS-9-12-02-03-131025 (280-48532-4), SDS-15-07-08-131025 (280-48532-5), SDS-16-09-10-131025 (280-48532-6), SDS-18-19-23-131025 (280-48532-8), SDS-22-11-12-131028 (280-48532-12), SDS-24-11-12-131028 (280-48532-14) and SDS-25-04-05-131028 (280-48532-15) were analyzed for total mercury (CVAA) in accordance with EPA SW-846 Method 7471B. The samples were prepared and analyzed on 11/11/2013.

No difficulties were encountered during the mercury analysis.

All quality control parameters were within the acceptance limits.

## Job ID: 280-48532-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Client Sample ID: SDS-13-03-04-131025 — Lab Sample ID: 280-48532-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 3300 | J | 5600 | 290 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 2500 | J | 5600 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 1500 | J | 5600 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 14000 | | 5600 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 11000 | | 5600 | 800 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 23000 | | 5600 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 25000 | | 5600 | 820 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 30000 | | 5600 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 19000 | | 5600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 11000 | | 5600 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 30000 | | 5600 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 5400 | J | 5600 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 41000 | | 5600 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 4300 | J | 5600 | 520 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 15000 | | 5600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 1900 | J | 5600 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 38000 | | 5600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 50000 | | 5600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 22000 | | 11 | 1.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.5 | | 2.2 | 0.72 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 43 | | 1.1 | 0.083 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.48 | J | 0.55 | 0.036 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 9.5 | | 1.6 | 0.064 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 2.8 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 14 | | 2.2 | 0.24 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 21000 | | 16 | 4.2 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 31 | | 0.88 | 0.30 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 250 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.1 | J | 4.4 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 43 | | 2.2 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 29 | B | 3.3 | 0.44 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 20 | J | 21 | 6.8 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-14-03-04-131025 — Lab Sample ID: 280-48532-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 17000 | | 5500 | 290 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 21000 | | 5500 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 5000 | J | 5500 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 6300 | | 5500 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 14000 | | 5500 | 800 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 34000 | | 5500 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 35000 | | 5500 | 820 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 51000 | | 5500 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 25000 | | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 18000 | | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 41000 | | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 7600 | | 5500 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 74000 | | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 4900 | J | 5500 | 520 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Client Sample ID: SDS-14-03-04-131025 (Continued) — Lab Sample ID: 280-48532-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Indeno[1,2,3-cd]pyrene | 21000 | | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 17000 | | 5500 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 63000 | | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 61000 | | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 13000 | | 10 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.9 | | 2.0 | 0.66 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 48 | | 1.0 | 0.076 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.57 | | 0.50 | 0.033 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 9.2 | | 1.5 | 0.058 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 5.2 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 21 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 15000 | | 15 | 3.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 14 | | 0.80 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 240 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 4.2 | | 4.0 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 30 | | 2.0 | 0.094 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 44 | B | 3.0 | 0.40 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 20 | J | 23 | 7.4 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-12-02-03-131025 — Lab Sample ID: 280-48532-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 3800 | J | 6000 | 310 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 4900 | J | 6000 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 490 | J | 6000 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 2000 | J | 6000 | 200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 1900 | J | 6000 | 860 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 3600 | J | 6000 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 3600 | J | 6000 | 880 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 5900 | J | 6000 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 2900 | J | 6000 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 1900 | J | 6000 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 5800 | J | 6000 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 9600 | | 6000 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1300 | J | 6000 | 560 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 2400 | J | 6000 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 2700 | J | 6000 | 390 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 11000 | | 6000 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 8300 | | 6000 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 6800 | | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.7 | J | 2.0 | 0.67 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 86 | | 1.0 | 0.078 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.40 | J | 0.51 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 7.1 | | 1.5 | 0.059 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.4 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 8.5 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 5200 | | 15 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 9.1 | | 0.82 | 0.28 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 46 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.2 | J | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SDS-12-02-03-131025 (Continued) — Lab Sample ID: 280-48532-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Vanadium | 15 | | 2.0 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 14 | B | 3.1 | 0.41 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 34 | | 23 | 7.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-9-12-02-03-131025 — Lab Sample ID: 280-48532-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 3400 | J | 5500 | 280 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 4300 | J | 5500 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 1100 | J | 5500 | 170 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 1200 | J | 5500 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 2600 | J | 5500 | 790 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 4400 | J | 5500 | 980 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 4300 | J | 5500 | 810 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 7200 | | 5500 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 3300 | J | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 2000 | J | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 6700 | | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 11000 | | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1300 | J | 5500 | 510 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 2700 | J | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 2300 | J | 5500 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 12000 | | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 9500 | | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 8600 | | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.2 | | 2.1 | 0.68 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 120 | | 1.0 | 0.079 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.52 | | 0.52 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 9.4 | | 1.6 | 0.060 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.9 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 12 | | 2.1 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 6600 | | 16 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 12 | | 0.83 | 0.28 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 54 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.0 | J | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 0.96 | J | 1.3 | 0.89 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 19 | | 2.1 | 0.097 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 17 | B | 3.1 | 0.41 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 35 | | 21 | 6.8 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-15-07-08-131025 — Lab Sample ID: 280-48532-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 15000 | | 6500 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 19000 | | 6500 | 400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 2100 | J | 6500 | 210 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 2800 | J | 6500 | 220 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 3600 | J | 6500 | 930 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 6900 | | 6500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 6600 | | 6500 | 960 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Client Sample ID: SDS-15-07-08-131025 (Continued) — Lab Sample ID: 280-48532-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[b]fluoranthene | 10000 | | 6500 | 1600 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 4600 | J | 6500 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 3300 | J | 6500 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 9900 | | 6500 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 14000 | | 6500 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 2500 | J | 6500 | 610 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 3700 | J | 6500 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 14000 | | 6500 | 420 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 19000 | | 6500 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 14000 | | 6500 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 15000 | | 12 | 1.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 3.5 | | 2.5 | 0.82 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 42 | | 1.2 | 0.095 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.42 | J | 0.62 | 0.041 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 8.7 | | 1.9 | 0.072 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 2.4 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 16 | | 2.5 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 13000 | | 19 | 4.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 15 | | 1.0 | 0.34 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 69 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.7 | J | 5.0 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 41 | | 2.5 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 31 | B | 3.7 | 0.50 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 64 | | 23 | 7.6 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-16-09-10-131025 — Lab Sample ID: 280-48532-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 450 | J | 5900 | 390 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 16000 | | 11 | 1.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.0 | J | 2.2 | 0.72 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 14 | | 1.1 | 0.083 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.17 | J | 0.54 | 0.036 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 7.7 | | 1.6 | 0.063 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.6 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 13 | | 2.2 | 0.24 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 6500 | | 16 | 4.1 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 8.5 | | 0.87 | 0.29 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 45 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.0 | J | 4.4 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 24 | | 2.2 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 19 | B | 3.3 | 0.43 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 14 | J | 21 | 6.9 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-18-19-23-131025 — Lab Sample ID: 280-48532-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 11000 | | 7700 | 400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 11000 | | 7700 | 480 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 790 | J | 7700 | 250 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SDS-18-19-23-131025 (Continued) — Lab Sample ID: 280-48532-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthylene | 830 | J | 7700 | 260 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 1900 | J | 7700 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1000 | J | 7700 | 730 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 9500 | | 7700 | 500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 2700 | J | 7700 | 1700 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 6.0 | J | 100 | 4.8 | ng/L | 1 | | 8270D SIM | SPLP East |
| Naphthalene | 14 | J B | 100 | 8.0 | ng/L | 1 | | 8270D SIM | SPLP East |
| Phenanthrene | 17 | J B | 100 | 9.3 | ng/L | 1 | | 8270D SIM | SPLP East |
| Aluminum | 31000 | | 14 | 2.2 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 28 | | 2.8 | 0.92 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 710 | | 1.4 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 5.9 | | 0.70 | 0.046 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.27 | J | 0.70 | 0.057 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 20 | | 2.1 | 0.081 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 9.4 | | 1.4 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 200 | | 2.8 | 0.30 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 26000 | | 21 | 5.3 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 26 | | 1.1 | 0.38 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 600 | | 1.4 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 15 | | 5.6 | 0.17 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 4.9 | | 1.8 | 1.2 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 54 | | 2.8 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 130 | B | 4.2 | 0.55 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Aluminum | 390 | | 100 | 18 | ug/L | 1 | | 6010C | SPLP East |
| Antimony | 6.8 | J | 10 | 3.1 | ug/L | 1 | | 6010C | SPLP East |
| Arsenic | 4.8 | J | 15 | 4.4 | ug/L | 1 | | 6010C | SPLP East |
| Barium | 110 | B | 10 | 0.58 | ug/L | 1 | | 6010C | SPLP East |
| Copper | 5.3 | J B | 15 | 0.14 | ug/L | 1 | | 6010C | SPLP East |
| Iron | 280 | J | 1000 | 22 | ug/L | 1 | | 6010C | SPLP East |
| Manganese | 17 | B | 10 | 0.25 | ug/L | 1 | | 6010C | SPLP East |
| Selenium | 6.6 | J | 15 | 4.9 | ug/L | 1 | | 6010C | SPLP East |
| Zinc | 10 | J B | 20 | 4.5 | ug/L | 1 | | 6010C | SPLP East |
| Vanadium | 17 | | 10 | 1.1 | ug/L | 1 | | 6010C | SPLP East |
| Mercury | 1300 | | 30 | 9.9 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-22-11-12-131028 — Lab Sample ID: 280-48532-12

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 11000 | | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 0.90 | J | 2.0 | 0.66 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 34 | | 1.0 | 0.076 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.75 | | 0.50 | 0.033 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.11 | J | 0.50 | 0.041 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 12 | | 1.5 | 0.058 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 11 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 23 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 13000 | | 15 | 3.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 13 | | 0.80 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 680 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.5 | J | 4.0 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Client Sample ID: SDS-22-11-12-131028 (Continued) — Lab Sample ID: 280-48532-12

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Vanadium | 30 | | 2.0 | 0.094 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 52 | B | 3.0 | 0.40 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: SDS-24-11-12-131028 — Lab Sample ID: 280-48532-14

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 20000 | | 11 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.4 | J | 2.3 | 0.75 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 23 | | 1.1 | 0.086 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.46 | J | 0.57 | 0.038 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 10 | | 1.7 | 0.066 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 12 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 22 | | 2.3 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 18000 | | 17 | 4.3 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 21 | | 0.91 | 0.31 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 320 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.8 | J | 4.5 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 34 | | 2.3 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 72 | B | 3.4 | 0.45 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 27 | | 24 | 7.9 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-25-04-05-131028 — Lab Sample ID: 280-48532-15

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 44000 | | 5600 | 290 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 51000 | | 5600 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 5600 | | 5600 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 19000 | | 5600 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 31000 | | 5600 | 800 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 58000 | | 5600 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 56000 | | 5600 | 820 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 96000 | | 5600 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 41000 | | 5600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 35000 | | 5600 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 75000 | | 5600 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 13000 | | 5600 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 100000 | | 5600 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 8100 | | 5600 | 520 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 35000 | | 5600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 33000 | | 5600 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 91000 | | 5600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 100000 | | 5600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 11000 | | 9.6 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 3.6 | | 1.9 | 0.64 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 43 | | 0.96 | 0.073 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.65 | | 0.48 | 0.032 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 7.9 | | 1.4 | 0.056 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 3.7 | | 0.96 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 12 | | 1.9 | 0.21 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 12000 | | 14 | 3.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Client Sample ID: SDS-25-04-05-131028 (Continued) — Lab Sample ID: 280-48532-15

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 15 | | 0.77 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 200 | | 0.96 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.8 | J | 3.9 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 25 | | 1.9 | 0.091 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 37 | B | 2.9 | 0.38 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 42 | | 20 | 6.4 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: EB-100-131028 — Lab Sample ID: 280-48532-17

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 22 | J | 110 | 6.0 | ng/L | 1 | | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 32 | J | 110 | 5.5 | ng/L | 1 | | 8270D SIM | Total/NA |
| Naphthalene | 75 | J | 110 | 5.7 | ng/L | 1 | | 8270D SIM | Total/NA |
| Aluminum | 49 | J | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 8.0 | J | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 4.6 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 7471B | Mercury (CVAA) | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-48532-1 | SDS-13-03-04-131025 | Solid | 10/25/13 11:35 | 10/29/13 09:00 |
| 280-48532-2 | SDS-14-03-04-131025 | Solid | 10/25/13 11:45 | 10/29/13 09:00 |
| 280-48532-3 | SDS-12-02-03-131025 | Solid | 10/25/13 10:00 | 10/29/13 09:00 |
| 280-48532-4 | SDS-9-12-02-03-131025 | Solid | 10/25/13 10:00 | 10/29/13 09:00 |
| 280-48532-5 | SDS-15-07-08-131025 | Solid | 10/25/13 14:40 | 10/29/13 09:00 |
| 280-48532-6 | SDS-16-09-10-131025 | Solid | 10/25/13 14:45 | 10/29/13 09:00 |
| 280-48532-8 | SDS-18-19-23-131025 | Solid | 10/25/13 16:20 | 10/29/13 09:00 |
| 280-48532-12 | SDS-22-11-12-131028 | Solid | 10/28/13 13:45 | 10/29/13 09:00 |
| 280-48532-14 | SDS-24-11-12-131028 | Solid | 10/28/13 15:10 | 10/29/13 09:00 |
| 280-48532-15 | SDS-25-04-05-131028 | Solid | 10/28/13 16:20 | 10/29/13 09:00 |
| 280-48532-17 | EB-100-131028 | Water | 10/28/13 15:15 | 10/29/13 09:00 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SDS-13-03-04-131025**
**Date Collected: 10/25/13 11:35**
**Date Received: 10/29/13 09:00**

**Lab Sample ID: 280-48532-1**
**Matrix: Solid**
**Percent Solids: 86.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 3300 | J | 5600 | 290 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| 2-Methylnaphthalene | 2500 | J | 5600 | 340 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Acenaphthene | 1500 | J | 5600 | 180 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Acenaphthylene | 14000 | | 5600 | 190 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Anthracene | 11000 | | 5600 | 800 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Benzo[a]anthracene | 23000 | | 5600 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Benzo[a]pyrene | 25000 | | 5600 | 820 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Benzo[b]fluoranthene | 30000 | | 5600 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Benzo[g,h,i]perylene | 19000 | | 5600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Benzo[k]fluoranthene | 11000 | | 5600 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Chrysene | 30000 | | 5600 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Dibenz(a,h)anthracene | 5400 | J | 5600 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Fluoranthene | 41000 | | 5600 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Fluorene | 4300 | J | 5600 | 520 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Indeno[1,2,3-cd]pyrene | 15000 | | 5600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Naphthalene | 1900 | J | 5600 | 360 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Phenanthrene | 38000 | | 5600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |
| Pyrene | 50000 | | 5600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:15 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *83* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 16:15* | *1* |
| *Nitrobenzene-d5* | *80* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 16:15* | *1* |
| *Terphenyl-d14* | *84* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 16:15* | *1* |

**Client Sample ID: SDS-14-03-04-131025**
**Date Collected: 10/25/13 11:45**
**Date Received: 10/29/13 09:00**

**Lab Sample ID: 280-48532-2**
**Matrix: Solid**
**Percent Solids: 88.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 17000 | | 5500 | 290 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| 2-Methylnaphthalene | 21000 | | 5500 | 340 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Acenaphthene | 5000 | J | 5500 | 180 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Acenaphthylene | 6300 | | 5500 | 190 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Anthracene | 14000 | | 5500 | 800 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Benzo[a]anthracene | 34000 | | 5500 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Benzo[a]pyrene | 35000 | | 5500 | 820 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Benzo[b]fluoranthene | 51000 | | 5500 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Benzo[g,h,i]perylene | 25000 | | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Benzo[k]fluoranthene | 18000 | | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Chrysene | 41000 | | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Dibenz(a,h)anthracene | 7600 | | 5500 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Fluoranthene | 74000 | | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Fluorene | 4900 | J | 5500 | 520 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Indeno[1,2,3-cd]pyrene | 21000 | | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Naphthalene | 17000 | | 5500 | 360 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Phenanthrene | 63000 | | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |
| Pyrene | 61000 | | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 16:43 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *86* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 16:43* | *1* |
| *Nitrobenzene-d5* | *86* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 16:43* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SDS-14-03-04-131025**
**Date Collected: 10/25/13 11:45**
**Date Received: 10/29/13 09:00**

**Lab Sample ID: 280-48532-2**
**Matrix: Solid**
**Percent Solids: 88.1**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| Terphenyl-d14 | 87 | | 35 - 124 | 11/05/13 19:00 | 11/14/13 16:43 | 1 |

**Client Sample ID: SDS-12-02-03-131025**
**Date Collected: 10/25/13 10:00**
**Date Received: 10/29/13 09:00**

**Lab Sample ID: 280-48532-3**
**Matrix: Solid**
**Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 3800 | J | 6000 | 310 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| 2-Methylnaphthalene | 4900 | J | 6000 | 370 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Acenaphthene | 490 | J | 6000 | 190 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Acenaphthylene | 2000 | J | 6000 | 200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Anthracene | 1900 | J | 6000 | 860 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Benzo[a]anthracene | 3600 | J | 6000 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Benzo[a]pyrene | 3600 | J | 6000 | 880 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Benzo[b]fluoranthene | 5900 | J | 6000 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Benzo[g,h,i]perylene | 2900 | J | 6000 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Benzo[k]fluoranthene | 1900 | J | 6000 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Chrysene | 5800 | J | 6000 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Dibenz(a,h)anthracene | 1500 | U | 6000 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Fluoranthene | 9600 | | 6000 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Fluorene | 1300 | J | 6000 | 560 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Indeno[1,2,3-cd]pyrene | 2400 | J | 6000 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Naphthalene | 2700 | J | 6000 | 390 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Phenanthrene | 11000 | | 6000 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Pyrene | 8300 | | 6000 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 17:10 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 84 | | 39 - 120 | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Nitrobenzene-d5 | 91 | | 42 - 120 | 11/05/13 19:00 | 11/14/13 17:10 | 1 |
| Terphenyl-d14 | 84 | | 35 - 124 | 11/05/13 19:00 | 11/14/13 17:10 | 1 |

**Client Sample ID: SDS-9-12-02-03-131025**
**Date Collected: 10/25/13 10:00**
**Date Received: 10/29/13 09:00**

**Lab Sample ID: 280-48532-4**
**Matrix: Solid**
**Percent Solids: 84.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 3400 | J | 5500 | 280 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| 2-Methylnaphthalene | 4300 | J | 5500 | 340 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Acenaphthene | 1100 | J | 5500 | 170 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Acenaphthylene | 1200 | J | 5500 | 190 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Anthracene | 2600 | J | 5500 | 790 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Benzo[a]anthracene | 4400 | J | 5500 | 980 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Benzo[a]pyrene | 4300 | J | 5500 | 810 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Benzo[b]fluoranthene | 7200 | | 5500 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Benzo[g,h,i]perylene | 3300 | J | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Benzo[k]fluoranthene | 2000 | J | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Chrysene | 6700 | | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5500 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Fluoranthene | 11000 | | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Fluorene | 1300 | J | 5500 | 510 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Indeno[1,2,3-cd]pyrene | 2700 | J | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Naphthalene | 2300 | J | 5500 | 360 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SDS-9-12-02-03-131025** — **Lab Sample ID: 280-48532-4**
**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 84.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 12000 | | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |
| Pyrene | 9500 | | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:32 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *86* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 18:32* | *1* |
| *Nitrobenzene-d5* | *86* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 18:32* | *1* |
| *Terphenyl-d14* | *87* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 18:32* | *1* |

**Client Sample ID: SDS-15-07-08-131025** — **Lab Sample ID: 280-48532-5**
**Date Collected: 10/25/13 14:40** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 74.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 15000 | | 6500 | 340 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| 2-Methylnaphthalene | 19000 | | 6500 | 400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Acenaphthene | 2100 | J | 6500 | 210 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Acenaphthylene | 2800 | J | 6500 | 220 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Anthracene | 3600 | J | 6500 | 930 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Benzo[a]anthracene | 6900 | | 6500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Benzo[a]pyrene | 6600 | | 6500 | 960 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Benzo[b]fluoranthene | 10000 | | 6500 | 1600 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Benzo[g,h,i]perylene | 4600 | J | 6500 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Benzo[k]fluoranthene | 3300 | J | 6500 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Chrysene | 9900 | | 6500 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Dibenz(a,h)anthracene | 1700 | U | 6500 | 1700 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Fluoranthene | 14000 | | 6500 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Fluorene | 2500 | J | 6500 | 610 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Indeno[1,2,3-cd]pyrene | 3700 | J | 6500 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Naphthalene | 14000 | | 6500 | 420 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Phenanthrene | 19000 | | 6500 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |
| Pyrene | 14000 | | 6500 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 18:59 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *78* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 18:59* | *1* |
| *Nitrobenzene-d5* | *86* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 18:59* | *1* |
| *Terphenyl-d14* | *74* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 18:59* | *1* |

**Client Sample ID: SDS-16-09-10-131025** — **Lab Sample ID: 280-48532-6**
**Date Collected: 10/25/13 14:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 310 | U | 5900 | 310 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| 2-Methylnaphthalene | 370 | U | 5900 | 370 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Acenaphthene | 190 | U | 5900 | 190 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Acenaphthylene | 200 | U | 5900 | 200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Anthracene | 850 | U | 5900 | 850 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Benzo[a]anthracene | 1100 | U | 5900 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Benzo[a]pyrene | 870 | U | 5900 | 870 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Benzo[b]fluoranthene | 1400 | U | 5900 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Benzo[g,h,i]perylene | 1300 | U | 5900 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Benzo[k]fluoranthene | 1200 | U | 5900 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SDS-16-09-10-131025** — **Lab Sample ID: 280-48532-6**
**Date Collected: 10/25/13 14:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chrysene | 1200 | U | 5900 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Dibenz(a,h)anthracene | 1500 | U | 5900 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Fluoranthene | 1200 | U | 5900 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Fluorene | 560 | U | 5900 | 560 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Indeno[1,2,3-cd]pyrene | 1300 | U | 5900 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| **Naphthalene** | **450** | **J** | 5900 | 390 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Phenanthrene | 1300 | U | 5900 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |
| Pyrene | 1300 | U | 5900 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:26 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 19:26* | *1* |
| *Nitrobenzene-d5* | *85* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 19:26* | *1* |
| *Terphenyl-d14* | *91* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 19:26* | *1* |

**Client Sample ID: SDS-18-19-23-131025** — **Lab Sample ID: 280-48532-8**
**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 61.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | **11000** | | 7700 | 400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| **2-Methylnaphthalene** | **11000** | | 7700 | 480 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| **Acenaphthene** | **790** | **J** | 7700 | 250 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| **Acenaphthylene** | **830** | **J** | 7700 | 260 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Anthracene | 1100 | U | 7700 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Benzo[a]anthracene | 1400 | U | 7700 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Benzo[a]pyrene | 1100 | U | 7700 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Benzo[b]fluoranthene | 1900 | U | 7700 | 1900 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Benzo[g,h,i]perylene | 1700 | U | 7700 | 1700 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Benzo[k]fluoranthene | 1500 | U | 7700 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Chrysene | 1500 | U | 7700 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Dibenz(a,h)anthracene | 2000 | U | 7700 | 2000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| **Fluoranthene** | **1900** | **J** | 7700 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| **Fluorene** | **1000** | **J** | 7700 | 730 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Indeno[1,2,3-cd]pyrene | 1700 | U | 7700 | 1700 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| **Naphthalene** | **9500** | | 7700 | 500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| **Phenanthrene** | **2700** | **J** | 7700 | 1700 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |
| Pyrene | 1700 | U | 7700 | 1700 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 19:54 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *18* | *X* | *39 - 120* | *11/05/13 19:00* | *11/14/13 19:54* | *1* |
| *Nitrobenzene-d5* | *31* | *X* | *42 - 120* | *11/05/13 19:00* | *11/14/13 19:54* | *1* |
| *Terphenyl-d14* | *3* | *X* | *35 - 124* | *11/05/13 19:00* | *11/14/13 19:54* | *1* |

**Client Sample ID: SDS-22-11-12-131028** — **Lab Sample ID: 280-48532-12**
**Date Collected: 10/28/13 13:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 280 | U | 5500 | 280 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| 2-Methylnaphthalene | 340 | U | 5500 | 340 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Acenaphthene | 170 | U | 5500 | 170 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Acenaphthylene | 190 | U | 5500 | 190 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SDS-22-11-12-131028** — **Lab Sample ID: 280-48532-12**
**Date Collected: 10/28/13 13:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Anthracene | 790 | U | 5500 | 790 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Benzo[a]anthracene | 980 | U | 5500 | 980 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Benzo[a]pyrene | 810 | U | 5500 | 810 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Benzo[b]fluoranthene | 1300 | U | 5500 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Benzo[g,h,i]perylene | 1200 | U | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Benzo[k]fluoranthene | 1100 | U | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Chrysene | 1100 | U | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5500 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Fluoranthene | 1100 | U | 5500 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Fluorene | 510 | U | 5500 | 510 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Indeno[1,2,3-cd]pyrene | 1200 | U | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Naphthalene | 360 | U | 5500 | 360 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Phenanthrene | 1200 | U | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |
| Pyrene | 1200 | U | 5500 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:21 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *87* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 20:21* | *1* |
| *Nitrobenzene-d5* | *87* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 20:21* | *1* |
| *Terphenyl-d14* | *82* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 20:21* | *1* |

**Client Sample ID: SDS-24-11-12-131028** — **Lab Sample ID: 280-48532-14**
**Date Collected: 10/28/13 15:10** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 83.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 300 | U | 5800 | 300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| 2-Methylnaphthalene | 360 | U | 5800 | 360 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Acenaphthene | 180 | U | 5800 | 180 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Acenaphthylene | 200 | U | 5800 | 200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Anthracene | 830 | U | 5800 | 830 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Benzo[a]anthracene | 1000 | U | 5800 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Benzo[a]pyrene | 850 | U | 5800 | 850 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Benzo[b]fluoranthene | 1400 | U | 5800 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Benzo[g,h,i]perylene | 1300 | U | 5800 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Benzo[k]fluoranthene | 1200 | U | 5800 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Chrysene | 1200 | U | 5800 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Dibenz(a,h)anthracene | 1500 | U | 5800 | 1500 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Fluoranthene | 1200 | U | 5800 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Fluorene | 540 | U | 5800 | 540 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Indeno[1,2,3-cd]pyrene | 1300 | U | 5800 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Naphthalene | 380 | U | 5800 | 380 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Phenanthrene | 1300 | U | 5800 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |
| Pyrene | 1300 | U | 5800 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 20:48 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *84* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 20:48* | *1* |
| *Nitrobenzene-d5* | *85* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 20:48* | *1* |
| *Terphenyl-d14* | *88* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 20:48* | *1* |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SDS-25-04-05-131028**
**Date Collected: 10/28/13 16:20**
**Date Received: 10/29/13 09:00**

**Lab Sample ID: 280-48532-15**
**Matrix: Solid**
**Percent Solids: 86.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 44000 | | 5600 | 290 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| 2-Methylnaphthalene | 51000 | | 5600 | 340 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Acenaphthene | 5600 | | 5600 | 180 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Acenaphthylene | 19000 | | 5600 | 190 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Anthracene | 31000 | | 5600 | 800 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Benzo[a]anthracene | 58000 | | 5600 | 1000 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Benzo[a]pyrene | 56000 | | 5600 | 820 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Benzo[b]fluoranthene | 96000 | | 5600 | 1300 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Benzo[g,h,i]perylene | 41000 | | 5600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Benzo[k]fluoranthene | 35000 | | 5600 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Chrysene | 75000 | | 5600 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Dibenz(a,h)anthracene | 13000 | | 5600 | 1400 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Fluoranthene | 100000 | | 5600 | 1100 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Fluorene | 8100 | | 5600 | 520 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Indeno[1,2,3-cd]pyrene | 35000 | | 5600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Naphthalene | 33000 | | 5600 | 360 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Phenanthrene | 91000 | | 5600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |
| Pyrene | 100000 | | 5600 | 1200 | ng/Kg | ☼ | 11/05/13 19:00 | 11/14/13 21:15 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *93* | | *39 - 120* | *11/05/13 19:00* | *11/14/13 21:15* | *1* |
| *Nitrobenzene-d5* | *90* | | *42 - 120* | *11/05/13 19:00* | *11/14/13 21:15* | *1* |
| *Terphenyl-d14* | *96* | | *35 - 124* | *11/05/13 19:00* | *11/14/13 21:15* | *1* |

**Client Sample ID: EB-100-131028**
**Date Collected: 10/28/13 15:15**
**Date Received: 10/29/13 09:00**

**Lab Sample ID: 280-48532-17**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 22 | J | 110 | 6.0 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| 2-Methylnaphthalene | 32 | J | 110 | 5.5 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Acenaphthene | 12 | U | 110 | 12 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Acenaphthylene | 11 | U | 110 | 11 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Anthracene | 15 | U | 110 | 15 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Benzo[a]anthracene | 3.4 | U | 110 | 3.4 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Benzo[a]pyrene | 5.5 | U | 110 | 5.5 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Benzo[b]fluoranthene | 3.7 | U | 110 | 3.7 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Benzo[g,h,i]perylene | 3.8 | U | 110 | 3.8 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Benzo[k]fluoranthene | 5.4 | U | 110 | 5.4 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Chrysene | 3.4 | U | 110 | 3.4 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Dibenz(a,h)anthracene | 5.1 | U | 110 | 5.1 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Fluoranthene | 4.8 | U | 110 | 4.8 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Fluorene | 20 | U | 110 | 20 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Indeno[1,2,3-cd]pyrene | 16 | U | 110 | 16 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Naphthalene | 75 | J | 110 | 5.7 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Phenanthrene | 10 | U | 110 | 10 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |
| Pyrene | 8.6 | U | 110 | 8.6 | ng/L | | 11/04/13 15:56 | 11/08/13 21:27 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *70* | | *42 - 120* | *11/04/13 15:56* | *11/08/13 21:27* | *1* |
| *Nitrobenzene-d5* | *83* | | *43 - 120* | *11/04/13 15:56* | *11/08/13 21:27* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: EB-100-131028** — **Lab Sample ID: 280-48532-17**
**Date Collected: 10/28/13 15:15** — **Matrix: Water**
**Date Received: 10/29/13 09:00**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *96* | | *47 - 120* | *11/04/13 15:56* | *11/08/13 21:27* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - SPLP East

**Client Sample ID: SDS-18-19-23-131025** — **Lab Sample ID: 280-48532-8**
**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.9 | U | 100 | 5.9 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| 2-Methylnaphthalene | 6.0 | U | 100 | 6.0 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Acenaphthene | 4.2 | U | 100 | 4.2 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Acenaphthylene | 5.1 | U | 100 | 5.1 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Anthracene | 5.6 | U | 100 | 5.6 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Benzo[a]anthracene | 4.2 | U | 100 | 4.2 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Benzo[a]pyrene | 6.9 | U | 100 | 6.9 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Benzo[b]fluoranthene | 3.1 | U | 100 | 3.1 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Benzo[g,h,i]perylene | 6.2 | U | 100 | 6.2 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Benzo[k]fluoranthene | 6.3 | U | 100 | 6.3 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Chrysene | 3.3 | U | 100 | 3.3 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Dibenz(a,h)anthracene | 4.1 | U | 100 | 4.1 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| **Fluoranthene** | **6.0** | **J** | 100 | 4.8 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Fluorene | 5.5 | U | 100 | 5.5 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Indeno[1,2,3-cd]pyrene | 4.5 | U | 100 | 4.5 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| **Naphthalene** | **14** | **J B** | 100 | 8.0 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| **Phenanthrene** | **17** | **J B** | 100 | 9.3 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |
| Pyrene | 6.1 | U | 100 | 6.1 | ng/L | | 11/08/13 15:05 | 11/19/13 21:46 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *90* | | *42 - 120* | *11/08/13 15:05* | *11/19/13 21:46* | *1* |
| *Nitrobenzene-d5* | *105* | | *43 - 120* | *11/08/13 15:05* | *11/19/13 21:46* | *1* |
| *Terphenyl-d14* | *103* | | *47 - 120* | *11/08/13 15:05* | *11/19/13 21:46* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: SDS-13-03-04-131025** — **Lab Sample ID: 280-48532-1**
**Date Collected: 10/25/13 11:35** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 86.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **22000** | | 11 | 1.7 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| Antimony | 0.42 | U | 1.6 | 0.42 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Arsenic** | **2.5** | | 2.2 | 0.72 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Barium** | **43** | | 1.1 | 0.083 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Beryllium** | **0.48** | **J** | 0.55 | 0.036 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| Cadmium | 0.045 | U | 0.55 | 0.045 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Chromium** | **9.5** | | 1.6 | 0.064 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Cobalt** | **2.8** | | 1.1 | 0.11 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Copper** | **14** | | 2.2 | 0.24 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Iron** | **21000** | | 16 | 4.2 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Lead** | **31** | | 0.88 | 0.30 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Manganese** | **250** | | 1.1 | 0.11 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-13-03-04-131025** — **Lab Sample ID: 280-48532-1**
**Date Collected: 10/25/13 11:35** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 86.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Nickel** | **3.1** | **J** | 4.4 | 0.14 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| Selenium | 0.94 | U | 1.4 | 0.94 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| Silver | 0.18 | U | 1.1 | 0.18 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| Thallium | 0.71 | U | 1.3 | 0.71 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Vanadium** | **43** | | 2.2 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |
| **Zinc** | **29** | **B** | 3.3 | 0.44 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:18 | 1 |

**Client Sample ID: SDS-14-03-04-131025** — **Lab Sample ID: 280-48532-2**
**Date Collected: 10/25/13 11:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **13000** | | 10 | 1.5 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Arsenic** | **2.9** | | 2.0 | 0.66 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Barium** | **48** | | 1.0 | 0.076 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Beryllium** | **0.57** | | 0.50 | 0.033 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Chromium** | **9.2** | | 1.5 | 0.058 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Cobalt** | **5.2** | | 1.0 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Copper** | **21** | | 2.0 | 0.22 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Iron** | **15000** | | 15 | 3.8 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Lead** | **14** | | 0.80 | 0.27 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Manganese** | **240** | | 1.0 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Nickel** | **4.2** | | 4.0 | 0.12 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Vanadium** | **30** | | 2.0 | 0.094 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |
| **Zinc** | **44** | **B** | 3.0 | 0.40 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:20 | 1 |

**Client Sample ID: SDS-12-02-03-131025** — **Lab Sample ID: 280-48532-3**
**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **6800** | | 10 | 1.6 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| Antimony | 0.39 | U | 1.5 | 0.39 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Arsenic** | **1.7** | **J** | 2.0 | 0.67 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Barium** | **86** | | 1.0 | 0.078 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Beryllium** | **0.40** | **J** | 0.51 | 0.034 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| Cadmium | 0.042 | U | 0.51 | 0.042 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Chromium** | **7.1** | | 1.5 | 0.059 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Cobalt** | **1.4** | | 1.0 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Copper** | **8.5** | | 2.0 | 0.22 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Iron** | **5200** | | 15 | 3.9 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Lead** | **9.1** | | 0.82 | 0.28 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Manganese** | **46** | | 1.0 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| **Nickel** | **2.2** | **J** | 4.1 | 0.13 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| Selenium | 0.88 | U | 1.3 | 0.88 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| Thallium | 0.66 | U | 1.2 | 0.66 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-12-02-03-131025** — **Lab Sample ID: 280-48532-3**
**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Vanadium | 15 | | 2.0 | 0.096 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |
| Zinc | 14 | B | 3.1 | 0.41 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:23 | 1 |

**Client Sample ID: SDS-9-12-02-03-131025** — **Lab Sample ID: 280-48532-4**
**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 84.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 8600 | | 10 | 1.6 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Antimony | 0.39 | U | 1.6 | 0.39 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Arsenic | 2.2 | | 2.1 | 0.68 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Barium | 120 | | 1.0 | 0.079 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Beryllium | 0.52 | | 0.52 | 0.034 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Cadmium | 0.042 | U | 0.52 | 0.042 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Chromium | 9.4 | | 1.6 | 0.060 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Cobalt | 1.9 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Copper | 12 | | 2.1 | 0.22 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Iron | 6600 | | 16 | 3.9 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Lead | 12 | | 0.83 | 0.28 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Manganese | 54 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Nickel | 3.0 | J | 4.1 | 0.13 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Selenium | 0.96 | J | 1.3 | 0.89 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Silver | 0.17 | U | 1.0 | 0.17 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Thallium | 0.67 | U | 1.2 | 0.67 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Vanadium | 19 | | 2.1 | 0.097 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |
| Zinc | 17 | B | 3.1 | 0.41 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:43 | 1 |

**Client Sample ID: SDS-15-07-08-131025** — **Lab Sample ID: 280-48532-5**
**Date Collected: 10/25/13 14:40** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 74.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 15000 | | 12 | 1.9 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Antimony | 0.47 | U | 1.9 | 0.47 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Arsenic | 3.5 | | 2.5 | 0.82 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Barium | 42 | | 1.2 | 0.095 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Beryllium | 0.42 | J | 0.62 | 0.041 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Cadmium | 0.051 | U | 0.62 | 0.051 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Chromium | 8.7 | | 1.9 | 0.072 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Cobalt | 2.4 | | 1.2 | 0.12 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Copper | 16 | | 2.5 | 0.27 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Iron | 13000 | | 19 | 4.7 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Lead | 15 | | 1.0 | 0.34 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Manganese | 69 | | 1.2 | 0.12 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Nickel | 2.7 | J | 5.0 | 0.15 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Selenium | 1.1 | U | 1.6 | 1.1 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Silver | 0.20 | U | 1.2 | 0.20 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Thallium | 0.81 | U | 1.5 | 0.81 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Vanadium | 41 | | 2.5 | 0.12 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |
| Zinc | 31 | B | 3.7 | 0.50 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:45 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Method: 6010C - Metals (ICP)

**Client Sample ID: SDS-16-09-10-131025** — **Lab Sample ID: 280-48532-6**
**Date Collected: 10/25/13 14:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | | 11 | 1.7 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Antimony | 0.41 | U | 1.6 | 0.41 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Arsenic | 1.0 | J | 2.2 | 0.72 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Barium | 14 | | 1.1 | 0.083 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Beryllium | 0.17 | J | 0.54 | 0.036 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Cadmium | 0.045 | U | 0.54 | 0.045 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Chromium | 7.7 | | 1.6 | 0.063 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Cobalt | 1.6 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Copper | 13 | | 2.2 | 0.24 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Iron | 6500 | | 16 | 4.1 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Lead | 8.5 | | 0.87 | 0.29 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Manganese | 45 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Nickel | 2.0 | J | 4.4 | 0.13 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Selenium | 0.94 | U | 1.4 | 0.94 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Silver | 0.17 | U | 1.1 | 0.17 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Thallium | 0.71 | U | 1.3 | 0.71 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Vanadium | 24 | | 2.2 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |
| Zinc | 19 | B | 3.3 | 0.43 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:48 | 1 |

**Client Sample ID: SDS-18-19-23-131025** — **Lab Sample ID: 280-48532-8**
**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 61.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 31000 | | 14 | 2.2 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Antimony | 0.53 | U | 2.1 | 0.53 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Arsenic | 28 | | 2.8 | 0.92 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Barium | 710 | | 1.4 | 0.11 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Beryllium | 5.9 | | 0.70 | 0.046 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Cadmium | 0.27 | J | 0.70 | 0.057 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Chromium | 20 | | 2.1 | 0.081 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Cobalt | 9.4 | | 1.4 | 0.14 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Copper | 200 | | 2.8 | 0.30 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Iron | 26000 | | 21 | 5.3 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Lead | 26 | | 1.1 | 0.38 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Manganese | 600 | | 1.4 | 0.14 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Nickel | 15 | | 5.6 | 0.17 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Selenium | 4.9 | | 1.8 | 1.2 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Silver | 0.22 | U | 1.4 | 0.22 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Thallium | 0.90 | U | 1.7 | 0.90 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Vanadium | 54 | | 2.8 | 0.13 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |
| Zinc | 130 | B | 4.2 | 0.55 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 15:52 | 1 |

**Client Sample ID: SDS-22-11-12-131028** — **Lab Sample ID: 280-48532-12**
**Date Collected: 10/28/13 13:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 11000 | | 10 | 1.6 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Arsenic | 0.90 | J | 2.0 | 0.66 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Barium | 34 | | 1.0 | 0.076 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-22-11-12-131028** — **Lab Sample ID: 280-48532-12**
**Date Collected: 10/28/13 13:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Beryllium | 0.75 | | 0.50 | 0.033 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Cadmium | 0.11 | J | 0.50 | 0.041 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Chromium | 12 | | 1.5 | 0.058 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Cobalt | 11 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Copper | 23 | | 2.0 | 0.22 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Iron | 13000 | | 15 | 3.8 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Lead | 13 | | 0.80 | 0.27 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Manganese | 680 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Nickel | 3.5 | J | 4.0 | 0.12 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Vanadium | 30 | | 2.0 | 0.094 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |
| Zinc | 52 | B | 3.0 | 0.40 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:11 | 1 |

**Client Sample ID: SDS-24-11-12-131028** — **Lab Sample ID: 280-48532-14**
**Date Collected: 10/28/13 15:10** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 83.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 20000 | | 11 | 1.8 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Antimony | 0.43 | U | 1.7 | 0.43 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Arsenic | 1.4 | J | 2.3 | 0.75 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Barium | 23 | | 1.1 | 0.086 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Beryllium | 0.46 | J | 0.57 | 0.038 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Cadmium | 0.047 | U | 0.57 | 0.047 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Chromium | 10 | | 1.7 | 0.066 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Cobalt | 12 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Copper | 22 | | 2.3 | 0.25 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Iron | 18000 | | 17 | 4.3 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Lead | 21 | | 0.91 | 0.31 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Manganese | 320 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Nickel | 3.8 | J | 4.5 | 0.14 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Selenium | 0.98 | U | 1.5 | 0.98 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Silver | 0.18 | U | 1.1 | 0.18 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Thallium | 0.74 | U | 1.4 | 0.74 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Vanadium | 34 | | 2.3 | 0.11 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |
| Zinc | 72 | B | 3.4 | 0.45 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:15 | 1 |

**Client Sample ID: SDS-25-04-05-131028** — **Lab Sample ID: 280-48532-15**
**Date Collected: 10/28/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 86.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 11000 | | 9.6 | 1.5 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Antimony | 0.37 | U | 1.4 | 0.37 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Arsenic | 3.6 | | 1.9 | 0.64 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Barium | 43 | | 0.96 | 0.073 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Beryllium | 0.65 | | 0.48 | 0.032 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Cadmium | 0.040 | U | 0.48 | 0.040 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Chromium | 7.9 | | 1.4 | 0.056 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Cobalt | 3.7 | | 0.96 | 0.096 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-25-04-05-131028** — **Lab Sample ID: 280-48532-15**
**Date Collected: 10/28/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 86.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Copper** | **12** | | 1.9 | 0.21 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| **Iron** | **12000** | | 14 | 3.7 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| **Lead** | **15** | | 0.77 | 0.26 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| **Manganese** | **200** | | 0.96 | 0.096 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| **Nickel** | **2.8** | **J** | 3.9 | 0.12 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Selenium | 0.83 | U | 1.3 | 0.83 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Silver | 0.15 | U | 0.96 | 0.15 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| Thallium | 0.63 | U | 1.2 | 0.63 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| **Vanadium** | **25** | | 1.9 | 0.091 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |
| **Zinc** | **37** | **B** | 2.9 | 0.38 | mg/Kg | ☼ | 11/01/13 18:07 | 11/05/13 16:18 | 1 |

**Client Sample ID: EB-100-131028** — **Lab Sample ID: 280-48532-17**
**Date Collected: 10/28/13 15:15** — **Matrix: Water**
**Date Received: 10/29/13 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **49** | **J** | 100 | 18 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| **Manganese** | **8.0** | **J** | 10 | 0.25 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| **Zinc** | **4.6** | **J** | 20 | 4.5 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/08/13 13:00 | 11/09/13 02:11 | 1 |

## Method: 6010C - Metals (ICP) - SPLP East

**Client Sample ID: SDS-18-19-23-131025** — **Lab Sample ID: 280-48532-8**
**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **390** | | 100 | 18 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Antimony** | **6.8** | **J** | 10 | 3.1 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Arsenic** | **4.8** | **J** | 15 | 4.4 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Barium** | **110** | **B** | 10 | 0.58 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Copper** | **5.3** | **J B** | 15 | 0.14 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| Cobalt | 0.12 | U | 10 | 0.12 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Iron** | **280** | **J** | 1000 | 22 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |

## Method: 6010C - Metals (ICP) - SPLP East (Continued)

**Client Sample ID: SDS-18-19-23-131025** — **Lab Sample ID: 280-48532-8**
**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Manganese** | **17** | **B** | 10 | 0.25 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| Nickel | 1.3 | U * | 40 | 1.3 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Selenium** | **6.6** | **J** | 15 | 4.9 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Zinc** | **10** | **J B** | 20 | 4.5 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |
| **Vanadium** | **17** | | 10 | 1.1 | ug/L | | 11/14/13 07:30 | 11/15/13 09:29 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: EB-100-131028** — **Lab Sample ID: 280-48532-17**
**Date Collected: 10/28/13 15:15** — **Matrix: Water**
**Date Received: 10/29/13 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 11/06/13 13:00 | 11/06/13 22:20 | 1 |

## Method: 7470A - Mercury (CVAA) - SPLP East

**Client Sample ID: SDS-18-19-23-131025** — **Lab Sample ID: 280-48532-8**
**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.000030 | U | 0.0020 | 0.000030 | mg/L | | 11/08/13 13:30 | 11/08/13 23:24 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SDS-13-03-04-131025** — **Lab Sample ID: 280-48532-1**
**Date Collected: 10/25/13 11:35** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 86.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **20** | **J** | 21 | 6.8 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 21:36 | 1 |

**Client Sample ID: SDS-14-03-04-131025** — **Lab Sample ID: 280-48532-2**
**Date Collected: 10/25/13 11:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **20** | **J** | 23 | 7.4 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 21:38 | 1 |

**Client Sample ID: SDS-12-02-03-131025** — **Lab Sample ID: 280-48532-3**
**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **34** | | 23 | 7.3 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 21:40 | 1 |

**Client Sample ID: SDS-9-12-02-03-131025** — **Lab Sample ID: 280-48532-4**
**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 84.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **35** | | 21 | 6.8 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 21:52 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SDS-15-07-08-131025** — **Lab Sample ID: 280-48532-5**
**Date Collected: 10/25/13 14:40** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 74.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 64 | | 23 | 7.6 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 21:54 | 1 |

**Client Sample ID: SDS-16-09-10-131025** — **Lab Sample ID: 280-48532-6**
**Date Collected: 10/25/13 14:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 14 | J | 21 | 6.9 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 21:56 | 1 |

**Client Sample ID: SDS-18-19-23-131025** — **Lab Sample ID: 280-48532-8**
**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 61.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 1300 | | 30 | 9.9 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 22:01 | 1 |

**Client Sample ID: SDS-22-11-12-131028** — **Lab Sample ID: 280-48532-12**
**Date Collected: 10/28/13 13:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 7.5 | U | 23 | 7.5 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 22:10 | 1 |

**Client Sample ID: SDS-24-11-12-131028** — **Lab Sample ID: 280-48532-14**
**Date Collected: 10/28/13 15:10** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 83.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 27 | | 24 | 7.9 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 22:20 | 1 |

**Client Sample ID: SDS-25-04-05-131028** — **Lab Sample ID: 280-48532-15**
**Date Collected: 10/28/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 86.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 42 | | 20 | 6.4 | ug/Kg | ☼ | 11/11/13 14:10 | 11/11/13 22:22 | 1 |

## General Chemistry

**Client Sample ID: SDS-13-03-04-131025** — **Lab Sample ID: 280-48532-1**
**Date Collected: 10/25/13 11:35** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 86.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 13 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 87 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

**Client Sample ID: SDS-14-03-04-131025** — **Lab Sample ID: 280-48532-2**
**Date Collected: 10/25/13 11:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 12 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 88 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

## General Chemistry

**Client Sample ID: SDS-12-02-03-131025** — **Lab Sample ID: 280-48532-3**
**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 18 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 82 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

**Client Sample ID: SDS-9-12-02-03-131025** — **Lab Sample ID: 280-48532-4**
**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 84.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 16 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 84 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

**Client Sample ID: SDS-15-07-08-131025** — **Lab Sample ID: 280-48532-5**
**Date Collected: 10/25/13 14:40** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 74.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 26 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 74 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

**Client Sample ID: SDS-16-09-10-131025** — **Lab Sample ID: 280-48532-6**
**Date Collected: 10/25/13 14:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 17 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 83 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

**Client Sample ID: SDS-18-19-23-131025** — **Lab Sample ID: 280-48532-8**
**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 38 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 62 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

**Client Sample ID: SDS-22-11-12-131028** — **Lab Sample ID: 280-48532-12**
**Date Collected: 10/28/13 13:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 11 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 89 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

**Client Sample ID: SDS-24-11-12-131028** — **Lab Sample ID: 280-48532-14**
**Date Collected: 10/28/13 15:10** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 83.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 16 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 84 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

**Client Sample ID: SDS-25-04-05-131028** — **Lab Sample ID: 280-48532-15**
**Date Collected: 10/28/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 86.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 14 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |
| Percent Solids | 86 | | 0.10 | 0.10 | % | | | 11/01/13 12:14 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-48532-1 | SDS-13-03-04-131025 | 83 | 80 | 84 |
| 280-48532-2 | SDS-14-03-04-131025 | 86 | 86 | 87 |
| 280-48532-3 | SDS-12-02-03-131025 | 84 | 91 | 84 |
| 280-48532-3 MS | SDS-12-02-03-131025 | 81 | 79 | 85 |
| 280-48532-3 MSD | SDS-12-02-03-131025 | 81 | 85 | 82 |
| 280-48532-4 | SDS-9-12-02-03-131025 | 86 | 86 | 87 |
| 280-48532-5 | SDS-15-07-08-131025 | 78 | 86 | 74 |
| 280-48532-6 | SDS-16-09-10-131025 | 85 | 85 | 91 |
| 280-48532-8 | SDS-18-19-23-131025 | 18 X | 31 X | 3 X |
| 280-48532-12 | SDS-22-11-12-131028 | 87 | 87 | 82 |
| 280-48532-14 | SDS-24-11-12-131028 | 84 | 85 | 88 |
| 280-48532-15 | SDS-25-04-05-131028 | 93 | 90 | 96 |
| LCS 280-199407/2-A | Lab Control Sample | 90 | 88 | 93 |
| MB 280-199407/1-A | Method Blank | 88 | 89 | 89 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: SPLP East**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (42-120) | (43-120) | (47-120) |
| 280-48532-8 | SDS-18-19-23-131025 | 90 | 105 | 103 |
| LB 280-199618/1-D | Method Blank | 71 | 90 | 87 |
| LCS 280-199618/2-D | Lab Control Sample | 75 | 94 | 99 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (42-120) | (43-120) | (47-120) |
| 280-48532-17 | EB-100-131028 | 70 | 83 | 96 |
| LCS 280-199212/2-A | Lab Control Sample | 67 | 68 | 102 |
| MB 280-199212/1-A | Method Blank | 71 | 73 | 96 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-199212/1-A**
**Matrix: Water**
**Analysis Batch: 200225**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 199212**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 11/04/13 15:56 | 11/11/13 10:01 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *71* | | *42 - 120* | *11/04/13 15:56* | *11/11/13 10:01* | *1* |
| *Nitrobenzene-d5* | *73* | | *43 - 120* | *11/04/13 15:56* | *11/11/13 10:01* | *1* |
| *Terphenyl-d14* | *96* | | *47 - 120* | *11/04/13 15:56* | *11/11/13 10:01* | *1* |

**Lab Sample ID: LCS 280-199212/2-A**
**Matrix: Water**
**Analysis Batch: 200002**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 199212**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 670 | | ng/L | | 74 | 47 - 120 |
| Acenaphthylene | 900 | 695 | | ng/L | | 77 | 39 - 120 |
| Anthracene | 900 | 836 | | ng/L | | 93 | 28 - 120 |
| Benzo[a]anthracene | 900 | 899 | | ng/L | | 100 | 42 - 120 |
| Benzo[a]pyrene | 900 | 906 | | ng/L | | 101 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 928 | | ng/L | | 103 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 862 | | ng/L | | 96 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 905 | | ng/L | | 101 | 43 - 120 |
| Chrysene | 900 | 940 | | ng/L | | 104 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 869 | | ng/L | | 97 | 27 - 126 |
| Fluoranthene | 900 | 907 | | ng/L | | 101 | 46 - 120 |
| Fluorene | 900 | 713 | | ng/L | | 79 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 875 | | ng/L | | 97 | 38 - 120 |
| Naphthalene | 900 | 621 | | ng/L | | 69 | 37 - 120 |
| Phenanthrene | 900 | 824 | | ng/L | | 92 | 46 - 120 |
| Pyrene | 900 | 925 | | ng/L | | 103 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-199212/2-A**
**Matrix: Water**
**Analysis Batch: 200002**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 199212**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *67* | | *42 - 120* |
| *Nitrobenzene-d5* | *68* | | *43 - 120* |
| *Terphenyl-d14* | *102* | | *47 - 120* |

**Lab Sample ID: MB 280-199407/1-A**
**Matrix: Solid**
**Analysis Batch: 200677**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 199407**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 240 | U | 4600 | 240 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| 2-Methylnaphthalene | 280 | U | 4600 | 280 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Acenaphthene | 150 | U | 4600 | 150 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Acenaphthylene | 160 | U | 4600 | 160 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Anthracene | 660 | U | 4600 | 660 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[a]anthracene | 830 | U | 4600 | 830 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[a]pyrene | 680 | U | 4600 | 680 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[b]fluoranthene | 1100 | U | 4600 | 1100 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[g,h,i]perylene | 1000 | U | 4600 | 1000 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Benzo[k]fluoranthene | 920 | U | 4600 | 920 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Chrysene | 920 | U | 4600 | 920 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Dibenz(a,h)anthracene | 1200 | U | 4600 | 1200 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Fluoranthene | 920 | U | 4600 | 920 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Fluorene | 430 | U | 4600 | 430 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Indeno[1,2,3-cd]pyrene | 1000 | U | 4600 | 1000 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Naphthalene | 300 | U | 4600 | 300 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Phenanthrene | 1000 | U | 4600 | 1000 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |
| Pyrene | 1000 | U | 4600 | 1000 | ng/Kg | | 11/05/13 19:00 | 11/13/13 10:00 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *39 - 120* | *11/05/13 19:00* | *11/13/13 10:00* | *1* |
| *Nitrobenzene-d5* | *89* | | *42 - 120* | *11/05/13 19:00* | *11/13/13 10:00* | *1* |
| *Terphenyl-d14* | *89* | | *35 - 124* | *11/05/13 19:00* | *11/13/13 10:00* | *1* |

**Lab Sample ID: LCS 280-199407/2-A**
**Matrix: Solid**
**Analysis Batch: 200677**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 199407**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 27800 | 24600 | | ng/Kg | | 89 | 35 - 120 |
| Acenaphthylene | 27800 | 23800 | | ng/Kg | | 86 | 41 - 120 |
| Anthracene | 27800 | 25300 | | ng/Kg | | 91 | 43 - 120 |
| Benzo[a]anthracene | 27800 | 25600 | | ng/Kg | | 92 | 36 - 120 |
| Benzo[a]pyrene | 27800 | 23800 | | ng/Kg | | 86 | 20 - 120 |
| Benzo[b]fluoranthene | 27800 | 24800 | | ng/Kg | | 89 | 37 - 120 |
| Benzo[g,h,i]perylene | 27800 | 25400 | | ng/Kg | | 91 | 20 - 123 |
| Benzo[k]fluoranthene | 27800 | 24800 | | ng/Kg | | 89 | 46 - 120 |
| Chrysene | 27800 | 28300 | | ng/Kg | | 102 | 34 - 120 |
| Dibenz(a,h)anthracene | 27800 | 24900 | | ng/Kg | | 90 | 20 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-199407/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200677** — **Prep Batch: 199407**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Fluoranthene | 27800 | 24400 | | ng/Kg | | 88 | 45 - 120 |
| Fluorene | 27800 | 24200 | | ng/Kg | | 87 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 27800 | 25100 | | ng/Kg | | 90 | 20 - 127 |
| Naphthalene | 27800 | 28000 | | ng/Kg | | 101 | 44 - 120 |
| Phenanthrene | 27800 | 25700 | | ng/Kg | | 93 | 44 - 120 |
| Pyrene | 27800 | 24300 | | ng/Kg | | 87 | 43 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *90* | | *39 - 120* |
| *Nitrobenzene-d5* | *88* | | *42 - 120* |
| *Terphenyl-d14* | *93* | | *35 - 124* |

**Lab Sample ID: 280-48532-3 MS** — **Client Sample ID: SDS-12-02-03-131025**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 201027** — **Prep Batch: 199407**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 490 | J | 36200 | 30100 | | ng/Kg | ☼ | 82 | 35 - 120 |
| Acenaphthylene | 2000 | J | 36200 | 30400 | | ng/Kg | ☼ | 78 | 41 - 120 |
| Anthracene | 1900 | J | 36200 | 32100 | | ng/Kg | ☼ | 83 | 43 - 120 |
| Benzo[a]anthracene | 3600 | J | 36200 | 34700 | | ng/Kg | ☼ | 86 | 36 - 120 |
| Benzo[a]pyrene | 3600 | J | 36200 | 34400 | | ng/Kg | ☼ | 85 | 20 - 120 |
| Benzo[b]fluoranthene | 5900 | J | 36200 | 39000 | | ng/Kg | ☼ | 91 | 37 - 120 |
| Benzo[g,h,i]perylene | 2900 | J | 36200 | 33400 | | ng/Kg | ☼ | 84 | 20 - 123 |
| Benzo[k]fluoranthene | 1900 | J | 36200 | 33800 | | ng/Kg | ☼ | 88 | 46 - 120 |
| Chrysene | 5800 | J | 36200 | 38400 | | ng/Kg | ☼ | 90 | 34 - 120 |
| Dibenz(a,h)anthracene | 1500 | U | 36200 | 30500 | | ng/Kg | ☼ | 84 | 20 - 120 |
| Fluoranthene | 9600 | | 36200 | 41100 | | ng/Kg | ☼ | 87 | 45 - 120 |
| Fluorene | 1300 | J | 36200 | 30600 | | ng/Kg | ☼ | 81 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 2400 | J | 36200 | 32700 | | ng/Kg | ☼ | 84 | 20 - 127 |
| Naphthalene | 2700 | J | 36200 | 33500 | | ng/Kg | ☼ | 85 | 44 - 120 |
| Phenanthrene | 11000 | | 36200 | 43700 | | ng/Kg | ☼ | 90 | 44 - 120 |
| Pyrene | 8300 | | 36200 | 38900 | | ng/Kg | ☼ | 84 | 43 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | | *39 - 120* |
| *Nitrobenzene-d5* | *79* | | *42 - 120* |
| *Terphenyl-d14* | *85* | | *35 - 124* |

**Lab Sample ID: 280-48532-3 MSD** — **Client Sample ID: SDS-12-02-03-131025**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 201287** — **Prep Batch: 199407**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 490 | J | 34900 | 29800 | | ng/Kg | ☼ | 84 | 35 - 120 | 1 | 50 |
| Acenaphthylene | 2000 | J | 34900 | 29800 | | ng/Kg | ☼ | 80 | 41 - 120 | 2 | 50 |
| Anthracene | 1900 | J | 34900 | 30900 | | ng/Kg | ☼ | 83 | 43 - 120 | 4 | 50 |
| Benzo[a]anthracene | 3600 | J | 34900 | 32000 | | ng/Kg | ☼ | 81 | 36 - 120 | 8 | 40 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: 280-48532-3 MSD**
**Matrix: Solid**
**Analysis Batch: 201287**

**Client Sample ID: SDS-12-02-03-131025**
**Prep Type: Total/NA**
**Prep Batch: 199407**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzo[a]pyrene | 3600 | J | 34900 | 30600 | | ng/Kg | ☼ | 77 | 20 - 120 | 12 | 30 |
| Benzo[b]fluoranthene | 5900 | J | 34900 | 35200 | | ng/Kg | ☼ | 84 | 37 - 120 | 10 | 28 |
| Benzo[g,h,i]perylene | 2900 | J | 34900 | 31200 | | ng/Kg | ☼ | 81 | 20 - 123 | 7 | 30 |
| Benzo[k]fluoranthene | 1900 | J | 34900 | 30700 | | ng/Kg | ☼ | 83 | 46 - 120 | 10 | 28 |
| Chrysene | 5800 | J | 34900 | 36300 | | ng/Kg | ☼ | 87 | 34 - 120 | 6 | 41 |
| Dibenz(a,h)anthracene | 1500 | U | 34900 | 29100 | | ng/Kg | ☼ | 83 | 20 - 120 | 5 | 25 |
| Fluoranthene | 9600 | | 34900 | 37500 | | ng/Kg | ☼ | 80 | 45 - 120 | 9 | 30 |
| Fluorene | 1300 | J | 34900 | 30600 | | ng/Kg | ☼ | 84 | 44 - 120 | 0 | 50 |
| Indeno[1,2,3-cd]pyrene | 2400 | J | 34900 | 30000 | | ng/Kg | ☼ | 79 | 20 - 127 | 9 | 50 |
| Naphthalene | 2700 | J | 34900 | 32600 | | ng/Kg | ☼ | 86 | 44 - 120 | 3 | 50 |
| Phenanthrene | 11000 | | 34900 | 42600 | | ng/Kg | ☼ | 91 | 44 - 120 | 2 | 42 |
| Pyrene | 8300 | | 34900 | 35900 | | ng/Kg | ☼ | 79 | 43 - 120 | 8 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | | *39 - 120* |
| *Nitrobenzene-d5* | *85* | | *42 - 120* |
| *Terphenyl-d14* | *82* | | *35 - 124* |

**Lab Sample ID: LB 280-199618/1-D**
**Matrix: Solid**
**Analysis Batch: 201718**

**Client Sample ID: Method Blank**
**Prep Type: SPLP East**
**Prep Batch: 200096**

| Analyte | LB Result | LB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.9 | U | 100 | 5.9 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| 2-Methylnaphthalene | 7.34 | J | 100 | 6.0 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Acenaphthene | 4.61 | J | 100 | 4.2 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Acenaphthylene | 5.1 | U | 100 | 5.1 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Anthracene | 5.6 | U | 100 | 5.6 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[a]anthracene | 4.2 | U | 100 | 4.2 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[a]pyrene | 6.9 | U | 100 | 6.9 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[b]fluoranthene | 3.1 | U | 100 | 3.1 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[g,h,i]perylene | 6.2 | U | 100 | 6.2 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[k]fluoranthene | 6.3 | U | 100 | 6.3 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Chrysene | 3.3 | U | 100 | 3.3 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Dibenz(a,h)anthracene | 4.1 | U | 100 | 4.1 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Fluoranthene | 4.8 | U | 100 | 4.8 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Fluorene | 5.5 | U | 100 | 5.5 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Indeno[1,2,3-cd]pyrene | 4.5 | U | 100 | 4.5 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Naphthalene | 54.6 | J | 100 | 8.0 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Phenanthrene | 17.4 | J | 100 | 9.3 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Pyrene | 6.1 | U | 100 | 6.1 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |

| *Surrogate* | *LB %Recovery* | *LB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *71* | | *42 - 120* | *11/08/13 15:05* | *11/19/13 20:46* | *1* |
| *Nitrobenzene-d5* | *90* | | *43 - 120* | *11/08/13 15:05* | *11/19/13 20:46* | *1* |
| *Terphenyl-d14* | *87* | | *47 - 120* | *11/08/13 15:05* | *11/19/13 20:46* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-199618/2-D**
**Matrix: Solid**
**Analysis Batch: 201718**

**Client Sample ID: Lab Control Sample**
**Prep Type: SPLP East**
**Prep Batch: 200096**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 741 | | ng/L | | 82 | 47 - 120 |
| Acenaphthylene | 900 | 776 | | ng/L | | 86 | 39 - 120 |
| Anthracene | 900 | 803 | | ng/L | | 89 | 28 - 120 |
| Benzo[a]anthracene | 900 | 937 | | ng/L | | 104 | 42 - 120 |
| Benzo[a]pyrene | 900 | 987 | | ng/L | | 110 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 966 | | ng/L | | 107 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 956 | | ng/L | | 106 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 955 | | ng/L | | 106 | 43 - 120 |
| Chrysene | 900 | 1010 | | ng/L | | 112 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 973 | | ng/L | | 108 | 27 - 126 |
| Fluoranthene | 900 | 888 | | ng/L | | 99 | 46 - 120 |
| Fluorene | 900 | 744 | | ng/L | | 83 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 993 | | ng/L | | 110 | 38 - 120 |
| Naphthalene | 900 | 799 | | ng/L | | 89 | 37 - 120 |
| Phenanthrene | 900 | 797 | | ng/L | | 89 | 46 - 120 |
| Pyrene | 900 | 904 | | ng/L | | 100 | 49 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *75* | | *42 - 120* |
| *Nitrobenzene-d5* | *94* | | *43 - 120* |
| *Terphenyl-d14* | *99* | | *47 - 120* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-198988/1-A**
**Matrix: Solid**
**Analysis Batch: 199470**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 198988**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.6 | U | 10 | 1.6 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Barium | 0.076 | U | 1.0 | 0.076 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Iron | 3.8 | U | 15 | 3.8 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Zinc | 0.437 | J | 3.0 | 0.40 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 11/01/13 18:07 | 11/05/13 15:14 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-198988/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199470** — **Prep Batch: 198988**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 188 | | mg/Kg | | 94 | 82 - 116 |
| Antimony | 50.0 | 46.6 | | mg/Kg | | 93 | 82 - 110 |
| Arsenic | 100 | 96.2 | | mg/Kg | | 96 | 85 - 110 |
| Barium | 200 | 193 | | mg/Kg | | 96 | 87 - 112 |
| Beryllium | 5.00 | 4.66 | | mg/Kg | | 93 | 84 - 114 |
| Cadmium | 10.0 | 9.99 | | mg/Kg | | 100 | 87 - 110 |
| Chromium | 20.0 | 19.1 | | mg/Kg | | 96 | 84 - 114 |
| Copper | 25.0 | 24.5 | | mg/Kg | | 98 | 88 - 110 |
| Cobalt | 50.0 | 47.6 | | mg/Kg | | 95 | 87 - 110 |
| Iron | 100 | 95.6 | | mg/Kg | | 96 | 87 - 120 |
| Lead | 50.0 | 47.9 | | mg/Kg | | 96 | 86 - 110 |
| Manganese | 50.0 | 47.5 | | mg/Kg | | 95 | 88 - 110 |
| Nickel | 50.0 | 47.3 | | mg/Kg | | 95 | 87 - 110 |
| Selenium | 200 | 191 | | mg/Kg | | 95 | 83 - 110 |
| Silver | 5.00 | 4.77 | | mg/Kg | | 95 | 87 - 114 |
| Thallium | 200 | 189 | | mg/Kg | | 95 | 84 - 110 |
| Zinc | 50.0 | 48.2 | | mg/Kg | | 96 | 76 - 114 |
| Vanadium | 50.0 | 48.0 | | mg/Kg | | 96 | 88 - 110 |

**Lab Sample ID: 280-48532-3 MS** — **Client Sample ID: SDS-12-02-03-131025**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199470** — **Prep Batch: 198988**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 6800 | | 232 | 19400 | 4 | mg/Kg | ☼ | 5444 | 50 - 200 |
| Antimony | 0.39 | U | 57.9 | 21.5 | | mg/Kg | ☼ | 37 | 20 - 200 |
| Arsenic | 1.7 | J | 116 | 103 | | mg/Kg | ☼ | 87 | 76 - 111 |
| Barium | 86 | | 232 | 318 | | mg/Kg | ☼ | 100 | 52 - 159 |
| Beryllium | 0.40 | J | 5.79 | 5.55 | | mg/Kg | ☼ | 89 | 72 - 105 |
| Cadmium | 0.042 | U | 11.6 | 10.7 | | mg/Kg | ☼ | 92 | 40 - 130 |
| Chromium | 7.1 | | 23.2 | 28.6 | | mg/Kg | ☼ | 93 | 70 - 200 |
| Cobalt | 1.4 | | 57.9 | 52.3 | | mg/Kg | ☼ | 88 | 72 - 106 |
| Copper | 8.5 | | 29.0 | 38.2 | | mg/Kg | ☼ | 102 | 37 - 187 |
| Iron | 5200 | | 116 | 6880 | 4 | mg/Kg | ☼ | 1462 | 70 - 200 |
| Lead | 9.1 | | 57.9 | 59.4 | | mg/Kg | ☼ | 87 | 70 - 200 |
| Manganese | 46 | | 57.9 | 102 | | mg/Kg | ☼ | 97 | 40 - 200 |
| Nickel | 2.2 | J | 57.9 | 53.3 | | mg/Kg | ☼ | 88 | 61 - 126 |
| Selenium | 0.88 | U | 232 | 200 | | mg/Kg | ☼ | 86 | 76 - 104 |
| Silver | 0.16 | U | 5.79 | 5.23 | | mg/Kg | ☼ | 90 | 75 - 141 |
| Thallium | 0.66 | U | 232 | 193 | | mg/Kg | ☼ | 84 | 78 - 101 |
| Vanadium | 15 | | 57.9 | 69.8 | | mg/Kg | ☼ | 95 | 50 - 169 |
| Zinc | 14 | B | 57.9 | 71.9 | | mg/Kg | ☼ | 100 | 70 - 200 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-48532-3 MSD** — **Client Sample ID: SDS-12-02-03-131025**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199470** — **Prep Batch: 198988**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 6800 | | 219 | 19400 | 4 | mg/Kg | ☼ | 5777 | 50 - 200 | 0 | 20 |
| Antimony | 0.39 | U | 54.8 | 18.9 | | mg/Kg | ☼ | 35 | 20 - 200 | 13 | 20 |
| Arsenic | 1.7 | J | 110 | 96.5 | | mg/Kg | ☼ | 87 | 76 - 111 | 6 | 20 |
| Barium | 86 | | 219 | 305 | | mg/Kg | ☼ | 100 | 52 - 159 | 4 | 20 |
| Beryllium | 0.40 | J | 5.48 | 5.22 | | mg/Kg | ☼ | 88 | 72 - 105 | 6 | 20 |
| Cadmium | 0.042 | U | 11.0 | 10.0 | | mg/Kg | ☼ | 92 | 40 - 130 | 6 | 20 |
| Chromium | 7.1 | | 21.9 | 27.8 | | mg/Kg | ☼ | 95 | 70 - 200 | 3 | 20 |
| Cobalt | 1.4 | | 54.8 | 49.1 | | mg/Kg | ☼ | 87 | 72 - 106 | 6 | 20 |
| Copper | 8.5 | | 27.4 | 37.3 | | mg/Kg | ☼ | 105 | 37 - 187 | 2 | 20 |
| Iron | 5200 | | 110 | 7360 | 4 | mg/Kg | ☼ | 1983 | 70 - 200 | 7 | 20 |
| Lead | 9.1 | | 54.8 | 56.9 | | mg/Kg | ☼ | 87 | 70 - 200 | 4 | 20 |
| Manganese | 46 | | 54.8 | 105 | | mg/Kg | ☼ | 107 | 40 - 200 | 2 | 20 |
| Nickel | 2.2 | J | 54.8 | 50.5 | | mg/Kg | ☼ | 88 | 61 - 126 | 5 | 20 |
| Selenium | 0.88 | U | 219 | 188 | | mg/Kg | ☼ | 86 | 76 - 104 | 6 | 20 |
| Silver | 0.16 | U | 5.48 | 4.95 | | mg/Kg | ☼ | 90 | 75 - 141 | 6 | 20 |
| Thallium | 0.66 | U | 219 | 182 | | mg/Kg | ☼ | 83 | 78 - 101 | 6 | 20 |
| Vanadium | 15 | | 54.8 | 67.6 | | mg/Kg | ☼ | 97 | 50 - 169 | 3 | 20 |
| Zinc | 14 | B | 54.8 | 70.3 | | mg/Kg | ☼ | 103 | 70 - 200 | 2 | 20 |

**Lab Sample ID: MB 280-199912/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 200255** — **Prep Batch: 199912**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/08/13 13:00 | 11/09/13 01:55 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-199912/2-A**
**Matrix: Water**
**Analysis Batch: 200255**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 199912**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1930 | | ug/L | | 96 | 87 - 111 |
| Antimony | 500 | 510 | | ug/L | | 102 | 88 - 110 |
| Arsenic | 1000 | 1010 | | ug/L | | 101 | 88 - 110 |
| Barium | 2000 | 2050 | | ug/L | | 103 | 90 - 112 |
| Beryllium | 50.0 | 50.4 | | ug/L | | 101 | 89 - 113 |
| Cadmium | 100 | 105 | | ug/L | | 105 | 88 - 111 |
| Chromium | 200 | 204 | | ug/L | | 102 | 90 - 113 |
| Copper | 250 | 261 | | ug/L | | 104 | 86 - 112 |
| Cobalt | 500 | 497 | | ug/L | | 99 | 89 - 111 |
| Iron | 1000 | 961 | | ug/L | | 96 | 89 - 115 |
| Lead | 500 | 498 | | ug/L | | 100 | 89 - 110 |
| Manganese | 500 | 497 | | ug/L | | 99 | 90 - 110 |
| Nickel | 500 | 498 | | ug/L | | 100 | 89 - 111 |
| Selenium | 2000 | 2000 | | ug/L | | 100 | 85 - 112 |
| Silver | 50.0 | 49.2 | | ug/L | | 98 | 86 - 115 |
| Thallium | 2000 | 1960 | | ug/L | | 98 | 88 - 110 |
| Zinc | 500 | 488 | | ug/L | | 98 | 85 - 111 |
| Vanadium | 500 | 516 | | ug/L | | 103 | 90 - 111 |

**Lab Sample ID: LB 280-199618/1-C**
**Matrix: Solid**
**Analysis Batch: 201181**

**Client Sample ID: Method Blank**
**Prep Type: SPLP East**
**Prep Batch: 199998**

| Analyte | LB Result | LB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Barium | 1.78 | J | 10 | 0.58 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Copper | 0.220 | J | 15 | 0.14 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Cobalt | 0.12 | U | 10 | 0.12 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Iron | 22 | U | 1000 | 22 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Manganese | 0.330 | J | 10 | 0.25 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Zinc | 7.00 | J | 20 | 4.5 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-199618/2-C** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 201181** — **Prep Batch: 199998**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 2090 | | ug/L | | 104 | 87 - 111 |
| Antimony | 500 | 516 | | ug/L | | 103 | 88 - 110 |
| Arsenic | 1000 | 1080 | | ug/L | | 108 | 88 - 110 |
| Barium | 2000 | 2110 | | ug/L | | 106 | 90 - 112 |
| Beryllium | 50.0 | 46.8 | | ug/L | | 94 | 89 - 113 |
| Cadmium | 100 | 99.6 | | ug/L | | 100 | 88 - 111 |
| Chromium | 200 | 222 | | ug/L | | 111 | 90 - 113 |
| Copper | 250 | 259 | | ug/L | | 104 | 86 - 112 |
| Cobalt | 500 | 501 | | ug/L | | 100 | 89 - 111 |
| Iron | 1000 | 1040 | | ug/L | | 104 | 89 - 115 |
| Lead | 500 | 473 | | ug/L | | 95 | 89 - 110 |
| Manganese | 500 | 499 | | ug/L | | 100 | 90 - 110 |
| Nickel | 500 | 609 | * | ug/L | | 122 | 89 - 111 |
| Selenium | 2000 | 2170 | | ug/L | | 109 | 85 - 112 |
| Silver | 50.0 | 54.4 | | ug/L | | 109 | 86 - 115 |
| Thallium | 2000 | 1960 | | ug/L | | 98 | 88 - 110 |
| Zinc | 500 | 508 | | ug/L | | 102 | 85 - 111 |
| Vanadium | 500 | 499 | | ug/L | | 100 | 90 - 111 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-199509/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 199728** — **Prep Batch: 199509**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 11/06/13 13:00 | 11/06/13 21:55 | 1 |

**Lab Sample ID: LCS 280-199509/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 199728** — **Prep Batch: 199509**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.80 | | ug/L | | 96 | 84 - 120 |

**Lab Sample ID: LCSD 280-199509/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 199728** — **Prep Batch: 199509**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.82 | | ug/L | | 96 | 84 - 120 | 0 | 15 |

**Lab Sample ID: LB 280-199618/1-B** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 200323** — **Prep Batch: 199977**

| Analyte | LB Result | LB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.000030 | U | 0.0020 | 0.000030 | mg/L | | 11/08/13 13:30 | 11/08/13 23:19 | 1 |

## Method: 7470A - Mercury (CVAA) (Continued)

**Lab Sample ID: LCS 280-199618/2-B** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 200323** — **Prep Batch: 199977**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | | | 0.00500 | 0.00462 | | mg/L | | 92 | 90 - 116 | | |

## Method: 7471B - Mercury (CVAA)

**Lab Sample ID: MB 280-198925/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200545** — **Prep Batch: 198925**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.5 | U | 17 | 5.5 | ug/Kg | | 11/11/13 14:10 | 11/11/13 21:31 | 1 |

**Lab Sample ID: LCS 280-198925/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200545** — **Prep Batch: 198925**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | | | 417 | 421 | | ug/Kg | | 101 | 87 - 111 | | |

**Lab Sample ID: 280-48532-3 MS** — **Client Sample ID: SDS-12-02-03-131025**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200545** — **Prep Batch: 198925**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 34 | | 563 | 578 | | ug/Kg | ☼ | 97 | 87 - 111 | | |

**Lab Sample ID: 280-48532-3 MSD** — **Client Sample ID: SDS-12-02-03-131025**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200545** — **Prep Batch: 198925**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 34 | | 507 | 535 | | ug/Kg | ☼ | 99 | 87 - 111 | 8 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## GC/MS Semi VOA

### Prep Batch: 199212

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-17 | EB-100-131028 | Total/NA | Water | 3510C | |
| LCS 280-199212/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| MB 280-199212/1-A | Method Blank | Total/NA | Water | 3510C | |

### Prep Batch: 199407

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-1 | SDS-13-03-04-131025 | Total/NA | Solid | 3546 | |
| 280-48532-2 | SDS-14-03-04-131025 | Total/NA | Solid | 3546 | |
| 280-48532-3 | SDS-12-02-03-131025 | Total/NA | Solid | 3546 | |
| 280-48532-3 MS | SDS-12-02-03-131025 | Total/NA | Solid | 3546 | |
| 280-48532-3 MSD | SDS-12-02-03-131025 | Total/NA | Solid | 3546 | |
| 280-48532-4 | SDS-9-12-02-03-131025 | Total/NA | Solid | 3546 | |
| 280-48532-5 | SDS-15-07-08-131025 | Total/NA | Solid | 3546 | |
| 280-48532-6 | SDS-16-09-10-131025 | Total/NA | Solid | 3546 | |
| 280-48532-8 | SDS-18-19-23-131025 | Total/NA | Solid | 3546 | |
| 280-48532-12 | SDS-22-11-12-131028 | Total/NA | Solid | 3546 | |
| 280-48532-14 | SDS-24-11-12-131028 | Total/NA | Solid | 3546 | |
| 280-48532-15 | SDS-25-04-05-131028 | Total/NA | Solid | 3546 | |
| LCS 280-199407/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-199407/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Leach Batch: 199618

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-8 | SDS-18-19-23-131025 | SPLP East | Solid | 1312 | |
| LB 280-199618/1-D | Method Blank | SPLP East | Solid | 1312 | |
| LCS 280-199618/2-D | Lab Control Sample | SPLP East | Solid | 1312 | |

### Analysis Batch: 200002

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-17 | EB-100-131028 | Total/NA | Water | 8270D SIM | 199212 |
| LCS 280-199212/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 199212 |

### Prep Batch: 200096

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-8 | SDS-18-19-23-131025 | SPLP East | Solid | 3510C | 199618 |
| LB 280-199618/1-D | Method Blank | SPLP East | Solid | 3510C | 199618 |
| LCS 280-199618/2-D | Lab Control Sample | SPLP East | Solid | 3510C | 199618 |

### Analysis Batch: 200225

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 280-199212/1-A | Method Blank | Total/NA | Water | 8270D SIM | 199212 |

### Analysis Batch: 200677

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-199407/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 199407 |
| MB 280-199407/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 199407 |

### Analysis Batch: 201027

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-1 | SDS-13-03-04-131025 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-2 | SDS-14-03-04-131025 | Total/NA | Solid | 8270D SIM | 199407 |

## GC/MS Semi VOA (Continued)

### Analysis Batch: 201027 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-3 | SDS-12-02-03-131025 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-3 MS | SDS-12-02-03-131025 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-4 | SDS-9-12-02-03-131025 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-5 | SDS-15-07-08-131025 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-6 | SDS-16-09-10-131025 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-8 | SDS-18-19-23-131025 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-12 | SDS-22-11-12-131028 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-14 | SDS-24-11-12-131028 | Total/NA | Solid | 8270D SIM | 199407 |
| 280-48532-15 | SDS-25-04-05-131028 | Total/NA | Solid | 8270D SIM | 199407 |

### Analysis Batch: 201287

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-3 MSD | SDS-12-02-03-131025 | Total/NA | Solid | 8270D SIM | 199407 |

### Analysis Batch: 201718

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-8 | SDS-18-19-23-131025 | SPLP East | Solid | 8270D SIM | 200096 |
| LB 280-199618/1-D | Method Blank | SPLP East | Solid | 8270D SIM | 200096 |
| LCS 280-199618/2-D | Lab Control Sample | SPLP East | Solid | 8270D SIM | 200096 |

## Metals

### Prep Batch: 198925

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-1 | SDS-13-03-04-131025 | Total/NA | Solid | 7471B | |
| 280-48532-2 | SDS-14-03-04-131025 | Total/NA | Solid | 7471B | |
| 280-48532-3 | SDS-12-02-03-131025 | Total/NA | Solid | 7471B | |
| 280-48532-3 MS | SDS-12-02-03-131025 | Total/NA | Solid | 7471B | |
| 280-48532-3 MSD | SDS-12-02-03-131025 | Total/NA | Solid | 7471B | |
| 280-48532-4 | SDS-9-12-02-03-131025 | Total/NA | Solid | 7471B | |
| 280-48532-5 | SDS-15-07-08-131025 | Total/NA | Solid | 7471B | |
| 280-48532-6 | SDS-16-09-10-131025 | Total/NA | Solid | 7471B | |
| 280-48532-8 | SDS-18-19-23-131025 | Total/NA | Solid | 7471B | |
| 280-48532-12 | SDS-22-11-12-131028 | Total/NA | Solid | 7471B | |
| 280-48532-14 | SDS-24-11-12-131028 | Total/NA | Solid | 7471B | |
| 280-48532-15 | SDS-25-04-05-131028 | Total/NA | Solid | 7471B | |
| LCS 280-198925/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| MB 280-198925/1-A | Method Blank | Total/NA | Solid | 7471B | |

### Prep Batch: 198988

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-1 | SDS-13-03-04-131025 | Total/NA | Solid | 3050B | |
| 280-48532-2 | SDS-14-03-04-131025 | Total/NA | Solid | 3050B | |
| 280-48532-3 | SDS-12-02-03-131025 | Total/NA | Solid | 3050B | |
| 280-48532-3 MS | SDS-12-02-03-131025 | Total/NA | Solid | 3050B | |
| 280-48532-3 MSD | SDS-12-02-03-131025 | Total/NA | Solid | 3050B | |
| 280-48532-4 | SDS-9-12-02-03-131025 | Total/NA | Solid | 3050B | |
| 280-48532-5 | SDS-15-07-08-131025 | Total/NA | Solid | 3050B | |
| 280-48532-6 | SDS-16-09-10-131025 | Total/NA | Solid | 3050B | |
| 280-48532-8 | SDS-18-19-23-131025 | Total/NA | Solid | 3050B | |

## Metals (Continued)

### Prep Batch: 198988 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-12 | SDS-22-11-12-131028 | Total/NA | Solid | 3050B | |
| 280-48532-14 | SDS-24-11-12-131028 | Total/NA | Solid | 3050B | |
| 280-48532-15 | SDS-25-04-05-131028 | Total/NA | Solid | 3050B | |
| LCS 280-198988/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-198988/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Analysis Batch: 199470

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-1 | SDS-13-03-04-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-2 | SDS-14-03-04-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-3 | SDS-12-02-03-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-3 MS | SDS-12-02-03-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-3 MSD | SDS-12-02-03-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-4 | SDS-9-12-02-03-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-5 | SDS-15-07-08-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-6 | SDS-16-09-10-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-8 | SDS-18-19-23-131025 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-12 | SDS-22-11-12-131028 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-14 | SDS-24-11-12-131028 | Total/NA | Solid | 6010C | 198988 |
| 280-48532-15 | SDS-25-04-05-131028 | Total/NA | Solid | 6010C | 198988 |
| LCS 280-198988/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 198988 |
| MB 280-198988/1-A | Method Blank | Total/NA | Solid | 6010C | 198988 |

### Prep Batch: 199509

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-17 | EB-100-131028 | Total/NA | Water | 7470A | |
| LCS 280-199509/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| LCSD 280-199509/3-A | Lab Control Sample Dup | Total/NA | Water | 7470A | |
| MB 280-199509/1-A | Method Blank | Total/NA | Water | 7470A | |

### Leach Batch: 199618

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-8 | SDS-18-19-23-131025 | SPLP East | Solid | 1312 | |
| LB 280-199618/1-B | Method Blank | SPLP East | Solid | 1312 | |
| LB 280-199618/1-C | Method Blank | SPLP East | Solid | 1312 | |
| LCS 280-199618/2-B | Lab Control Sample | SPLP East | Solid | 1312 | |
| LCS 280-199618/2-C | Lab Control Sample | SPLP East | Solid | 1312 | |

### Analysis Batch: 199728

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-17 | EB-100-131028 | Total/NA | Water | 7470A | 199509 |
| LCS 280-199509/2-A | Lab Control Sample | Total/NA | Water | 7470A | 199509 |
| LCSD 280-199509/3-A | Lab Control Sample Dup | Total/NA | Water | 7470A | 199509 |
| MB 280-199509/1-A | Method Blank | Total/NA | Water | 7470A | 199509 |

### Prep Batch: 199912

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-17 | EB-100-131028 | Total/NA | Water | 3010A | |
| LCS 280-199912/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-199912/1-A | Method Blank | Total/NA | Water | 3010A | |

## Metals (Continued)

### Prep Batch: 199977

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-8 | SDS-18-19-23-131025 | SPLP East | Solid | 7470A | 199618 |
| LB 280-199618/1-B | Method Blank | SPLP East | Solid | 7470A | 199618 |
| LCS 280-199618/2-B | Lab Control Sample | SPLP East | Solid | 7470A | 199618 |

### Prep Batch: 199998

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-8 | SDS-18-19-23-131025 | SPLP East | Solid | 3010A | 199618 |
| LB 280-199618/1-C | Method Blank | SPLP East | Solid | 3010A | 199618 |
| LCS 280-199618/2-C | Lab Control Sample | SPLP East | Solid | 3010A | 199618 |

### Analysis Batch: 200255

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-17 | EB-100-131028 | Total/NA | Water | 6010C | 199912 |
| LCS 280-199912/2-A | Lab Control Sample | Total/NA | Water | 6010C | 199912 |
| MB 280-199912/1-A | Method Blank | Total/NA | Water | 6010C | 199912 |

### Analysis Batch: 200323

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-8 | SDS-18-19-23-131025 | SPLP East | Solid | 7470A | 199977 |
| LB 280-199618/1-B | Method Blank | SPLP East | Solid | 7470A | 199977 |
| LCS 280-199618/2-B | Lab Control Sample | SPLP East | Solid | 7470A | 199977 |

### Analysis Batch: 200545

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-1 | SDS-13-03-04-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-2 | SDS-14-03-04-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-3 | SDS-12-02-03-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-3 MS | SDS-12-02-03-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-3 MSD | SDS-12-02-03-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-4 | SDS-9-12-02-03-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-5 | SDS-15-07-08-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-6 | SDS-16-09-10-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-8 | SDS-18-19-23-131025 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-12 | SDS-22-11-12-131028 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-14 | SDS-24-11-12-131028 | Total/NA | Solid | 7471B | 198925 |
| 280-48532-15 | SDS-25-04-05-131028 | Total/NA | Solid | 7471B | 198925 |
| LCS 280-198925/2-A | Lab Control Sample | Total/NA | Solid | 7471B | 198925 |
| MB 280-198925/1-A | Method Blank | Total/NA | Solid | 7471B | 198925 |

### Analysis Batch: 201181

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-8 | SDS-18-19-23-131025 | SPLP East | Solid | 6010C | 199998 |
| LB 280-199618/1-C | Method Blank | SPLP East | Solid | 6010C | 199998 |
| LCS 280-199618/2-C | Lab Control Sample | SPLP East | Solid | 6010C | 199998 |

## General Chemistry

### Analysis Batch: 198914

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-1 | SDS-13-03-04-131025 | Total/NA | Solid | Moisture | |

## General Chemistry (Continued)

### Analysis Batch: 198914 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48532-2 | SDS-14-03-04-131025 | Total/NA | Solid | Moisture | |
| 280-48532-3 | SDS-12-02-03-131025 | Total/NA | Solid | Moisture | |
| 280-48532-4 | SDS-9-12-02-03-131025 | Total/NA | Solid | Moisture | |
| 280-48532-5 | SDS-15-07-08-131025 | Total/NA | Solid | Moisture | |
| 280-48532-6 | SDS-16-09-10-131025 | Total/NA | Solid | Moisture | |
| 280-48532-8 | SDS-18-19-23-131025 | Total/NA | Solid | Moisture | |
| 280-48532-12 | SDS-22-11-12-131028 | Total/NA | Solid | Moisture | |
| 280-48532-14 | SDS-24-11-12-131028 | Total/NA | Solid | Moisture | |
| 280-48532-15 | SDS-25-04-05-131028 | Total/NA | Solid | Moisture | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Client Sample ID: SDS-13-03-04-131025
**Lab Sample ID: 280-48532-1**
**Date Collected: 10/25/13 11:35**
**Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-13-03-04-131025
**Lab Sample ID: 280-48532-1**
**Date Collected: 10/25/13 11:35**
**Matrix: Solid**
**Date Received: 10/29/13 09:00**
**Percent Solids: 86.8**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.1 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.1 g | 1000 uL | 201027 | 11/14/13 16:15 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.05 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.05 g | 100 mL | 199470 | 11/05/13 15:18 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .56 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .56 g | 50 mL | 200545 | 11/11/13 21:36 | JM | TAL DEN |

## Client Sample ID: SDS-14-03-04-131025
**Lab Sample ID: 280-48532-2**
**Date Collected: 10/25/13 11:45**
**Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-14-03-04-131025
**Lab Sample ID: 280-48532-2**
**Date Collected: 10/25/13 11:45**
**Matrix: Solid**
**Date Received: 10/29/13 09:00**
**Percent Solids: 88.1**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.7 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.7 g | 1000 uL | 201027 | 11/14/13 16:43 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.14 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.14 g | 100 mL | 199470 | 11/05/13 15:20 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .51 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .51 g | 50 mL | 200545 | 11/11/13 21:38 | JM | TAL DEN |

## Client Sample ID: SDS-12-02-03-131025
**Lab Sample ID: 280-48532-3**
**Date Collected: 10/25/13 10:00**
**Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Client Sample ID: SDS-12-02-03-131025 — Lab Sample ID: 280-48532-3

**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.6 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.6 g | 1000 uL | 201027 | 11/14/13 17:10 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.19 g | 100 mL | 199470 | 11/05/13 15:23 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .55 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .55 g | 50 mL | 200545 | 11/11/13 21:40 | JM | TAL DEN |

## Client Sample ID: SDS-9-12-02-03-131025 — Lab Sample ID: 280-48532-4

**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-9-12-02-03-131025 — Lab Sample ID: 280-48532-4

**Date Collected: 10/25/13 10:00** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 84.1**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 32.7 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 32.7 g | 1000 uL | 201027 | 11/14/13 18:32 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.15 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.15 g | 100 mL | 199470 | 11/05/13 15:43 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .58 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .58 g | 50 mL | 200545 | 11/11/13 21:52 | JM | TAL DEN |

## Client Sample ID: SDS-15-07-08-131025 — Lab Sample ID: 280-48532-5

**Date Collected: 10/25/13 14:40** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-15-07-08-131025 — Lab Sample ID: 280-48532-5

**Date Collected: 10/25/13 14:40** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 74.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.3 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.3 g | 1000 uL | 201027 | 11/14/13 18:59 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.08 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.08 g | 100 mL | 199470 | 11/05/13 15:45 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .59 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |

## Client Sample ID: SDS-15-07-08-131025 — Lab Sample ID: 280-48532-5

**Date Collected: 10/25/13 14:40** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 74.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 7471B | | 1 | .59 g | 50 mL | 200545 | 11/11/13 21:54 | JM | TAL DEN |

## Client Sample ID: SDS-16-09-10-131025 — Lab Sample ID: 280-48532-6

**Date Collected: 10/25/13 14:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-16-09-10-131025 — Lab Sample ID: 280-48532-6

**Date Collected: 10/25/13 14:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 82.7**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.7 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.7 g | 1000 uL | 201027 | 11/14/13 19:26 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199470 | 11/05/13 15:48 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .58 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .58 g | 50 mL | 200545 | 11/11/13 21:56 | JM | TAL DEN |

## Client Sample ID: SDS-18-19-23-131025 — Lab Sample ID: 280-48532-8

**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| SPLP East | Leach | 1312 | | | 1.0 g | 1.0 mL | 199618 | 11/06/13 16:49 | DFB1 | TAL DEN |
| SPLP East | Prep | 3510C | | | 250 mL | 1000 uL | 200096 | 11/08/13 15:05 | EER | TAL DEN |
| SPLP East | Analysis | 8270D SIM | | 1 | 250 mL | 1000 uL | 201718 | 11/19/13 21:46 | KGV | TAL DEN |
| SPLP East | Leach | 1312 | | | 1.0 g | 1.0 mL | 199618 | 11/06/13 16:49 | DFB1 | TAL DEN |
| SPLP East | Prep | 3010A | | | 50 mL | 50 mL | 199998 | 11/14/13 07:30 | JAM | TAL DEN |
| SPLP East | Analysis | 6010C | | 1 | 50 mL | 50 mL | 201181 | 11/15/13 09:29 | JKH | TAL DEN |
| SPLP East | Leach | 1312 | | | 1.0 g | 1.0 mL | 199618 | 11/06/13 16:49 | DFB1 | TAL DEN |
| SPLP East | Prep | 7470A | | | 30 mL | 30 mL | 199977 | 11/08/13 13:30 | JM | TAL DEN |
| SPLP East | Analysis | 7470A | | 1 | 30 mL | 30 mL | 200323 | 11/08/13 23:24 | JM | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-18-19-23-131025 — Lab Sample ID: 280-48532-8

**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 61.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.3 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |

## Client Sample ID: SDS-18-19-23-131025 — Lab Sample ID: 280-48532-8

**Date Collected: 10/25/13 16:20** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 61.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8270D SIM | | 1 | 31.3 g | 1000 uL | 201027 | 11/14/13 19:54 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.16 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.16 g | 100 mL | 199470 | 11/05/13 15:52 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .54 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .54 g | 50 mL | 200545 | 11/11/13 22:01 | JM | TAL DEN |

## Client Sample ID: SDS-22-11-12-131028 — Lab Sample ID: 280-48532-12

**Date Collected: 10/28/13 13:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-22-11-12-131028 — Lab Sample ID: 280-48532-12

**Date Collected: 10/28/13 13:45** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 88.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.9 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.9 g | 1000 uL | 201027 | 11/14/13 20:21 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.12 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.12 g | 100 mL | 199470 | 11/05/13 16:11 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .50 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .50 g | 50 mL | 200545 | 11/11/13 22:10 | JM | TAL DEN |

## Client Sample ID: SDS-24-11-12-131028 — Lab Sample ID: 280-48532-14

**Date Collected: 10/28/13 15:10** — **Matrix: Solid**
**Date Received: 10/29/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-24-11-12-131028 — Lab Sample ID: 280-48532-14

**Date Collected: 10/28/13 15:10** — **Matrix: Solid**
**Date Received: 10/29/13 09:00** — **Percent Solids: 83.8**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.0 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.0 g | 1000 uL | 201027 | 11/14/13 20:48 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.05 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.05 g | 100 mL | 199470 | 11/05/13 16:15 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .50 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .50 g | 50 mL | 200545 | 11/11/13 22:20 | JM | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Client Sample ID: SDS-25-04-05-131028 — Lab Sample ID: 280-48532-15

**Date Collected: 10/28/13 16:20**
**Date Received: 10/29/13 09:00**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 198914 | 11/01/13 12:14 | BAN | TAL DEN |

## Client Sample ID: SDS-25-04-05-131028 — Lab Sample ID: 280-48532-15

**Date Collected: 10/28/13 16:20**
**Date Received: 10/29/13 09:00**
**Matrix: Solid**
**Percent Solids: 86.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.2 g | 1000 uL | 199407 | 11/05/13 19:00 | BWJ | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.2 g | 1000 uL | 201027 | 11/14/13 21:15 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.20 g | 100 mL | 198988 | 11/01/13 18:07 | JAM | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.20 g | 100 mL | 199470 | 11/05/13 16:18 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .60 g | 50 mL | 198925 | 11/11/13 14:10 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .60 g | 50 mL | 200545 | 11/11/13 22:22 | JM | TAL DEN |

## Client Sample ID: EB-100-131028 — Lab Sample ID: 280-48532-17

**Date Collected: 10/28/13 15:15**
**Date Received: 10/29/13 09:00**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 937.2 mL | 1000 uL | 199212 | 11/04/13 15:56 | RJM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 937.2 mL | 1000 uL | 200002 | 11/08/13 21:27 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 199912 | 11/08/13 13:00 | LLB | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 200255 | 11/09/13 02:11 | JKH | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 199509 | 11/06/13 13:00 | JM | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 199728 | 11/06/13 22:20 | JM | TAL DEN |

**Laboratory References:**
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48532-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Colorado | State Program | 8 | N/A | 09-30-14 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Maryland | State Program | 3 | 268 | 03-31-14 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

**H3K020410 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 42**

**Total Number of Pages ..... 45**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-48532-1

UNC Cogen

Lot #: H3K020410

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

November 25, 2013

# ANALYTICAL METHODS SUMMARY

**H3K020410**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |
| Percent Moisture | MCAWW 160.3 MOD |

**References:**

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H3K020410**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M2ETX | 001 | SDS-13-03-04-131025 | 10/25/13 | 11:35 |
| M2ET0 | 002 | SDS-14-03-04-131025 | 10/25/13 | 11:45 |
| M2ET1 | 003 | SDS-12-02-03-131025 | 10/25/13 | 10:00 |
| M2ET2 | 004 | SDS-9-12-02-03-131025 | 10/25/13 | 10:00 |
| M2ET3 | 005 | SDS-15-07-08-131025 | 10/25/13 | 14:40 |
| M2ET4 | 006 | SDS-16-09-10-131025 | 10/25/13 | 14:45 |
| M2ET6 | 008 | SDS-18-19-23-131025 | 10/25/13 | 16:20 |
| M2EVA | 012 | SDS-22-11-12-131028 | 10/28/13 | 13:45 |
| M2EVD | 014 | SDS-24-11-12-131028 | 10/28/13 | 15:10 |
| M2EVE | 015 | SDS-25-04-05-131028 | 10/28/13 | 16:20 |
| M2EVG | 017 | EB-100-131028 | 10/28/13 | 15:15 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H3K020410

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

For solid and sediments samples, when percent moisture is included in the report header field, the sample results are reported on a dry weight basis. When percent moisture is not contained in the header field, sample results are reported on an as received or wet weight basis.

The matrix spike and duplicate on sample SDS-12-02-03-131025 exhibited native OCDD recoveries below the established QC limit. The laboratory control sample was within limits indicating a lack of sample homogeneity.

Samples SDS-14-03-04-131025 and SDS-15-07-08-131025 exhibited native OCDD above the upper calibration range. The method does not require further action be taken; therefore, the results were reported as is with an "E" qualifier.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass

# PROJECT NARRATIVE
## H3K020410

in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

# PROJECT NARRATIVE
## H3K020410

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated

# PROJECT NARRATIVE
## H3K020410

estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: SDS-13-03-04-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 001 | **Work Order #....:** | M2ETX1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 13 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.021 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.30** | **J** | **5.7** | **0.033** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **1.1** | **J** | **5.7** | **0.089** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **2.6** | **J** | **5.7** | **0.091** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **2.1** | **C J** | **5.7** | **0.082** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **120** | | **5.7** | **0.14** | **pg/g** |
| **OCDD** | **4500** | **B** | **11** | **0.33** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.1 | 0.020 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.7 | 0.046 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.7 | 0.042 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.66** | **Q J** | **5.7** | **0.049** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **1.4** | **Q J** | **5.7** | **0.046** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.33** | **Q J** | **5.7** | **0.046** | **pg/g** |
| **1,2,3,7,8,9-HxCDF** | **0.36** | **J** | **5.7** | **0.061** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDF** | **14** | | **5.7** | **0.066** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **1.3** | **B J** | **5.7** | **0.11** | **pg/g** |
| **OCDF** | **53** | **B** | **11** | **0.067** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 76 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 91 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 87 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 60 | 40 - 135 |
| 13C-OCDD | 67 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 75 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 82 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 86 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 72 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 66 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 60 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-13-03-04-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 001 | **Work Order #....:** | M2ETX1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 13 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| C | Co-eluting isomer. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

TestAmerica Denver

Sample ID: SDS-14-03-04-131025

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| Lot - Sample #....: | H3K020410 - 002 | Work Order #....: | M2ET01AC | Matrix....: | SOLID |
| Date Sampled....: | 10/25/13 | Date Received....: | 11/02/13 | Dilution Factor: | 1 |
| Prep Date....: | 11/04/13 | Analysis Date....: | 11/19/13 | Percent Moisture | 11 |
| Prep Batch # ....: | 3308016 | | | | |
| Initial Wgt/Vol : | 10 g | Instrument ID....: | D2A | Method: | SW846 8290 |
| Analyst ID....: | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **0.043** | **J** | **1.1** | **0.056** | **pg/g** |
| **1,2,3,7,8-PeCDD** | **0.87** | **Q J** | **5.6** | **0.066** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **12** | | **5.6** | **0.16** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **20** | | **5.6** | **0.17** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **5.4** | **C J** | **5.6** | **0.15** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **580** | | **5.6** | **0.34** | **pg/g** |
| **OCDD** | **8900** | **B E** | **11** | **0.26** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.1 | 0.034 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.6 | 0.081 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.6 | 0.099 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **3.6** | **Q J** | **5.6** | **0.11** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **8.6** | **Q** | **5.6** | **0.11** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **1.6** | **Q J** | **5.6** | **0.11** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 5.6 | 0.14 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **91** | | **5.6** | **0.22** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **8.3** | **Q B** | **5.6** | **0.35** | **pg/g** |
| **OCDF** | **230** | **B** | **11** | **0.16** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 84 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 87 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 72 | 40 - 135 |
| 13C-OCDD | 72 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 90 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 85 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 90 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 66 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-14-03-04-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 002 | **Work Order #....:** | M2ET01AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 11 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| C | Co-eluting isomer. |
| E | Estimated result. Result concentration exceeds the calibration range. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

TestAmerica Denver

Sample ID: SDS-12-02-03-131025

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 003 | **Work Order #....:** | M2ET11AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 21 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.2 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **1.3** | | **1.2** | **0.063** | **pg/g** |
| **1,2,3,7,8-PeCDD** | **0.91** | **Q J** | **6.2** | **0.065** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **0.71** | **Q J** | **6.2** | **0.10** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **1.1** | **J** | **6.2** | **0.11** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.53** | **Q J** | **6.2** | **0.098** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **40** | | **6.2** | **0.13** | **pg/g** |
| **OCDD** | **1800** | **B** | **12** | **0.45** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.066 | pg/g |
| **1,2,3,7,8-PeCDF** | **0.12** | **Q J** | **6.2** | **0.059** | **pg/g** |
| **2,3,4,7,8-PeCDF** | **0.073** | **Q J** | **6.2** | **0.057** | **pg/g** |
| **1,2,3,4,7,8-HxCDF** | **0.11** | **Q J** | **6.2** | **0.053** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.84** | **Q J** | **6.2** | **0.056** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.22** | **Q J** | **6.2** | **0.053** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 6.2 | 0.080 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **2.3** | **Q J** | **6.2** | **0.057** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 6.2 | 0.10 | pg/g |
| **OCDF** | **6.6** | **B J** | **12** | **0.11** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 76 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 88 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 89 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 67 | 40 - 135 |
| 13C-OCDD | 63 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 79 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 88 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 87 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 87 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 87 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 90 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 68 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 55 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-12-02-03-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 003 | **Work Order #....:** | M2ET11AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 21 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.2 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: SDS-9-12-02-03-131025

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 004 | **Work Order #....:** | M2ET21AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 16 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **0.38** | **Q J** | **1.2** | **0.052** | **pg/g** |
| **1,2,3,7,8-PeCDD** | **1.2** | **J** | **5.9** | **0.088** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **0.93** | **J** | **5.9** | **0.059** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **0.62** | **Q J** | **5.9** | **0.056** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **1.2** | **C J** | **5.9** | **0.052** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **44** | | **5.9** | **0.13** | **pg/g** |
| **OCDD** | **1900** | **B** | **12** | **0.33** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.040 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.9 | 0.035 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.9 | 0.033 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.23** | **Q J** | **5.9** | **0.036** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.69** | **Q J** | **5.9** | **0.036** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.17** | **Q J** | **5.9** | **0.032** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 5.9 | 0.045 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **1.6** | **Q J** | **5.9** | **0.029** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.9 | 0.042 | pg/g |
| **OCDF** | **6.5** | **B J** | **12** | **0.043** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 71 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 78 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 91 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 110 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 78 | 40 - 135 |
| 13C-OCDD | 85 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 74 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 92 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 88 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 85 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 87 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 97 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 87 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 84 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 76 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-9-12-02-03-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 004 | **Work Order #....:** | M2ET21AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 16 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| C | Co-eluting isomer. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

TestAmerica Denver

Sample ID: SDS-15-07-08-131025

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| Lot - Sample #....: | H3K020410 - 005 | Work Order #....: | M2ET31AC | Matrix....: | SOLID |
| Date Sampled....: | 10/25/13 | Date Received....: | 11/02/13 | Dilution Factor: | 1 |
| Prep Date....: | 11/04/13 | Analysis Date....: | 11/20/13 | Percent Moisture | 27 |
| Prep Batch # ....: | 3308016 | | | | |
| Initial Wgt/Vol : | 10 g | Instrument ID....: | D2A | Method: | SW846 8290 |
| Analyst ID....: | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.50 | Q J | 1.4 | 0.10 | pg/g |
| 1,2,3,7,8-PeCDD | 0.79 | Q J | 6.9 | 0.089 | pg/g |
| 1,2,3,4,7,8-HxCDD | 16 | | 6.9 | 0.11 | pg/g |
| 1,2,3,6,7,8-HxCDD | 42 | | 6.9 | 0.11 | pg/g |
| 1,2,3,7,8,9-HxCDD | 12 | C | 6.9 | 0.10 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | 1100 | | 6.9 | 0.35 | pg/g |
| OCDD | 15000 | B E | 14 | 0.38 | pg/g |
| 2,3,7,8-TCDF | 0.19 | Q J | 1.4 | 0.047 | pg/g |
| 1,2,3,7,8-PeCDF | 0.17 | Q J | 6.9 | 0.095 | pg/g |
| 2,3,4,7,8-PeCDF | 0.40 | J | 6.9 | 0.11 | pg/g |
| 1,2,3,4,7,8-HxCDF | 12 | Q | 6.9 | 0.10 | pg/g |
| 1,2,3,6,7,8-HxCDF | 28 | Q | 6.9 | 0.10 | pg/g |
| 2,3,4,6,7,8-HxCDF | 2.2 | Q J | 6.9 | 0.10 | pg/g |
| 1,2,3,7,8,9-HxCDF | 0.49 | J | 6.9 | 0.14 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | 230 | Q | 6.9 | 0.19 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | 23 | B | 6.9 | 0.26 | pg/g |
| OCDF | 670 | B | 14 | 0.11 | pg/g |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 74 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 74 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 79 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 69 | 40 - 135 |
| 13C-OCDD | 84 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 79 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 84 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 71 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 72 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 71 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 70 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 67 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-15-07-08-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 005 | **Work Order #....:** | M2ET31AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 27 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| C | Co-eluting isomer. |
| E | Estimated result. Result concentration exceeds the calibration range. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

TestAmerica Denver

Sample ID: SDS-16-09-10-131025

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 006 | **Work Order #....:** | M2ET41AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 16 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.015 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.9 | 0.020 | pg/g |
| **1,2,3,4,7,8-HxCDD** | **0.23** | **J** | **5.9** | **0.057** | **pg/g** |
| 1,2,3,6,7,8-HxCDD | ND | | 5.9 | 0.046 | pg/g |
| **1,2,3,7,8,9-HxCDD** | **0.62** | **Q J** | **5.9** | **0.046** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **32** | | **5.9** | **0.15** | **pg/g** |
| **OCDD** | **2800** | **B** | **12** | **0.39** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.0065 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.9 | 0.013 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.9 | 0.010 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.9 | 0.033 | pg/g |
| **1,2,3,6,7,8-HxCDF** | **0.097** | **Q J** | **5.9** | **0.031** | **pg/g** |
| 2,3,4,6,7,8-HxCDF | ND | | 5.9 | 0.029 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.9 | 0.045 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **2.3** | **Q J** | **5.9** | **0.049** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.9 | 0.084 | pg/g |
| **OCDF** | **11** | **B J** | **12** | **0.028** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 67 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 93 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 71 | 40 - 135 |
| 13C-OCDD | 88 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 72 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 76 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 71 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 64 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-16-09-10-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 006 | **Work Order #....:** | M2ET41AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 16 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SDS-18-19-23-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 008 | **Work Order #....:** | M2ET61AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 39 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **0.13** | **Q J** | **1.6** | **0.070** | **pg/g** |
| **1,2,3,7,8-PeCDD** | **0.57** | **Q J** | **8.2** | **0.051** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **0.26** | **Q J** | **8.2** | **0.075** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **1.2** | **Q J** | **8.2** | **0.076** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **1.4** | **Q J** | **8.2** | **0.068** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **18** | | **8.2** | **0.13** | **pg/g** |
| **OCDD** | **490** | **B** | **16** | **0.20** | **pg/g** |
| **2,3,7,8-TCDF** | **1.3** | **Q J** | **1.6** | **0.088** | **pg/g** |
| **1,2,3,7,8-PeCDF** | **0.54** | **Q J** | **8.2** | **0.093** | **pg/g** |
| **2,3,4,7,8-PeCDF** | **0.39** | **Q J** | **8.2** | **0.090** | **pg/g** |
| **1,2,3,4,7,8-HxCDF** | **2.3** | **Q J** | **8.2** | **0.075** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.98** | **Q J** | **8.2** | **0.076** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.069** | **Q J** | **8.2** | **0.075** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 8.2 | 0.096 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **5.4** | **J** | **8.2** | **0.069** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 8.2 | 0.095 | pg/g |
| **OCDF** | **9.6** | **B J** | **16** | **0.051** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 78 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 90 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 85 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 68 | 40 - 135 |
| 13C-OCDD | 71 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 79 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 91 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 84 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 75 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 79 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 65 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 66 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-18-19-23-131025**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 008 | **Work Order #....:** | M2ET61AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/25/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 39 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SDS-22-11-12-131028**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 012 | **Work Order #....:** | M2EVA1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/28/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 13 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.025 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.011** | **Q J** | **5.7** | **0.012** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **0.20** | **Q J** | **5.7** | **0.055** | **pg/g** |
| 1,2,3,6,7,8-HxCDD | ND | | 5.7 | 0.057 | pg/g |
| **1,2,3,7,8,9-HxCDD** | **0.18** | **J** | **5.7** | **0.051** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **2.6** | **Q J** | **5.7** | **0.13** | **pg/g** |
| **OCDD** | **150** | **B** | **11** | **0.33** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.1 | 0.042 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.7 | 0.048 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.7 | 0.047 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.7 | 0.048 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 5.7 | 0.053 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 5.7 | 0.048 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.7 | 0.066 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.19** | **Q J** | **5.7** | **0.040** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.7 | 0.051 | pg/g |
| **OCDF** | **0.83** | **B J** | **11** | **0.036** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 74 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 87 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 90 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 70 | 40 - 135 |
| 13C-OCDD | 72 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 77 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 89 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 75 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 73 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 85 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 72 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 71 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-22-11-12-131028**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 012 | **Work Order #....:** | M2EVA1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/28/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 13 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SDS-24-11-12-131028**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 014 | **Work Order #....:** | M2EVD1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/28/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 16 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.035 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 6.0 | 0.017 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 6.0 | 0.067 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 6.0 | 0.057 | pg/g |
| **1,2,3,7,8,9-HxCDD** | **0.12** | **Q J** | **6.0** | **0.056** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **6.4** | **Q** | **6.0** | **0.23** | **pg/g** |
| **OCDD** | **1300** | **B** | **12** | **0.50** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.046 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 6.0 | 0.054 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 6.0 | 0.055 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 6.0 | 0.056 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 6.0 | 0.056 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 6.0 | 0.054 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 6.0 | 0.073 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | ND | | 6.0 | 0.046 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | ND | | 6.0 | 0.065 | pg/g |
| **OCDF** | **0.93** | **B J** | **12** | **0.080** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 74 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 92 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 62 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 84 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 67 | 40 - 135 |
| 13C-OCDD | 67 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 69 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 83 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 78 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 71 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 73 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 62 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 63 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-24-11-12-131028**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 014 | **Work Order #....:** | M2EVD1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/28/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 16 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: SDS-25-04-05-131028

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 015 | **Work Order #....:** | M2EVE1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/28/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 12 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **0.15** | **Q J** | **1.1** | **0.081** | **pg/g** |
| **1,2,3,7,8-PeCDD** | **0.23** | **Q J** | **5.7** | **0.072** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **0.99** | **Q J** | **5.7** | **0.18** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **14** | | **5.7** | **0.18** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **2.5** | **Q J** | **5.7** | **0.16** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **310** | | **5.7** | **0.31** | **pg/g** |
| **OCDD** | **4500** | **B** | **11** | **0.33** | **pg/g** |
| **2,3,7,8-TCDF** | **0.35** | **J** | **1.1** | **0.084** | **pg/g** |
| 1,2,3,7,8-PeCDF | ND | | 5.7 | 0.11 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.7 | 0.12 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **2.5** | **Q J** | **5.7** | **0.095** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **3.5** | **Q J** | **5.7** | **0.094** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.97** | **Q J** | **5.7** | **0.084** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 5.7 | 0.099 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **69** | | **5.7** | **0.19** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **7.4** | **B** | **5.7** | **0.23** | **pg/g** |
| **OCDF** | **150** | **B** | **11** | **0.10** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 75 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 89 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 66 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 74 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 69 | 40 - 135 |
| 13C-OCDD | 86 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 78 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 87 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 60 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 60 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 68 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 75 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 58 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 64 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-25-04-05-131028**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 015 | **Work Order #....:** | M2EVE1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/28/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 12 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: EB-100-131028**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 017 | **Work Order #....:** | M2EVG1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 10/28/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/06/13 | **Analysis Date....:** | 11/20/13 | | |
| **Prep Batch # ....:** | 3310026 | | | | |
| **Initial Wgt/Vol :** | 971 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.19 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 51 | 0.097 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 51 | 0.46 | pg/L |
| **1,2,3,6,7,8-HxCDD** | **1.3** | **J** | **51** | **0.45** | **pg/L** |
| **1,2,3,7,8,9-HxCDD** | **1.4** | **Q J** | **51** | **0.41** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **29** | **B J** | **51** | **0.71** | **pg/L** |
| **OCDD** | **310** | **B** | **100** | **0.92** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.21 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 51 | 0.30 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 51 | 0.31 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 51 | 0.39 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **1.2** | **Q B J** | **51** | **0.36** | **pg/L** |
| 2,3,4,6,7,8-HxCDF | ND | | 51 | 0.35 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 51 | 0.45 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **4.0** | **Q B J** | **51** | **0.33** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 51 | 0.48 | pg/L |
| **OCDF** | **5.5** | **Q B J** | **100** | **0.27** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 106 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 93 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 84 | 40 - 135 |
| 13C-OCDD | 86 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 89 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 105 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 98 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 86 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 93 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 99 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 81 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 79 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: EB-100-131028**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020410 - 017 | **Work Order #....:** | M2EVG1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 10/28/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/06/13 | **Analysis Date....:** | 11/20/13 | | |
| **Prep Batch # ....:** | 3310026 | | | | |
| **Initial Wgt/Vol :** | 971 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K040000 - 016B | **Work Order #....:** | M2EXN1AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.0 | 0.021 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.0 | 0.0044 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.0 | 0.013 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.0 | 0.012 | pg/g |
| 1,2,3,7,8,9-HxCDD | ND | | 5.0 | 0.011 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | ND | | 5.0 | 0.027 | pg/g |
| **OCDD** | **1.9** | **J** | **10** | **0.051** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.0 | 0.011 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.0 | 0.013 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.0 | 0.012 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.0 | 0.014 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 5.0 | 0.014 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 5.0 | 0.013 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.0 | 0.020 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | ND | | 5.0 | 0.0093 | pg/g |
| **1,2,3,4,7,8,9-HpCDF** | **0.038** | **Q J** | **5.0** | **0.013** | **pg/g** |
| **OCDF** | **0.63** | **Q J** | **10** | **0.038** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 80 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 97 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 69 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 86 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 58 | 40 - 135 |
| 13C-OCDD | 57 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 83 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 101 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 89 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 78 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 61 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 62 | 40 - 135 |

## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K040000 - 016B | **Work Order #....:** | M2EXN1AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# LABORATORY CONTROL SAMPLE DATA REPORT

## Trace Level Organic Compounds

**Client Lot # ...:** H3K020410 **Work Order # ...:** M2EXN1AC-LCS **Matrix .....:** SOLID
**LCS Lot-Sample# :** H3K040000 - 016
**Prep Date .....:** 11/04/13 **Analysis Date ..:** 11/18/13
**Prep Batch # ...:** 3308016
**Dilution Factor :** 1
**Analyst ID.....:** Linda K. McWhirter **Instrument ID..:** D2A **Method.....:** SW846 8290
**Initial Wgt/Vol:** 10 g

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **20.0** | **21.1** | **pg/g** | **105** | | **(79 - 129)** |
| **1,2,3,7,8-PeCDD** | **100** | **99.3** | **pg/g** | **99** | | **(79 - 129)** |
| **1,2,3,4,7,8-HxCDD** | **100** | **95.7** | **pg/g** | **96** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **100** | **94.3** | **pg/g** | **94** | | **(74 - 124)** |
| **1,2,3,7,8,9-HxCDD** | **100** | **89.8** | **pg/g** | **90** | | **(70 - 124)** |
| **1,2,3,4,6,7,8-HpCDD** | **100** | **99.8** | **pg/g** | **100** | | **(73 - 123)** |
| **OCDD** | **200** | **185** | **pg/g** | **93** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **20.0** | **22.4** | **pg/g** | **112** | | **(75 - 125)** |
| **1,2,3,7,8-PeCDF** | **100** | **107** | **pg/g** | **107** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **100** | **100** | **pg/g** | **100** | | **(75 - 125)** |
| **1,2,3,4,7,8-HxCDF** | **100** | **92.5** | **pg/g** | **93** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **100** | **93.6** | **pg/g** | **94** | | **(76 - 126)** |
| **2,3,4,6,7,8-HxCDF** | **100** | **106** | **pg/g** | **106** | | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **100** | **95.9** | **pg/g** | **96** | | **(77 - 127)** |
| **1,2,3,4,6,7,8-HpCDF** | **100** | **106** | **pg/g** | **106** | | **(77 - 127)** |
| **1,2,3,4,7,8,9-HpCDF** | **100** | **98.2** | **pg/g** | **98** | **B** | **(73 - 123)** |
| **OCDF** | **200** | **172** | **pg/g** | **86** | **B** | **(49 - 128)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 79 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 84 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 80 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 89 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 68 | (40 - 135) |
| 13C-OCDD | 79 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 73 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 78 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 81 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 78 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 81 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 78 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 86 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 71 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

## MATRIX/MATRIX SPIKE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H3K020410 | **Work Order # ...:** | M2ET11AD-MS | **Matrix .....:** | SOLID |
| **OS Lot-Sample# :** | H3K020410 - 003 | | M2ET11AE-MSD | | |
| **Prep Date .....:** | 11/04/13 | **Analysis Date ..:** | 11/19/13 | | |
| **Prep Batch # ...:** | 3308016 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Melissa A. Davidson | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 10.2 g | | | | |

| PARAMETER | SAMPLE AMOUNT | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | RECOVERY LIMITS | RPD | RPD LIMITS |
|---|---|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | 1.3 | 24.7 | 27.1 | pg/g | 104 | (79 - 129) | | |
| | 1.3 | 24.7 | 25.8 | pg/g | 99 | (79 - 129) | 4.8 | (0 - 15) |
| **1,2,3,7,8-PeCDD** | 0.91 | 124 | 118 | pg/g | 95 | (79 - 129) | | |
| | 0.91 | 124 | 116 | pg/g | 93 | (79 - 129) | 1.9 | (0 - 15) |
| **1,2,3,4,7,8-HxCDD** | 0.71 | 124 | 113 | pg/g | 90 | (73 - 123) | | |
| | 0.71 | 124 | 121 | pg/g | 97 | (73 - 123) | 6.9 | (0 - 15) |
| **1,2,3,6,7,8-HxCDD** | 1.1 | 124 | 125 | pg/g | 100 | (73 - 127) | | |
| | 1.1 | 124 | 118 | pg/g | 95 | (73 - 127) | 5.3 | (0 - 15) |
| **1,2,3,7,8,9-HxCDD** | 0.53 | 124 | 109 | pg/g | 88 | (65 - 141) | | |
| | 0.53 | 124 | 113 | pg/g | 91 | (65 - 141) | 3.5 | (0 - 15) |
| **1,2,3,4,6,7,8-HpCDD** | 40 | 124 | 143 | pg/g | 83 | (54 - 138) | | |
| | 40 | 124 | 141 | pg/g | 82 | (54 - 138) | 1.2 | (0 - 15) |
| **OCDD** | 1800 | 247 | 1590 | pg/g | 0.0 a B | (31 - 154) | | |
| | 1800 | 247 | 1670 | pg/g | 0.0 a B | (31 - 154) | 0.0 | (0 - 15) |
| **2,3,7,8-TCDF** | ND | 24.7 | 26.7 | pg/g | 108 X | (75 - 125) | | |
| | ND | 24.7 | 27.4 | pg/g | 111 X | (75 - 125) | 2.4 | (0 - 15) |
| **1,2,3,7,8-PeCDF** | 0.12 | 124 | 114 | pg/g | 92 | (74 - 124) | | |
| | 0.12 | 124 | 118 | pg/g | 95 | (74 - 124) | 3.4 | (0 - 15) |
| **2,3,4,7,8-PeCDF** | 0.073 | 124 | 122 | pg/g | 98 | (75 - 125) | | |
| | 0.073 | 124 | 123 | pg/g | 100 | (75 - 125) | 1.2 | (0 - 15) |
| **1,2,3,4,7,8-HxCDF** | 0.11 | 124 | 124 | pg/g | 100 | (75 - 125) | | |
| | 0.11 | 124 | 130 | pg/g | 105 | (75 - 125) | 4.8 | (0 - 15) |
| **1,2,3,6,7,8-HxCDF** | 0.84 | 124 | 123 | pg/g | 98 | (73 - 131) | | |
| | 0.84 | 124 | 125 | pg/g | 100 | (73 - 131) | 2.0 | (0 - 15) |
| **2,3,4,6,7,8-HxCDF** | 0.22 | 124 | 121 | pg/g | 97 | (76 - 129) | | |
| | 0.22 | 124 | 126 | pg/g | 101 | (76 - 129) | 4.2 | (0 - 15) |
| **1,2,3,7,8,9-HxCDF** | ND | 124 | 118 | pg/g | 95 | (77 - 127) | | |
| | ND | 124 | 119 | pg/g | 96 | (77 - 127) | 0.96 | (0 - 15) |
| **1,2,3,4,6,7,8-HpCDF** | 2.3 | 124 | 126 | pg/g | 100 | (72 - 134) | | |
| | 2.3 | 124 | 122 | pg/g | 97 | (72 - 134) | 3.3 | (0 - 15) |
| **1,2,3,4,7,8,9-HpCDF** | ND | 124 | 125 | pg/g | 101 B | (73 - 124) | | |
| | ND | 124 | 123 | pg/g | 99 B | (73 - 124) | 1.9 | (0 - 15) |
| **OCDF** | 6.6 | 247 | 223 | pg/g | 87 B | (45 - 135) | | |
| | 6.6 | 247 | 219 | pg/g | 86 B | (45 - 135) | 1.8 | (0 - 15) |

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## MATRIX/MATRIX SPIKE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H3K020410 | **Work Order # ...:** | M2ET11AD-MS | **Matrix .....:** | SOLID |
| **OS Lot-Sample# :** | H3K020410 - 003 | | M2ET11AE-MSD | | |
| **Prep Date .....:** | 11/04/13 | **Analysis Date ..:** | 11/19/13 | | |
| **Prep Batch # ...:** | 3308016 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Melissa A. Davidson | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 10.2 g | | | | |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 78 | (40 - 135) |
| | 77 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 95 | (40 - 135) |
| | 92 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 86 | (40 - 135) |
| | 83 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 87 | (40 - 135) |
| | 84 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 73 | (40 - 135) |
| | 75 | (40 - 135) |
| 13C-OCDD | 81 | (40 - 135) |
| | 80 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 79 | (40 - 135) |
| | 77 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 96 | (40 - 135) |
| | 91 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 86 | (40 - 135) |
| | 83 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 78 | (40 - 135) |
| | 74 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 79 | (40 - 135) |
| | 81 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 85 | (40 - 135) |
| | 83 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 93 | (40 - 135) |
| | 90 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 73 | (40 - 135) |
| | 79 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 71 | (40 - 135) |
| | 72 | (40 - 135) |

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

a Spiked analyte recovery is outside stated control limits.

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

X See project narrative.

SOG_Stnd_msmsd_rev1.rpt 11/22/2013

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K060000 - 026B | **Work Order #....:** | M2FPK1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/06/13 | **Analysis Date....:** | 11/20/13 | | |
| **Prep Batch # ....:** | 3310026 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.33 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 0.087 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.39 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 50 | 0.40 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.36 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.94** | **Q J** | **50** | **0.45** | **pg/L** |
| **OCDD** | **59** | **J** | **100** | **0.79** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.22 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.33 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.35 | pg/L |
| **1,2,3,4,7,8-HxCDF** | **0.41** | **Q J** | **50** | **0.27** | **pg/L** |
| **1,2,3,6,7,8-HxCDF** | **0.43** | **Q J** | **50** | **0.25** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.68** | **Q J** | **50** | **0.25** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.66** | **Q J** | **50** | **0.29** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **1.3** | **Q J** | **50** | **0.15** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 50 | 0.21 | pg/L |
| **OCDF** | **4.3** | **Q J** | **100** | **0.30** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 87 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 96 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 85 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 91 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 71 | 40 - 135 |
| 13C-OCDD | 70 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 102 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 87 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 88 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 96 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 75 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 73 | 40 - 135 |

## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K060000 - 026B | **Work Order #....:** | M2FPK1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/06/13 | **Analysis Date....:** | 11/20/13 | | |
| **Prep Batch # ....:** | 3310026 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

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## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H3K020410 | **Work Order # ...:** | M2FPK1AC-LCS<br>M2FPK1AD-LCSD | **Matrix .....:** | WATER |
| **LCS Lot-Sample# :** | H3K060000 - 026 | | | | |
| **Prep Date .....:** | 11/06/13 | **Analysis Date ..:** | 11/20/13 | | |
| **Prep Batch # ...:** | 3310026 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1000 mL | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS | RPD | RPD LIMITS |
|---|---|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | 200 | 198 | pg/L | 99 | | (77 - 127) | | |
| | 200 | 214 | pg/L | 107 | | (77 - 127) | 7.6 | (0 - 15) |
| **1,2,3,7,8-PeCDD** | 1000 | 1020 | pg/L | 102 | | (78 - 128) | | |
| | 1000 | 929 | pg/L | 93 | | (78 - 128) | 8.9 | (0 - 15) |
| **1,2,3,4,7,8-HxCDD** | 1000 | 880 | pg/L | 88 | | (73 - 123) | | |
| | 1000 | 927 | pg/L | 93 | | (73 - 123) | 5.2 | (0 - 15) |
| **1,2,3,6,7,8-HxCDD** | 1000 | 1000 | pg/L | 100 | | (72 - 127) | | |
| | 1000 | 939 | pg/L | 94 | | (72 - 127) | 6.4 | (0 - 15) |
| **1,2,3,7,8,9-HxCDD** | 1000 | 968 | pg/L | 97 | | (76 - 126) | | |
| | 1000 | 956 | pg/L | 96 | | (76 - 126) | 1.3 | (0 - 15) |
| **1,2,3,4,6,7,8-HpCDD** | 1000 | 903 | pg/L | 90 | B | (73 - 123) | | |
| | 1000 | 885 | pg/L | 89 | B | (73 - 123) | 2.0 | (0 - 15) |
| **OCDD** | 2000 | 1780 | pg/L | 89 | B | (75 - 125) | | |
| | 2000 | 1810 | pg/L | 91 | B | (75 - 125) | 1.8 | (0 - 15) |
| **2,3,7,8-TCDF** | 200 | 212 | pg/L | 106 | | (74 - 124) | | |
| | 200 | 207 | pg/L | 104 | | (74 - 124) | 2.4 | (0 - 15) |
| **1,2,3,7,8-PeCDF** | 1000 | 889 | pg/L | 89 | | (74 - 124) | | |
| | 1000 | 934 | pg/L | 93 | | (74 - 124) | 4.9 | (0 - 15) |
| **2,3,4,7,8-PeCDF** | 1000 | 952 | pg/L | 95 | | (74 - 124) | | |
| | 1000 | 947 | pg/L | 95 | | (74 - 124) | 0.44 | (0 - 15) |
| **1,2,3,4,7,8-HxCDF** | 1000 | 990 | pg/L | 99 | B | (75 - 125) | | |
| | 1000 | 975 | pg/L | 97 | B | (75 - 125) | 1.6 | (0 - 15) |
| **1,2,3,6,7,8-HxCDF** | 1000 | 952 | pg/L | 95 | B | (75 - 125) | | |
| | 1000 | 969 | pg/L | 97 | B | (75 - 125) | 1.8 | (0 - 15) |
| **2,3,4,6,7,8-HxCDF** | 1000 | 985 | pg/L | 98 | B | (76 - 126) | | |
| | 1000 | 986 | pg/L | 99 | B | (76 - 126) | 0.12 | (0 - 15) |
| **1,2,3,7,8,9-HxCDF** | 1000 | 989 | pg/L | 99 | B | (76 - 126) | | |
| | 1000 | 939 | pg/L | 94 | B | (76 - 126) | 5.2 | (0 - 15) |
| **1,2,3,4,6,7,8-HpCDF** | 1000 | 962 | pg/L | 96 | B | (71 - 121) | | |
| | 1000 | 990 | pg/L | 99 | B | (71 - 121) | 2.9 | (0 - 15) |
| **1,2,3,4,7,8,9-HpCDF** | 1000 | 1020 | pg/L | 102 | | (73 - 123) | | |
| | 1000 | 959 | pg/L | 96 | | (73 - 123) | 6.1 | (0 - 15) |
| **OCDF** | 2000 | 1790 | pg/L | 89 | B | (68 - 132) | | |
| | 2000 | 1790 | pg/L | 89 | B | (68 - 132) | 0.030 | (0 - 15) |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 90 | (40 - 135) |
| | 81 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 93 | (40 - 135) |
| | 101 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 85 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Client Lot # ...:** H3K020410 **Work Order # ...:** M2FPK1AC-LCS **Matrix .....:** WATER
**LCS Lot-Sample# :** H3K060000 - 026 M2FPK1AD-LCSD

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| | 82 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 87 | (40 - 135) |
| | 89 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 78 | (40 - 135) |
| | 82 | (40 - 135) |
| 13C-OCDD | 104 | (40 - 135) |
| | 87 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 85 | (40 - 135) |
| | 86 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 104 | (40 - 135) |
| | 100 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 90 | (40 - 135) |
| | 92 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 79 | (40 - 135) |
| | 79 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 86 | (40 - 135) |
| | 80 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 88 | (40 - 135) |
| | 87 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 98 | (40 - 135) |
| | 96 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 77 | (40 - 135) |
| | 75 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 73 | (40 - 135) |
| | 82 | (40 - 135) |

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H3K020410

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-215020.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving- Terry Wasmund | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 2 |
| Company: TestAmerica Laboratories, Inc. | | Analysis Requested | | Job #: 280-48532-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 11/14/2013 | | | Preservation Codes: |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUBCONTRACT/ SW8290 - 17 Dioxins and Furans | | | | | | | | | | | | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | | | | | | | | |
| SDS-13-03-04-131025 (280-48532-1) | 10/25/13 | 11:35 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-14-03-04-131025 (280-48532-2) | 10/25/13 | 11:45 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-12-02-03-131025 (280-48532-3) | 10/25/13 | 10:00 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-12-02-03-131025 (280-48532-3MS) | 10/25/13 | 10:00 Eastern | MS | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-12-02-03-131025 (280-48532-3MSD) | 10/25/13 | 10:00 Eastern | MSD | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-9-12-02-03-131025 (280-48532-4) | 10/25/13 | 10:00 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-15-07-08-131025 (280-48532-5) | 10/25/13 | 14:40 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-16-09-10-131025 (280-48532-6) | 10/25/13 | 14:45 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-17-27-28-131025 (280-48532-7) | 10/25/13 | 16:00 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-18-19-23-131025 (280-48532-8) | 10/25/13 | 16:20 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |
| SDS-19-18-19-131028 (280-48532-9) | 10/28/13 | 10:20 Eastern | | Solid | | | X | | | | | | | | | | | | 1 | Hold Samples/Extracts for 60 days |

CUSTODY SEALS INTACT
RECEIVED AT 0.2°C
ALSO 11-2-13
1 COOLER FEDEX #
5687 6174 5955

| Possible Hazard Identification | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) |
|---|---|
| Unconfirmed | ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months |
| Deliverable Requested: I, II, III, IV, Other (specify) | Special Instructions/QC Requirements: |

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 11/1/13 1330 | Company | Received by: | Date/Time: 11-2-13 10:00 | Company TA KNOX |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

H3K020410

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-215020.2 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving- Terry Wasmund | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 2 of 2 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-48532-1 |
| Address: 5815 Middlebrook Pike, | Due Date Requested: 11/14/2013 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUBCONTRACT/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| SDS-20-11-12-131028 (280-48532-10) | 10/28/13 | 11:45 Eastern | | Solid | | | X | 1 | Hold Samples/Extracts for 60 days |
| SDS-21-04-05-131028 (280-48532-11) | 10/28/13 | 13:40 Eastern | | Solid | | | X | 1 | Hold Samples/Extracts for 60 days |
| SDS-22-11-12-131028 (280-48532-12) | 10/28/13 | 13:45 Eastern | | Solid | | | X | 1 | Hold Samples/Extracts for 60 days |
| SDS-23-04-05-131028 (280-48532-13) | 10/28/13 | 15:15 Eastern | | Solid | | | X | 1 | Hold Samples/Extracts for 60 days |
| SDS-24-11-12-131028 (280-48532-14) | 10/28/13 | 15:10 Eastern | | Solid | | | X | 1 | Hold Samples/Extracts for 60 days |
| SDS-25-04-05-131028 (280-48532-15) | 10/28/13 | 16:20 Eastern | | Solid | | | X | 1 | Hold Samples/Extracts for 60 days |
| SDS-26-11-12-131028 (280-48532-16) | 10/28/13 | 16:15 Eastern | | Solid | | | X | 1 | Hold Samples/Extracts for 60 days |
| EB-100-131028 (280-48532-17) | 10/28/13 | 15:15 Eastern | | Water | | | X | 2 | Hold Samples/Extracts for 60 days |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 11/1/13 1330 | | [signature] | 11-2-13 10:00 | TA KNOX |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** 1-131K0120410

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ 1a Do not match COC<br>☐ 1b Incomplete information<br>☐ 1c Marking smeared<br>☐ 1d Label torn<br>☐ 1e No label<br>☐ 1f COC not received<br>☐ 1g Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) | ✓ | | | ☐ 2a Temp Blank = _____<br>☐ 2b Cooler Temp = _____<br>☐ 2c Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ 3a See box 3A for pH Preservation<br>☐ 3b Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ 4a Not present<br>☐ 4b Not intact<br>☐ 4c Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ 5a Samples received-not on COC<br>☐ 5b Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ 6a Leaking<br>☐ 6b Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ 7a Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ 8a Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) | | | ✓ | ☐ 9a Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ 10a Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ 13a Leaking<br>☐ 13b Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ 14a Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ 15a Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ 15a Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ 15a Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ 15a Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ 19a Other |

**Comments/Actions Taken**

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| Preservative: | | |
| Lot Number: | | |
| Exp Date: | | |
| Analyst: | | |
| Date: | | |
| Time: | | |

Quote #: 91585 PM Instructions: NA

Sample Receiving Associate: [signature] Date: 11-2-13

QA026R25.doc, 071813

**Chain of Custody**

280-48532 Chain of Custody

Sampler ID 1.8

Temperature on Receipt 1.3 IR4 10/29/13

Drinking Water? Yes ☐ No ☐

**TestAmerica** THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

| | | | |
|---|---|---|---|
| Client: Geosyntec Consultants | Project Manager: Beau Hodge | Date: 10/28/13 | Chain of Custody Number: 175585 |
| Address: 4601 Six Forks Rd Suite 340 | Telephone Number (Area Code)/Fax Number: 919-870-0576 | Lab Number: Denver/Knox | Page 1 of 2 |
| City: Raleigh; State: NC; Zip Code: 27609 | Site Contact: | Lab Contact: Patrick M. | |
| Project Name and Location (State): NNC Cogen | Carrier/Waybill Number: | | |
| Contract/Purchase Order/Quote No.: | | | |

Analysis (Attach list if more space is needed)

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Matrix: Air | Aqueous | Sed. | Soil | Containers & Preservatives: Unpres | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | 6010C | 7470A | 8270D SIM | 8290 | SPLP 6010C | SPLP 7470A | SPLP 8270D SIM | SPLP 8290 | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDS-13-03-04-131025 | 10/25/13 | 1135 | | | | X | 2 | | | | | | X | X | X | X | | | | | * Hold only * |
| SDS-14-03-04-131025 | 10/25/13 | 1145 | | | | X | 2 | | | | | | X | X | X | X | | | | | * Refer to |
| SDS-12-02-03-131025 | 10/25/13 | 1000 | | | | X | 2 | | | | | | X | X | X | X | | | | | QAPP for |
| SDS-9-12-02-03-131025 | 10/25/13 | 1000 | | | | X | 2 | | | | | | X | X | X | X | | | | | analyte |
| SDS-12-02-03-131025 MS/MSD | 10/25/13 | 1000 | | | | X | 4 | | | | | | X | X | X | X | | | | | lists for |
| SDS-15-07-08-131025 | 10/25/13 | 1440 | | | | X | 2 | | | | | | X | X | X | X | | | | | each method |
| SDS-16-09-10-131025 | 10/25/13 | 1445 | | | | X | 2 | | | | | | X | X | X | X | | | | | |
| SDS-17-27-28-131025 | 10/25/13 | 1600 | | | | X | 2 | | | | | | X | X | X | X | | | | | * 3 |
| SDS-18-19-23-131025 | 10/25/13 | 1620 | | | | X | 5 | | | | | | X | X | X | X | X | X | X | X | coolers |
| SDS-19-18-19-131028 | 10/28/13 | 1020 | | | | X | 2 | | | | | | X | X | X | X | | | | | |
| SDS-20-11-12-131028 | 10/28/13 | 1145 | | | | X | 2 | | | | | | X | X | X | X | | | | | |
| SDS-21-04-05-131028 | 10/28/13 | 1340 | | | | X | 2 | | | | | | X | X | X | X | | | | | |

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STD

QC Requirements (Specify):

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By: Caitlin Collins | Date: 10/28/13 | Time: 1730 | 1. Received By: | Date: 10/29/13 | Time: 0900 |
| 2. Relinquished By: | Date: | Time: | 2. Received By: | Date: | Time: |
| 3. Relinquished By: | Date: | Time: | 3. Received By: | Date: | Time: |

Comments: Shipped VIA FedEX Priority Overnight

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Chain of Custody Record

Sampler ID _____

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☐

**TestAmerica**

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TAL-4124-280 (0508)

| | | | |
|---|---|---|---|
| Client: Geosyntec Consultants | Project Manager: Beau Hodge | Date: 10/28/13 | Chain of Custody Number: 175586 |
| Address: 4601 Six Forks Rd. #340 | Telephone Number (Area Code)/Fax Number: 919-870-0576 | Lab Number: Denver/Knox. | Page 2 of 2 |
| City: Raleigh State: NC Zip Code: 27609 | Site Contact: | Lab Contact: Patrick M | |
| Project Name and Location (State): UNC Cogen (NC) | Carrier/Waybill Number: | | |
| Contract/Purchase Order/Quote No.: | | | |

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Matrix: Air | Aqueous | Sed. | Soil | | Containers & Preservatives: Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | | Analysis (Attach list if more space is needed): 6010C | 7470A | 8270D SIM | 8290 | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDS-22-11-12-131028 | 10/28/13 | 1345 | | | | X | | 2 | | | | | | | X | X | X | X | ★ Hold Only ★ |
| SDS-23-04-05-131028 | 10/28/13 | 1515 | | | | X | | 2 | | | | | | | X | X | X | X | ★ Refer to |
| SDS-24-11-12-131028 | 10/28/13 | 1510 | | | | X | | 2 | | | | | | | X | X | X | X | QAPP for |
| SDS-25-04-05-131028 | 10/28/13 | 1620 | | | | X | | 2 | | | | | | | X | X | X | X | analyte |
| SDS-26-11-12-131028 | 10/28/13 | 1615 | | | | X | | 2 | | | | | | | X | X | X | X | list for |
| EB-100-131028 | 10/28/13 | 1515 | | | | X | | 2 | | | | | | | X | X | X | X | each method |
| | | | | | | | | | | | | | | | | | | | ★3 coolers |

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other STD

QC Requirements (Specify):

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By: Caitlin Collins | Date: 10/28/13 | Time: 1730 | 1. Received By: | Date: 10/29/13 | Time: 0900 |
| 2. Relinquished By: | Date: | Time: | 2. Received By: | Date: | Time: |
| 3. Relinquished By: | Date: | Time: | 3. Received By: | Date: | Time: |

Comments: shipped via FedEx Priority Overnight

**DISTRIBUTION:** WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-48532-1

**Login Number: 48532**
**List Number: 1**
**Creator: Roman, Alex F**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Field on COC is blank. |
| There are no discrepancies between the containers received and the COC. | False | Refer to Job Narrative for details. |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

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# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-48643-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 6:22:42 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| D | Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples. |
| X | Surrogate is outside control limits |
| B | Compound was found in the blank and sample. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| * | LCS or LCSD is outside acceptance limits. |
| F | MS/MSD Recovery and/or RPD exceeds the control limits |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-48643-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-48643-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**

The samples were received on 10/31/2013 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.5º C.

On October 31, 2013, the client cancelled SPLP 8290 analysis on sample SDS-33-01-02-131030 (280-48643-6).

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrooke Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 11/2/2013 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.2º C.

**8270D SIM (GCMS)**

Samples SDS-31-12-13-131029 (280-48643-1), SDS-27-16-17-131029 (280-48643-2), SDS-29-12-13-131029 (280-48643-3), SDS-34-02-03-131030 (280-48643-4), SDS-35-02-03-131030 (280-48643-5) and SDS-33-01-02-131030 (280-48643-6) were analyzed for 8270D SIM GCMS in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 11/08/2013 and analyzed on 11/14/2013, 11/15/2013 and 11/18/2013.

Due to target analyte concentration, samples SDS-34-02-03-131030 (280-48643-4)[10X] and SDS-33-01-02-131030 (280-48643-6)[40X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Nitrobenzene-d5 and Terphenyl-d14 failed the surrogate recovery criteria low for SDS-34-02-03-131030 (280-48643-4). 2-Fluorobiphenyl, Nitrobenzene-d5 and Terphenyl-d14 failed the surrogate recovery criteria low for SDS-33-01-02-131030 (280-48643-6). Refer to the QC report for details. Surrogate recoveries could not be calculated, because the extracts were diluted beyond the ability to quantitate recoveries.

No other difficulties were encountered during the 8270D SIM analysis.

All other quality control parameters were within the acceptance limits.

**SPLP SEMIVOLATILE ORGANIC COMPOUNDS (GC/MS SIM)**

Sample SDS-33-01-02-131030 (280-48643-6) was analyzed for SPLP Semivolatile Organic Compounds (GC/MS SIM) in accordance with SW 846 1312/8270 SIM. The samples were leached on 11/06/2013, prepared on 11/08/2013 and analyzed on 11/19/2013.

2-Methylnaphthalene , Acenaphthene, Naphthalene and Phenanthrene were detected in method blank LB 280-199618/1-D at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged.

## Job ID: 280-48643-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No other difficulties were encountered during the 8270D SIM analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL METALS (ICP)**
Samples SDS-31-12-13-131029 (280-48643-1), SDS-27-16-17-131029 (280-48643-2), SDS-29-12-13-131029 (280-48643-3), SDS-34-02-03-131030 (280-48643-4), SDS-35-02-03-131030 (280-48643-5) and SDS-33-01-02-131030 (280-48643-6) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/05/2013 and 11/08/2013 and analyzed on 11/07/2013 and 11/11/2013.

Aluminum, Iron and Zinc were detected in method blank MB 280-199346/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

MS/MSD analyses were not requested for prep batches 280-199346 and 280-199799.

No other difficulties were encountered during the metals analysis.

All other quality control parameters were within the acceptance limits.

**SPLP METALS (ICP)**
Sample SDS-33-01-02-131030 (280-48643-6) was analyzed for SPLP Metals (ICP) in accordance with SW 846 1312/6010C. The samples were leached on 11/06/2013, prepared on 11/14/2013 and analyzed on 11/15/2013.

Barium, Copper, Manganese and Zinc were detected in method blank LB 280-199618/1-C at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Nickel failed the recovery criteria high for LCS 280-199618/2-C. Refer to the QC report for details. This analyte was biased high in the LCS and was not present in a concentration above the RL in the associated samples; therefore, the data have been reported.

Aluminum and Iron failed the recovery criteria high for the MS of sample SDS-33-01-02-131030MS (280-48643-6) in batch 280-201181. Aluminum and Iron failed the recovery criteria high for the MSD of sample SDS-33-01-02-131030MSD (280-48643-6) in batch 280-201181. Refer to the QC report for details.

The serial dilution performed on sample SDS-33-01-02-131030MS (280-48643-6) associated with analysis batch 280-201181 was outside control limits for Aluminum.

No other difficulties were encountered during the SPLP Metals (ICP) analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL MERCURY (CVAA)**
Samples SDS-31-12-13-131029 (280-48643-1), SDS-27-16-17-131029 (280-48643-2), SDS-29-12-13-131029 (280-48643-3), SDS-34-02-03-131030 (280-48643-4), SDS-35-02-03-131030 (280-48643-5) and SDS-33-01-02-131030 (280-48643-6) were analyzed for total mercury (CVAA) in accordance with EPA SW-846 Method 7471B. The samples were prepared and analyzed on 11/07/2013.

MS/MSD analyses were not requested for prep batch 280-198924.

No difficulties were encountered during the mercury analysis.

All quality control parameters were within the acceptance limits.

## Job ID: 280-48643-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

**SPLP MERCURY**

Sample SDS-33-01-02-131030 (280-48643-6) was analyzed for SPLP mercury in accordance with EPA SW-846 Methods 1312/7470A. The samples were leached on 11/06/2013, and prepared and analyzed on 11/08/2013.

No difficulties were encountered during the SPLP mercury analysis.

All quality control parameters were within the acceptance limits.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Client Sample ID: SDS-31-12-13-131029 — Lab Sample ID: 280-48643-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 430 | J | 6000 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 380 | J | 6000 | 200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 19000 | B | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.0 | J | 2.1 | 0.69 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 17 | | 1.0 | 0.080 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.45 | J | 0.52 | 0.035 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 15 | | 1.6 | 0.061 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 3.4 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 26 | | 2.1 | 0.23 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 27000 | B | 16 | 4.0 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 9.6 | | 0.84 | 0.28 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 110 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.3 | J | 4.2 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 93 | | 2.1 | 0.098 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 16 | B | 3.1 | 0.42 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 39 | | 24 | 7.8 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-27-16-17-131029 — Lab Sample ID: 280-48643-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 12000 | B | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.1 | J | 2.0 | 0.66 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 22 | | 1.0 | 0.076 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.17 | J | 0.50 | 0.033 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 11 | | 1.5 | 0.058 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.5 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 14 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 13000 | B | 15 | 3.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 8.4 | | 0.80 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 52 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.9 | J | 4.0 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 35 | | 2.0 | 0.094 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 11 | B | 3.0 | 0.40 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 11 | J | 23 | 7.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-29-12-13-131029 — Lab Sample ID: 280-48643-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 10000 | B | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.6 | J | 2.1 | 0.68 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 18 | | 1.0 | 0.079 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.57 | | 0.52 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 6.2 | | 1.6 | 0.060 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 4.5 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 16 | | 2.1 | 0.23 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 8400 | B | 16 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 15 | | 0.83 | 0.28 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 240 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.7 | J | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 16 | | 2.1 | 0.098 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Client Sample ID: SDS-29-12-13-131029 (Continued) — Lab Sample ID: 280-48643-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Zinc | 34 | B | 3.1 | 0.41 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 8.3 | J | 21 | 6.8 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-34-02-03-131030 — Lab Sample ID: 280-48643-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 76000 | | 5700 | 300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 56000 | | 5700 | 350 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 36000 | | 5700 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 150000 | | 5700 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 76000 | | 5700 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 110000 | | 5700 | 540 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 190000 | | 5700 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 41000 | | 5700 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene - DL | 290000 | | 57000 | 1900 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Anthracene - DL | 190000 | | 57000 | 8300 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene - DL | 360000 | | 57000 | 10000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene - DL | 360000 | | 57000 | 8500 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene - DL | 420000 | | 57000 | 14000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene - DL | 250000 | | 57000 | 13000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Chrysene - DL | 550000 | | 57000 | 11000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene - DL | 880000 | | 57000 | 11000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene - DL | 1000000 | | 57000 | 13000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 1200000 | | 57000 | 13000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 6400 | B | 11 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 4.1 | | 2.1 | 0.70 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 52 | | 1.1 | 0.081 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.43 | J | 0.53 | 0.035 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 7.1 | | 1.6 | 0.062 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 3.2 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 12 | | 2.1 | 0.23 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 6100 | B | 16 | 4.0 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 18 | | 0.85 | 0.29 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 120 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.4 | J | 4.2 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 13 | | 2.1 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 30 | B | 3.2 | 0.42 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 46 | | 22 | 7.1 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-35-02-03-131030 — Lab Sample ID: 280-48643-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 450 | J | 5500 | 290 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 510 | J | 5500 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 570 | J | 5500 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 1100 | J | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 1700 | J | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 640 | J | 5500 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 1500 | J | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 1400 | J | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SDS-35-02-03-131030 (Continued) — Lab Sample ID: 280-48643-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18000 | B | 11 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.6 | J | 2.3 | 0.76 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 48 | | 1.1 | 0.087 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 1.2 | | 0.57 | 0.038 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 29 | | 1.7 | 0.067 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 3.5 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 40 | | 2.3 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 27000 | B | 17 | 4.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 11 | | 0.92 | 0.31 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 130 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 5.6 | | 4.6 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 68 | | 2.3 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 57 | B | 3.4 | 0.46 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 23 | | 23 | 7.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SDS-33-01-02-131030 — Lab Sample ID: 280-48643-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 430000 | | 8500 | 530 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene - DL | 760000 | | 340000 | 18000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene - DL | 420000 | | 340000 | 11000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene - DL | 2000000 | | 340000 | 12000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Anthracene - DL | 1600000 | | 340000 | 49000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene - DL | 2700000 | | 340000 | 61000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene - DL | 2400000 | | 340000 | 51000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene - DL | 2700000 | | 340000 | 82000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene - DL | 1600000 | | 340000 | 75000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene - DL | 950000 | | 340000 | 68000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Chrysene - DL | 3800000 | | 340000 | 68000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene - DL | 460000 | | 340000 | 89000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene - DL | 6600000 | | 340000 | 68000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Fluorene - DL | 1100000 | | 340000 | 32000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene - DL | 1200000 | | 340000 | 75000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Naphthalene - DL | 400000 | | 340000 | 22000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene - DL | 8600000 | | 340000 | 75000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 8800000 | | 340000 | 75000 | ng/Kg | 40 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene | 31 | J | 100 | 5.9 | ng/L | 1 | | 8270D SIM | SPLP East |
| 2-Methylnaphthalene | 7.7 | J B | 100 | 6.0 | ng/L | 1 | | 8270D SIM | SPLP East |
| Acenaphthene | 24 | J B | 100 | 4.2 | ng/L | 1 | | 8270D SIM | SPLP East |
| Acenaphthylene | 16 | J | 100 | 5.1 | ng/L | 1 | | 8270D SIM | SPLP East |
| Anthracene | 11 | J | 100 | 5.6 | ng/L | 1 | | 8270D SIM | SPLP East |
| Benzo[a]anthracene | 9.8 | J | 100 | 4.2 | ng/L | 1 | | 8270D SIM | SPLP East |
| Benzo[a]pyrene | 8.2 | J | 100 | 6.9 | ng/L | 1 | | 8270D SIM | SPLP East |
| Benzo[b]fluoranthene | 11 | J | 100 | 3.1 | ng/L | 1 | | 8270D SIM | SPLP East |
| Benzo[g,h,i]perylene | 8.2 | J | 100 | 6.2 | ng/L | 1 | | 8270D SIM | SPLP East |
| Chrysene | 14 | J | 100 | 3.3 | ng/L | 1 | | 8270D SIM | SPLP East |
| Fluoranthene | 27 | J | 100 | 4.8 | ng/L | 1 | | 8270D SIM | SPLP East |
| Fluorene | 15 | J | 100 | 5.5 | ng/L | 1 | | 8270D SIM | SPLP East |
| Indeno[1,2,3-cd]pyrene | 7.0 | J | 100 | 4.5 | ng/L | 1 | | 8270D SIM | SPLP East |
| Naphthalene | 23 | J B | 100 | 8.0 | ng/L | 1 | | 8270D SIM | SPLP East |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SDS-33-01-02-131030 (Continued) — Lab Sample ID: 280-48643-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 60 | J B | 100 | 9.3 | ng/L | 1 | | 8270D SIM | SPLP East |
| Pyrene | 32 | J | 100 | 6.1 | ng/L | 1 | | 8270D SIM | SPLP East |
| Aluminum | 8500 | | 15 | 2.3 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 15 | | 2.9 | 0.96 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 160 | | 1.5 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 1.4 | | 0.73 | 0.048 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.25 | J | 0.73 | 0.060 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 25 | | 2.2 | 0.084 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 6.9 | | 1.5 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 200 | | 2.9 | 0.32 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 8600 | | 22 | 5.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 73 | | 1.2 | 0.39 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 86 | | 1.5 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 10 | | 5.8 | 0.18 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 26 | | 2.9 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 85 | | 4.4 | 0.58 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Aluminum | 5700 | | 100 | 18 | ug/L | 1 | | 6010C | SPLP East |
| Arsenic | 21 | | 15 | 4.4 | ug/L | 1 | | 6010C | SPLP East |
| Barium | 110 | B | 10 | 0.58 | ug/L | 1 | | 6010C | SPLP East |
| Beryllium | 0.95 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | SPLP East |
| Chromium | 23 | | 10 | 0.66 | ug/L | 1 | | 6010C | SPLP East |
| Copper | 110 | B | 15 | 0.14 | ug/L | 1 | | 6010C | SPLP East |
| Cobalt | 2.8 | J | 10 | 0.12 | ug/L | 1 | | 6010C | SPLP East |
| Iron | 5600 | | 1000 | 22 | ug/L | 1 | | 6010C | SPLP East |
| Lead | 74 | | 9.0 | 2.6 | ug/L | 1 | | 6010C | SPLP East |
| Manganese | 53 | B | 10 | 0.25 | ug/L | 1 | | 6010C | SPLP East |
| Nickel | 7.0 | J * | 40 | 1.3 | ug/L | 1 | | 6010C | SPLP East |
| Zinc | 59 | B | 20 | 4.5 | ug/L | 1 | | 6010C | SPLP East |
| Vanadium | 27 | | 10 | 1.1 | ug/L | 1 | | 6010C | SPLP East |
| Mercury | 0.000040 | J | 0.0020 | 0.000030 | mg/L | 1 | | 7470A | SPLP East |
| Mercury | 72 | | 35 | 11 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 7471B | Mercury (CVAA) | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Solid | 10/29/13 15:00 | 10/31/13 09:00 |
| 280-48643-2 | SDS-27-16-17-131029 | Solid | 10/29/13 09:40 | 10/31/13 09:00 |
| 280-48643-3 | SDS-29-12-13-131029 | Solid | 10/29/13 11:55 | 10/31/13 09:00 |
| 280-48643-4 | SDS-34-02-03-131030 | Solid | 10/30/13 12:30 | 10/31/13 09:00 |
| 280-48643-5 | SDS-35-02-03-131030 | Solid | 10/30/13 14:55 | 10/31/13 09:00 |
| 280-48643-6 | SDS-33-01-02-131030 | Solid | 10/30/13 12:35 | 10/31/13 09:00 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SDS-31-12-13-131029**
**Date Collected: 10/29/13 15:00**
**Date Received: 10/31/13 09:00**

**Lab Sample ID: 280-48643-1**
**Matrix: Solid**
**Percent Solids: 81.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 310 | U | 6000 | 310 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| **2-Methylnaphthalene** | **430** | **J** | 6000 | 370 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Acenaphthene | 190 | U | 6000 | 190 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| **Acenaphthylene** | **380** | **J** | 6000 | 200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Anthracene | 860 | U | 6000 | 860 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Benzo[a]anthracene | 1100 | U | 6000 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Benzo[a]pyrene | 880 | U | 6000 | 880 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Benzo[b]fluoranthene | 1400 | U | 6000 | 1400 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Benzo[g,h,i]perylene | 1300 | U | 6000 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Benzo[k]fluoranthene | 1200 | U | 6000 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Chrysene | 1200 | U | 6000 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Dibenz(a,h)anthracene | 1600 | U | 6000 | 1600 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Fluoranthene | 1200 | U | 6000 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Fluorene | 560 | U | 6000 | 560 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Indeno[1,2,3-cd]pyrene | 1300 | U | 6000 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Naphthalene | 390 | U | 6000 | 390 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Phenanthrene | 1300 | U | 6000 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |
| Pyrene | 1300 | U | 6000 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 21:42 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *92* | | *39 - 120* | *11/08/13 12:56* | *11/14/13 21:42* | *1* |
| *Nitrobenzene-d5* | *90* | | *42 - 120* | *11/08/13 12:56* | *11/14/13 21:42* | *1* |
| *Terphenyl-d14* | *90* | | *35 - 124* | *11/08/13 12:56* | *11/14/13 21:42* | *1* |

**Client Sample ID: SDS-27-16-17-131029**
**Date Collected: 10/29/13 09:40**
**Date Received: 10/31/13 09:00**

**Lab Sample ID: 280-48643-2**
**Matrix: Solid**
**Percent Solids: 85.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 300 | U | 5700 | 300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| 2-Methylnaphthalene | 350 | U | 5700 | 350 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Acenaphthene | 180 | U | 5700 | 180 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Acenaphthylene | 190 | U | 5700 | 190 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Anthracene | 830 | U | 5700 | 830 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Benzo[a]anthracene | 1000 | U | 5700 | 1000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Benzo[a]pyrene | 850 | U | 5700 | 850 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Benzo[b]fluoranthene | 1400 | U | 5700 | 1400 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Benzo[g,h,i]perylene | 1300 | U | 5700 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Benzo[k]fluoranthene | 1100 | U | 5700 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Chrysene | 1100 | U | 5700 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Dibenz(a,h)anthracene | 1500 | U | 5700 | 1500 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Fluoranthene | 1100 | U | 5700 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Fluorene | 540 | U | 5700 | 540 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Indeno[1,2,3-cd]pyrene | 1300 | U | 5700 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Naphthalene | 370 | U | 5700 | 370 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Phenanthrene | 1300 | U | 5700 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |
| Pyrene | 1300 | U | 5700 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:04 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *86* | | *39 - 120* | *11/08/13 12:56* | *11/14/13 23:04* | *1* |
| *Nitrobenzene-d5* | *89* | | *42 - 120* | *11/08/13 12:56* | *11/14/13 23:04* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SDS-27-16-17-131029** — **Lab Sample ID: 280-48643-2**
**Date Collected: 10/29/13 09:40** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 85.2**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| Terphenyl-d14 | 87 | | 35 - 124 | 11/08/13 12:56 | 11/14/13 23:04 | 1 |

**Client Sample ID: SDS-29-12-13-131029** — **Lab Sample ID: 280-48643-3**
**Date Collected: 10/29/13 11:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 86.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 280 | U | 5400 | 280 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| 2-Methylnaphthalene | 340 | U | 5400 | 340 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Acenaphthene | 170 | U | 5400 | 170 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Acenaphthylene | 190 | U | 5400 | 190 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Anthracene | 780 | U | 5400 | 780 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Benzo[a]anthracene | 980 | U | 5400 | 980 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Benzo[a]pyrene | 810 | U | 5400 | 810 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Benzo[b]fluoranthene | 1300 | U | 5400 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Benzo[g,h,i]perylene | 1200 | U | 5400 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Benzo[k]fluoranthene | 1100 | U | 5400 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Chrysene | 1100 | U | 5400 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5400 | 1400 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Fluoranthene | 1100 | U | 5400 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Fluorene | 510 | U | 5400 | 510 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Indeno[1,2,3-cd]pyrene | 1200 | U | 5400 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Naphthalene | 360 | U | 5400 | 360 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Phenanthrene | 1200 | U | 5400 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Pyrene | 1200 | U | 5400 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:31 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 84 | | 39 - 120 | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Nitrobenzene-d5 | 84 | | 42 - 120 | 11/08/13 12:56 | 11/14/13 23:31 | 1 |
| Terphenyl-d14 | 86 | | 35 - 124 | 11/08/13 12:56 | 11/14/13 23:31 | 1 |

**Client Sample ID: SDS-34-02-03-131030** — **Lab Sample ID: 280-48643-4**
**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 84.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | **76000** | | 5700 | 300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| **2-Methylnaphthalene** | **56000** | | 5700 | 350 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| **Acenaphthene** | **36000** | | 5700 | 180 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| **Benzo[k]fluoranthene** | **150000** | | 5700 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| **Dibenz(a,h)anthracene** | **76000** | | 5700 | 1500 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| **Fluorene** | **110000** | | 5700 | 540 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **190000** | | 5700 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| **Naphthalene** | **41000** | | 5700 | 370 | ng/Kg | ☼ | 11/08/13 12:56 | 11/14/13 23:59 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 79 | | 39 - 120 | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| Nitrobenzene-d5 | 86 | | 42 - 120 | 11/08/13 12:56 | 11/14/13 23:59 | 1 |
| Terphenyl-d14 | 97 | | 35 - 124 | 11/08/13 12:56 | 11/14/13 23:59 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SDS-35-02-03-131030** — **Lab Sample ID: 280-48643-5**
**Date Collected: 10/30/13 14:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 83.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 450 | J | 5500 | 290 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| 2-Methylnaphthalene | 510 | J | 5500 | 340 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Acenaphthene | 180 | U | 5500 | 180 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Acenaphthylene | 570 | J | 5500 | 190 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Anthracene | 800 | U | 5500 | 800 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Benzo[a]anthracene | 1000 | U | 5500 | 1000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Benzo[a]pyrene | 820 | U | 5500 | 820 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Benzo[b]fluoranthene | 1300 | U | 5500 | 1300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Benzo[g,h,i]perylene | 1200 | U | 5500 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Benzo[k]fluoranthene | 1100 | U | 5500 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Chrysene | 1100 | J | 5500 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5500 | 1400 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Fluoranthene | 1700 | J | 5500 | 1100 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Fluorene | 520 | U | 5500 | 520 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Indeno[1,2,3-cd]pyrene | 1200 | U | 5500 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Naphthalene | 640 | J | 5500 | 360 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Phenanthrene | 1500 | J | 5500 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |
| Pyrene | 1400 | J | 5500 | 1200 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:00 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *77* | | *39 - 120* | *11/08/13 12:56* | *11/18/13 14:00* | *1* |
| *Nitrobenzene-d5* | *74* | | *42 - 120* | *11/08/13 12:56* | *11/18/13 14:00* | *1* |
| *Terphenyl-d14* | *75* | | *35 - 124* | *11/08/13 12:56* | *11/18/13 14:00* | *1* |

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 430000 | | 8500 | 530 | ng/Kg | ☼ | 11/08/13 12:56 | 11/15/13 15:19 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *63* | | *39 - 120* | *11/08/13 12:56* | *11/15/13 15:19* | *1* |
| *Nitrobenzene-d5* | *90* | | *42 - 120* | *11/08/13 12:56* | *11/15/13 15:19* | *1* |
| *Terphenyl-d14* | *105* | | *35 - 124* | *11/08/13 12:56* | *11/15/13 15:19* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

**Client Sample ID: SDS-34-02-03-131030** — **Lab Sample ID: 280-48643-4**
**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 84.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthylene | 290000 | | 57000 | 1900 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |
| Anthracene | 190000 | | 57000 | 8300 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |
| Benzo[a]anthracene | 360000 | | 57000 | 10000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |
| Benzo[a]pyrene | 360000 | | 57000 | 8500 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |
| Benzo[b]fluoranthene | 420000 | | 57000 | 14000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |
| Benzo[g,h,i]perylene | 250000 | | 57000 | 13000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |
| Chrysene | 550000 | | 57000 | 11000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |
| Fluoranthene | 880000 | | 57000 | 11000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |
| Phenanthrene | 1000000 | | 57000 | 13000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL (Continued)

**Client Sample ID: SDS-34-02-03-131030** — **Lab Sample ID: 280-48643-4**
**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 84.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Pyrene | 1200000 | | 57000 | 13000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 13:33 | 10 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *72* | *D* | *39 - 120* | *11/08/13 12:56* | *11/18/13 13:33* | *10* |
| *Nitrobenzene-d5* | *0* | *D X* | *42 - 120* | *11/08/13 12:56* | *11/18/13 13:33* | *10* |
| *Terphenyl-d14* | *0* | *D X* | *35 - 124* | *11/08/13 12:56* | *11/18/13 13:33* | *10* |

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 760000 | | 340000 | 18000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Acenaphthene | 420000 | | 340000 | 11000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Acenaphthylene | 2000000 | | 340000 | 12000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Anthracene | 1600000 | | 340000 | 49000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Benzo[a]anthracene | 2700000 | | 340000 | 61000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Benzo[a]pyrene | 2400000 | | 340000 | 51000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Benzo[b]fluoranthene | 2700000 | | 340000 | 82000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Benzo[g,h,i]perylene | 1600000 | | 340000 | 75000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Benzo[k]fluoranthene | 950000 | | 340000 | 68000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Chrysene | 3800000 | | 340000 | 68000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Dibenz(a,h)anthracene | 460000 | | 340000 | 89000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Fluoranthene | 6600000 | | 340000 | 68000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Fluorene | 1100000 | | 340000 | 32000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Indeno[1,2,3-cd]pyrene | 1200000 | | 340000 | 75000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Naphthalene | 400000 | | 340000 | 22000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Phenanthrene | 8600000 | | 340000 | 75000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |
| Pyrene | 8800000 | | 340000 | 75000 | ng/Kg | ☼ | 11/08/13 12:56 | 11/18/13 14:28 | 40 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *0* | *D X* | *39 - 120* | *11/08/13 12:56* | *11/18/13 14:28* | *40* |
| *Nitrobenzene-d5* | *0* | *D X* | *42 - 120* | *11/08/13 12:56* | *11/18/13 14:28* | *40* |
| *Terphenyl-d14* | *0* | *D X* | *35 - 124* | *11/08/13 12:56* | *11/18/13 14:28* | *40* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - SPLP East

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 31 | J | 100 | 5.9 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| 2-Methylnaphthalene | 7.7 | J B | 100 | 6.0 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Acenaphthene | 24 | J B | 100 | 4.2 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Acenaphthylene | 16 | J | 100 | 5.1 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Anthracene | 11 | J | 100 | 5.6 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Benzo[a]anthracene | 9.8 | J | 100 | 4.2 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Benzo[a]pyrene | 8.2 | J | 100 | 6.9 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Benzo[b]fluoranthene | 11 | J | 100 | 3.1 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Benzo[g,h,i]perylene | 8.2 | J | 100 | 6.2 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Benzo[k]fluoranthene | 6.3 | U | 100 | 6.3 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - SPLP East (Continued)

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chrysene | 14 | J | 100 | 3.3 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Dibenz(a,h)anthracene | 4.1 | U | 100 | 4.1 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Fluoranthene | 27 | J | 100 | 4.8 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Fluorene | 15 | J | 100 | 5.5 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Indeno[1,2,3-cd]pyrene | 7.0 | J | 100 | 4.5 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Naphthalene | 23 | J B | 100 | 8.0 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Phenanthrene | 60 | J B | 100 | 9.3 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |
| Pyrene | 32 | J | 100 | 6.1 | ng/L | | 11/08/13 15:05 | 11/19/13 22:17 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *42 - 120* | *11/08/13 15:05* | *11/19/13 22:17* | *1* |
| *Nitrobenzene-d5* | *96* | | *43 - 120* | *11/08/13 15:05* | *11/19/13 22:17* | *1* |
| *Terphenyl-d14* | *100* | | *47 - 120* | *11/08/13 15:05* | *11/19/13 22:17* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: SDS-31-12-13-131029** — **Lab Sample ID: 280-48643-1**
**Date Collected: 10/29/13 15:00** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 81.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 19000 | B | 10 | 1.6 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Antimony | 0.40 | U | 1.6 | 0.40 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Arsenic | 2.0 | J | 2.1 | 0.69 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Barium | 17 | | 1.0 | 0.080 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Beryllium | 0.45 | J | 0.52 | 0.035 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Cadmium | 0.043 | U | 0.52 | 0.043 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Chromium | 15 | | 1.6 | 0.061 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Cobalt | 3.4 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Copper | 26 | | 2.1 | 0.23 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Iron | 27000 | B | 16 | 4.0 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:24 | 1 |
| Lead | 9.6 | | 0.84 | 0.28 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Manganese | 110 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Nickel | 2.3 | J | 4.2 | 0.13 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:24 | 1 |
| Selenium | 0.90 | U | 1.4 | 0.90 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Silver | 0.17 | U | 1.0 | 0.17 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Thallium | 0.68 | U | 1.3 | 0.68 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Vanadium | 93 | | 2.1 | 0.098 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:17 | 1 |
| Zinc | 16 | B | 3.1 | 0.42 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:24 | 1 |

**Client Sample ID: SDS-27-16-17-131029** — **Lab Sample ID: 280-48643-2**
**Date Collected: 10/29/13 09:40** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 85.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 12000 | B | 10 | 1.6 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Arsenic | 1.1 | J | 2.0 | 0.66 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Barium | 22 | | 1.0 | 0.076 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Beryllium | 0.17 | J | 0.50 | 0.033 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Chromium | 11 | | 1.5 | 0.058 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-27-16-17-131029** — **Lab Sample ID: 280-48643-2**
**Date Collected: 10/29/13 09:40** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 85.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cobalt | 1.5 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Copper | 14 | | 2.0 | 0.22 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Iron | 13000 | B | 15 | 3.8 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:26 | 1 |
| Lead | 8.4 | | 0.80 | 0.27 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Manganese | 52 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Nickel | 1.9 | J | 4.0 | 0.12 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:26 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Vanadium | 35 | | 2.0 | 0.094 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:19 | 1 |
| Zinc | 11 | B | 3.0 | 0.40 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:26 | 1 |

**Client Sample ID: SDS-29-12-13-131029** — **Lab Sample ID: 280-48643-3**
**Date Collected: 10/29/13 11:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 86.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 10000 | B | 10 | 1.6 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Antimony | 0.39 | U | 1.6 | 0.39 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Arsenic | 1.6 | J | 2.1 | 0.68 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Barium | 18 | | 1.0 | 0.079 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Beryllium | 0.57 | | 0.52 | 0.034 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Cadmium | 0.043 | U | 0.52 | 0.043 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Chromium | 6.2 | | 1.6 | 0.060 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Cobalt | 4.5 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Copper | 16 | | 2.1 | 0.23 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Iron | 8400 | B | 16 | 3.9 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:28 | 1 |
| Lead | 15 | | 0.83 | 0.28 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Manganese | 240 | | 1.0 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Nickel | 1.7 | J | 4.1 | 0.13 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:28 | 1 |
| Selenium | 0.89 | U | 1.3 | 0.89 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Silver | 0.17 | U | 1.0 | 0.17 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Thallium | 0.67 | U | 1.2 | 0.67 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Vanadium | 16 | | 2.1 | 0.098 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:21 | 1 |
| Zinc | 34 | B | 3.1 | 0.41 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:28 | 1 |

**Client Sample ID: SDS-34-02-03-131030** — **Lab Sample ID: 280-48643-4**
**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 84.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 6400 | B | 11 | 1.6 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Antimony | 0.40 | U | 1.6 | 0.40 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Arsenic | 4.1 | | 2.1 | 0.70 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Barium | 52 | | 1.1 | 0.081 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Beryllium | 0.43 | J | 0.53 | 0.035 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Cadmium | 0.043 | U | 0.53 | 0.043 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Chromium | 7.1 | | 1.6 | 0.062 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Cobalt | 3.2 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Copper | 12 | | 2.1 | 0.23 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Iron | 6100 | B | 16 | 4.0 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:31 | 1 |
| Lead | 18 | | 0.85 | 0.29 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-34-02-03-131030** — **Lab Sample ID: 280-48643-4**
**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 84.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Manganese | 120 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Nickel | 3.4 | J | 4.2 | 0.13 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:31 | 1 |
| Selenium | 0.91 | U | 1.4 | 0.91 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Silver | 0.17 | U | 1.1 | 0.17 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Thallium | 0.69 | U | 1.3 | 0.69 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Vanadium | 13 | | 2.1 | 0.10 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:23 | 1 |
| Zinc | 30 | B | 3.2 | 0.42 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:31 | 1 |

**Client Sample ID: SDS-35-02-03-131030** — **Lab Sample ID: 280-48643-5**
**Date Collected: 10/30/13 14:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 83.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18000 | B | 11 | 1.8 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Antimony | 0.44 | U | 1.7 | 0.44 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Arsenic | 1.6 | J | 2.3 | 0.76 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Barium | 48 | | 1.1 | 0.087 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Beryllium | 1.2 | | 0.57 | 0.038 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Cadmium | 0.047 | U | 0.57 | 0.047 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Chromium | 29 | | 1.7 | 0.067 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Cobalt | 3.5 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Copper | 40 | | 2.3 | 0.25 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Iron | 27000 | B | 17 | 4.4 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:33 | 1 |
| Lead | 11 | | 0.92 | 0.31 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Manganese | 130 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Nickel | 5.6 | | 4.6 | 0.14 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:33 | 1 |
| Selenium | 0.99 | U | 1.5 | 0.99 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Silver | 0.18 | U | 1.1 | 0.18 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Thallium | 0.75 | U | 1.4 | 0.75 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Vanadium | 68 | | 2.3 | 0.11 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 01:26 | 1 |
| Zinc | 57 | B | 3.4 | 0.46 | mg/Kg | ☼ | 11/05/13 12:18 | 11/07/13 18:33 | 1 |

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 8500 | | 15 | 2.3 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Antimony | 0.55 | U | 2.2 | 0.55 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Arsenic | 15 | | 2.9 | 0.96 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Barium | 160 | | 1.5 | 0.11 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Beryllium | 1.4 | | 0.73 | 0.048 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Cadmium | 0.25 | J | 0.73 | 0.060 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Chromium | 25 | | 2.2 | 0.084 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Cobalt | 6.9 | | 1.5 | 0.15 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Copper | 200 | | 2.9 | 0.32 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Iron | 8600 | | 22 | 5.5 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Lead | 73 | | 1.2 | 0.39 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Manganese | 86 | | 1.5 | 0.15 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Nickel | 10 | | 5.8 | 0.18 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Selenium | 1.3 | U | 1.9 | 1.3 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| Silver | 0.23 | U | 1.5 | 0.23 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Thallium | 0.95 | U | 1.7 | 0.95 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| **Vanadium** | **26** | | 2.9 | 0.14 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |
| **Zinc** | **85** | | 4.4 | 0.58 | mg/Kg | ☼ | 11/08/13 13:00 | 11/11/13 17:45 | 1 |

## Method: 6010C - Metals (ICP) - SPLP East

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **5700** | | 100 | 18 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Arsenic** | **21** | | 15 | 4.4 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Barium** | **110** | **B** | 10 | 0.58 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Beryllium** | **0.95** | **J** | 1.0 | 0.47 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Chromium** | **23** | | 10 | 0.66 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Copper** | **110** | **B** | 15 | 0.14 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Cobalt** | **2.8** | **J** | 10 | 0.12 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Iron** | **5600** | | 1000 | 22 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Lead** | **74** | | 9.0 | 2.6 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Manganese** | **53** | **B** | 10 | 0.25 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Nickel** | **7.0** | **J *** | 40 | 1.3 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Zinc** | **59** | **B** | 20 | 4.5 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |
| **Vanadium** | **27** | | 10 | 1.1 | ug/L | | 11/14/13 07:30 | 11/15/13 09:31 | 1 |

## Method: 7470A - Mercury (CVAA) - SPLP East

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **0.000040** | **J** | 0.0020 | 0.000030 | mg/L | | 11/08/13 13:30 | 11/08/13 23:30 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SDS-31-12-13-131029** — **Lab Sample ID: 280-48643-1**
**Date Collected: 10/29/13 15:00** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 81.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **39** | | 24 | 7.8 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 20:06 | 1 |

**Client Sample ID: SDS-27-16-17-131029** — **Lab Sample ID: 280-48643-2**
**Date Collected: 10/29/13 09:40** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 85.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **11** | **J** | 23 | 7.3 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 20:09 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SDS-29-12-13-131029** — **Lab Sample ID: 280-48643-3**
**Date Collected: 10/29/13 11:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 86.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 8.3 | J | 21 | 6.8 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 20:11 | 1 |

**Client Sample ID: SDS-34-02-03-131030** — **Lab Sample ID: 280-48643-4**
**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 84.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 46 | | 22 | 7.1 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 20:13 | 1 |

**Client Sample ID: SDS-35-02-03-131030** — **Lab Sample ID: 280-48643-5**
**Date Collected: 10/30/13 14:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 83.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 23 | | 23 | 7.3 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 20:16 | 1 |

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 72 | | 35 | 11 | ug/Kg | ☼ | 11/07/13 13:20 | 11/07/13 20:18 | 1 |

## General Chemistry

**Client Sample ID: SDS-31-12-13-131029** — **Lab Sample ID: 280-48643-1**
**Date Collected: 10/29/13 15:00** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 81.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 18 | | 0.10 | 0.10 | % | | | 11/04/13 11:05 | 1 |
| Percent Solids | 82 | | 0.10 | 0.10 | % | | | 11/04/13 11:05 | 1 |

**Client Sample ID: SDS-27-16-17-131029** — **Lab Sample ID: 280-48643-2**
**Date Collected: 10/29/13 09:40** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 85.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 15 | | 0.10 | 0.10 | % | | | 11/04/13 11:05 | 1 |
| Percent Solids | 85 | | 0.10 | 0.10 | % | | | 11/04/13 11:05 | 1 |

**Client Sample ID: SDS-29-12-13-131029** — **Lab Sample ID: 280-48643-3**
**Date Collected: 10/29/13 11:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 86.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 13 | | 0.10 | 0.10 | % | | | 11/04/13 11:05 | 1 |
| Percent Solids | 87 | | 0.10 | 0.10 | % | | | 11/04/13 11:05 | 1 |

**Client Sample ID: SDS-34-02-03-131030** — **Lab Sample ID: 280-48643-4**
**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 84.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 15 | | 0.10 | 0.10 | % | | | 11/05/13 10:25 | 1 |
| Percent Solids | 85 | | 0.10 | 0.10 | % | | | 11/05/13 10:25 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## General Chemistry

**Client Sample ID: SDS-35-02-03-131030** — **Lab Sample ID: 280-48643-5**
**Date Collected: 10/30/13 14:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 83.7**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 16 | | 0.10 | 0.10 | % | | | 11/05/13 10:25 | 1 |
| Percent Solids | 84 | | 0.10 | 0.10 | % | | | 11/05/13 10:25 | 1 |

**Client Sample ID: SDS-33-01-02-131030** — **Lab Sample ID: 280-48643-6**
**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 42 | | 0.10 | 0.10 | % | | | 11/05/13 10:25 | 1 |
| Percent Solids | 58 | | 0.10 | 0.10 | % | | | 11/05/13 10:25 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-48643-1 | SDS-31-12-13-131029 | 92 | 90 | 90 |
| 280-48643-1 MS | SDS-31-12-13-131029 | 88 | 92 | 89 |
| 280-48643-1 MSD | SDS-31-12-13-131029 | 85 | 85 | 81 |
| 280-48643-2 | SDS-27-16-17-131029 | 86 | 89 | 87 |
| 280-48643-3 | SDS-29-12-13-131029 | 84 | 84 | 86 |
| 280-48643-4 | SDS-34-02-03-131030 | 79 | 86 | 97 |
| 280-48643-4 - DL | SDS-34-02-03-131030 | 72 D | 0 D X | 0 D X |
| 280-48643-5 | SDS-35-02-03-131030 | 77 | 74 | 75 |
| 280-48643-6 | SDS-33-01-02-131030 | 63 | 90 | 105 |
| 280-48643-6 - DL | SDS-33-01-02-131030 | 0 D X | 0 D X | 0 D X |
| LCS 280-200040/2-A | Lab Control Sample | 88 | 81 | 117 |
| MB 280-200040/1-A | Method Blank | 92 | 94 | 94 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: SPLP East**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (42-120) | (43-120) | (47-120) |
| 280-48643-6 | SDS-33-01-02-131030 | 88 | 96 | 100 |
| 280-48643-6 MS | SDS-33-01-02-131030 | 79 | 86 | 101 |
| 280-48643-6 MSD | SDS-33-01-02-131030 | 77 | 85 | 98 |
| LB 280-199618/1-D | Method Blank | 71 | 90 | 87 |
| LCS 280-199618/2-D | Lab Control Sample | 75 | 94 | 99 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-200040/1-A**
**Matrix: Solid**
**Analysis Batch: 201027**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 200040**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 240 | U | 4700 | 240 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| 2-Methylnaphthalene | 290 | U | 4700 | 290 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Acenaphthene | 150 | U | 4700 | 150 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Acenaphthylene | 160 | U | 4700 | 160 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Anthracene | 670 | U | 4700 | 670 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Benzo[a]anthracene | 840 | U | 4700 | 840 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Benzo[a]pyrene | 690 | U | 4700 | 690 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Benzo[b]fluoranthene | 1100 | U | 4700 | 1100 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Benzo[g,h,i]perylene | 1000 | U | 4700 | 1000 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Benzo[k]fluoranthene | 930 | U | 4700 | 930 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Chrysene | 930 | U | 4700 | 930 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Dibenz(a,h)anthracene | 1200 | U | 4700 | 1200 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Fluoranthene | 930 | U | 4700 | 930 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Fluorene | 440 | U | 4700 | 440 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Indeno[1,2,3-cd]pyrene | 1000 | U | 4700 | 1000 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Naphthalene | 300 | U | 4700 | 300 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Phenanthrene | 1000 | U | 4700 | 1000 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |
| Pyrene | 1000 | U | 4700 | 1000 | ng/Kg | | 11/08/13 12:56 | 11/14/13 13:25 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *92* | | *39 - 120* | *11/08/13 12:56* | *11/14/13 13:25* | *1* |
| *Nitrobenzene-d5* | *94* | | *42 - 120* | *11/08/13 12:56* | *11/14/13 13:25* | *1* |
| *Terphenyl-d14* | *94* | | *35 - 124* | *11/08/13 12:56* | *11/14/13 13:25* | *1* |

**Lab Sample ID: LCS 280-200040/2-A**
**Matrix: Solid**
**Analysis Batch: 201027**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 200040**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 27400 | 24400 | | ng/Kg | | 89 | 35 - 120 |
| Acenaphthylene | 27400 | 23600 | | ng/Kg | | 86 | 41 - 120 |
| Anthracene | 27400 | 26400 | | ng/Kg | | 96 | 43 - 120 |
| Benzo[a]anthracene | 27400 | 25400 | | ng/Kg | | 93 | 36 - 120 |
| Benzo[a]pyrene | 27400 | 24300 | | ng/Kg | | 89 | 20 - 120 |
| Benzo[b]fluoranthene | 27400 | 24700 | | ng/Kg | | 90 | 37 - 120 |
| Benzo[g,h,i]perylene | 27400 | 25200 | | ng/Kg | | 92 | 20 - 123 |
| Benzo[k]fluoranthene | 27400 | 24900 | | ng/Kg | | 91 | 46 - 120 |
| Chrysene | 27400 | 27600 | | ng/Kg | | 101 | 34 - 120 |
| Dibenz(a,h)anthracene | 27400 | 25100 | | ng/Kg | | 92 | 20 - 120 |
| Fluoranthene | 27400 | 25000 | | ng/Kg | | 92 | 45 - 120 |
| Fluorene | 27400 | 23900 | | ng/Kg | | 88 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 27400 | 24900 | | ng/Kg | | 91 | 20 - 127 |
| Naphthalene | 27400 | 27100 | | ng/Kg | | 99 | 44 - 120 |
| Phenanthrene | 27400 | 25900 | | ng/Kg | | 95 | 44 - 120 |
| Pyrene | 27400 | 25000 | | ng/Kg | | 91 | 43 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-200040/2-A**
**Matrix: Solid**
**Analysis Batch: 201027**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 200040**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *39 - 120* |
| *Nitrobenzene-d5* | *81* | | *42 - 120* |
| *Terphenyl-d14* | *117* | | *35 - 124* |

**Lab Sample ID: 280-48643-1 MS**
**Matrix: Solid**
**Analysis Batch: 201027**

**Client Sample ID: SDS-31-12-13-131029**
**Prep Type: Total/NA**
**Prep Batch: 200040**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 190 | U | 35600 | 31900 | | ng/Kg | ☼ | 90 | 35 - 120 |
| Acenaphthylene | 380 | J | 35600 | 32100 | | ng/Kg | ☼ | 89 | 41 - 120 |
| Anthracene | 860 | U | 35600 | 33300 | | ng/Kg | ☼ | 94 | 43 - 120 |
| Benzo[a]anthracene | 1100 | U | 35600 | 33700 | | ng/Kg | ☼ | 95 | 36 - 120 |
| Benzo[a]pyrene | 880 | U | 35600 | 35500 | | ng/Kg | ☼ | 100 | 20 - 120 |
| Benzo[b]fluoranthene | 1400 | U | 35600 | 35500 | | ng/Kg | ☼ | 100 | 37 - 120 |
| Benzo[g,h,i]perylene | 1300 | U | 35600 | 34800 | | ng/Kg | ☼ | 98 | 20 - 123 |
| Benzo[k]fluoranthene | 1200 | U | 35600 | 35900 | | ng/Kg | ☼ | 101 | 46 - 120 |
| Chrysene | 1200 | U | 35600 | 35200 | | ng/Kg | ☼ | 99 | 34 - 120 |
| Dibenz(a,h)anthracene | 1600 | U | 35600 | 35100 | | ng/Kg | ☼ | 99 | 20 - 120 |
| Fluoranthene | 1200 | U | 35600 | 31800 | | ng/Kg | ☼ | 90 | 45 - 120 |
| Fluorene | 560 | U | 35600 | 31000 | | ng/Kg | ☼ | 87 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 1300 | U | 35600 | 35200 | | ng/Kg | ☼ | 99 | 20 - 127 |
| Naphthalene | 390 | U | 35600 | 35600 | | ng/Kg | ☼ | 100 | 44 - 120 |
| Phenanthrene | 1300 | U | 35600 | 33100 | | ng/Kg | ☼ | 93 | 44 - 120 |
| Pyrene | 1300 | U | 35600 | 31900 | | ng/Kg | ☼ | 90 | 43 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *39 - 120* |
| *Nitrobenzene-d5* | *92* | | *42 - 120* |
| *Terphenyl-d14* | *89* | | *35 - 124* |

**Lab Sample ID: 280-48643-1 MSD**
**Matrix: Solid**
**Analysis Batch: 201027**

**Client Sample ID: SDS-31-12-13-131029**
**Prep Type: Total/NA**
**Prep Batch: 200040**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 190 | U | 35700 | 30000 | | ng/Kg | ☼ | 84 | 35 - 120 | 6 | 50 |
| Acenaphthylene | 380 | J | 35700 | 30600 | | ng/Kg | ☼ | 85 | 41 - 120 | 5 | 50 |
| Anthracene | 860 | U | 35700 | 31400 | | ng/Kg | ☼ | 88 | 43 - 120 | 6 | 50 |
| Benzo[a]anthracene | 1100 | U | 35700 | 31900 | | ng/Kg | ☼ | 89 | 36 - 120 | 5 | 40 |
| Benzo[a]pyrene | 880 | U | 35700 | 33600 | | ng/Kg | ☼ | 94 | 20 - 120 | 6 | 30 |
| Benzo[b]fluoranthene | 1400 | U | 35700 | 33900 | | ng/Kg | ☼ | 95 | 37 - 120 | 5 | 28 |
| Benzo[g,h,i]perylene | 1300 | U | 35700 | 34000 | | ng/Kg | ☼ | 95 | 20 - 123 | 2 | 30 |
| Benzo[k]fluoranthene | 1200 | U | 35700 | 33700 | | ng/Kg | ☼ | 94 | 46 - 120 | 6 | 28 |
| Chrysene | 1200 | U | 35700 | 34000 | | ng/Kg | ☼ | 95 | 34 - 120 | 3 | 41 |
| Dibenz(a,h)anthracene | 1600 | U | 35700 | 34000 | | ng/Kg | ☼ | 95 | 20 - 120 | 3 | 25 |
| Fluoranthene | 1200 | U | 35700 | 29500 | | ng/Kg | ☼ | 83 | 45 - 120 | 8 | 30 |
| Fluorene | 560 | U | 35700 | 29500 | | ng/Kg | ☼ | 83 | 44 - 120 | 5 | 50 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: 280-48643-1 MSD** — **Client Sample ID: SDS-31-12-13-131029**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 201027** — **Prep Batch: 200040**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Indeno[1,2,3-cd]pyrene | 1300 | U | 35700 | 33700 | | ng/Kg | ☼ | 94 | 20 - 127 | 4 | 50 |
| Naphthalene | 390 | U | 35700 | 33600 | | ng/Kg | ☼ | 94 | 44 - 120 | 6 | 50 |
| Phenanthrene | 1300 | U | 35700 | 31200 | | ng/Kg | ☼ | 87 | 44 - 120 | 6 | 42 |
| Pyrene | 1300 | U | 35700 | 29900 | | ng/Kg | ☼ | 84 | 43 - 120 | 7 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *39 - 120* |
| *Nitrobenzene-d5* | *85* | | *42 - 120* |
| *Terphenyl-d14* | *81* | | *35 - 124* |

**Lab Sample ID: LB 280-199618/1-D** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 201718** — **Prep Batch: 200096**

| Analyte | LB Result | LB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.9 | U | 100 | 5.9 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| 2-Methylnaphthalene | 7.34 | J | 100 | 6.0 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Acenaphthene | 4.61 | J | 100 | 4.2 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Acenaphthylene | 5.1 | U | 100 | 5.1 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Anthracene | 5.6 | U | 100 | 5.6 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[a]anthracene | 4.2 | U | 100 | 4.2 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[a]pyrene | 6.9 | U | 100 | 6.9 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[b]fluoranthene | 3.1 | U | 100 | 3.1 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[g,h,i]perylene | 6.2 | U | 100 | 6.2 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Benzo[k]fluoranthene | 6.3 | U | 100 | 6.3 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Chrysene | 3.3 | U | 100 | 3.3 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Dibenz(a,h)anthracene | 4.1 | U | 100 | 4.1 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Fluoranthene | 4.8 | U | 100 | 4.8 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Fluorene | 5.5 | U | 100 | 5.5 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Indeno[1,2,3-cd]pyrene | 4.5 | U | 100 | 4.5 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Naphthalene | 54.6 | J | 100 | 8.0 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Phenanthrene | 17.4 | J | 100 | 9.3 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |
| Pyrene | 6.1 | U | 100 | 6.1 | ng/L | | 11/08/13 15:05 | 11/19/13 20:46 | 1 |

| *Surrogate* | *LB %Recovery* | *LB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *71* | | *42 - 120* | *11/08/13 15:05* | *11/19/13 20:46* | *1* |
| *Nitrobenzene-d5* | *90* | | *43 - 120* | *11/08/13 15:05* | *11/19/13 20:46* | *1* |
| *Terphenyl-d14* | *87* | | *47 - 120* | *11/08/13 15:05* | *11/19/13 20:46* | *1* |

**Lab Sample ID: LCS 280-199618/2-D** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 201718** — **Prep Batch: 200096**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 741 | | ng/L | | 82 | 47 - 120 |
| Acenaphthylene | 900 | 776 | | ng/L | | 86 | 39 - 120 |
| Anthracene | 900 | 803 | | ng/L | | 89 | 28 - 120 |
| Benzo[a]anthracene | 900 | 937 | | ng/L | | 104 | 42 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-199618/2-D**
**Matrix: Solid**
**Analysis Batch: 201718**

**Client Sample ID: Lab Control Sample**
**Prep Type: SPLP East**
**Prep Batch: 200096**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Benzo[a]pyrene | 900 | 987 | | ng/L | | 110 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 966 | | ng/L | | 107 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 956 | | ng/L | | 106 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 955 | | ng/L | | 106 | 43 - 120 |
| Chrysene | 900 | 1010 | | ng/L | | 112 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 973 | | ng/L | | 108 | 27 - 126 |
| Fluoranthene | 900 | 888 | | ng/L | | 99 | 46 - 120 |
| Fluorene | 900 | 744 | | ng/L | | 83 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 993 | | ng/L | | 110 | 38 - 120 |
| Naphthalene | 900 | 799 | | ng/L | | 89 | 37 - 120 |
| Phenanthrene | 900 | 797 | | ng/L | | 89 | 46 - 120 |
| Pyrene | 900 | 904 | | ng/L | | 100 | 49 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *75* | | *42 - 120* |
| *Nitrobenzene-d5* | *94* | | *43 - 120* |
| *Terphenyl-d14* | *99* | | *47 - 120* |

**Lab Sample ID: 280-48643-6 MS**
**Matrix: Solid**
**Analysis Batch: 201718**

**Client Sample ID: SDS-33-01-02-131030**
**Prep Type: SPLP East**
**Prep Batch: 200096**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 24 | J B | 900 | 789 | | ng/L | | 85 | 47 - 120 |
| Acenaphthylene | 16 | J | 900 | 817 | | ng/L | | 89 | 39 - 120 |
| Anthracene | 11 | J | 900 | 895 | | ng/L | | 98 | 28 - 120 |
| Benzo[a]anthracene | 9.8 | J | 900 | 930 | | ng/L | | 102 | 42 - 120 |
| Benzo[a]pyrene | 8.2 | J | 900 | 910 | | ng/L | | 100 | 38 - 120 |
| Benzo[b]fluoranthene | 11 | J | 900 | 885 | | ng/L | | 97 | 44 - 120 |
| Benzo[g,h,i]perylene | 8.2 | J | 900 | 772 | | ng/L | | 85 | 39 - 120 |
| Benzo[k]fluoranthene | 6.3 | U | 900 | 867 | | ng/L | | 96 | 43 - 120 |
| Chrysene | 14 | J | 900 | 993 | | ng/L | | 109 | 35 - 120 |
| Dibenz(a,h)anthracene | 4.1 | U | 900 | 800 | | ng/L | | 89 | 27 - 126 |
| Fluoranthene | 27 | J | 900 | 956 | | ng/L | | 103 | 46 - 120 |
| Fluorene | 15 | J | 900 | 796 | | ng/L | | 87 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 7.0 | J | 900 | 778 | | ng/L | | 86 | 38 - 120 |
| Naphthalene | 23 | J B | 900 | 772 | | ng/L | | 83 | 37 - 120 |
| Phenanthrene | 60 | J B | 900 | 910 | | ng/L | | 94 | 46 - 120 |
| Pyrene | 32 | J | 900 | 964 | | ng/L | | 104 | 49 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *79* | | *42 - 120* |
| *Nitrobenzene-d5* | *86* | | *43 - 120* |
| *Terphenyl-d14* | *101* | | *47 - 120* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: 280-48643-6 MSD** | **Client Sample ID: SDS-33-01-02-131030**
**Matrix: Solid** | **Prep Type: SPLP East**
**Analysis Batch: 201718** | **Prep Batch: 200096**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 24 | J B | 900 | 763 | | ng/L | | 82 | 47 - 120 | 3 | 50 |
| Acenaphthylene | 16 | J | 900 | 801 | | ng/L | | 87 | 39 - 120 | 2 | 50 |
| Anthracene | 11 | J | 900 | 904 | | ng/L | | 99 | 28 - 120 | 1 | 50 |
| Benzo[a]anthracene | 9.8 | J | 900 | 920 | | ng/L | | 101 | 42 - 120 | 1 | 40 |
| Benzo[a]pyrene | 8.2 | J | 900 | 898 | | ng/L | | 99 | 38 - 120 | 1 | 21 |
| Benzo[b]fluoranthene | 11 | J | 900 | 884 | | ng/L | | 97 | 44 - 120 | 0 | 28 |
| Benzo[g,h,i]perylene | 8.2 | J | 900 | 782 | | ng/L | | 86 | 39 - 120 | 1 | 23 |
| Benzo[k]fluoranthene | 6.3 | U | 900 | 869 | | ng/L | | 97 | 43 - 120 | 0 | 28 |
| Chrysene | 14 | J | 900 | 979 | | ng/L | | 107 | 35 - 120 | 1 | 41 |
| Dibenz(a,h)anthracene | 4.1 | U | 900 | 812 | | ng/L | | 90 | 27 - 126 | 1 | 25 |
| Fluoranthene | 27 | J | 900 | 949 | | ng/L | | 102 | 46 - 120 | 1 | 24 |
| Fluorene | 15 | J | 900 | 782 | | ng/L | | 85 | 49 - 120 | 2 | 50 |
| Indeno[1,2,3-cd]pyrene | 7.0 | J | 900 | 745 | | ng/L | | 82 | 38 - 120 | 4 | 25 |
| Naphthalene | 23 | J B | 900 | 755 | | ng/L | | 81 | 37 - 120 | 2 | 50 |
| Phenanthrene | 60 | J B | 900 | 911 | | ng/L | | 94 | 46 - 120 | 0 | 42 |
| Pyrene | 32 | J | 900 | 964 | | ng/L | | 104 | 49 - 120 | 0 | 22 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *77* | | *42 - 120* |
| *Nitrobenzene-d5* | *85* | | *43 - 120* |
| *Terphenyl-d14* | *98* | | *47 - 120* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-199346/1-A** | **Client Sample ID: Method Blank**
**Matrix: Solid** | **Prep Type: Total/NA**
**Analysis Batch: 199685** | **Prep Batch: 199346**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 2.75 | J | 10 | 1.6 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Barium | 0.076 | U | 1.0 | 0.076 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 11/05/13 12:18 | 11/07/13 00:21 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-199346/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199914** — **Prep Batch: 199346**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 10.1 | J | 15 | 3.8 | mg/Kg | | 11/05/13 12:18 | 11/07/13 17:29 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 11/05/13 12:18 | 11/07/13 17:29 | 1 |
| Zinc | 0.634 | J | 3.0 | 0.40 | mg/Kg | | 11/05/13 12:18 | 11/07/13 17:29 | 1 |

**Lab Sample ID: LCS 280-199346/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199685** — **Prep Batch: 199346**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 186 | | mg/Kg | | 93 | 82 - 116 |
| Antimony | 50.0 | 45.1 | | mg/Kg | | 90 | 82 - 110 |
| Arsenic | 100 | 97.9 | | mg/Kg | | 98 | 85 - 110 |
| Barium | 200 | 194 | | mg/Kg | | 97 | 87 - 112 |
| Beryllium | 5.00 | 4.62 | | mg/Kg | | 92 | 84 - 114 |
| Cadmium | 10.0 | 10.2 | | mg/Kg | | 102 | 87 - 110 |
| Chromium | 20.0 | 19.5 | | mg/Kg | | 98 | 84 - 114 |
| Copper | 25.0 | 24.6 | | mg/Kg | | 98 | 88 - 110 |
| Cobalt | 50.0 | 47.8 | | mg/Kg | | 96 | 87 - 110 |
| Lead | 50.0 | 48.4 | | mg/Kg | | 97 | 86 - 110 |
| Manganese | 50.0 | 47.3 | | mg/Kg | | 95 | 88 - 110 |
| Selenium | 200 | 194 | | mg/Kg | | 97 | 83 - 110 |
| Silver | 5.00 | 4.95 | | mg/Kg | | 99 | 87 - 114 |
| Thallium | 200 | 189 | | mg/Kg | | 94 | 84 - 110 |
| Vanadium | 50.0 | 48.5 | | mg/Kg | | 97 | 88 - 110 |

**Lab Sample ID: LCS 280-199346/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199914** — **Prep Batch: 199346**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 100 | 94.2 | | mg/Kg | | 94 | 87 - 120 |
| Nickel | 50.0 | 46.9 | | mg/Kg | | 94 | 87 - 110 |
| Zinc | 50.0 | 46.0 | | mg/Kg | | 92 | 76 - 114 |

**Lab Sample ID: MB 280-199799/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200522** — **Prep Batch: 199799**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.6 | U | 10 | 1.6 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Barium | 0.076 | U | 1.0 | 0.076 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Iron | 3.8 | U | 15 | 3.8 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-199799/1-A**
**Matrix: Solid**
**Analysis Batch: 200522**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 199799**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Zinc | 0.40 | U | 3.0 | 0.40 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 11/08/13 13:00 | 11/11/13 17:28 | 1 |

**Lab Sample ID: LCS 280-199799/2-A**
**Matrix: Solid**
**Analysis Batch: 200522**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 199799**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 194 | | mg/Kg | | 97 | 82 - 116 |
| Antimony | 50.0 | 48.1 | | mg/Kg | | 96 | 82 - 110 |
| Arsenic | 100 | 96.8 | | mg/Kg | | 97 | 85 - 110 |
| Barium | 200 | 200 | | mg/Kg | | 100 | 87 - 112 |
| Beryllium | 5.00 | 4.80 | | mg/Kg | | 96 | 84 - 114 |
| Cadmium | 10.0 | 9.97 | | mg/Kg | | 100 | 87 - 110 |
| Chromium | 20.0 | 19.8 | | mg/Kg | | 99 | 84 - 114 |
| Copper | 25.0 | 24.9 | | mg/Kg | | 100 | 88 - 110 |
| Cobalt | 50.0 | 48.5 | | mg/Kg | | 97 | 87 - 110 |
| Iron | 100 | 104 | | mg/Kg | | 104 | 87 - 120 |
| Lead | 50.0 | 48.0 | | mg/Kg | | 96 | 86 - 110 |
| Manganese | 50.0 | 48.1 | | mg/Kg | | 96 | 88 - 110 |
| Nickel | 50.0 | 48.6 | | mg/Kg | | 97 | 87 - 110 |
| Selenium | 200 | 191 | | mg/Kg | | 96 | 83 - 110 |
| Silver | 5.00 | 4.77 | | mg/Kg | | 95 | 87 - 114 |
| Thallium | 200 | 191 | | mg/Kg | | 96 | 84 - 110 |
| Zinc | 50.0 | 48.4 | | mg/Kg | | 97 | 76 - 114 |
| Vanadium | 50.0 | 48.6 | | mg/Kg | | 97 | 88 - 110 |

**Lab Sample ID: LB 280-199618/1-C**
**Matrix: Solid**
**Analysis Batch: 201181**

**Client Sample ID: Method Blank**
**Prep Type: SPLP East**
**Prep Batch: 199998**

| Analyte | LB Result | LB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Barium | 1.78 | J | 10 | 0.58 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Copper | 0.220 | J | 15 | 0.14 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Cobalt | 0.12 | U | 10 | 0.12 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Iron | 22 | U | 1000 | 22 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LB 280-199618/1-C**
**Matrix: Solid**
**Analysis Batch: 201181**

**Client Sample ID: Method Blank**
**Prep Type: SPLP East**
**Prep Batch: 199998**

| Analyte | LB Result | LB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Manganese | 0.330 | J | 10 | 0.25 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Zinc | 7.00 | J | 20 | 4.5 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/14/13 07:30 | 11/15/13 09:24 | 1 |

**Lab Sample ID: LCS 280-199618/2-C**
**Matrix: Solid**
**Analysis Batch: 201181**

**Client Sample ID: Lab Control Sample**
**Prep Type: SPLP East**
**Prep Batch: 199998**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 2090 | | ug/L | | 104 | 87 - 111 |
| Antimony | 500 | 516 | | ug/L | | 103 | 88 - 110 |
| Arsenic | 1000 | 1080 | | ug/L | | 108 | 88 - 110 |
| Barium | 2000 | 2110 | | ug/L | | 106 | 90 - 112 |
| Beryllium | 50.0 | 46.8 | | ug/L | | 94 | 89 - 113 |
| Cadmium | 100 | 99.6 | | ug/L | | 100 | 88 - 111 |
| Chromium | 200 | 222 | | ug/L | | 111 | 90 - 113 |
| Copper | 250 | 259 | | ug/L | | 104 | 86 - 112 |
| Cobalt | 500 | 501 | | ug/L | | 100 | 89 - 111 |
| Iron | 1000 | 1040 | | ug/L | | 104 | 89 - 115 |
| Lead | 500 | 473 | | ug/L | | 95 | 89 - 110 |
| Manganese | 500 | 499 | | ug/L | | 100 | 90 - 110 |
| Nickel | 500 | 609 | * | ug/L | | 122 | 89 - 111 |
| Selenium | 2000 | 2170 | | ug/L | | 109 | 85 - 112 |
| Silver | 50.0 | 54.4 | | ug/L | | 109 | 86 - 115 |
| Thallium | 2000 | 1960 | | ug/L | | 98 | 88 - 110 |
| Zinc | 500 | 508 | | ug/L | | 102 | 85 - 111 |
| Vanadium | 500 | 499 | | ug/L | | 100 | 90 - 111 |

**Lab Sample ID: 280-48643-6 MS**
**Matrix: Solid**
**Analysis Batch: 201181**

**Client Sample ID: SDS-33-01-02-131030**
**Prep Type: SPLP East**
**Prep Batch: 199998**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5700 | | 2000 | 15100 | F | ug/L | | 470 | 80 - 120 |
| Antimony | 3.1 | U | 500 | 483 | | ug/L | | 97 | 80 - 120 |
| Arsenic | 21 | | 1000 | 1030 | | ug/L | | 101 | 80 - 120 |
| Barium | 110 | B | 2000 | 2110 | | ug/L | | 100 | 80 - 120 |
| Beryllium | 0.95 | J | 50.0 | 44.9 | | ug/L | | 88 | 80 - 120 |
| Cadmium | 0.45 | U | 100 | 93.4 | | ug/L | | 93 | 80 - 120 |
| Chromium | 23 | | 200 | 234 | | ug/L | | 106 | 80 - 120 |
| Copper | 110 | B | 250 | 360 | | ug/L | | 100 | 80 - 120 |
| Cobalt | 2.8 | J | 500 | 474 | | ug/L | | 94 | 80 - 120 |
| Iron | 5600 | | 1000 | 7750 | 4 | ug/L | | 218 | 80 - 120 |
| Lead | 74 | | 500 | 517 | | ug/L | | 89 | 80 - 120 |
| Manganese | 53 | B | 500 | 525 | | ug/L | | 94 | 80 - 120 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-48643-6 MS** — **Client Sample ID: SDS-33-01-02-131030**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 201181** — **Prep Batch: 199998**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Nickel | 7.0 | J * | 500 | 514 | | ug/L | | 101 | 80 - 120 |
| Selenium | 4.9 | U | 2000 | 2030 | | ug/L | | 102 | 80 - 120 |
| Silver | 0.93 | U | 50.0 | 52.0 | | ug/L | | 104 | 80 - 120 |
| Thallium | 4.9 | U | 2000 | 1830 | | ug/L | | 91 | 80 - 120 |
| Zinc | 59 | B | 500 | 539 | | ug/L | | 96 | 80 - 120 |
| Vanadium | 27 | | 500 | 497 | | ug/L | | 94 | 80 - 120 |

**Lab Sample ID: 280-48643-6 MSD** — **Client Sample ID: SDS-33-01-02-131030**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 201181** — **Prep Batch: 199998**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5700 | | 2000 | 13600 | F | ug/L | | 396 | 80 - 120 | 10 | 20 |
| Antimony | 3.1 | U | 500 | 489 | | ug/L | | 98 | 80 - 120 | 1 | 20 |
| Arsenic | 21 | | 1000 | 1060 | | ug/L | | 104 | 80 - 120 | 2 | 20 |
| Barium | 110 | B | 2000 | 2140 | | ug/L | | 102 | 80 - 120 | 2 | 20 |
| Beryllium | 0.95 | J | 50.0 | 45.7 | | ug/L | | 90 | 80 - 120 | 2 | 20 |
| Cadmium | 0.45 | U | 100 | 95.3 | | ug/L | | 95 | 80 - 120 | 2 | 20 |
| Chromium | 23 | | 200 | 237 | | ug/L | | 107 | 80 - 120 | 1 | 20 |
| Copper | 110 | B | 250 | 365 | | ug/L | | 102 | 80 - 120 | 1 | 20 |
| Cobalt | 2.8 | J | 500 | 482 | | ug/L | | 96 | 80 - 120 | 2 | 20 |
| Iron | 5600 | | 1000 | 7270 | 4 | ug/L | | 170 | 80 - 120 | 6 | 20 |
| Lead | 74 | | 500 | 525 | | ug/L | | 90 | 80 - 120 | 2 | 20 |
| Manganese | 53 | B | 500 | 535 | | ug/L | | 96 | 80 - 120 | 2 | 20 |
| Nickel | 7.0 | J * | 500 | 523 | | ug/L | | 103 | 80 - 120 | 2 | 20 |
| Selenium | 4.9 | U | 2000 | 2070 | | ug/L | | 103 | 80 - 120 | 2 | 20 |
| Silver | 0.93 | U | 50.0 | 52.8 | | ug/L | | 106 | 80 - 120 | 2 | 20 |
| Thallium | 4.9 | U | 2000 | 1860 | | ug/L | | 93 | 80 - 120 | 2 | 20 |
| Zinc | 59 | B | 500 | 548 | | ug/L | | 98 | 80 - 120 | 2 | 20 |
| Vanadium | 27 | | 500 | 507 | | ug/L | | 96 | 80 - 120 | 2 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: LB 280-199618/1-B** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 200323** — **Prep Batch: 199977**

| Analyte | LB Result | LB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.000030 | U | 0.0020 | 0.000030 | mg/L | | 11/08/13 13:30 | 11/08/13 23:19 | 1 |

**Lab Sample ID: LCS 280-199618/2-B** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 200323** — **Prep Batch: 199977**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 0.00500 | 0.00462 | | mg/L | | 92 | 90 - 116 |

## Method: 7470A - Mercury (CVAA) (Continued)

**Lab Sample ID: 280-48643-6 MS** — **Client Sample ID: SDS-33-01-02-131030**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 200323** — **Prep Batch: 199977**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.000040 | J | 0.00500 | 0.00476 | | mg/L | | 94 | 90 - 116 | | |

**Lab Sample ID: 280-48643-6 MSD** — **Client Sample ID: SDS-33-01-02-131030**
**Matrix: Solid** — **Prep Type: SPLP East**
**Analysis Batch: 200323** — **Prep Batch: 199977**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.000040 | J | 0.00500 | 0.00479 | | mg/L | | 95 | 90 - 116 | 1 | 10 |

## Method: 7471B - Mercury (CVAA)

**Lab Sample ID: MB 280-198924/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200005** — **Prep Batch: 198924**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.5 | U | 17 | 5.5 | ug/Kg | | 11/07/13 13:20 | 11/07/13 19:25 | 1 |

**Lab Sample ID: LCS 280-198924/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 200005** — **Prep Batch: 198924**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | | | 417 | 455 | | ug/Kg | | 109 | 87 - 111 | | |

## Method: Moisture - Percent Moisture

**Lab Sample ID: 280-48643-1 DU** — **Client Sample ID: SDS-31-12-13-131029**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 199153**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 18 | | | 18 | | % | | | | 2 | 20 |
| Percent Solids | 82 | | | 82 | | % | | | | 0.5 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## GC/MS Semi VOA

### Leach Batch: 199618

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | SPLP East | Solid | 1312 | |
| 280-48643-6 MS | SDS-33-01-02-131030 | SPLP East | Solid | 1312 | |
| 280-48643-6 MSD | SDS-33-01-02-131030 | SPLP East | Solid | 1312 | |
| LB 280-199618/1-D | Method Blank | SPLP East | Solid | 1312 | |
| LCS 280-199618/2-D | Lab Control Sample | SPLP East | Solid | 1312 | |

### Prep Batch: 200040

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Total/NA | Solid | 3546 | |
| 280-48643-1 MS | SDS-31-12-13-131029 | Total/NA | Solid | 3546 | |
| 280-48643-1 MSD | SDS-31-12-13-131029 | Total/NA | Solid | 3546 | |
| 280-48643-2 | SDS-27-16-17-131029 | Total/NA | Solid | 3546 | |
| 280-48643-3 | SDS-29-12-13-131029 | Total/NA | Solid | 3546 | |
| 280-48643-4 - DL | SDS-34-02-03-131030 | Total/NA | Solid | 3546 | |
| 280-48643-4 | SDS-34-02-03-131030 | Total/NA | Solid | 3546 | |
| 280-48643-5 | SDS-35-02-03-131030 | Total/NA | Solid | 3546 | |
| 280-48643-6 - DL | SDS-33-01-02-131030 | Total/NA | Solid | 3546 | |
| 280-48643-6 | SDS-33-01-02-131030 | Total/NA | Solid | 3546 | |
| LCS 280-200040/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-200040/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Prep Batch: 200096

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | SPLP East | Solid | 3510C | 199618 |
| 280-48643-6 MS | SDS-33-01-02-131030 | SPLP East | Solid | 3510C | 199618 |
| 280-48643-6 MSD | SDS-33-01-02-131030 | SPLP East | Solid | 3510C | 199618 |
| LB 280-199618/1-D | Method Blank | SPLP East | Solid | 3510C | 199618 |
| LCS 280-199618/2-D | Lab Control Sample | SPLP East | Solid | 3510C | 199618 |

### Analysis Batch: 201027

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Total/NA | Solid | 8270D SIM | 200040 |
| 280-48643-1 MS | SDS-31-12-13-131029 | Total/NA | Solid | 8270D SIM | 200040 |
| 280-48643-1 MSD | SDS-31-12-13-131029 | Total/NA | Solid | 8270D SIM | 200040 |
| 280-48643-2 | SDS-27-16-17-131029 | Total/NA | Solid | 8270D SIM | 200040 |
| 280-48643-3 | SDS-29-12-13-131029 | Total/NA | Solid | 8270D SIM | 200040 |
| 280-48643-4 | SDS-34-02-03-131030 | Total/NA | Solid | 8270D SIM | 200040 |
| LCS 280-200040/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 200040 |
| MB 280-200040/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 200040 |

### Analysis Batch: 201287

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | Total/NA | Solid | 8270D SIM | 200040 |

### Analysis Batch: 201519

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-4 - DL | SDS-34-02-03-131030 | Total/NA | Solid | 8270D SIM | 200040 |
| 280-48643-5 | SDS-35-02-03-131030 | Total/NA | Solid | 8270D SIM | 200040 |
| 280-48643-6 - DL | SDS-33-01-02-131030 | Total/NA | Solid | 8270D SIM | 200040 |

## GC/MS Semi VOA (Continued)

### Analysis Batch: 201718

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | SPLP East | Solid | 8270D SIM | 200096 |
| 280-48643-6 MS | SDS-33-01-02-131030 | SPLP East | Solid | 8270D SIM | 200096 |
| 280-48643-6 MSD | SDS-33-01-02-131030 | SPLP East | Solid | 8270D SIM | 200096 |
| LB 280-199618/1-D | Method Blank | SPLP East | Solid | 8270D SIM | 200096 |
| LCS 280-199618/2-D | Lab Control Sample | SPLP East | Solid | 8270D SIM | 200096 |

## Metals

### Prep Batch: 198924

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Total/NA | Solid | 7471B | |
| 280-48643-2 | SDS-27-16-17-131029 | Total/NA | Solid | 7471B | |
| 280-48643-3 | SDS-29-12-13-131029 | Total/NA | Solid | 7471B | |
| 280-48643-4 | SDS-34-02-03-131030 | Total/NA | Solid | 7471B | |
| 280-48643-5 | SDS-35-02-03-131030 | Total/NA | Solid | 7471B | |
| 280-48643-6 | SDS-33-01-02-131030 | Total/NA | Solid | 7471B | |
| LCS 280-198924/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| MB 280-198924/1-A | Method Blank | Total/NA | Solid | 7471B | |

### Prep Batch: 199346

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Total/NA | Solid | 3050B | |
| 280-48643-2 | SDS-27-16-17-131029 | Total/NA | Solid | 3050B | |
| 280-48643-3 | SDS-29-12-13-131029 | Total/NA | Solid | 3050B | |
| 280-48643-4 | SDS-34-02-03-131030 | Total/NA | Solid | 3050B | |
| 280-48643-5 | SDS-35-02-03-131030 | Total/NA | Solid | 3050B | |
| LCS 280-199346/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-199346/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Leach Batch: 199618

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | SPLP East | Solid | 1312 | |
| 280-48643-6 MS | SDS-33-01-02-131030 | SPLP East | Solid | 1312 | |
| 280-48643-6 MSD | SDS-33-01-02-131030 | SPLP East | Solid | 1312 | |
| LB 280-199618/1-B | Method Blank | SPLP East | Solid | 1312 | |
| LB 280-199618/1-C | Method Blank | SPLP East | Solid | 1312 | |
| LCS 280-199618/2-B | Lab Control Sample | SPLP East | Solid | 1312 | |
| LCS 280-199618/2-C | Lab Control Sample | SPLP East | Solid | 1312 | |

### Analysis Batch: 199685

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Total/NA | Solid | 6010C | 199346 |
| 280-48643-2 | SDS-27-16-17-131029 | Total/NA | Solid | 6010C | 199346 |
| 280-48643-3 | SDS-29-12-13-131029 | Total/NA | Solid | 6010C | 199346 |
| 280-48643-4 | SDS-34-02-03-131030 | Total/NA | Solid | 6010C | 199346 |
| 280-48643-5 | SDS-35-02-03-131030 | Total/NA | Solid | 6010C | 199346 |
| LCS 280-199346/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 199346 |
| MB 280-199346/1-A | Method Blank | Total/NA | Solid | 6010C | 199346 |

## Metals (Continued)

### Prep Batch: 199799

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | Total/NA | Solid | 3050B | |
| LCS 280-199799/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-199799/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Analysis Batch: 199914

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Total/NA | Solid | 6010C | 199346 |
| 280-48643-2 | SDS-27-16-17-131029 | Total/NA | Solid | 6010C | 199346 |
| 280-48643-3 | SDS-29-12-13-131029 | Total/NA | Solid | 6010C | 199346 |
| 280-48643-4 | SDS-34-02-03-131030 | Total/NA | Solid | 6010C | 199346 |
| 280-48643-5 | SDS-35-02-03-131030 | Total/NA | Solid | 6010C | 199346 |
| LCS 280-199346/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 199346 |
| MB 280-199346/1-A | Method Blank | Total/NA | Solid | 6010C | 199346 |

### Prep Batch: 199977

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | SPLP East | Solid | 7470A | 199618 |
| 280-48643-6 MS | SDS-33-01-02-131030 | SPLP East | Solid | 7470A | 199618 |
| 280-48643-6 MSD | SDS-33-01-02-131030 | SPLP East | Solid | 7470A | 199618 |
| LB 280-199618/1-B | Method Blank | SPLP East | Solid | 7470A | 199618 |
| LCS 280-199618/2-B | Lab Control Sample | SPLP East | Solid | 7470A | 199618 |

### Prep Batch: 199998

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | SPLP East | Solid | 3010A | 199618 |
| 280-48643-6 MS | SDS-33-01-02-131030 | SPLP East | Solid | 3010A | 199618 |
| 280-48643-6 MSD | SDS-33-01-02-131030 | SPLP East | Solid | 3010A | 199618 |
| LB 280-199618/1-C | Method Blank | SPLP East | Solid | 3010A | 199618 |
| LCS 280-199618/2-C | Lab Control Sample | SPLP East | Solid | 3010A | 199618 |

### Analysis Batch: 200005

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Total/NA | Solid | 7471B | 198924 |
| 280-48643-2 | SDS-27-16-17-131029 | Total/NA | Solid | 7471B | 198924 |
| 280-48643-3 | SDS-29-12-13-131029 | Total/NA | Solid | 7471B | 198924 |
| 280-48643-4 | SDS-34-02-03-131030 | Total/NA | Solid | 7471B | 198924 |
| 280-48643-5 | SDS-35-02-03-131030 | Total/NA | Solid | 7471B | 198924 |
| 280-48643-6 | SDS-33-01-02-131030 | Total/NA | Solid | 7471B | 198924 |
| LCS 280-198924/2-A | Lab Control Sample | Total/NA | Solid | 7471B | 198924 |
| MB 280-198924/1-A | Method Blank | Total/NA | Solid | 7471B | 198924 |

### Analysis Batch: 200323

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | SPLP East | Solid | 7470A | 199977 |
| 280-48643-6 MS | SDS-33-01-02-131030 | SPLP East | Solid | 7470A | 199977 |
| 280-48643-6 MSD | SDS-33-01-02-131030 | SPLP East | Solid | 7470A | 199977 |
| LB 280-199618/1-B | Method Blank | SPLP East | Solid | 7470A | 199977 |
| LCS 280-199618/2-B | Lab Control Sample | SPLP East | Solid | 7470A | 199977 |

## Metals (Continued)

### Analysis Batch: 200522

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | Total/NA | Solid | 6010C | 199799 |
| LCS 280-199799/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 199799 |
| MB 280-199799/1-A | Method Blank | Total/NA | Solid | 6010C | 199799 |

### Analysis Batch: 201181

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-6 | SDS-33-01-02-131030 | SPLP East | Solid | 6010C | 199998 |
| 280-48643-6 MS | SDS-33-01-02-131030 | SPLP East | Solid | 6010C | 199998 |
| 280-48643-6 MSD | SDS-33-01-02-131030 | SPLP East | Solid | 6010C | 199998 |
| LB 280-199618/1-C | Method Blank | SPLP East | Solid | 6010C | 199998 |
| LCS 280-199618/2-C | Lab Control Sample | SPLP East | Solid | 6010C | 199998 |

## General Chemistry

### Analysis Batch: 199153

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-1 | SDS-31-12-13-131029 | Total/NA | Solid | Moisture | |
| 280-48643-1 DU | SDS-31-12-13-131029 | Total/NA | Solid | Moisture | |
| 280-48643-2 | SDS-27-16-17-131029 | Total/NA | Solid | Moisture | |
| 280-48643-3 | SDS-29-12-13-131029 | Total/NA | Solid | Moisture | |

### Analysis Batch: 199320

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-48643-4 | SDS-34-02-03-131030 | Total/NA | Solid | Moisture | |
| 280-48643-5 | SDS-35-02-03-131030 | Total/NA | Solid | Moisture | |
| 280-48643-6 | SDS-33-01-02-131030 | Total/NA | Solid | Moisture | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Client Sample ID: SDS-31-12-13-131029 — Lab Sample ID: 280-48643-1

**Date Collected: 10/29/13 15:00**
**Date Received: 10/31/13 09:00**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 199153 | 11/04/13 11:05 | BAN | TAL DEN |

## Client Sample ID: SDS-31-12-13-131029 — Lab Sample ID: 280-48643-1

**Date Collected: 10/29/13 15:00**
**Date Received: 10/31/13 09:00**
**Matrix: Solid**
**Percent Solids: 81.6**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.8 g | 1000 uL | 200040 | 11/08/13 12:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.8 g | 1000 uL | 201027 | 11/14/13 21:42 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.17 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.17 g | 100 mL | 199685 | 11/07/13 01:17 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.17 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.17 g | 100 mL | 199914 | 11/07/13 18:24 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .52 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .52 g | 50 mL | 200005 | 11/07/13 20:06 | JM | TAL DEN |

## Client Sample ID: SDS-27-16-17-131029 — Lab Sample ID: 280-48643-2

**Date Collected: 10/29/13 09:40**
**Date Received: 10/31/13 09:00**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 199153 | 11/04/13 11:05 | BAN | TAL DEN |

## Client Sample ID: SDS-27-16-17-131029 — Lab Sample ID: 280-48643-2

**Date Collected: 10/29/13 09:40**
**Date Received: 10/31/13 09:00**
**Matrix: Solid**
**Percent Solids: 85.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.7 g | 1000 uL | 200040 | 11/08/13 12:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.7 g | 1000 uL | 201027 | 11/14/13 23:04 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.17 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.17 g | 100 mL | 199685 | 11/07/13 01:19 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.17 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.17 g | 100 mL | 199914 | 11/07/13 18:26 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .53 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .53 g | 50 mL | 200005 | 11/07/13 20:09 | JM | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Client Sample ID: SDS-29-12-13-131029 — Lab Sample ID: 280-48643-3

**Date Collected: 10/29/13 11:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 199153 | 11/04/13 11:05 | BAN | TAL DEN |

## Client Sample ID: SDS-29-12-13-131029 — Lab Sample ID: 280-48643-3

**Date Collected: 10/29/13 11:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 86.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.7 g | 1000 uL | 200040 | 11/08/13 12:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.7 g | 1000 uL | 201027 | 11/14/13 23:31 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199685 | 11/07/13 01:21 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199914 | 11/07/13 18:28 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .56 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .56 g | 50 mL | 200005 | 11/07/13 20:11 | JM | TAL DEN |

## Client Sample ID: SDS-34-02-03-131030 — Lab Sample ID: 280-48643-4

**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 199320 | 11/05/13 10:25 | BAN | TAL DEN |

## Client Sample ID: SDS-34-02-03-131030 — Lab Sample ID: 280-48643-4

**Date Collected: 10/30/13 12:30** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 84.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.8 g | 1000 uL | 200040 | 11/08/13 12:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.8 g | 1000 uL | 201027 | 11/14/13 23:59 | KGV | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 30.8 g | 1000 uL | 200040 | 11/08/13 12:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 10 | 30.8 g | 1000 uL | 201519 | 11/18/13 13:33 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199685 | 11/07/13 01:23 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 199914 | 11/07/13 18:31 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .55 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .55 g | 50 mL | 200005 | 11/07/13 20:13 | JM | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Client Sample ID: SDS-35-02-03-131030 — Lab Sample ID: 280-48643-5

**Date Collected: 10/30/13 14:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 199320 | 11/05/13 10:25 | BAN | TAL DEN |

## Client Sample ID: SDS-35-02-03-131030 — Lab Sample ID: 280-48643-5

**Date Collected: 10/30/13 14:55** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 83.7**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 32.4 g | 1000 uL | 200040 | 11/08/13 12:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 32.4 g | 1000 uL | 201519 | 11/18/13 14:00 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.04 g | 100 mL | 199685 | 11/07/13 01:26 | JKH | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 199346 | 11/05/13 12:18 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.04 g | 100 mL | 199914 | 11/07/13 18:33 | JKH | TAL DEN |
| Total/NA | Prep | 7471B | | | .54 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .54 g | 50 mL | 200005 | 11/07/13 20:16 | JM | TAL DEN |

## Client Sample ID: SDS-33-01-02-131030 — Lab Sample ID: 280-48643-6

**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| SPLP East | Leach | 1312 | | | 1.0 g | 1.0 mL | 199618 | 11/06/13 16:49 | DFB1 | TAL DEN |
| SPLP East | Prep | 3510C | | | 250 mL | 1000 uL | 200096 | 11/08/13 15:05 | EER | TAL DEN |
| SPLP East | Analysis | 8270D SIM | | 1 | 250 mL | 1000 uL | 201718 | 11/19/13 22:17 | KGV | TAL DEN |
| SPLP East | Leach | 1312 | | | 1.0 g | 1.0 mL | 199618 | 11/06/13 16:49 | DFB1 | TAL DEN |
| SPLP East | Prep | 3010A | | | 50 mL | 50 mL | 199998 | 11/14/13 07:30 | JAM | TAL DEN |
| SPLP East | Analysis | 6010C | | 1 | 50 mL | 50 mL | 201181 | 11/15/13 09:31 | JKH | TAL DEN |
| SPLP East | Leach | 1312 | | | 1.0 g | 1.0 mL | 199618 | 11/06/13 16:49 | DFB1 | TAL DEN |
| SPLP East | Prep | 7470A | | | 30 mL | 30 mL | 199977 | 11/08/13 13:30 | JM | TAL DEN |
| SPLP East | Analysis | 7470A | | 1 | 30 mL | 30 mL | 200323 | 11/08/13 23:30 | JM | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 199320 | 11/05/13 10:25 | BAN | TAL DEN |

## Client Sample ID: SDS-33-01-02-131030 — Lab Sample ID: 280-48643-6

**Date Collected: 10/30/13 12:35** — **Matrix: Solid**
**Date Received: 10/31/13 09:00** — **Percent Solids: 57.8**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.4 g | 1000 uL | 200040 | 11/08/13 12:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.4 g | 1000 uL | 201287 | 11/15/13 15:19 | KGV | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 30.4 g | 1000 uL | 200040 | 11/08/13 12:56 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 40 | 30.4 g | 1000 uL | 201519 | 11/18/13 14:28 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.19 g | 100 mL | 199799 | 11/08/13 13:00 | LLB | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.19 g | 100 mL | 200522 | 11/11/13 17:45 | SJS | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Client Sample ID: SDS-33-01-02-131030

**Date Collected: 10/30/13 12:35**
**Date Received: 10/31/13 09:00**

## Lab Sample ID: 280-48643-6

**Matrix: Solid**
**Percent Solids: 57.8**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 7471B | | | .51 g | 50 mL | 198924 | 11/07/13 13:20 | JM | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | .51 g | 50 mL | 200005 | 11/07/13 20:18 | JM | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-48643-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Colorado | State Program | 8 | N/A | 09-30-14 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Maryland | State Program | 3 | 268 | 03-31-14 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

**H3K020408 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 26**

**Total Number of Pages ..... 28**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-48643-1

UNC Cogen

Lot #: H3K020408

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

November 22, 2013

# ANALYTICAL METHODS SUMMARY

**H3K020408**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |
| Percent Moisture | MCAWW 160.3 MOD |

**References:**

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H3K020408**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M2ETD | 001 | SDS-31-12-13-131029 | 10/29/13 | 15:00 |
| M2ETE | 002 | SDS-27-16-17-131029 | 10/29/13 | 09:40 |
| M2ETF | 003 | SDS-29-12-13-131029 | 10/29/13 | 11:55 |
| M2ETG | 004 | SDS-34-02-03-131030 | 10/30/13 | 12:30 |
| M2ETH | 005 | SDS-35-02-03-131030 | 10/30/13 | 14:55 |
| M2ETJ | 006 | SDS-33-01-02-131030 | 10/30/13 | 12:35 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H3K020408

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

For solid and sediments samples, when percent moisture is included in the report header field, the sample results are reported on a dry weight basis. When percent moisture is not contained in the header field, sample results are reported on an as received or wet weight basis.

Samples SDS-27-16-17-131029, SDS-34-02-03-131030, and SDS-35-02-03-131030 exhibited native OCDD above the upper calibration level. The method does not require further action be taken; therefore, the results were reported as is with an "E" qualifier.

Sample SDS-33-01-02-131030 was diluted 10-fold due to high levels of native analytes.

The following flags are used to qualify results for chlorinated dioxin and furan results:

> **J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:
>
> **Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.
>
> Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

# PROJECT NARRATIVE
## H3K020408

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

# PROJECT NARRATIVE
## H3K020408

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

# PROJECT NARRATIVE
## H3K020408

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: SDS-31-12-13-131029**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 001 | **Work Order #....:** | M2ETD1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/29/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 18 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.0062 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 6.0 | 0.015 | pg/g |
| **1,2,3,4,7,8-HxCDD** | **0.064** | **Q J** | **6.0** | **0.033** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **0.082** | **Q J** | **6.0** | **0.031** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.33** | **Q J** | **6.0** | **0.029** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **29** | | **6.0** | **0.14** | **pg/g** |
| **OCDD** | **4000** | **B** | **12** | **0.40** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.0078 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 6.0 | 0.011 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 6.0 | 0.011 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 6.0 | 0.0094 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 6.0 | 0.0092 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 6.0 | 0.0099 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 6.0 | 0.012 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | ND | | 6.0 | 0.0084 | pg/g |
| **1,2,3,4,7,8,9-HpCDF** | **0.054** | **Q B J** | **6.0** | **0.014** | **pg/g** |
| **OCDF** | **0.21** | **Q B J** | **12** | **0.025** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 66 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 80 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 92 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 72 | 40 - 135 |
| 13C-OCDD | 79 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 77 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 75 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 71 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 75 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 61 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-31-12-13-131029**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 001 | **Work Order #....:** | M2ETD1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/29/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 18 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SDS-27-16-17-131029**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 002 | **Work Order #....:** | M2ETE1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/29/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 14 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.2 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.012 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.7 | 0.016 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.7 | 0.033 | pg/g |
| **1,2,3,6,7,8-HxCDD** | **0.23** | **Q J** | **5.7** | **0.032** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.19** | **Q J** | **5.7** | **0.029** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **32** | | **5.7** | **0.21** | **pg/g** |
| **OCDD** | **6300** | **B E** | **11** | **0.77** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.1 | 0.0067 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.7 | 0.017 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.7 | 0.018 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.7 | 0.010 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 5.7 | 0.011 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 5.7 | 0.010 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.7 | 0.015 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.025** | **Q J** | **5.7** | **0.0067** | **pg/g** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.7 | 0.012 | pg/g |
| OCDF | ND | | 11 | 0.030 | pg/g |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 66 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 87 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 71 | 40 - 135 |
| 13C-OCDD | 67 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 88 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 89 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 83 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 69 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-27-16-17-131029**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 002 | **Work Order #....:** | M2ETE1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/29/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 14 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.2 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| E | Estimated result. Result concentration exceeds the calibration range. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

**TestAmerica Denver**

**Sample ID: SDS-29-12-13-131029**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 003 | **Work Order #....:** | M2ETF1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/29/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 13 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.2 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.011 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.6 | 0.0097 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.6 | 0.0087 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.6 | 0.0089 | pg/g |
| 1,2,3,7,8,9-HxCDD | ND | | 5.6 | 0.0080 | pg/g |
| **1,2,3,4,6,7,8-HpCDD** | **3.7** | **J** | **5.6** | **0.058** | **pg/g** |
| **OCDD** | **520** | **B** | **11** | **0.23** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.1 | 0.0089 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.6 | 0.012 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.6 | 0.011 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.6 | 0.0099 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 5.6 | 0.0097 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 5.6 | 0.0098 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.6 | 0.014 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | ND | | 5.6 | 0.010 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | ND | | 5.6 | 0.017 | pg/g |
| **OCDF** | **0.068** | **Q B J** | **11** | **0.016** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 78 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 80 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 67 | 40 - 135 |
| 13C-OCDD | 63 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 88 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 90 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 71 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 73 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 68 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 61 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-29-12-13-131029**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 003 | **Work Order #....:** | M2ETF1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/29/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 13 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.2 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SDS-34-02-03-131030**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 004 | **Work Order #....:** | M2ETG1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/30/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 15 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.086 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.34** | **Q J** | **5.9** | **0.11** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **7.5** | | **5.9** | **0.092** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **22** | | **5.9** | **0.085** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **8.0** | | **5.9** | **0.080** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **480** | | **5.9** | **0.17** | **pg/g** |
| **OCDD** | **6100** | **B E** | **12** | **0.31** | **pg/g** |
| **2,3,7,8-TCDF** | **0.37** | **Q J** | **1.2** | **0.065** | **pg/g** |
| **1,2,3,7,8-PeCDF** | **0.20** | **Q J** | **5.9** | **0.12** | **pg/g** |
| **2,3,4,7,8-PeCDF** | **0.26** | **Q J** | **5.9** | **0.12** | **pg/g** |
| **1,2,3,4,7,8-HxCDF** | **5.7** | **Q J** | **5.9** | **0.096** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **9.5** | **Q** | **5.9** | **0.093** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **1.3** | **J** | **5.9** | **0.081** | **pg/g** |
| **1,2,3,7,8,9-HxCDF** | **0.35** | **Q J** | **5.9** | **0.11** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDF** | **100** | | **5.9** | **0.20** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **10** | **B** | **5.9** | **0.26** | **pg/g** |
| **OCDF** | **280** | **B** | **12** | **0.18** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 86 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 73 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 68 | 40 - 135 |
| 13C-OCDD | 66 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 90 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 94 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 84 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 73 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 69 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 62 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 63 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-34-02-03-131030**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 004 | **Work Order #....:** | M2ETG1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/30/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 15 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

E Estimated result. Result concentration exceeds the calibration range.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SDS-35-02-03-131030**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 005 | **Work Order #....:** | M2ETH1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/30/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 15 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.010 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.9 | 0.011 | pg/g |
| **1,2,3,4,7,8-HxCDD** | **0.17** | **Q J** | **5.9** | **0.046** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **0.22** | **Q J** | **5.9** | **0.047** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.38** | **Q J** | **5.9** | **0.042** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **65** | | **5.9** | **0.15** | **pg/g** |
| **OCDD** | **11000** | **B E** | **12** | **0.35** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.023 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.9 | 0.021 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.9 | 0.021 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.035** | **Q J** | **5.9** | **0.016** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.033** | **Q J** | **5.9** | **0.015** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.030** | **Q J** | **5.9** | **0.016** | **pg/g** |
| **1,2,3,7,8,9-HxCDF** | **0.022** | **Q J** | **5.9** | **0.024** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDF** | **0.19** | **Q J** | **5.9** | **0.011** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.043** | **Q B J** | **5.9** | **0.022** | **pg/g** |
| **OCDF** | **0.41** | **Q B J** | **12** | **0.024** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 76 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 89 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 96 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 66 | 40 - 135 |
| 13C-OCDD | 71 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 63 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 86 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 82 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 85 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 77 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 62 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-35-02-03-131030**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 005 | **Work Order #....:** | M2ETH1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/30/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture** | 15 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| E | Estimated result. Result concentration exceeds the calibration range. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

**TestAmerica Denver**

**Sample ID: SDS-33-01-02-131030**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 006 | **Work Order #....:** | M2ETJ1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/30/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 10 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 28 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 8.5 | J | 14 | 1.2 | pg/g |
| 1,2,3,7,8-PeCDD | 60 | J | 68 | 1.2 | pg/g |
| 1,2,3,4,7,8-HxCDD | 410 | | 68 | 1.7 | pg/g |
| 1,2,3,6,7,8-HxCDD | 640 | | 68 | 2.1 | pg/g |
| 1,2,3,7,8,9-HxCDD | 650 | | 68 | 1.7 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | 15000 | | 68 | 2.2 | pg/g |
| OCDD | 24000 | B | 140 | 1.8 | pg/g |
| 2,3,7,8-TCDF | 1.9 | Q J | 14 | 0.25 | pg/g |
| 1,2,3,7,8-PeCDF | 4.4 | Q J | 68 | 0.58 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 68 | 0.65 | pg/g |
| 1,2,3,4,7,8-HxCDF | 36 | Q J | 68 | 0.49 | pg/g |
| 1,2,3,6,7,8-HxCDF | 55 | Q J | 68 | 0.41 | pg/g |
| 2,3,4,6,7,8-HxCDF | 7.6 | Q J | 68 | 0.39 | pg/g |
| 1,2,3,7,8,9-HxCDF | 13 | Q J | 68 | 0.58 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | 950 | | 68 | 0.88 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | 130 | B | 68 | 1.5 | pg/g |
| OCDF | 2300 | B | 140 | 0.47 | pg/g |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 69 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 77 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 67 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 63 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 67 | 40 - 135 |
| 13C-OCDD | 104 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 88 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 66 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 72 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 79 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 70 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 57 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SDS-33-01-02-131030**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K020408 - 006 | **Work Order #....:** | M2ETJ1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 10/30/13 | **Date Received....:** | 11/02/13 | **Dilution Factor:** | 10 |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/20/13 | **Percent Moisture** | 28 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K040000 - 016B | **Work Order #....:** | M2EXN1AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.0 | 0.021 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.0 | 0.0044 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.0 | 0.013 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.0 | 0.012 | pg/g |
| 1,2,3,7,8,9-HxCDD | ND | | 5.0 | 0.011 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | ND | | 5.0 | 0.027 | pg/g |
| **OCDD** | **1.9** | **J** | **10** | **0.051** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.0 | 0.011 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.0 | 0.013 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.0 | 0.012 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.0 | 0.014 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 5.0 | 0.014 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 5.0 | 0.013 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.0 | 0.020 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | ND | | 5.0 | 0.0093 | pg/g |
| **1,2,3,4,7,8,9-HpCDF** | **0.038** | **Q J** | **5.0** | **0.013** | **pg/g** |
| **OCDF** | **0.63** | **Q J** | **10** | **0.038** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 80 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 97 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 69 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 86 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 58 | 40 - 135 |
| 13C-OCDD | 57 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 83 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 101 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 89 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 78 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 61 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 62 | 40 - 135 |

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H3K040000 - 016B | **Work Order #....:** | M2EXN1AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/04/13 | **Analysis Date....:** | 11/19/13 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 3308016 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H3K020408 | **Work Order # ...:** | M2EXN1AC-LCS | **Matrix .....:** | SOLID |
| **LCS Lot-Sample# :** | H3K040000 - 016 | | | | |
| **Prep Date .....:** | 11/04/13 | **Analysis Date ..:** | 11/18/13 | | |
| **Prep Batch # ...:** | 3308016 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 10 g | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **20.0** | **21.1** | **pg/g** | **105** | | **(79 - 129)** |
| **1,2,3,7,8-PeCDD** | **100** | **99.3** | **pg/g** | **99** | | **(79 - 129)** |
| **1,2,3,4,7,8-HxCDD** | **100** | **95.7** | **pg/g** | **96** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **100** | **94.3** | **pg/g** | **94** | | **(74 - 124)** |
| **1,2,3,7,8,9-HxCDD** | **100** | **89.8** | **pg/g** | **90** | | **(70 - 124)** |
| **1,2,3,4,6,7,8-HpCDD** | **100** | **99.8** | **pg/g** | **100** | | **(73 - 123)** |
| **OCDD** | **200** | **185** | **pg/g** | **93** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **20.0** | **22.4** | **pg/g** | **112** | | **(75 - 125)** |
| **1,2,3,7,8-PeCDF** | **100** | **107** | **pg/g** | **107** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **100** | **100** | **pg/g** | **100** | | **(75 - 125)** |
| **1,2,3,4,7,8-HxCDF** | **100** | **92.5** | **pg/g** | **93** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **100** | **93.6** | **pg/g** | **94** | | **(76 - 126)** |
| **2,3,4,6,7,8-HxCDF** | **100** | **106** | **pg/g** | **106** | | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **100** | **95.9** | **pg/g** | **96** | | **(77 - 127)** |
| **1,2,3,4,6,7,8-HpCDF** | **100** | **106** | **pg/g** | **106** | | **(77 - 127)** |
| **1,2,3,4,7,8,9-HpCDF** | **100** | **98.2** | **pg/g** | **98** | **B** | **(73 - 123)** |
| **OCDF** | **200** | **172** | **pg/g** | **86** | **B** | **(49 - 128)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 79 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 84 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 80 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 89 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 68 | (40 - 135) |
| 13C-OCDD | 79 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 73 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 78 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 81 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 78 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 81 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 78 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 86 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 71 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H3K020408

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-215022.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving- Terry Wasmund | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-48643-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 11/18/2013 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

SUBCONTRACT/ SW8290 - 17 Dioxins and Furans

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUBCONTRACT/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| SDS-31-12-13-131029 (280-48643-1) | 10/29/13 | 15:00 Eastern | | Solid | | | X | 1 | Hold Samples/extracts for 60 sdays |
| SDS-27-16-17-131029 (280-48643-2) | 10/29/13 | 09:40 Eastern | | Solid | | | X | 1 | Hold Samples/extracts for 60 sdays |
| SDS-29-12-13-131029 (280-48643-3) | 10/29/13 | 11:55 Eastern | | Solid | | | X | 1 | Hold Samples/extracts for 60 sdays |
| SDS-34-02-03-131030 (280-48643-4) | 10/30/13 | 12:30 Eastern | | Solid | | | X | 1 | Hold Samples/extracts for 60 sdays |
| SDS-35-02-03-131030 (280-48643-5) | 10/30/13 | 14:55 Eastern | | Solid | | | X | 1 | Hold Samples/extracts for 60 sdays |
| SDS-33-01-02-131030 (280-48643-6) | 10/30/13 | 12:35 Eastern | | Solid | | | X | 1 | Hold Samples/extracts for 60 sdays |
| | | | | | | | | | CUSTODY SEALS INTACT |
| | | | | | | | | | RECEIVED AT 0.2°C |
| | | | | | | | | | BKD 11-2-13 |
| | | | | | | | | | 1 COOLER FED X# |
| | | | | | | | | | 5687 6174 5955 |

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 11/1/13 1230 | | [signature] | 11-2-13 10:00 | TA KNOX |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H3K020408

| Review Items | Yes | No | NA | If No, what was the problem? | Comments/Actions Taken |
|---|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: | |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. | |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: | |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: | |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC | |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken | |
| 7. Were VOA samples received without headspace? | ✓ | | ✓ | ☐ **7a** Headspace (VOA only) | |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container | |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) | | | ✓ | ☐ **9a** Could not be determined due to matrix interference | |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired | |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information | |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ | |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: | |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished | |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information | |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information | |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information | |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information | |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other | |

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: [signature] Date: 11-2-13

QA026R25.doc, 071813

280-48643 Chain of Custody

# Chain of Custody Record

4/5 JK
IK4 10-31-13

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

America Laboratory location: _____

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other _____

| Client Contact | | | |
|---|---|---|---|
| Company Name: Geosyntec | Client Project Manager: Beau Hodge | Site Contact: | Lab Contact: Patrick M |
| Address: 4601 Six Forks Rd Suite 340 | Telephone: 919 870-0576 | Telephone: | Telephone: |
| City/State/Zip: Raleigh NC 27609 | Email: bhodge@geosyntec.com | | |
| Phone: 919 324-2597 | | | |
| Project Name: UNC Cogen | Method of Shipment/Carrier: FEDEX | | |
| Project Number: GN 5219 | Shipping/Tracking No: | | |
| PO # | | | |

COC No: 063289

_____ of _____ COCs

Analysis Turnaround Time (in BUS days)

TAT if different from below _____

☐ 3 weeks
☐ 2 weeks
☐ 1 week
☐ 2 days
☐ 1 day

standard

For lab use only

Walk-in client ☐
Lab pickup ☐
Lab sampling ☐

Job/SDG No.

| Sample Identification | Sample Date | Sample Time | Matrix: Air | Aqueous | Sediment | Solid | Other: | Containers & Preservatives: H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | Unpres | Other: | Filtered Sample (Y / N) | Composite=C / Grab=G | Analyses: 6010C | 7470A | 8270D SIM | 8290 | SPLP 6010C | SPLP 7470A | SPLP 8270 SIM | SPLP 8290 | | | Sample Specific Notes / Special Instructions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SDS-31-12-13-131029 | 10/29/13 | 1500 | | | | X | | | | | | | X | | | | X | X | X | X | | | | | | | *Refer to |
| SDS-27-16-17-131029 | 10/29/13 | 0940 | | | | X | | | | | | | X | | | | X | X | X | X | | | | | | | QAPP for analyte |
| SDS-29-12-13-131029 | 10/29/13 | 1155 | | | | X | | | | | | | X | | | | X | X | X | X | | | | | | | lists for each method |
| SDS-34-02-03-131030 | 10/30/13 | 1230 | | | | X | | | | | | | X | | | | X | X | X | X | | | | | | | |
| SDS-35-02-03-131030 | 10/30/13 | 1455 | | | | X | | | | | | | X | | | | X | X | X | X | | | | | | | |
| SDS-33-01-02-131030 | 10/30/13 | 1235 | | | | X | | | | | | | X | | | | X | X | X | X | X | X | X | X | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | |

NE Etp

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☐ Disposal By Lab ☐ Archive For _____ Months

Special Instructions/QC Requirements & Comments:

| Relinquished by: | Company | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| Mind Sitt | Geosyntec | 10/30/13 1830 | Nathaniel Downey | TAL | 10/31/13 0900 |
| Relinquished by: | Company: | Date/Time | Received by: | Company: | Date/Time. |
| Relinquished by | Company: | Date/Time | Received in Laboratory by: | Company: | Date/Time: |

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TAL 0018- 1 (04/10)

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-48643-1

**Login Number: 48643**
**List Number: 1**
**Creator: O'Tormey, Stephanie R**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Not requested on COC. |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-62581-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 5:47:41 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |
| B | Compound was found in the blank and sample. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| F2 | MS/MSD RPD exceeds control limits |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-62581-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-62581-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**
The samples were received on 11/14/2014 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.0º C.

**8270D SIM GCMS**
Samples SB-32-2.7-2.9 (280-62581-1), SB-33-1.5-2.5 (280-62581-2), SB-34-1.5-2.5 (280-62581-3), SB-35-0.5-1 (280-62581-4) and SB-36-0.75-2 (280-62581-5) were analyzed for 8270D SIM GCMS in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 11/17/2014 and analyzed on 11/21/2014 and 11/24/2014.

Due to target analyte concentration, sample SB-35-0.5-1 (280-62581-4)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Nitrobenzene-d5 failed the surrogate recovery criteria high for 280-62541-A-2-E MSD. Refer to the QC report for details. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Naphthalene failed the recovery criteria high for the MS of sample 280-62541-2 in batch 280-254218. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**
Samples SB-32-2.7-2.9 (280-62581-1), SB-33-1.5-2.5 (280-62581-2), SB-34-1.5-2.5 (280-62581-3), SB-35-0.5-1 (280-62581-4) and SB-36-0.75-2 (280-62581-5) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/18/2014 and analyzed on 11/25/2014, 11/26/2014, 12/01/2014 and 12/03/2014.

Barium and Chromium were detected in method blank MB 280-253406/1-A at levels that were above the method detection limit but below one half the reporting limit. The values should be considered estimates, and have been flagged. Refer to the QC report for details.

Chromium was detected in method blank MB 280-253618/1-A at a level that was above the method detection limit but below one half the reporting limit. The value should be considered an estimate, and has been flagged. Refer to the QC report for details.

Aluminum and Iron failed the recovery criteria high for the MS of sample SB-32-2.7-2.9MS (280-62581-1) in batch 280-254873. Aluminum and Iron failed the recovery criteria high for the MSD of sample SB-32-2.7-2.9MSD (280-62581-1) in batch 280-254873. Manganese

## Job ID: 280-62581-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

exceeded the RPD limit. The PDS failed recovery criteria low for Manganese. Refer to the QC report for details.

Copper failed the recovery criteria low for the MS of sample SB-35-0.5-1MS (280-62581-4) in batch 280-255718. Aluminum and Iron failed the recovery criteria high. For the MSD of sample SB-35-0.5-1MSD (280-62581-4) in batch 280-255718, Iron failed the recovery criteria low. Aluminum failed the recovery criteria high. Also, Copper and Manganese exceeded the RPD limit. Refer to the QC report for details.

The continuing calibration verification low level (CCVL 280-255392/26) associated with anlaytical batch 255392 recovered above the upper control limit for Be. The samples associated with this CCVL were non-detects for the affected analytes; therefore, the data have been reported.

The CCVL's (CCVL 280-255392/26), (CCVL 280-255392/37) associated with analytical batch 25592 recovered above the established control criteria for Pb. The associated samples contained detects for this analyte greater than 10x's the RL, the Method Blank was not detect for Pb and the LCS recovered within the established control limits; therefore the data have been reported.

The continuing calibration verification low level (CCVL 280-255718/40) associated with analytical batch 255718 recovered above the upper control limit for Sb & Se. The samples associated with this CCVL were below the reporting limit for the affected analytes; therefore, the data have been reported.

The continuing calibration verification low level (CCVL 280-255718/51) associated with analytical batch 255718 recovered above the upper control limit for Se. The samples associated with this CCVL were below the reporting limit for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY (CVAA)**

Samples SB-32-2.7-2.9 (280-62581-1), SB-33-1.5-2.5 (280-62581-2), SB-34-1.5-2.5 (280-62581-3), SB-35-0.5-1 (280-62581-4) and SB-36-0.75-2 (280-62581-5) were analyzed for total mercury (CVAA) in accordance with EPA SW-846 Method 7471B. The samples were prepared and analyzed on 11/19/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**PERCENT SOLIDS**

Samples SB-32-2.7-2.9 (280-62581-1), SB-33-1.5-2.5 (280-62581-2), SB-34-1.5-2.5 (280-62581-3), SB-35-0.5-1 (280-62581-4) and SB-36-0.75-2 (280-62581-5) were analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 11/17/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Client Sample ID: SB-32-2.7-2.9 — Lab Sample ID: 280-62581-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 2700 | J | 5300 | 270 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 2000 | J | 5300 | 330 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 2400 | J | 5300 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 2100 | J | 5300 | 760 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 6000 | | 5300 | 950 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 5400 | | 5300 | 780 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 6600 | | 5300 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 1800 | J | 5300 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 8700 | | 5300 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 1700 | J | 5300 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 10000 | | 5300 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1800 | J | 5300 | 500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 16000 | | 5300 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 14000 | | 5300 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 4200 | | 11 | 1.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 30 | B | 1.1 | 0.082 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.21 | J | 0.54 | 0.035 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 9.0 | B | 1.6 | 0.062 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.0 | J | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 3.4 | | 2.1 | 0.23 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 1700 | | 16 | 4.1 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 4.6 | | 0.86 | 0.29 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 53 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.4 | J | 4.3 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 5.6 | | 2.1 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 8.7 | | 3.2 | 0.43 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 13 | J | 19 | 6.2 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SB-33-1.5-2.5 — Lab Sample ID: 280-62581-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[b]fluoranthene | 2000 | J | 5100 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 2400 | J | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 5700 | | 9.4 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 41 | B | 0.94 | 0.072 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.34 | J | 0.47 | 0.031 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 8.6 | B | 1.4 | 0.055 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.2 | | 0.94 | 0.094 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 5.1 | | 1.9 | 0.20 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 1200 | | 14 | 3.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 5.1 | | 0.75 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 38 | | 0.94 | 0.094 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.9 | J | 3.8 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 6.9 | | 1.9 | 0.089 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 9.0 | | 2.8 | 0.37 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 12 | J | 18 | 5.8 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SB-34-1.5-2.5 — Lab Sample ID: 280-62581-3

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Client Sample ID: SB-34-1.5-2.5 (Continued) — Lab Sample ID: 280-62581-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[a]pyrene | 1400 | J | 6000 | 890 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 2000 | J | 6000 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 2000 | J | 6000 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 4800 | | 11 | 1.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 33 | B | 1.1 | 0.084 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.31 | J | 0.55 | 0.036 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 5.4 | B | 1.7 | 0.064 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.5 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 4.4 | | 2.2 | 0.24 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 1900 | | 17 | 4.2 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 5.4 | | 0.88 | 0.30 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 32 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.0 | J | 4.4 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 6.9 | | 2.2 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 8.5 | | 3.3 | 0.44 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 15 | J | 19 | 6.1 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SB-35-0.5-1 — Lab Sample ID: 280-62581-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 81000 | | 7000 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 87000 | | 7000 | 430 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 11000 | | 7000 | 220 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 41000 | | 7000 | 240 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 57000 | | 7000 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 120000 | | 7000 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 110000 | | 7000 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 150000 | | 7000 | 1700 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 78000 | | 7000 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 43000 | | 7000 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 160000 | | 7000 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 22000 | | 7000 | 1800 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 32000 | | 7000 | 660 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 63000 | | 7000 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 76000 | | 7000 | 450 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene - DL | 280000 | | 14000 | 2800 | ng/Kg | 2 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene - DL | 280000 | | 14000 | 3100 | ng/Kg | 2 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 300000 | | 14000 | 3100 | ng/Kg | 2 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 6300 | | 12 | 1.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.1 | J | 2.5 | 0.82 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 34 | | 1.2 | 0.095 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.23 | J ^ | 0.62 | 0.041 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.25 | J | 0.62 | 0.051 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 10 | B | 1.9 | 0.072 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 4.3 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 75 | | 2.5 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 7400 | | 19 | 4.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 30 | ^ | 1.0 | 0.34 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 81 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 5.1 | | 5.0 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SB-35-0.5-1 (Continued) — Lab Sample ID: 280-62581-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Selenium | 1.3 | J ^ | 1.6 | 1.1 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 21 | | 2.5 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 58 | | 3.7 | 0.50 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 55 | | 22 | 7.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SB-36-0.75-2 — Lab Sample ID: 280-62581-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 4800 | J | 5500 | 290 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 5200 | J | 5500 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 2100 | J | 5500 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 1700 | J | 5500 | 790 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 3900 | J | 5500 | 990 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 3800 | J | 5500 | 810 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 4800 | J | 5500 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 2800 | J | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 1200 | J | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 5900 | | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 7400 | | 5500 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1100 | J | 5500 | 520 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 2200 | J | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 11000 | | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 9600 | | 5500 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 5900 | | 11 | 1.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.1 | J | 2.2 | 0.74 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 39 | B | 1.1 | 0.085 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.63 | | 0.56 | 0.037 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.12 | J | 0.56 | 0.046 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 6.6 | B | 1.7 | 0.065 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 3.1 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 18 | | 2.2 | 0.24 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 5400 | | 17 | 4.3 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 56 | | 0.90 | 0.30 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 240 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.0 | J | 4.5 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 11 | | 2.2 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 24 | | 3.4 | 0.45 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 9.8 | J | 18 | 5.9 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7471B | Mercury (CVAA) | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Solid | 11/13/14 11:00 | 11/14/14 10:30 |
| 280-62581-2 | SB-33-1.5-2.5 | Solid | 11/13/14 11:10 | 11/14/14 10:30 |
| 280-62581-3 | SB-34-1.5-2.5 | Solid | 11/13/14 11:15 | 11/14/14 10:30 |
| 280-62581-4 | SB-35-0.5-1 | Solid | 11/13/14 11:40 | 11/14/14 10:30 |
| 280-62581-5 | SB-36-0.75-2 | Solid | 11/13/14 12:00 | 11/14/14 10:30 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SB-32-2.7-2.9**
**Date Collected: 11/13/14 11:00**
**Date Received: 11/14/14 10:30**

**Lab Sample ID: 280-62581-1**
**Matrix: Solid**
**Percent Solids: 86.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | **2700** | **J** | 5300 | 270 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **2-Methylnaphthalene** | **2000** | **J** | 5300 | 330 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| Acenaphthene | 170 | U | 5300 | 170 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Acenaphthylene** | **2400** | **J** | 5300 | 180 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Anthracene** | **2100** | **J** | 5300 | 760 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Benzo[a]anthracene** | **6000** | | 5300 | 950 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Benzo[a]pyrene** | **5400** | | 5300 | 780 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Benzo[b]fluoranthene** | **6600** | | 5300 | 1300 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| Benzo[g,h,i]perylene | 1200 | U | 5300 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Benzo[k]fluoranthene** | **1800** | **J** | 5300 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Chrysene** | **8700** | | 5300 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Dibenz(a,h)anthracene** | **1700** | **J** | 5300 | 1400 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Fluoranthene** | **10000** | | 5300 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Fluorene** | **1800** | **J** | 5300 | 500 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| Indeno[1,2,3-cd]pyrene | 1200 | U | 5300 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| Naphthalene | 340 | U | 5300 | 340 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Phenanthrene** | **16000** | | 5300 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |
| **Pyrene** | **14000** | | 5300 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:01 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *83* | | *39 - 120* | *11/17/14 17:10* | *11/21/14 13:01* | *1* |
| *Nitrobenzene-d5* | *101* | | *42 - 120* | *11/17/14 17:10* | *11/21/14 13:01* | *1* |
| *Terphenyl-d14* | *73* | | *35 - 124* | *11/17/14 17:10* | *11/21/14 13:01* | *1* |

**Client Sample ID: SB-33-1.5-2.5**
**Date Collected: 11/13/14 11:10**
**Date Received: 11/14/14 10:30**

**Lab Sample ID: 280-62581-2**
**Matrix: Solid**
**Percent Solids: 91.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 270 | U | 5100 | 270 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| 2-Methylnaphthalene | 320 | U | 5100 | 320 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Acenaphthene | 160 | U | 5100 | 160 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Acenaphthylene | 170 | U | 5100 | 170 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Anthracene | 740 | U | 5100 | 740 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Benzo[a]anthracene | 920 | U | 5100 | 920 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Benzo[a]pyrene | 760 | U | 5100 | 760 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| **Benzo[b]fluoranthene** | **2000** | **J** | 5100 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Benzo[g,h,i]perylene | 1100 | U | 5100 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Benzo[k]fluoranthene | 1000 | U | 5100 | 1000 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Chrysene | 1000 | U | 5100 | 1000 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Dibenz(a,h)anthracene | 1300 | U | 5100 | 1300 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Fluoranthene | 1000 | U | 5100 | 1000 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Fluorene | 480 | U | 5100 | 480 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Indeno[1,2,3-cd]pyrene | 1100 | U | 5100 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Naphthalene | 330 | U | 5100 | 330 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| Phenanthrene | 1100 | U | 5100 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |
| **Pyrene** | **2400** | **J** | 5100 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:29 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | | *39 - 120* | *11/17/14 17:10* | *11/21/14 13:29* | *1* |
| *Nitrobenzene-d5* | *88* | | *42 - 120* | *11/17/14 17:10* | *11/21/14 13:29* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SB-33-1.5-2.5**
**Date Collected: 11/13/14 11:10**
**Date Received: 11/14/14 10:30**

**Lab Sample ID: 280-62581-2**
**Matrix: Solid**
**Percent Solids: 91.6**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| Terphenyl-d14 | 80 | | 35 - 124 | 11/17/14 17:10 | 11/21/14 13:29 | 1 |

**Client Sample ID: SB-34-1.5-2.5**
**Date Collected: 11/13/14 11:15**
**Date Received: 11/14/14 10:30**

**Lab Sample ID: 280-62581-3**
**Matrix: Solid**
**Percent Solids: 79.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 310 | U | 6000 | 310 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| 2-Methylnaphthalene | 370 | U | 6000 | 370 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Acenaphthene | 190 | U | 6000 | 190 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Acenaphthylene | 200 | U | 6000 | 200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Anthracene | 870 | U | 6000 | 870 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Benzo[a]anthracene | 1100 | U | 6000 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| **Benzo[a]pyrene** | **1400** | **J** | 6000 | 890 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| **Benzo[b]fluoranthene** | **2000** | **J** | 6000 | 1400 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Benzo[g,h,i]perylene | 1300 | U | 6000 | 1300 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Benzo[k]fluoranthene | 1200 | U | 6000 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Chrysene | 1200 | U | 6000 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Dibenz(a,h)anthracene | 1600 | U | 6000 | 1600 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Fluoranthene | 1200 | U | 6000 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Fluorene | 570 | U | 6000 | 570 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Indeno[1,2,3-cd]pyrene | 1300 | U | 6000 | 1300 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Naphthalene | 390 | U | 6000 | 390 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Phenanthrene | 1300 | U | 6000 | 1300 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| **Pyrene** | **2000** | **J** | 6000 | 1300 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 13:56 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 81 | | 39 - 120 | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Nitrobenzene-d5 | 90 | | 42 - 120 | 11/17/14 17:10 | 11/21/14 13:56 | 1 |
| Terphenyl-d14 | 68 | | 35 - 124 | 11/17/14 17:10 | 11/21/14 13:56 | 1 |

**Client Sample ID: SB-35-0.5-1**
**Date Collected: 11/13/14 11:40**
**Date Received: 11/14/14 10:30**

**Lab Sample ID: 280-62581-4**
**Matrix: Solid**
**Percent Solids: 69.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | **81000** | | 7000 | 360 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **2-Methylnaphthalene** | **87000** | | 7000 | 430 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Acenaphthene** | **11000** | | 7000 | 220 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Acenaphthylene** | **41000** | | 7000 | 240 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Anthracene** | **57000** | | 7000 | 1000 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Benzo[a]anthracene** | **120000** | | 7000 | 1300 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Benzo[a]pyrene** | **110000** | | 7000 | 1000 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Benzo[b]fluoranthene** | **150000** | | 7000 | 1700 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Benzo[g,h,i]perylene** | **78000** | | 7000 | 1500 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Benzo[k]fluoranthene** | **43000** | | 7000 | 1400 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Chrysene** | **160000** | | 7000 | 1400 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Dibenz(a,h)anthracene** | **22000** | | 7000 | 1800 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Fluorene** | **32000** | | 7000 | 660 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **63000** | | 7000 | 1500 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| **Naphthalene** | **76000** | | 7000 | 450 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:24 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 73 | | 39 - 120 | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| Nitrobenzene-d5 | 108 | | 42 - 120 | 11/17/14 17:10 | 11/21/14 14:24 | 1 |
| Terphenyl-d14 | 62 | | 35 - 124 | 11/17/14 17:10 | 11/21/14 14:24 | 1 |

**Client Sample ID: SB-36-0.75-2** — **Lab Sample ID: 280-62581-5**
**Date Collected: 11/13/14 12:00** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 87.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 4800 | J | 5500 | 290 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| 2-Methylnaphthalene | 5200 | J | 5500 | 340 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Acenaphthene | 180 | U | 5500 | 180 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Acenaphthylene | 2100 | J | 5500 | 190 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Anthracene | 1700 | J | 5500 | 790 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Benzo[a]anthracene | 3900 | J | 5500 | 990 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Benzo[a]pyrene | 3800 | J | 5500 | 810 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Benzo[b]fluoranthene | 4800 | J | 5500 | 1300 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Benzo[g,h,i]perylene | 2800 | J | 5500 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Benzo[k]fluoranthene | 1200 | J | 5500 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Chrysene | 5900 | | 5500 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5500 | 1400 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Fluoranthene | 7400 | | 5500 | 1100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Fluorene | 1100 | J | 5500 | 520 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Indeno[1,2,3-cd]pyrene | 2200 | J | 5500 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Naphthalene | 360 | U | 5500 | 360 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Phenanthrene | 11000 | | 5500 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Pyrene | 9600 | | 5500 | 1200 | ng/Kg | ☼ | 11/17/14 17:10 | 11/21/14 14:52 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 86 | | 39 - 120 | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Nitrobenzene-d5 | 97 | | 42 - 120 | 11/17/14 17:10 | 11/21/14 14:52 | 1 |
| Terphenyl-d14 | 77 | | 35 - 124 | 11/17/14 17:10 | 11/21/14 14:52 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

**Client Sample ID: SB-35-0.5-1** — **Lab Sample ID: 280-62581-4**
**Date Collected: 11/13/14 11:40** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 69.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | 280000 | | 14000 | 2800 | ng/Kg | ☼ | 11/17/14 17:10 | 11/24/14 16:24 | 2 |
| Phenanthrene | 280000 | | 14000 | 3100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/24/14 16:24 | 2 |
| Pyrene | 300000 | | 14000 | 3100 | ng/Kg | ☼ | 11/17/14 17:10 | 11/24/14 16:24 | 2 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 79 | | 39 - 120 | 11/17/14 17:10 | 11/24/14 16:24 | 2 |
| Nitrobenzene-d5 | 119 | | 42 - 120 | 11/17/14 17:10 | 11/24/14 16:24 | 2 |
| Terphenyl-d14 | 66 | | 35 - 124 | 11/17/14 17:10 | 11/24/14 16:24 | 2 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Method: 6010C - Metals (ICP)

**Client Sample ID: SB-32-2.7-2.9** — **Lab Sample ID: 280-62581-1**
**Date Collected: 11/13/14 11:00** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 86.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **4200** | | 11 | 1.7 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| Antimony | 0.41 | U | 1.6 | 0.41 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:37 | 1 |
| Arsenic | 0.71 | U | 2.1 | 0.71 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Barium** | **30** | **B** | 1.1 | 0.082 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Beryllium** | **0.21** | **J** | 0.54 | 0.035 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| Cadmium | 0.044 | U | 0.54 | 0.044 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Chromium** | **9.0** | **B** | 1.6 | 0.062 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Cobalt** | **1.0** | **J** | 1.1 | 0.11 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Copper** | **3.4** | | 2.1 | 0.23 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Iron** | **1700** | | 16 | 4.1 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Lead** | **4.6** | | 0.86 | 0.29 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Manganese** | **53** | | 1.1 | 0.11 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Nickel** | **3.4** | **J** | 4.3 | 0.13 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| Selenium | 0.92 | U | 1.4 | 0.92 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:37 | 1 |
| Silver | 0.17 | U | 1.1 | 0.17 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| Thallium | 0.70 | U | 1.3 | 0.70 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:37 | 1 |
| **Vanadium** | **5.6** | | 2.1 | 0.10 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |
| **Zinc** | **8.7** | | 3.2 | 0.43 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:35 | 1 |

**Client Sample ID: SB-33-1.5-2.5** — **Lab Sample ID: 280-62581-2**
**Date Collected: 11/13/14 11:10** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 91.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **5700** | | 9.4 | 1.5 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| Antimony | 0.36 | U | 1.4 | 0.36 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:49 | 1 |
| Arsenic | 0.62 | U | 1.9 | 0.62 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Barium** | **41** | **B** | 0.94 | 0.072 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Beryllium** | **0.34** | **J** | 0.47 | 0.031 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| Cadmium | 0.039 | U | 0.47 | 0.039 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Chromium** | **8.6** | **B** | 1.4 | 0.055 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Cobalt** | **1.2** | | 0.94 | 0.094 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Copper** | **5.1** | | 1.9 | 0.20 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Iron** | **1200** | | 14 | 3.6 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Lead** | **5.1** | | 0.75 | 0.25 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Manganese** | **38** | | 0.94 | 0.094 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Nickel** | **2.9** | **J** | 3.8 | 0.12 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| Selenium | 0.81 | U | 1.2 | 0.81 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:49 | 1 |
| Silver | 0.15 | U | 0.94 | 0.15 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| Thallium | 0.61 | U | 1.1 | 0.61 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:49 | 1 |
| **Vanadium** | **6.9** | | 1.9 | 0.089 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |
| **Zinc** | **9.0** | | 2.8 | 0.37 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:48 | 1 |

**Client Sample ID: SB-34-1.5-2.5** — **Lab Sample ID: 280-62581-3**
**Date Collected: 11/13/14 11:15** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 79.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **4800** | | 11 | 1.7 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Antimony | 0.42 | U | 1.7 | 0.42 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:52 | 1 |
| Arsenic | 0.73 | U | 2.2 | 0.73 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| **Barium** | **33** | **B** | 1.1 | 0.084 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SB-34-1.5-2.5** — **Lab Sample ID: 280-62581-3**
**Date Collected: 11/13/14 11:15** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 79.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Beryllium | 0.31 | J | 0.55 | 0.036 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Cadmium | 0.045 | U | 0.55 | 0.045 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Chromium | 5.4 | B | 1.7 | 0.064 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Cobalt | 1.5 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Copper | 4.4 | | 2.2 | 0.24 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Iron | 1900 | | 17 | 4.2 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Lead | 5.4 | | 0.88 | 0.30 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Manganese | 32 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Nickel | 2.0 | J | 4.4 | 0.14 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Selenium | 0.95 | U | 1.4 | 0.95 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:52 | 1 |
| Silver | 0.18 | U | 1.1 | 0.18 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Thallium | 0.72 | U | 1.3 | 0.72 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:52 | 1 |
| Vanadium | 6.9 | | 2.2 | 0.10 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |
| Zinc | 8.5 | | 3.3 | 0.44 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:50 | 1 |

**Client Sample ID: SB-35-0.5-1** — **Lab Sample ID: 280-62581-4**
**Date Collected: 11/13/14 11:40** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 69.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 6300 | | 12 | 1.9 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Antimony | 0.47 | U ^ | 1.9 | 0.47 | mg/Kg | ☼ | 11/18/14 13:30 | 12/03/14 17:15 | 1 |
| Arsenic | 2.1 | J | 2.5 | 0.82 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Barium | 34 | | 1.2 | 0.095 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Beryllium | 0.23 | J ^ | 0.62 | 0.041 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Cadmium | 0.25 | J | 0.62 | 0.051 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Chromium | 10 | B | 1.9 | 0.072 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Cobalt | 4.3 | | 1.2 | 0.12 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Copper | 75 | | 2.5 | 0.27 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Iron | 7400 | | 19 | 4.7 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Lead | 30 | ^ | 1.0 | 0.34 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Manganese | 81 | | 1.2 | 0.12 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Nickel | 5.1 | | 5.0 | 0.15 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Selenium | 1.3 | J ^ | 1.6 | 1.1 | mg/Kg | ☼ | 11/18/14 13:30 | 12/03/14 17:15 | 1 |
| Silver | 0.20 | U | 1.2 | 0.20 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Thallium | 0.81 | U | 1.5 | 0.81 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Vanadium | 21 | | 2.5 | 0.12 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |
| Zinc | 58 | | 3.7 | 0.50 | mg/Kg | ☼ | 11/18/14 13:30 | 12/01/14 20:08 | 1 |

**Client Sample ID: SB-36-0.75-2** — **Lab Sample ID: 280-62581-5**
**Date Collected: 11/13/14 12:00** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 87.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5900 | | 11 | 1.7 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Antimony | 0.43 | U | 1.7 | 0.43 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:55 | 1 |
| Arsenic | 1.1 | J | 2.2 | 0.74 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Barium | 39 | B | 1.1 | 0.085 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Beryllium | 0.63 | | 0.56 | 0.037 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Cadmium | 0.12 | J | 0.56 | 0.046 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Chromium | 6.6 | B | 1.7 | 0.065 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Cobalt | 3.1 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SB-36-0.75-2** — **Lab Sample ID: 280-62581-5**
**Date Collected: 11/13/14 12:00** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 87.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Copper | 18 | | 2.2 | 0.24 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Iron | 5400 | | 17 | 4.3 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Lead | 56 | | 0.90 | 0.30 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Manganese | 240 | | 1.1 | 0.11 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Nickel | 3.0 | J | 4.5 | 0.14 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Selenium | 0.96 | U | 1.5 | 0.96 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:55 | 1 |
| Silver | 0.18 | U | 1.1 | 0.18 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Thallium | 0.73 | U | 1.3 | 0.73 | mg/Kg | ☼ | 11/18/14 08:14 | 11/26/14 15:55 | 1 |
| Vanadium | 11 | | 2.2 | 0.11 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |
| Zinc | 24 | | 3.4 | 0.45 | mg/Kg | ☼ | 11/18/14 08:14 | 11/25/14 20:53 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SB-32-2.7-2.9** — **Lab Sample ID: 280-62581-1**
**Date Collected: 11/13/14 11:00** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 86.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 13 | J | 19 | 6.2 | ug/Kg | ☼ | 11/19/14 08:43 | 11/19/14 21:01 | 1 |

**Client Sample ID: SB-33-1.5-2.5** — **Lab Sample ID: 280-62581-2**
**Date Collected: 11/13/14 11:10** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 91.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 12 | J | 18 | 5.8 | ug/Kg | ☼ | 11/19/14 08:43 | 11/19/14 21:08 | 1 |

**Client Sample ID: SB-34-1.5-2.5** — **Lab Sample ID: 280-62581-3**
**Date Collected: 11/13/14 11:15** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 79.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 15 | J | 19 | 6.1 | ug/Kg | ☼ | 11/19/14 08:43 | 11/19/14 21:10 | 1 |

**Client Sample ID: SB-35-0.5-1** — **Lab Sample ID: 280-62581-4**
**Date Collected: 11/13/14 11:40** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 69.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 55 | | 22 | 7.3 | ug/Kg | ☼ | 11/19/14 08:43 | 11/19/14 21:13 | 1 |

**Client Sample ID: SB-36-0.75-2** — **Lab Sample ID: 280-62581-5**
**Date Collected: 11/13/14 12:00** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 87.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 9.8 | J | 18 | 5.9 | ug/Kg | ☼ | 11/19/14 08:43 | 11/19/14 21:15 | 1 |

## General Chemistry

**Client Sample ID: SB-32-2.7-2.9** — **Lab Sample ID: 280-62581-1**
**Date Collected: 11/13/14 11:00** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 86.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 14 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |
| Percent Solids | 86 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

**Client Sample ID: SB-33-1.5-2.5** — **Lab Sample ID: 280-62581-2**
**Date Collected: 11/13/14 11:10** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 91.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 8.4 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |
| Percent Solids | 92 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |

**Client Sample ID: SB-34-1.5-2.5** — **Lab Sample ID: 280-62581-3**
**Date Collected: 11/13/14 11:15** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 79.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 21 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |
| Percent Solids | 79 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |

**Client Sample ID: SB-35-0.5-1** — **Lab Sample ID: 280-62581-4**
**Date Collected: 11/13/14 11:40** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 69.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 30 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |
| Percent Solids | 70 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |

**Client Sample ID: SB-36-0.75-2** — **Lab Sample ID: 280-62581-5**
**Date Collected: 11/13/14 12:00** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 87.6**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 12 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |
| Percent Solids | 88 | | 0.10 | 0.10 | % | | | 11/17/14 13:51 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-62581-1 | SB-32-2.7-2.9 | 83 | 101 | 73 |
| 280-62581-2 | SB-33-1.5-2.5 | 81 | 88 | 80 |
| 280-62581-3 | SB-34-1.5-2.5 | 81 | 90 | 68 |
| 280-62581-4 | SB-35-0.5-1 | 73 | 108 | 62 |
| 280-62581-4 - DL | SB-35-0.5-1 | 79 | 119 | 66 |
| 280-62581-5 | SB-36-0.75-2 | 86 | 97 | 77 |
| LCS 280-253443/2-A | Lab Control Sample | 85 | 100 | 79 |
| MB 280-253443/1-A | Method Blank | 95 | 106 | 85 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-253443/1-A**
**Matrix: Solid**
**Analysis Batch: 254523**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 253443**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 240 | U | 4700 | 240 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| 2-Methylnaphthalene | 290 | U | 4700 | 290 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Acenaphthene | 150 | U | 4700 | 150 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Acenaphthylene | 160 | U | 4700 | 160 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Anthracene | 670 | U | 4700 | 670 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Benzo[a]anthracene | 840 | U | 4700 | 840 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Benzo[a]pyrene | 690 | U | 4700 | 690 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Benzo[b]fluoranthene | 1100 | U | 4700 | 1100 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Benzo[g,h,i]perylene | 1000 | U | 4700 | 1000 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Benzo[k]fluoranthene | 930 | U | 4700 | 930 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Chrysene | 930 | U | 4700 | 930 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Dibenz(a,h)anthracene | 1200 | U | 4700 | 1200 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Fluoranthene | 930 | U | 4700 | 930 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Fluorene | 440 | U | 4700 | 440 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Indeno[1,2,3-cd]pyrene | 1000 | U | 4700 | 1000 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Naphthalene | 300 | U | 4700 | 300 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Phenanthrene | 1000 | U | 4700 | 1000 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |
| Pyrene | 1000 | U | 4700 | 1000 | ng/Kg | | 11/17/14 17:10 | 11/24/14 10:53 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *95* | | *39 - 120* | *11/17/14 17:10* | *11/24/14 10:53* | *1* |
| *Nitrobenzene-d5* | *106* | | *42 - 120* | *11/17/14 17:10* | *11/24/14 10:53* | *1* |
| *Terphenyl-d14* | *85* | | *35 - 120* | *11/17/14 17:10* | *11/24/14 10:53* | *1* |

**Lab Sample ID: LCS 280-253443/2-A**
**Matrix: Solid**
**Analysis Batch: 254218**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 253443**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 28900 | 23200 | | ng/Kg | | 80 | 35 - 120 |
| Acenaphthylene | 28900 | 21900 | | ng/Kg | | 76 | 41 - 120 |
| Anthracene | 28900 | 23500 | | ng/Kg | | 81 | 43 - 120 |
| Benzo[a]anthracene | 28900 | 24000 | | ng/Kg | | 83 | 36 - 120 |
| Benzo[a]pyrene | 28900 | 21900 | | ng/Kg | | 76 | 20 - 120 |
| Benzo[b]fluoranthene | 28900 | 22800 | | ng/Kg | | 79 | 37 - 120 |
| Benzo[g,h,i]perylene | 28900 | 21300 | | ng/Kg | | 74 | 20 - 123 |
| Benzo[k]fluoranthene | 28900 | 22400 | | ng/Kg | | 77 | 46 - 120 |
| Chrysene | 28900 | 24600 | | ng/Kg | | 85 | 34 - 120 |
| Dibenz(a,h)anthracene | 28900 | 21400 | | ng/Kg | | 74 | 20 - 120 |
| Fluoranthene | 28900 | 22100 | | ng/Kg | | 76 | 45 - 120 |
| Fluorene | 28900 | 22700 | | ng/Kg | | 78 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 28900 | 20900 | | ng/Kg | | 72 | 20 - 127 |
| Naphthalene | 28900 | 24500 | | ng/Kg | | 85 | 44 - 120 |
| Phenanthrene | 28900 | 23200 | | ng/Kg | | 80 | 44 - 120 |
| Pyrene | 28900 | 20900 | | ng/Kg | | 72 | 43 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-253443/2-A**
**Matrix: Solid**
**Analysis Batch: 254218**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 253443**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *39 - 120* |
| *Nitrobenzene-d5* | *100* | | *42 - 120* |
| *Terphenyl-d14* | *79* | | *35 - 124* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-253406/1-A**
**Matrix: Solid**
**Analysis Batch: 254873**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 253406**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.6 | U | 10 | 1.6 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Barium | 0.134 | J | 1.0 | 0.076 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Chromium | 0.0590 | J | 1.5 | 0.058 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Iron | 3.8 | U | 15 | 3.8 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |
| Zinc | 0.40 | U | 3.0 | 0.40 | mg/Kg | | 11/18/14 08:14 | 11/25/14 20:30 | 1 |

**Lab Sample ID: MB 280-253406/1-A**
**Matrix: Solid**
**Analysis Batch: 255086**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 253406**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 11/18/14 08:14 | 11/26/14 15:32 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 11/18/14 08:14 | 11/26/14 15:32 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 11/18/14 08:14 | 11/26/14 15:32 | 1 |

**Lab Sample ID: LCS 280-253406/2-A**
**Matrix: Solid**
**Analysis Batch: 254873**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 253406**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 196 | | mg/Kg | | 98 | 82 - 116 |
| Arsenic | 100 | 99.7 | | mg/Kg | | 100 | 85 - 110 |
| Barium | 200 | 206 | | mg/Kg | | 103 | 87 - 112 |
| Beryllium | 5.00 | 5.09 | | mg/Kg | | 102 | 84 - 114 |
| Cadmium | 10.0 | 10.0 | | mg/Kg | | 100 | 87 - 110 |
| Chromium | 20.0 | 20.1 | | mg/Kg | | 100 | 84 - 114 |
| Cobalt | 50.0 | 49.4 | | mg/Kg | | 99 | 87 - 110 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-253406/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 254873** — **Prep Batch: 253406**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Copper | 25.0 | 25.2 | | mg/Kg | | 101 | 88 - 110 |
| Iron | 100 | 105 | | mg/Kg | | 105 | 87 - 120 |
| Lead | 50.0 | 50.9 | | mg/Kg | | 102 | 86 - 110 |
| Manganese | 50.0 | 48.6 | | mg/Kg | | 97 | 88 - 110 |
| Nickel | 50.0 | 49.4 | | mg/Kg | | 99 | 87 - 110 |
| Silver | 5.00 | 4.97 | | mg/Kg | | 99 | 87 - 114 |
| Vanadium | 50.0 | 49.0 | | mg/Kg | | 98 | 88 - 110 |
| Zinc | 50.0 | 49.2 | | mg/Kg | | 98 | 76 - 114 |

**Lab Sample ID: LCS 280-253406/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255086** — **Prep Batch: 253406**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 50.0 | 48.5 | | mg/Kg | | 97 | 82 - 110 |
| Selenium | 200 | 192 | | mg/Kg | | 96 | 83 - 110 |
| Thallium | 200 | 193 | | mg/Kg | | 96 | 84 - 110 |

**Lab Sample ID: 280-62581-1 MS** — **Client Sample ID: SB-32-2.7-2.9**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 254873** — **Prep Batch: 253406**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 4200 | | 219 | 11800 | 4 | mg/Kg | ☼ | 3472 | 50 - 200 |
| Arsenic | 0.71 | U | 109 | 102 | | mg/Kg | ☼ | 94 | 76 - 111 |
| Barium | 30 | B | 219 | 247 | | mg/Kg | ☼ | 99 | 52 - 159 |
| Beryllium | 0.21 | J | 5.47 | 5.45 | | mg/Kg | ☼ | 96 | 72 - 105 |
| Cadmium | 0.044 | U | 10.9 | 10.4 | | mg/Kg | ☼ | 95 | 40 - 130 |
| Chromium | 9.0 | B | 21.9 | 31.2 | | mg/Kg | ☼ | 101 | 70 - 200 |
| Cobalt | 1.0 | J | 54.7 | 52.5 | | mg/Kg | ☼ | 94 | 72 - 106 |
| Copper | 3.4 | | 27.3 | 31.6 | | mg/Kg | ☼ | 103 | 37 - 187 |
| Iron | 1700 | | 109 | 2630 | 4 | mg/Kg | ☼ | 857 | 70 - 200 |
| Lead | 4.6 | | 54.7 | 56.8 | | mg/Kg | ☼ | 95 | 70 - 200 |
| Manganese | 53 | | 54.7 | 110 | | mg/Kg | ☼ | 104 | 40 - 200 |
| Nickel | 3.4 | J | 54.7 | 55.2 | | mg/Kg | ☼ | 95 | 61 - 126 |
| Silver | 0.17 | U | 5.47 | 5.35 | | mg/Kg | ☼ | 98 | 75 - 141 |
| Vanadium | 5.6 | | 54.7 | 59.9 | | mg/Kg | ☼ | 99 | 50 - 169 |
| Zinc | 8.7 | | 54.7 | 63.4 | | mg/Kg | ☼ | 100 | 70 - 200 |

**Lab Sample ID: 280-62581-1 MS** — **Client Sample ID: SB-32-2.7-2.9**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255086** — **Prep Batch: 253406**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.41 | U | 54.7 | 33.6 | | mg/Kg | ☼ | 62 | 20 - 200 |
| Selenium | 0.92 | U | 219 | 201 | | mg/Kg | ☼ | 92 | 76 - 104 |
| Thallium | 0.70 | U | 219 | 199 | | mg/Kg | ☼ | 91 | 78 - 101 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-62581-1 MSD** — **Client Sample ID: SB-32-2.7-2.9**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 254873** — **Prep Batch: 253406**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 4200 | | 227 | 13600 | 4 | mg/Kg | ☼ | 4124 | 50 - 200 | 14 | 20 |
| Arsenic | 0.71 | U | 114 | 109 | | mg/Kg | ☼ | 96 | 76 - 111 | 6 | 20 |
| Barium | 30 | B | 227 | 264 | | mg/Kg | ☼ | 103 | 52 - 159 | 7 | 20 |
| Beryllium | 0.21 | J | 5.68 | 5.82 | | mg/Kg | ☼ | 99 | 72 - 105 | 7 | 20 |
| Cadmium | 0.044 | U | 11.4 | 11.1 | | mg/Kg | ☼ | 98 | 40 - 130 | 7 | 20 |
| Chromium | 9.0 | B | 22.7 | 33.4 | | mg/Kg | ☼ | 107 | 70 - 200 | 7 | 20 |
| Cobalt | 1.0 | J | 56.8 | 56.0 | | mg/Kg | ☼ | 97 | 72 - 106 | 6 | 20 |
| Copper | 3.4 | | 28.4 | 34.2 | | mg/Kg | ☼ | 108 | 37 - 187 | 8 | 20 |
| Iron | 1700 | | 114 | 3070 | 4 | mg/Kg | ☼ | 1210 | 70 - 200 | 15 | 20 |
| Lead | 4.6 | | 56.8 | 61.1 | | mg/Kg | ☼ | 99 | 70 - 200 | 7 | 20 |
| Manganese | 53 | | 56.8 | 143 | F2 | mg/Kg | ☼ | 159 | 40 - 200 | 27 | 20 |
| Nickel | 3.4 | J | 56.8 | 58.4 | | mg/Kg | ☼ | 97 | 61 - 126 | 6 | 20 |
| Silver | 0.17 | U | 5.68 | 5.68 | | mg/Kg | ☼ | 100 | 75 - 141 | 6 | 20 |
| Vanadium | 5.6 | | 56.8 | 63.8 | | mg/Kg | ☼ | 102 | 50 - 169 | 6 | 20 |
| Zinc | 8.7 | | 56.8 | 67.8 | | mg/Kg | ☼ | 104 | 70 - 200 | 7 | 20 |

**Lab Sample ID: 280-62581-1 MSD** — **Client Sample ID: SB-32-2.7-2.9**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255086** — **Prep Batch: 253406**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.41 | U | 56.8 | 34.1 | | mg/Kg | ☼ | 60 | 20 - 200 | 1 | 20 |
| Selenium | 0.92 | U | 227 | 212 | | mg/Kg | ☼ | 93 | 76 - 104 | 6 | 20 |
| Thallium | 0.70 | U | 227 | 209 | | mg/Kg | ☼ | 92 | 78 - 101 | 5 | 20 |

**Lab Sample ID: MB 280-253618/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255392** — **Prep Batch: 253618**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.6 | U | 10 | 1.6 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Barium | 0.076 | U | 1.0 | 0.076 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Beryllium | 0.033 | U ^ | 0.50 | 0.033 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Chromium | 0.0780 | J | 1.5 | 0.058 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Iron | 3.8 | U | 15 | 3.8 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Lead | 0.27 | U ^ | 0.80 | 0.27 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |
| Zinc | 0.40 | U | 3.0 | 0.40 | mg/Kg | | 11/18/14 13:30 | 12/01/14 20:03 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-253618/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255718** — **Prep Batch: 253618**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.38 | U ^ | 1.5 | 0.38 | mg/Kg | | 11/18/14 13:30 | 12/03/14 17:10 | 1 |
| Selenium | 0.86 | U ^ | 1.3 | 0.86 | mg/Kg | | 11/18/14 13:30 | 12/03/14 17:10 | 1 |

**Lab Sample ID: LCS 280-253618/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255392** — **Prep Batch: 253618**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 184 | | mg/Kg | | 92 | 82 - 116 |
| Arsenic | 100 | 92.0 | | mg/Kg | | 92 | 85 - 110 |
| Barium | 200 | 202 | | mg/Kg | | 101 | 87 - 112 |
| Beryllium | 5.00 | 4.60 | ^ | mg/Kg | | 92 | 84 - 114 |
| Cadmium | 10.0 | 9.32 | | mg/Kg | | 93 | 87 - 110 |
| Chromium | 20.0 | 19.2 | | mg/Kg | | 96 | 84 - 114 |
| Cobalt | 50.0 | 47.5 | | mg/Kg | | 95 | 87 - 110 |
| Copper | 25.0 | 25.2 | | mg/Kg | | 101 | 88 - 110 |
| Iron | 100 | 99.5 | | mg/Kg | | 99 | 87 - 120 |
| Lead | 50.0 | 45.4 | ^ | mg/Kg | | 91 | 86 - 110 |
| Manganese | 50.0 | 48.2 | | mg/Kg | | 96 | 88 - 110 |
| Nickel | 50.0 | 47.3 | | mg/Kg | | 95 | 87 - 110 |
| Silver | 5.00 | 5.00 | | mg/Kg | | 100 | 87 - 114 |
| Thallium | 200 | 182 | | mg/Kg | | 91 | 84 - 110 |
| Vanadium | 50.0 | 49.2 | | mg/Kg | | 98 | 88 - 110 |
| Zinc | 50.0 | 47.9 | | mg/Kg | | 96 | 76 - 114 |

**Lab Sample ID: LCS 280-253618/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255718** — **Prep Batch: 253618**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 50.0 | 48.7 | ^ | mg/Kg | | 97 | 82 - 110 |
| Selenium | 200 | 184 | ^ | mg/Kg | | 92 | 83 - 110 |

**Lab Sample ID: 280-62581-4 MS** — **Client Sample ID: SB-35-0.5-1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255392** — **Prep Batch: 253618**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 6300 | | 241 | 15800 | 4 | mg/Kg | ☼ | 3961 | 50 - 200 |
| Arsenic | 2.1 | J | 120 | 105 | | mg/Kg | ☼ | 85 | 76 - 111 |
| Barium | 34 | | 241 | 269 | | mg/Kg | ☼ | 98 | 52 - 159 |
| Beryllium | 0.23 | J ^ | 6.01 | 5.44 | ^ | mg/Kg | ☼ | 87 | 72 - 105 |
| Cadmium | 0.25 | J | 12.0 | 10.7 | | mg/Kg | ☼ | 87 | 40 - 130 |
| Chromium | 10 | B | 24.1 | 32.8 | | mg/Kg | ☼ | 94 | 70 - 200 |
| Cobalt | 4.3 | | 60.1 | 57.9 | | mg/Kg | ☼ | 89 | 72 - 106 |
| Copper | 75 | | 30.1 | 73.5 | F1 | mg/Kg | ☼ | -5 | 37 - 187 |
| Iron | 7400 | | 120 | 8370 | 4 | mg/Kg | ☼ | 791 | 70 - 200 |
| Lead | 30 | ^ | 60.1 | 75.8 | ^ | mg/Kg | ☼ | 76 | 70 - 200 |
| Manganese | 81 | | 60.1 | 167 | | mg/Kg | ☼ | 143 | 40 - 200 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-62581-4 MS** — **Client Sample ID: SB-35-0.5-1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255392** — **Prep Batch: 253618**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Nickel | 5.1 | | 60.1 | 59.7 | | mg/Kg | ☼ | 91 | 61 - 126 |
| Silver | 0.20 | U | 6.01 | 5.74 | | mg/Kg | ☼ | 95 | 75 - 141 |
| Thallium | 0.81 | U | 241 | 199 | | mg/Kg | ☼ | 83 | 78 - 101 |
| Vanadium | 21 | | 60.1 | 81.4 | | mg/Kg | ☼ | 100 | 50 - 169 |
| Zinc | 58 | | 60.1 | 126 | | mg/Kg | ☼ | 114 | 70 - 200 |

**Lab Sample ID: 280-62581-4 MS** — **Client Sample ID: SB-35-0.5-1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255718** — **Prep Batch: 253618**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.47 | U ^ | 60.1 | 30.1 | ^ | mg/Kg | ☼ | 50 | 20 - 200 |
| Selenium | 1.3 | J ^ | 241 | 208 | ^ | mg/Kg | ☼ | 86 | 76 - 104 |

**Lab Sample ID: 280-62581-4 MSD** — **Client Sample ID: SB-35-0.5-1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255392** — **Prep Batch: 253618**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 6300 | | 243 | 14000 | 4 | mg/Kg | ☼ | 3165 | 50 - 200 | 12 | 20 |
| Arsenic | 2.1 | J | 121 | 106 | | mg/Kg | ☼ | 86 | 76 - 111 | 1 | 20 |
| Barium | 34 | | 243 | 269 | | mg/Kg | ☼ | 97 | 52 - 159 | 0 | 20 |
| Beryllium | 0.23 | J ^ | 6.07 | 5.47 | ^ | mg/Kg | ☼ | 86 | 72 - 105 | 0 | 20 |
| Cadmium | 0.25 | J | 12.1 | 11.0 | | mg/Kg | ☼ | 88 | 40 - 130 | 3 | 20 |
| Chromium | 10 | B | 24.3 | 30.4 | | mg/Kg | ☼ | 83 | 70 - 200 | 8 | 20 |
| Cobalt | 4.3 | | 60.7 | 57.0 | | mg/Kg | ☼ | 87 | 72 - 106 | 2 | 20 |
| Copper | 75 | | 30.3 | 94.3 | F2 | mg/Kg | ☼ | 64 | 37 - 187 | 25 | 20 |
| Iron | 7400 | | 121 | 7160 | 4 | mg/Kg | ☼ | -206 | 70 - 200 | 15 | 20 |
| Lead | 30 | ^ | 60.7 | 74.8 | ^ | mg/Kg | ☼ | 74 | 70 - 200 | 1 | 20 |
| Manganese | 81 | | 60.7 | 134 | F2 | mg/Kg | ☼ | 88 | 40 - 200 | 21 | 20 |
| Nickel | 5.1 | | 60.7 | 60.0 | | mg/Kg | ☼ | 90 | 61 - 126 | 0 | 20 |
| Silver | 0.20 | U | 6.07 | 5.69 | | mg/Kg | ☼ | 94 | 75 - 141 | 1 | 20 |
| Thallium | 0.81 | U | 243 | 200 | | mg/Kg | ☼ | 83 | 78 - 101 | 1 | 20 |
| Vanadium | 21 | | 60.7 | 81.5 | | mg/Kg | ☼ | 99 | 50 - 169 | 0 | 20 |
| Zinc | 58 | | 60.7 | 123 | | mg/Kg | ☼ | 108 | 70 - 200 | 2 | 20 |

**Lab Sample ID: 280-62581-4 MSD** — **Client Sample ID: SB-35-0.5-1**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 255718** — **Prep Batch: 253618**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.47 | U ^ | 60.7 | 34.6 | ^ | mg/Kg | ☼ | 57 | 20 - 200 | 14 | 20 |
| Selenium | 1.3 | J ^ | 243 | 213 | ^ | mg/Kg | ☼ | 87 | 76 - 104 | 2 | 20 |

# QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Method: 7471B - Mercury (CVAA)

**Lab Sample ID: MB 280-253767/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 253954** — **Prep Batch: 253767**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.5 | U | 17 | 5.5 | ug/Kg | | 11/19/14 08:43 | 11/19/14 20:56 | 1 |

**Lab Sample ID: LCS 280-253767/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 253954** — **Prep Batch: 253767**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | | | 417 | 409 | | ug/Kg | | 98 | 87 - 111 | | |

**Lab Sample ID: 280-62581-1 MS** — **Client Sample ID: SB-32-2.7-2.9**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 253954** — **Prep Batch: 253767**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 13 | J | 483 | 494 | | ug/Kg | ☼ | 100 | 87 - 111 | | |

**Lab Sample ID: 280-62581-1 MSD** — **Client Sample ID: SB-32-2.7-2.9**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 253954** — **Prep Batch: 253767**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 13 | J | 483 | 501 | | ug/Kg | ☼ | 101 | 87 - 111 | 1 | 20 |

## Method: Moisture - Percent Moisture

**Lab Sample ID: 280-62581-1 DU** — **Client Sample ID: SB-32-2.7-2.9**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 253445**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 14 | | | 14 | | % | | | | 1 | 20 |
| Percent Solids | 86 | | | 86 | | % | | | | 0.2 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## GC/MS Semi VOA

### Prep Batch: 253443

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Total/NA | Solid | 3546 | |
| 280-62581-2 | SB-33-1.5-2.5 | Total/NA | Solid | 3546 | |
| 280-62581-3 | SB-34-1.5-2.5 | Total/NA | Solid | 3546 | |
| 280-62581-4 - DL | SB-35-0.5-1 | Total/NA | Solid | 3546 | |
| 280-62581-4 | SB-35-0.5-1 | Total/NA | Solid | 3546 | |
| 280-62581-5 | SB-36-0.75-2 | Total/NA | Solid | 3546 | |
| LCS 280-253443/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-253443/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Analysis Batch: 254218

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Total/NA | Solid | 8270D SIM | 253443 |
| 280-62581-2 | SB-33-1.5-2.5 | Total/NA | Solid | 8270D SIM | 253443 |
| 280-62581-3 | SB-34-1.5-2.5 | Total/NA | Solid | 8270D SIM | 253443 |
| 280-62581-4 | SB-35-0.5-1 | Total/NA | Solid | 8270D SIM | 253443 |
| 280-62581-5 | SB-36-0.75-2 | Total/NA | Solid | 8270D SIM | 253443 |
| LCS 280-253443/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 253443 |

### Analysis Batch: 254523

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-4 - DL | SB-35-0.5-1 | Total/NA | Solid | 8270D SIM | 253443 |
| MB 280-253443/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 253443 |

## Metals

### Prep Batch: 253406

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Total/NA | Solid | 3050B | |
| 280-62581-1 MS | SB-32-2.7-2.9 | Total/NA | Solid | 3050B | |
| 280-62581-1 MSD | SB-32-2.7-2.9 | Total/NA | Solid | 3050B | |
| 280-62581-2 | SB-33-1.5-2.5 | Total/NA | Solid | 3050B | |
| 280-62581-3 | SB-34-1.5-2.5 | Total/NA | Solid | 3050B | |
| 280-62581-5 | SB-36-0.75-2 | Total/NA | Solid | 3050B | |
| LCS 280-253406/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-253406/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Prep Batch: 253618

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-4 | SB-35-0.5-1 | Total/NA | Solid | 3050B | |
| 280-62581-4 MS | SB-35-0.5-1 | Total/NA | Solid | 3050B | |
| 280-62581-4 MSD | SB-35-0.5-1 | Total/NA | Solid | 3050B | |
| LCS 280-253618/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-253618/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Prep Batch: 253767

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Total/NA | Solid | 7471B | |
| 280-62581-1 MS | SB-32-2.7-2.9 | Total/NA | Solid | 7471B | |
| 280-62581-1 MSD | SB-32-2.7-2.9 | Total/NA | Solid | 7471B | |
| 280-62581-2 | SB-33-1.5-2.5 | Total/NA | Solid | 7471B | |

## Metals (Continued)

### Prep Batch: 253767 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-3 | SB-34-1.5-2.5 | Total/NA | Solid | 7471B | |
| 280-62581-4 | SB-35-0.5-1 | Total/NA | Solid | 7471B | |
| 280-62581-5 | SB-36-0.75-2 | Total/NA | Solid | 7471B | |
| LCS 280-253767/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| MB 280-253767/1-A | Method Blank | Total/NA | Solid | 7471B | |

### Analysis Batch: 253954

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Total/NA | Solid | 7471B | 253767 |
| 280-62581-1 MS | SB-32-2.7-2.9 | Total/NA | Solid | 7471B | 253767 |
| 280-62581-1 MSD | SB-32-2.7-2.9 | Total/NA | Solid | 7471B | 253767 |
| 280-62581-2 | SB-33-1.5-2.5 | Total/NA | Solid | 7471B | 253767 |
| 280-62581-3 | SB-34-1.5-2.5 | Total/NA | Solid | 7471B | 253767 |
| 280-62581-4 | SB-35-0.5-1 | Total/NA | Solid | 7471B | 253767 |
| 280-62581-5 | SB-36-0.75-2 | Total/NA | Solid | 7471B | 253767 |
| LCS 280-253767/2-A | Lab Control Sample | Total/NA | Solid | 7471B | 253767 |
| MB 280-253767/1-A | Method Blank | Total/NA | Solid | 7471B | 253767 |

### Analysis Batch: 254873

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-1 MS | SB-32-2.7-2.9 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-1 MSD | SB-32-2.7-2.9 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-2 | SB-33-1.5-2.5 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-3 | SB-34-1.5-2.5 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-5 | SB-36-0.75-2 | Total/NA | Solid | 6010C | 253406 |
| LCS 280-253406/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 253406 |
| MB 280-253406/1-A | Method Blank | Total/NA | Solid | 6010C | 253406 |

### Analysis Batch: 255086

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-1 MS | SB-32-2.7-2.9 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-1 MSD | SB-32-2.7-2.9 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-2 | SB-33-1.5-2.5 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-3 | SB-34-1.5-2.5 | Total/NA | Solid | 6010C | 253406 |
| 280-62581-5 | SB-36-0.75-2 | Total/NA | Solid | 6010C | 253406 |
| LCS 280-253406/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 253406 |
| MB 280-253406/1-A | Method Blank | Total/NA | Solid | 6010C | 253406 |

### Analysis Batch: 255392

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-4 | SB-35-0.5-1 | Total/NA | Solid | 6010C | 253618 |
| 280-62581-4 MS | SB-35-0.5-1 | Total/NA | Solid | 6010C | 253618 |
| 280-62581-4 MSD | SB-35-0.5-1 | Total/NA | Solid | 6010C | 253618 |
| LCS 280-253618/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 253618 |
| MB 280-253618/1-A | Method Blank | Total/NA | Solid | 6010C | 253618 |

### Analysis Batch: 255718

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-4 | SB-35-0.5-1 | Total/NA | Solid | 6010C | 253618 |

## Metals (Continued)

### Analysis Batch: 255718 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-4 MS | SB-35-0.5-1 | Total/NA | Solid | 6010C | 253618 |
| 280-62581-4 MSD | SB-35-0.5-1 | Total/NA | Solid | 6010C | 253618 |
| LCS 280-253618/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 253618 |
| MB 280-253618/1-A | Method Blank | Total/NA | Solid | 6010C | 253618 |

## General Chemistry

### Analysis Batch: 253445

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-62581-1 | SB-32-2.7-2.9 | Total/NA | Solid | Moisture | |
| 280-62581-1 DU | SB-32-2.7-2.9 | Total/NA | Solid | Moisture | |
| 280-62581-2 | SB-33-1.5-2.5 | Total/NA | Solid | Moisture | |
| 280-62581-3 | SB-34-1.5-2.5 | Total/NA | Solid | Moisture | |
| 280-62581-4 | SB-35-0.5-1 | Total/NA | Solid | Moisture | |
| 280-62581-5 | SB-36-0.75-2 | Total/NA | Solid | Moisture | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Client Sample ID: SB-32-2.7-2.9 — Lab Sample ID: 280-62581-1

**Date Collected: 11/13/14 11:00**
**Date Received: 11/14/14 10:30**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 253445 | 11/17/14 13:51 | OB1 | TAL DEN |

## Client Sample ID: SB-32-2.7-2.9 — Lab Sample ID: 280-62581-1

**Date Collected: 11/13/14 11:00**
**Date Received: 11/14/14 10:30**
**Matrix: Solid**
**Percent Solids: 86.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 33.0 g | 1 mL | 253443 | 11/17/14 17:10 | EJP | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 33.0 g | 1 mL | 254218 | 11/21/14 13:01 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.08 g | 100 mL | 253406 | 11/18/14 08:14 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.08 g | 100 mL | 254873 | 11/25/14 20:35 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.08 g | 100 mL | 253406 | 11/18/14 08:14 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.08 g | 100 mL | 255086 | 11/26/14 15:37 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.62 g | 50 mL | 253767 | 11/19/14 08:43 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.62 g | 50 mL | 253954 | 11/19/14 21:01 | CGG | TAL DEN |

## Client Sample ID: SB-33-1.5-2.5 — Lab Sample ID: 280-62581-2

**Date Collected: 11/13/14 11:10**
**Date Received: 11/14/14 10:30**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 253445 | 11/17/14 13:51 | OB1 | TAL DEN |

## Client Sample ID: SB-33-1.5-2.5 — Lab Sample ID: 280-62581-2

**Date Collected: 11/13/14 11:10**
**Date Received: 11/14/14 10:30**
**Matrix: Solid**
**Percent Solids: 91.6**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.9 g | 1 mL | 253443 | 11/17/14 17:10 | EJP | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.9 g | 1 mL | 254218 | 11/21/14 13:29 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.16 g | 100 mL | 253406 | 11/18/14 08:14 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.16 g | 100 mL | 254873 | 11/25/14 20:48 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.16 g | 100 mL | 253406 | 11/18/14 08:14 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.16 g | 100 mL | 255086 | 11/26/14 15:49 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.63 g | 50 mL | 253767 | 11/19/14 08:43 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.63 g | 50 mL | 253954 | 11/19/14 21:08 | CGG | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Client Sample ID: SB-34-1.5-2.5 — Lab Sample ID: 280-62581-3

**Date Collected: 11/13/14 11:15** — **Matrix: Solid**
**Date Received: 11/14/14 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 253445 | 11/17/14 13:51 | OB1 | TAL DEN |

## Client Sample ID: SB-34-1.5-2.5 — Lab Sample ID: 280-62581-3

**Date Collected: 11/13/14 11:15** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 79.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.4 g | 1 mL | 253443 | 11/17/14 17:10 | EJP | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.4 g | 1 mL | 254218 | 11/21/14 13:56 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.14 g | 100 mL | 253406 | 11/18/14 08:14 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.14 g | 100 mL | 254873 | 11/25/14 20:50 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.14 g | 100 mL | 253406 | 11/18/14 08:14 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.14 g | 100 mL | 255086 | 11/26/14 15:52 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.68 g | 50 mL | 253767 | 11/19/14 08:43 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.68 g | 50 mL | 253954 | 11/19/14 21:10 | CGG | TAL DEN |

## Client Sample ID: SB-35-0.5-1 — Lab Sample ID: 280-62581-4

**Date Collected: 11/13/14 11:40** — **Matrix: Solid**
**Date Received: 11/14/14 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 253445 | 11/17/14 13:51 | OB1 | TAL DEN |

## Client Sample ID: SB-35-0.5-1 — Lab Sample ID: 280-62581-4

**Date Collected: 11/13/14 11:40** — **Matrix: Solid**
**Date Received: 11/14/14 10:30** — **Percent Solids: 69.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.8 g | 1 mL | 253443 | 11/17/14 17:10 | EJP | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.8 g | 1 mL | 254218 | 11/21/14 14:24 | NRC | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 30.8 g | 1 mL | 253443 | 11/17/14 17:10 | EJP | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 2 | 30.8 g | 1 mL | 254523 | 11/24/14 16:24 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.15 g | 100 mL | 253618 | 11/18/14 13:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.15 g | 100 mL | 255392 | 12/01/14 20:08 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.15 g | 100 mL | 253618 | 11/18/14 13:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.15 g | 100 mL | 255718 | 12/03/14 17:15 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.65 g | 50 mL | 253767 | 11/19/14 08:43 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.65 g | 50 mL | 253954 | 11/19/14 21:13 | CGG | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Client Sample ID: SB-36-0.75-2

**Lab Sample ID: 280-62581-5**
**Date Collected: 11/13/14 12:00**
**Matrix: Solid**
**Date Received: 11/14/14 10:30**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 253445 | 11/17/14 13:51 | OB1 | TAL DEN |

## Client Sample ID: SB-36-0.75-2

**Lab Sample ID: 280-62581-5**
**Date Collected: 11/13/14 12:00**
**Matrix: Solid**
**Date Received: 11/14/14 10:30**
**Percent Solids: 87.6**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.2 g | 1 mL | 253443 | 11/17/14 17:10 | EJP | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.2 g | 1 mL | 254218 | 11/21/14 14:52 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.02 g | 100 mL | 253406 | 11/18/14 08:14 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.02 g | 100 mL | 254873 | 11/25/14 20:53 | LLB | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.02 g | 100 mL | 253406 | 11/18/14 08:14 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.02 g | 100 mL | 255086 | 11/26/14 15:55 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.64 g | 50 mL | 253767 | 11/19/14 08:43 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.64 g | 50 mL | 253954 | 11/19/14 21:15 | CGG | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-62581-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

280-62581 Chain of Custody

Sampler ID _____

Temperature on Receipt 1.5+0.5

IR-5 11/14/14 Transfer by [illegible]

Drinking Water? Yes ☐ No ☐

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

| | | | |
|---|---|---|---|
| Client: Geosyntec Consultants | Project Manager: Beau Hodge | Date: 11-13-14 | Chain of Custody Number: 183742 |
| Address: 2501 Blue Ridge Rd Suite 430 | Telephone Number (Area Code)/Fax Number: 919 870-0576 | Lab Number | Page 1 of 1 |
| City: Raleigh; State: NC; Zip Code: 27607 | Site Contact: Mike Schott | Lab Contact | |
| Project Name and Location (State): UNC Cogen NC | Carrier/Waybill Number | | |
| Contract/Purchase Order/Quote No. | | | |

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Air | Aqueous | Sed. | Soil | Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | 6010C | 8270D SIM | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB-32-2.7-2.9 | 11/13/14 | 1100 | | | | X | X | | | | | | X | X | (1) specific project list of Metals |
| SB-33-1.5-2.5 | ↓ | 1110 | | | | ↓ | ↓ | | | | | | X | X | |
| SB-34-1.5-2.5 | ↓ | 1115 | | | | ↓ | ↓ | | | | | | X | X | |
| SB-35-0.5-1 | ↓ | 1140 | | | | ↓ | ↓ | | | | | | X | X | (2) PAHs by 8270 SIM |
| SB-36-0.75-2 | ↓ | 1200 | | | | ↓ | ↓ | | | | | | X | X | |

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Standard

QC Requirements (Specify)

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By: [signature] | Date: 11/13/14 | Time: 1455 | 1. Received By: [signature] | Date: 11/14/14 | Time: 1030 |
| 2. Relinquished By | Date | Time | 2. Received By | Date | Time |
| 3. Relinquished By | Date | Time | 3. Received By | Date | Time |

Comments

**DISTRIBUTION:** WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-62581-1

**Login Number: 62581**
**List Number: 1**
**Creator: Orfield, Tayler C**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | FIELD LEFT BLANK |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-68396-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 5:45:29 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| X | Surrogate is outside control limits |
| D | Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |
| B | Compound was found in the blank and sample. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-68396-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-68396-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**

The samples were received on 4/24/2015 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.5º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 Middlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 4/28/2015 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1º C.

**SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)**

Samples SB39-18-18.5-150423 (280-68396-1), SB40-9-9.5-150423 (280-68396-2), SB940-9-9.5-150423 (280-68396-3), SB38-19.5-20-150422 (280-68396-4), SB41-11.5-12-150423 (280-68396-5) and SB40-12-12.5-150423 (280-68396-6) were analyzed for Semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with EPA SW-846 Method 8270D. The samples were prepared on 04/29/2015 and 05/07/2015 and analyzed on 05/05/2015, 05/06/2015, 05/12/2015 and 05/15/2015.

Due to target analyte concentration, sample SB38-19.5-20-150422 (280-68396-4)[4X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Nitrobenzene-d5 failed the surrogate recovery criteria low in the undiluted analysis of SB38-19.5-20-150422 (280-68396-4). 2-Fluorobiphenyl, Nitrobenzene-d5, Terphenyl-d14 failed the surrogate recovery criteria low in the 4x dilution of SB38-19.5-20-150422 (280-68396-4). The sample was re-extracted one day outside of holding time. Upon analysis, the surrogate recovery in the undiluted re-extract was acceptable and 2-Fluorobiphenyl, Nitrobenzene-d5, Terphenyl-d14 failed the surrogate recovery criteria low in the 10x dilution. It was noted that the target analyte results were considerably higher in the re-extract than the initial analysis. The client was contacted and instructed that laboratory to report the initial analysis within holding time.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**

Samples SB39-18-18.5-150423 (280-68396-1), SB40-9-9.5-150423 (280-68396-2), SB940-9-9.5-150423 (280-68396-3), SB38-19.5-20-150422 (280-68396-4), SB41-11.5-12-150423 (280-68396-5) and SB40-12-12.5-150423 (280-68396-6) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/29/2015 and analyzed on 04/30/2015.

## Job ID: 280-68396-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

Barium was detected in method blank MB 280-274813/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Aluminum and Iron failed the recovery criteria high for the MS of sample SB39-18-18.5-150423MS (280-68396-1) in batch 280-275514. Aluminum and Iron failed the recovery criteria high for the MSD of sample SB39-18-18.5-150423MSD (280-68396-1) in batch 280-275514. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount. The PDS failed the recovery critera low for for Silver and the SD failed %D criteria for Aluminum. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY (CVAA)**

Samples SB39-18-18.5-150423 (280-68396-1), SB40-9-9.5-150423 (280-68396-2), SB940-9-9.5-150423 (280-68396-3), SB38-19.5-20-150422 (280-68396-4), SB41-11.5-12-150423 (280-68396-5) and SB40-12-12.5-150423 (280-68396-6) were analyzed for total mercury (CVAA) in accordance with EPA SW-846 Method 7471B. The samples were prepared and analyzed on 04/28/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS)**

Samples SB39-18-18.5-150423 (280-68396-1), SB40-9-9.5-150423 (280-68396-2), SB940-9-9.5-150423 (280-68396-3), SB38-19.5-20-150422 (280-68396-4), SB41-11.5-12-150423 (280-68396-5) and SB40-12-12.5-150423 (280-68396-6) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were leached on 05/11/2015 and analyzed on 05/12/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**PERCENT SOLIDS**

Samples SB39-18-18.5-150423 (280-68396-1), SB40-9-9.5-150423 (280-68396-2), SB940-9-9.5-150423 (280-68396-3), SB38-19.5-20-150422 (280-68396-4), SB41-11.5-12-150423 (280-68396-5) and SB40-12-12.5-150423 (280-68396-6) were analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 04/28/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Client Sample ID: SB39-18-18.5-150423 — Lab Sample ID: 280-68396-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 550 | J | 5200 | 320 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 530 | J | 5200 | 170 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 3100 | J | 5200 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 2500 | J | 5200 | 750 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 3600 | J | 5200 | 940 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 4100 | J | 5200 | 770 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 4000 | J | 5200 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 3200 | J | 5200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 1400 | J | 5200 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 4100 | J | 5200 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 3600 | J | 5200 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 570 | J | 5200 | 490 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 2900 | J | 5200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 510 | J | 5200 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 1600 | J | 5200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 6200 | | 5200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 8200 | | 11 | 1.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.4 | J | 2.2 | 0.72 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 22 | B | 1.1 | 0.083 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.27 | J | 0.54 | 0.036 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 6.8 | | 1.6 | 0.063 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 4.7 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 6.5 | | 2.2 | 0.24 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 5900 | | 16 | 4.1 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 11 | | 0.87 | 0.29 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 150 | | 1.1 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.9 | J | 4.3 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 16 | | 2.2 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 12 | | 3.3 | 0.43 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 13 | J | 21 | 6.7 | ug/Kg | 1 | ☼ | 7471B | Total/NA |
| Sulfate | 75 | | 52 | 1.8 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SB40-9-9.5-150423 — Lab Sample ID: 280-68396-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 1700 | J | 5100 | 260 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 1500 | J | 5100 | 310 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 670 | J | 5100 | 160 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 1300 | J | 5100 | 170 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 2200 | J | 5100 | 730 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 4000 | J | 5100 | 920 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 3500 | J | 5100 | 750 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 5500 | | 5100 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 2700 | J | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 1700 | J | 5100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 6200 | | 5100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 9900 | | 5100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1100 | J | 5100 | 480 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 2400 | J | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 1100 | J | 5100 | 330 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Client Sample ID: SB40-9-9.5-150423 (Continued) — Lab Sample ID: 280-68396-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 10000 | | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 8800 | | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 5300 | | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.4 | J | 2.0 | 0.67 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 35 | B | 1.0 | 0.077 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.20 | J | 0.51 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 7.4 | | 1.5 | 0.059 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 2.2 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 7.4 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 5400 | | 15 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 9.0 | | 0.81 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 100 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.3 | J | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 13 | | 2.0 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 8.5 | | 3.1 | 0.40 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 13 | J | 19 | 6.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |
| Sulfate | 64 | | 49 | 1.7 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SB940-9-9.5-150423 — Lab Sample ID: 280-68396-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 2700 | J | 5100 | 270 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 2300 | J | 5100 | 320 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 1600 | J | 5100 | 170 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 1600 | J | 5100 | 740 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 3300 | J | 5100 | 920 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 3200 | J | 5100 | 760 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 5300 | | 5100 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 2600 | J | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 1700 | J | 5100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 6600 | | 5100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 9300 | | 5100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 1000 | J | 5100 | 480 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 2400 | J | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 1500 | J | 5100 | 330 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 9900 | | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 8300 | | 5100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 4700 | | 8.9 | 1.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 0.83 | J | 1.8 | 0.59 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 31 | B | 0.89 | 0.067 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.19 | J | 0.44 | 0.029 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 5.0 | | 1.3 | 0.052 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 2.0 | | 0.89 | 0.089 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 6.6 | | 1.8 | 0.19 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 4900 | | 13 | 3.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 7.9 | | 0.71 | 0.24 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 89 | | 0.89 | 0.089 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.1 | J | 3.6 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 11 | | 1.8 | 0.083 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 8.5 | | 2.7 | 0.35 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Client Sample ID: SB940-9-9.5-150423 (Continued) — Lab Sample ID: 280-68396-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 16 | J | 19 | 6.2 | ug/Kg | 1 | ☼ | 7471B | Total/NA |
| Sulfate | 63 | | 51 | 1.7 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SB38-19.5-20-150422 — Lab Sample ID: 280-68396-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 3100 | J | 6400 | 330 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 7400 | | 6400 | 390 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 56000 | | 6400 | 200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 11000 | | 6400 | 220 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 97000 | | 6400 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 52000 | | 6400 | 940 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 65000 | | 6400 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 25000 | | 6400 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 23000 | | 6400 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 96000 | | 6400 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 6300 | J | 6400 | 1700 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 200000 | | 6400 | 600 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 30000 | | 6400 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 24000 | | 6400 | 410 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 49000 | | 6400 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene - DL | 200000 | | 25000 | 3700 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene - DL | 530000 | | 25000 | 5100 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 410000 | | 25000 | 5600 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 16000 | | 12 | 1.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.3 | J | 2.4 | 0.80 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 59 | B | 1.2 | 0.092 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.57 | J | 0.61 | 0.040 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 3.9 | | 1.8 | 0.070 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.9 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 5.9 | | 2.4 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 23000 | | 18 | 4.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 9.2 | | 0.97 | 0.33 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 160 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.9 | J | 4.9 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 21 | | 2.4 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 48 | | 3.6 | 0.48 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 24 | | 23 | 7.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |
| Sulfate | 76 | | 64 | 2.2 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SB41-11.5-12-150423 — Lab Sample ID: 280-68396-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 11000 | | 5200 | 270 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 8800 | | 5200 | 320 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 2400 | J | 5200 | 170 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 7600 | | 5200 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 7800 | | 5200 | 750 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 14000 | | 5200 | 930 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 13000 | | 5200 | 770 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SB41-11.5-12-150423 (Continued) — Lab Sample ID: 280-68396-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[b]fluoranthene | 22000 | | 5200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 9400 | | 5200 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 6300 | | 5200 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 27000 | | 5200 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 2400 | J | 5200 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 39000 | | 5200 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 4400 | J | 5200 | 490 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 9700 | | 5200 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 6500 | | 5200 | 340 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 43000 | | 5200 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 37000 | | 5200 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 7400 | | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 0.69 | J | 2.0 | 0.67 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 32 | B | 1.0 | 0.078 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.29 | J | 0.51 | 0.034 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 7.2 | | 1.5 | 0.059 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 1.7 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 25 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 6600 | | 15 | 3.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 7.8 | | 0.82 | 0.28 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 38 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 1.4 | J | 4.1 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 17 | | 2.0 | 0.096 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 11 | | 3.1 | 0.41 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 25 | | 19 | 6.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |
| Sulfate | 39 | J | 54 | 1.9 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SB40-12-12.5-150423 — Lab Sample ID: 280-68396-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthylene | 1600 | J | 5700 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 1400 | J | 5700 | 820 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 2500 | J | 5700 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 2100 | J | 5700 | 840 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 2800 | J | 5700 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 1700 | J | 5700 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 2900 | J | 5700 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 4000 | J | 5700 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 530 | J | 5700 | 530 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 1700 | J | 5700 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 480 | J | 5700 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 2900 | J | 5700 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 4900 | J | 5700 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 11000 | | 10 | 1.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 0.93 | J | 2.0 | 0.67 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 16 | B | 1.0 | 0.077 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.29 | J | 0.51 | 0.033 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 11 | | 1.5 | 0.059 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 4.1 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 68 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Client Sample ID: SB40-12-12.5-150423 (Continued) — Lab Sample ID: 280-68396-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 13000 | | 15 | 3.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 11 | | 0.81 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 210 | | 1.0 | 0.10 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.5 | J | 4.1 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 21 | | 2.0 | 0.095 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 32 | | 3.0 | 0.40 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Sulfate | 39 | J | 54 | 1.8 | mg/Kg | 1 | ☼ | 9056A | Soluble |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7471B | Mercury (CVAA) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Solid | 04/23/15 15:30 | 04/24/15 09:30 |
| 280-68396-2 | SB40-9-9.5-150423 | Solid | 04/23/15 15:40 | 04/24/15 09:30 |
| 280-68396-3 | SB940-9-9.5-150423 | Solid | 04/23/15 15:40 | 04/24/15 09:30 |
| 280-68396-4 | SB38-19.5-20-150422 | Solid | 04/22/15 17:20 | 04/24/15 09:30 |
| 280-68396-5 | SB41-11.5-12-150423 | Solid | 04/23/15 16:15 | 04/24/15 09:30 |
| 280-68396-6 | SB40-12-12.5-150423 | Solid | 04/23/15 16:00 | 04/24/15 09:30 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SB39-18-18.5-150423** — **Lab Sample ID: 280-68396-1**
**Date Collected: 04/23/15 15:30** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 91.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 270 | U | 5200 | 270 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **2-Methylnaphthalene** | **550** | **J** | 5200 | 320 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Acenaphthene** | **530** | **J** | 5200 | 170 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Acenaphthylene** | **3100** | **J** | 5200 | 180 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Anthracene** | **2500** | **J** | 5200 | 750 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Benzo[a]anthracene** | **3600** | **J** | 5200 | 940 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Benzo[a]pyrene** | **4100** | **J** | 5200 | 770 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Benzo[b]fluoranthene** | **4000** | **J** | 5200 | 1300 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Benzo[g,h,i]perylene** | **3200** | **J** | 5200 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Benzo[k]fluoranthene** | **1400** | **J** | 5200 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Chrysene** | **4100** | **J** | 5200 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| Dibenz(a,h)anthracene | 1400 | U | 5200 | 1400 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Fluoranthene** | **3600** | **J** | 5200 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Fluorene** | **570** | **J** | 5200 | 490 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **2900** | **J** | 5200 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Naphthalene** | **510** | **J** | 5200 | 340 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Phenanthrene** | **1600** | **J** | 5200 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |
| **Pyrene** | **6200** | | 5200 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 16:47 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | | *39 - 120* | *04/29/15 15:54* | *05/05/15 16:47* | *1* |
| *Nitrobenzene-d5* | *72* | | *42 - 120* | *04/29/15 15:54* | *05/05/15 16:47* | *1* |
| *Terphenyl-d14* | *81* | | *35 - 124* | *04/29/15 15:54* | *05/05/15 16:47* | *1* |

**Client Sample ID: SB40-9-9.5-150423** — **Lab Sample ID: 280-68396-2**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | **1700** | **J** | 5100 | 260 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **2-Methylnaphthalene** | **1500** | **J** | 5100 | 310 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Acenaphthene** | **670** | **J** | 5100 | 160 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Acenaphthylene** | **1300** | **J** | 5100 | 170 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Anthracene** | **2200** | **J** | 5100 | 730 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Benzo[a]anthracene** | **4000** | **J** | 5100 | 920 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Benzo[a]pyrene** | **3500** | **J** | 5100 | 750 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Benzo[b]fluoranthene** | **5500** | | 5100 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Benzo[g,h,i]perylene** | **2700** | **J** | 5100 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Benzo[k]fluoranthene** | **1700** | **J** | 5100 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Chrysene** | **6200** | | 5100 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| Dibenz(a,h)anthracene | 1300 | U | 5100 | 1300 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Fluoranthene** | **9900** | | 5100 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Fluorene** | **1100** | **J** | 5100 | 480 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **2400** | **J** | 5100 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Naphthalene** | **1100** | **J** | 5100 | 330 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Phenanthrene** | **10000** | | 5100 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |
| **Pyrene** | **8800** | | 5100 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:12 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *72* | | *39 - 120* | *04/29/15 15:54* | *05/05/15 17:12* | *1* |
| *Nitrobenzene-d5* | *72* | | *42 - 120* | *04/29/15 15:54* | *05/05/15 17:12* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SB40-9-9.5-150423** — **Lab Sample ID: 280-68396-2**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.4**

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| Terphenyl-d14 | 74 | | 35 - 124 | 04/29/15 15:54 | 05/05/15 17:12 | 1 |

**Client Sample ID: SB940-9-9.5-150423** — **Lab Sample ID: 280-68396-3**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 2700 | J | 5100 | 270 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| 2-Methylnaphthalene | 2300 | J | 5100 | 320 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Acenaphthene | 160 | U | 5100 | 160 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Acenaphthylene | 1600 | J | 5100 | 170 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Anthracene | 1600 | J | 5100 | 740 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Benzo[a]anthracene | 3300 | J | 5100 | 920 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Benzo[a]pyrene | 3200 | J | 5100 | 760 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Benzo[b]fluoranthene | 5300 | | 5100 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Benzo[g,h,i]perylene | 2600 | J | 5100 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Benzo[k]fluoranthene | 1700 | J | 5100 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Chrysene | 6600 | | 5100 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Dibenz(a,h)anthracene | 1300 | U | 5100 | 1300 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Fluoranthene | 9300 | | 5100 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Fluorene | 1000 | J | 5100 | 480 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Indeno[1,2,3-cd]pyrene | 2400 | J | 5100 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Naphthalene | 1500 | J | 5100 | 330 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Phenanthrene | 9900 | | 5100 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Pyrene | 8300 | | 5100 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 17:37 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 71 | | 39 - 120 | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Nitrobenzene-d5 | 70 | | 42 - 120 | 04/29/15 15:54 | 05/05/15 17:37 | 1 |
| Terphenyl-d14 | 72 | | 35 - 124 | 04/29/15 15:54 | 05/05/15 17:37 | 1 |

**Client Sample ID: SB38-19.5-20-150422** — **Lab Sample ID: 280-68396-4**
**Date Collected: 04/22/15 17:20** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 75.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 3100 | J | 6400 | 330 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| 2-Methylnaphthalene | 7400 | | 6400 | 390 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Acenaphthene | 56000 | | 6400 | 200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Acenaphthylene | 11000 | | 6400 | 220 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Benzo[a]anthracene | 97000 | | 6400 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Benzo[a]pyrene | 52000 | | 6400 | 940 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Benzo[b]fluoranthene | 65000 | | 6400 | 1500 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Benzo[g,h,i]perylene | 25000 | | 6400 | 1400 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Benzo[k]fluoranthene | 23000 | | 6400 | 1300 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Chrysene | 96000 | | 6400 | 1300 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Dibenz(a,h)anthracene | 6300 | J | 6400 | 1700 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Fluorene | 200000 | | 6400 | 600 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Indeno[1,2,3-cd]pyrene | 30000 | | 6400 | 1400 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Naphthalene | 24000 | | 6400 | 410 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Phenanthrene | 49000 | | 6400 | 1400 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:03 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 41 | | 39 - 120 | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Nitrobenzene-d5 | 38 | X | 42 - 120 | 04/29/15 15:54 | 05/05/15 18:03 | 1 |
| Terphenyl-d14 | 43 | | 35 - 124 | 04/29/15 15:54 | 05/05/15 18:03 | 1 |

**Client Sample ID: SB41-11.5-12-150423** — **Lab Sample ID: 280-68396-5**
**Date Collected: 04/23/15 16:15** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 88.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 11000 | | 5200 | 270 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| 2-Methylnaphthalene | 8800 | | 5200 | 320 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Acenaphthene | 2400 | J | 5200 | 170 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Acenaphthylene | 7600 | | 5200 | 180 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Anthracene | 7800 | | 5200 | 750 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Benzo[a]anthracene | 14000 | | 5200 | 930 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Benzo[a]pyrene | 13000 | | 5200 | 770 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Benzo[b]fluoranthene | 22000 | | 5200 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Benzo[g,h,i]perylene | 9400 | | 5200 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Benzo[k]fluoranthene | 6300 | | 5200 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Chrysene | 27000 | | 5200 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Dibenz(a,h)anthracene | 2400 | J | 5200 | 1300 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Fluoranthene | 39000 | | 5200 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Fluorene | 4400 | J | 5200 | 490 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Indeno[1,2,3-cd]pyrene | 9700 | | 5200 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Naphthalene | 6500 | | 5200 | 340 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Phenanthrene | 43000 | | 5200 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Pyrene | 37000 | | 5200 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:28 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 72 | | 39 - 120 | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Nitrobenzene-d5 | 75 | | 42 - 120 | 04/29/15 15:54 | 05/05/15 18:28 | 1 |
| Terphenyl-d14 | 73 | | 35 - 124 | 04/29/15 15:54 | 05/05/15 18:28 | 1 |

**Client Sample ID: SB40-12-12.5-150423** — **Lab Sample ID: 280-68396-6**
**Date Collected: 04/23/15 16:00** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 87.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 290 | U | 5700 | 290 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| 2-Methylnaphthalene | 350 | U | 5700 | 350 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Acenaphthene | 180 | U | 5700 | 180 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Acenaphthylene | 1600 | J | 5700 | 190 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Anthracene | 1400 | J | 5700 | 820 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Benzo[a]anthracene | 2500 | J | 5700 | 1000 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Benzo[a]pyrene | 2100 | J | 5700 | 840 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Benzo[b]fluoranthene | 2800 | J | 5700 | 1400 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Benzo[g,h,i]perylene | 1700 | J | 5700 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Benzo[k]fluoranthene | 1100 | U | 5700 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Chrysene | 2900 | J | 5700 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Dibenz(a,h)anthracene | 1500 | U | 5700 | 1500 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Fluoranthene | 4000 | J | 5700 | 1100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Fluorene | 530 | J | 5700 | 530 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Indeno[1,2,3-cd]pyrene | 1700 | J | 5700 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Naphthalene | 480 | J | 5700 | 370 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |
| Phenanthrene | 2900 | J | 5700 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SB40-12-12.5-150423** — **Lab Sample ID: 280-68396-6**
**Date Collected: 04/23/15 16:00** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 87.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Pyrene | 4900 | J | 5700 | 1200 | ng/Kg | ☼ | 04/29/15 15:54 | 05/05/15 18:53 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *76* | | *39 - 120* | *04/29/15 15:54* | *05/05/15 18:53* | *1* |
| *Nitrobenzene-d5* | *86* | | *42 - 120* | *04/29/15 15:54* | *05/05/15 18:53* | *1* |
| *Terphenyl-d14* | *77* | | *35 - 124* | *04/29/15 15:54* | *05/05/15 18:53* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

**Client Sample ID: SB38-19.5-20-150422** — **Lab Sample ID: 280-68396-4**
**Date Collected: 04/22/15 17:20** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 75.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Anthracene | 200000 | | 25000 | 3700 | ng/Kg | ☼ | 04/29/15 15:54 | 05/06/15 15:43 | 4 |
| Fluoranthene | 530000 | | 25000 | 5100 | ng/Kg | ☼ | 04/29/15 15:54 | 05/06/15 15:43 | 4 |
| Pyrene | 410000 | | 25000 | 5600 | ng/Kg | ☼ | 04/29/15 15:54 | 05/06/15 15:43 | 4 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *0* | *D X* | *39 - 120* | *04/29/15 15:54* | *05/06/15 15:43* | *4* |
| *Nitrobenzene-d5* | *0* | *D X* | *42 - 120* | *04/29/15 15:54* | *05/06/15 15:43* | *4* |
| *Terphenyl-d14* | *0* | *D X* | *35 - 124* | *04/29/15 15:54* | *05/06/15 15:43* | *4* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: SB39-18-18.5-150423** — **Lab Sample ID: 280-68396-1**
**Date Collected: 04/23/15 15:30** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 91.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 8200 | | 11 | 1.7 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Antimony | 0.41 | U | 1.6 | 0.41 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Arsenic | 1.4 | J | 2.2 | 0.72 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Barium | 22 | B | 1.1 | 0.083 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Beryllium | 0.27 | J | 0.54 | 0.036 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Cadmium | 0.045 | U | 0.54 | 0.045 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Chromium | 6.8 | | 1.6 | 0.063 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Cobalt | 4.7 | | 1.1 | 0.11 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Copper | 6.5 | | 2.2 | 0.24 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Iron | 5900 | | 16 | 4.1 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Lead | 11 | | 0.87 | 0.29 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Manganese | 150 | | 1.1 | 0.11 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Nickel | 1.9 | J | 4.3 | 0.13 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Selenium | 0.93 | U | 1.4 | 0.93 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Silver | 0.17 | U | 1.1 | 0.17 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Thallium | 0.71 | U | 1.3 | 0.71 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Vanadium | 16 | | 2.2 | 0.10 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |
| Zinc | 12 | | 3.3 | 0.43 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:20 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Method: 6010C - Metals (ICP)

**Client Sample ID: SB40-9-9.5-150423** — **Lab Sample ID: 280-68396-2**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 5300 | | 10 | 1.6 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Antimony | 0.39 | U | 1.5 | 0.39 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Arsenic | 1.4 | J | 2.0 | 0.67 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Barium | 35 | B | 1.0 | 0.077 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Beryllium | 0.20 | J | 0.51 | 0.034 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Cadmium | 0.042 | U | 0.51 | 0.042 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Chromium | 7.4 | | 1.5 | 0.059 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Cobalt | 2.2 | | 1.0 | 0.10 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Copper | 7.4 | | 2.0 | 0.22 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Iron | 5400 | | 15 | 3.9 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Lead | 9.0 | | 0.81 | 0.27 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Manganese | 100 | | 1.0 | 0.10 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Nickel | 1.3 | J | 4.1 | 0.13 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Selenium | 0.88 | U | 1.3 | 0.88 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Thallium | 0.66 | U | 1.2 | 0.66 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Vanadium | 13 | | 2.0 | 0.096 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |
| Zinc | 8.5 | | 3.1 | 0.40 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:44 | 1 |

**Client Sample ID: SB940-9-9.5-150423** — **Lab Sample ID: 280-68396-3**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 4700 | | 8.9 | 1.4 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Antimony | 0.34 | U | 1.3 | 0.34 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Arsenic | 0.83 | J | 1.8 | 0.59 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Barium | 31 | B | 0.89 | 0.067 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Beryllium | 0.19 | J | 0.44 | 0.029 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Cadmium | 0.036 | U | 0.44 | 0.036 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Chromium | 5.0 | | 1.3 | 0.052 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Cobalt | 2.0 | | 0.89 | 0.089 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Copper | 6.6 | | 1.8 | 0.19 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Iron | 4900 | | 13 | 3.4 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Lead | 7.9 | | 0.71 | 0.24 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Manganese | 89 | | 0.89 | 0.089 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Nickel | 1.1 | J | 3.6 | 0.11 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Selenium | 0.76 | U | 1.2 | 0.76 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Silver | 0.14 | U | 0.89 | 0.14 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Thallium | 0.58 | U | 1.1 | 0.58 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Vanadium | 11 | | 1.8 | 0.083 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |
| Zinc | 8.5 | | 2.7 | 0.35 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:46 | 1 |

**Client Sample ID: SB38-19.5-20-150422** — **Lab Sample ID: 280-68396-4**
**Date Collected: 04/22/15 17:20** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 75.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 16000 | | 12 | 1.9 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| Antimony | 0.46 | U | 1.8 | 0.46 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| Arsenic | 1.3 | J | 2.4 | 0.80 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| Barium | 59 | B | 1.2 | 0.092 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SB38-19.5-20-150422** — **Lab Sample ID: 280-68396-4**
**Date Collected: 04/22/15 17:20** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 75.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Beryllium** | **0.57** | **J** | 0.61 | 0.040 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| Cadmium | 0.050 | U | 0.61 | 0.050 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Chromium** | **3.9** | | 1.8 | 0.070 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Cobalt** | **1.9** | | 1.2 | 0.12 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Copper** | **5.9** | | 2.4 | 0.26 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Iron** | **23000** | | 18 | 4.6 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Lead** | **9.2** | | 0.97 | 0.33 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Manganese** | **160** | | 1.2 | 0.12 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Nickel** | **1.9** | **J** | 4.9 | 0.15 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| Selenium | 1.0 | U | 1.6 | 1.0 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| Silver | 0.19 | U | 1.2 | 0.19 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| Thallium | 0.79 | U | 1.5 | 0.79 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Vanadium** | **21** | | 2.4 | 0.11 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |
| **Zinc** | **48** | | 3.6 | 0.48 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:49 | 1 |

**Client Sample ID: SB41-11.5-12-150423** — **Lab Sample ID: 280-68396-5**
**Date Collected: 04/23/15 16:15** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 88.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **7400** | | 10 | 1.6 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| Antimony | 0.39 | U | 1.5 | 0.39 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Arsenic** | **0.69** | **J** | 2.0 | 0.67 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Barium** | **32** | **B** | 1.0 | 0.078 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Beryllium** | **0.29** | **J** | 0.51 | 0.034 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| Cadmium | 0.042 | U | 0.51 | 0.042 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Chromium** | **7.2** | | 1.5 | 0.059 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Cobalt** | **1.7** | | 1.0 | 0.10 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Copper** | **25** | | 2.0 | 0.22 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Iron** | **6600** | | 15 | 3.9 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Lead** | **7.8** | | 0.82 | 0.28 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Manganese** | **38** | | 1.0 | 0.10 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Nickel** | **1.4** | **J** | 4.1 | 0.13 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| Selenium | 0.88 | U | 1.3 | 0.88 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| Thallium | 0.66 | U | 1.2 | 0.66 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Vanadium** | **17** | | 2.0 | 0.096 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |
| **Zinc** | **11** | | 3.1 | 0.41 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:52 | 1 |

**Client Sample ID: SB40-12-12.5-150423** — **Lab Sample ID: 280-68396-6**
**Date Collected: 04/23/15 16:00** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 87.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **11000** | | 10 | 1.6 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| **Arsenic** | **0.93** | **J** | 2.0 | 0.67 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| **Barium** | **16** | **B** | 1.0 | 0.077 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| **Beryllium** | **0.29** | **J** | 0.51 | 0.033 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Cadmium | 0.042 | U | 0.51 | 0.042 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| **Chromium** | **11** | | 1.5 | 0.059 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| **Cobalt** | **4.1** | | 1.0 | 0.10 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SB40-12-12.5-150423** — **Lab Sample ID: 280-68396-6**
**Date Collected: 04/23/15 16:00** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 87.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Copper | 68 | | 2.0 | 0.22 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Iron | 13000 | | 15 | 3.8 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Lead | 11 | | 0.81 | 0.27 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Manganese | 210 | | 1.0 | 0.10 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Nickel | 3.5 | J | 4.1 | 0.12 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Selenium | 0.87 | U | 1.3 | 0.87 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Thallium | 0.66 | U | 1.2 | 0.66 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Vanadium | 21 | | 2.0 | 0.095 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |
| Zinc | 32 | | 3.0 | 0.40 | mg/Kg | ☼ | 04/29/15 14:30 | 04/30/15 20:54 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SB39-18-18.5-150423** — **Lab Sample ID: 280-68396-1**
**Date Collected: 04/23/15 15:30** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 91.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 13 | J | 21 | 6.7 | ug/Kg | ☼ | 04/28/15 12:00 | 04/28/15 18:13 | 1 |

**Client Sample ID: SB40-9-9.5-150423** — **Lab Sample ID: 280-68396-2**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 13 | J | 19 | 6.3 | ug/Kg | ☼ | 04/28/15 12:00 | 04/28/15 18:20 | 1 |

**Client Sample ID: SB940-9-9.5-150423** — **Lab Sample ID: 280-68396-3**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 16 | J | 19 | 6.2 | ug/Kg | ☼ | 04/28/15 12:00 | 04/28/15 18:22 | 1 |

**Client Sample ID: SB38-19.5-20-150422** — **Lab Sample ID: 280-68396-4**
**Date Collected: 04/22/15 17:20** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 75.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 24 | | 23 | 7.3 | ug/Kg | ☼ | 04/28/15 12:00 | 04/28/15 18:29 | 1 |

**Client Sample ID: SB41-11.5-12-150423** — **Lab Sample ID: 280-68396-5**
**Date Collected: 04/23/15 16:15** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 88.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 25 | | 19 | 6.3 | ug/Kg | ☼ | 04/28/15 12:00 | 04/28/15 18:32 | 1 |

**Client Sample ID: SB40-12-12.5-150423** — **Lab Sample ID: 280-68396-6**
**Date Collected: 04/23/15 16:00** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 87.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 7.2 | U | 22 | 7.2 | ug/Kg | ☼ | 04/28/15 12:00 | 04/28/15 18:34 | 1 |

## General Chemistry

**Client Sample ID: SB39-18-18.5-150423** — **Lab Sample ID: 280-68396-1**
**Date Collected: 04/23/15 15:30** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 91.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 8.9 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |
| Percent Solids | 91 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |

**Client Sample ID: SB40-9-9.5-150423** — **Lab Sample ID: 280-68396-2**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 3.6 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |
| Percent Solids | 96 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |

**Client Sample ID: SB940-9-9.5-150423** — **Lab Sample ID: 280-68396-3**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 3.8 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |
| Percent Solids | 96 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |

**Client Sample ID: SB38-19.5-20-150422** — **Lab Sample ID: 280-68396-4**
**Date Collected: 04/22/15 17:20** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 75.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 24 | | 0.10 | 0.10 | % | | | 04/28/15 10:33 | 1 |
| Percent Solids | 76 | | 0.10 | 0.10 | % | | | 04/28/15 10:33 | 1 |

**Client Sample ID: SB41-11.5-12-150423** — **Lab Sample ID: 280-68396-5**
**Date Collected: 04/23/15 16:15** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 88.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 12 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |
| Percent Solids | 88 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |

**Client Sample ID: SB40-12-12.5-150423** — **Lab Sample ID: 280-68396-6**
**Date Collected: 04/23/15 16:00** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 87.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 13 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |
| Percent Solids | 87 | | 0.10 | 0.10 | % | | | 04/28/15 16:46 | 1 |

## General Chemistry - Soluble

**Client Sample ID: SB39-18-18.5-150423** — **Lab Sample ID: 280-68396-1**
**Date Collected: 04/23/15 15:30** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 91.1**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 75 | | 52 | 1.8 | mg/Kg | ☼ | | 05/12/15 00:22 | 1 |

**Client Sample ID: SB40-9-9.5-150423** — **Lab Sample ID: 280-68396-2**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 64 | | 49 | 1.7 | mg/Kg | ☼ | | 05/12/15 00:42 | 1 |

## General Chemistry - Soluble

**Client Sample ID: SB940-9-9.5-150423** — **Lab Sample ID: 280-68396-3**
**Date Collected: 04/23/15 15:40** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 96.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 63 | | 51 | 1.7 | mg/Kg | ☼ | | 05/12/15 01:02 | 1 |

**Client Sample ID: SB38-19.5-20-150422** — **Lab Sample ID: 280-68396-4**
**Date Collected: 04/22/15 17:20** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 75.5**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 76 | | 64 | 2.2 | mg/Kg | ☼ | | 05/12/15 01:22 | 1 |

**Client Sample ID: SB41-11.5-12-150423** — **Lab Sample ID: 280-68396-5**
**Date Collected: 04/23/15 16:15** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 88.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 39 | J | 54 | 1.9 | mg/Kg | ☼ | | 05/12/15 01:42 | 1 |

**Client Sample ID: SB40-12-12.5-150423** — **Lab Sample ID: 280-68396-6**
**Date Collected: 04/23/15 16:00** — **Matrix: Solid**
**Date Received: 04/24/15 09:30** — **Percent Solids: 87.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 39 | J | 54 | 1.8 | mg/Kg | ☼ | | 05/12/15 03:41 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-68396-1 | SB39-18-18.5-150423 | 81 | 72 | 81 |
| 280-68396-2 | SB40-9-9.5-150423 | 72 | 72 | 74 |
| 280-68396-3 | SB940-9-9.5-150423 | 71 | 70 | 72 |
| 280-68396-4 | SB38-19.5-20-150422 | 41 | 38 X | 43 |
| 280-68396-4 - DL | SB38-19.5-20-150422 | 0 D X | 0 D X | 0 D X |
| 280-68396-5 | SB41-11.5-12-150423 | 72 | 75 | 73 |
| 280-68396-6 | SB40-12-12.5-150423 | 76 | 86 | 77 |
| LCS 280-275083/2-A | Lab Control Sample | 75 | 88 | 76 |
| MB 280-275083/1-A | Method Blank | 80 | 89 | 75 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-275083/1-A**
**Matrix: Solid**
**Analysis Batch: 275826**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 275083**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 240 | U | 4600 | 240 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| 2-Methylnaphthalene | 280 | U | 4600 | 280 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Acenaphthene | 150 | U | 4600 | 150 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Acenaphthylene | 160 | U | 4600 | 160 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Anthracene | 660 | U | 4600 | 660 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Benzo[a]anthracene | 830 | U | 4600 | 830 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Benzo[a]pyrene | 680 | U | 4600 | 680 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Benzo[b]fluoranthene | 1100 | U | 4600 | 1100 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Benzo[g,h,i]perylene | 1000 | U | 4600 | 1000 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Benzo[k]fluoranthene | 920 | U | 4600 | 920 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Chrysene | 920 | U | 4600 | 920 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Dibenz(a,h)anthracene | 1200 | U | 4600 | 1200 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Fluoranthene | 920 | U | 4600 | 920 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Fluorene | 430 | U | 4600 | 430 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Indeno[1,2,3-cd]pyrene | 1000 | U | 4600 | 1000 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Naphthalene | 300 | U | 4600 | 300 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Phenanthrene | 1000 | U | 4600 | 1000 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |
| Pyrene | 1000 | U | 4600 | 1000 | ng/Kg | | 04/29/15 15:54 | 05/04/15 14:58 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *80* | | *39 - 120* | *04/29/15 15:54* | *05/04/15 14:58* | *1* |
| *Nitrobenzene-d5* | *89* | | *42 - 120* | *04/29/15 15:54* | *05/04/15 14:58* | *1* |
| *Terphenyl-d14* | *75* | | *35 - 124* | *04/29/15 15:54* | *05/04/15 14:58* | *1* |

**Lab Sample ID: LCS 280-275083/2-A**
**Matrix: Solid**
**Analysis Batch: 275826**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 275083**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 28200 | 22100 | | ng/Kg | | 78 | 35 - 120 |
| Acenaphthylene | 28200 | 20000 | | ng/Kg | | 71 | 41 - 120 |
| Anthracene | 28200 | 22900 | | ng/Kg | | 81 | 43 - 120 |
| Benzo[a]anthracene | 28200 | 22800 | | ng/Kg | | 81 | 36 - 120 |
| Benzo[a]pyrene | 28200 | 21500 | | ng/Kg | | 76 | 20 - 120 |
| Benzo[b]fluoranthene | 28200 | 22800 | | ng/Kg | | 81 | 37 - 120 |
| Benzo[g,h,i]perylene | 28200 | 23300 | | ng/Kg | | 83 | 20 - 123 |
| Benzo[k]fluoranthene | 28200 | 22800 | | ng/Kg | | 81 | 46 - 120 |
| Chrysene | 28200 | 23600 | | ng/Kg | | 84 | 34 - 120 |
| Dibenz(a,h)anthracene | 28200 | 23100 | | ng/Kg | | 82 | 20 - 120 |
| Fluoranthene | 28200 | 23100 | | ng/Kg | | 82 | 45 - 120 |
| Fluorene | 28200 | 21600 | | ng/Kg | | 76 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 28200 | 23000 | | ng/Kg | | 82 | 20 - 127 |
| Naphthalene | 28200 | 23100 | | ng/Kg | | 82 | 44 - 120 |
| Phenanthrene | 28200 | 22700 | | ng/Kg | | 80 | 44 - 120 |
| Pyrene | 28200 | 22600 | | ng/Kg | | 80 | 43 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-275083/2-A**
**Matrix: Solid**
**Analysis Batch: 275826**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 275083**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *75* | | *39 - 120* |
| *Nitrobenzene-d5* | *88* | | *42 - 120* |
| *Terphenyl-d14* | *76* | | *35 - 124* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-274813/1-A**
**Matrix: Solid**
**Analysis Batch: 275514**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 274813**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.6 | U | 10 | 1.6 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Barium | 0.169 | J | 1.0 | 0.076 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Iron | 3.8 | U | 15 | 3.8 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |
| Zinc | 0.40 | U | 3.0 | 0.40 | mg/Kg | | 04/29/15 14:30 | 04/30/15 20:15 | 1 |

**Lab Sample ID: LCS 280-274813/2-A**
**Matrix: Solid**
**Analysis Batch: 275514**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 274813**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 182 | | mg/Kg | | 91 | 82 - 116 |
| Antimony | 50.0 | 47.7 | | mg/Kg | | 95 | 82 - 110 |
| Arsenic | 100 | 91.1 | | mg/Kg | | 91 | 85 - 110 |
| Barium | 200 | 189 | | mg/Kg | | 94 | 87 - 112 |
| Beryllium | 5.00 | 4.70 | | mg/Kg | | 94 | 84 - 114 |
| Cadmium | 10.0 | 9.55 | | mg/Kg | | 95 | 87 - 110 |
| Chromium | 20.0 | 18.8 | | mg/Kg | | 94 | 84 - 114 |
| Cobalt | 50.0 | 46.8 | | mg/Kg | | 94 | 87 - 110 |
| Copper | 25.0 | 24.3 | | mg/Kg | | 97 | 88 - 110 |
| Iron | 100 | 94.4 | | mg/Kg | | 94 | 87 - 120 |
| Lead | 50.0 | 47.5 | | mg/Kg | | 95 | 86 - 110 |
| Manganese | 50.0 | 46.7 | | mg/Kg | | 93 | 88 - 110 |
| Nickel | 50.0 | 46.2 | | mg/Kg | | 92 | 87 - 110 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-274813/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 275514** — **Prep Batch: 274813**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Selenium | 200 | 188 | | mg/Kg | | 94 | 83 - 110 |
| Silver | 5.00 | 4.84 | | mg/Kg | | 97 | 87 - 114 |
| Thallium | 200 | 191 | | mg/Kg | | 95 | 84 - 110 |
| Vanadium | 50.0 | 46.4 | | mg/Kg | | 93 | 88 - 110 |
| Zinc | 50.0 | 46.1 | | mg/Kg | | 92 | 76 - 114 |

**Lab Sample ID: 280-68396-1 MS** — **Client Sample ID: SB39-18-18.5-150423**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 275514** — **Prep Batch: 274813**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 8200 | | 198 | 20100 | 4 | mg/Kg | ☼ | 6005 | 50 - 200 |
| Antimony | 0.41 | U | 49.5 | 22.0 | | mg/Kg | ☼ | 45 | 20 - 200 |
| Arsenic | 1.4 | J | 98.9 | 83.1 | | mg/Kg | ☼ | 83 | 76 - 111 |
| Barium | 22 | B | 198 | 201 | | mg/Kg | ☼ | 90 | 52 - 159 |
| Beryllium | 0.27 | J | 4.95 | 4.64 | | mg/Kg | ☼ | 88 | 72 - 105 |
| Cadmium | 0.045 | U | 9.89 | 8.76 | | mg/Kg | ☼ | 89 | 40 - 130 |
| Chromium | 6.8 | | 19.8 | 27.4 | | mg/Kg | ☼ | 104 | 70 - 200 |
| Cobalt | 4.7 | | 49.5 | 48.0 | | mg/Kg | ☼ | 88 | 72 - 106 |
| Copper | 6.5 | | 24.7 | 31.9 | | mg/Kg | ☼ | 103 | 37 - 187 |
| Iron | 5900 | | 98.9 | 7450 | 4 | mg/Kg | ☼ | 1619 | 70 - 200 |
| Lead | 11 | | 49.5 | 55.1 | | mg/Kg | ☼ | 90 | 70 - 200 |
| Manganese | 150 | | 49.5 | 208 | | mg/Kg | ☼ | 119 | 40 - 200 |
| Nickel | 1.9 | J | 49.5 | 45.6 | | mg/Kg | ☼ | 88 | 61 - 126 |
| Selenium | 0.93 | U | 198 | 170 | | mg/Kg | ☼ | 86 | 76 - 104 |
| Silver | 0.17 | U | 4.95 | 4.55 | | mg/Kg | ☼ | 92 | 75 - 141 |
| Thallium | 0.71 | U | 198 | 169 | | mg/Kg | ☼ | 85 | 78 - 101 |
| Vanadium | 16 | | 49.5 | 64.1 | | mg/Kg | ☼ | 97 | 50 - 169 |
| Zinc | 12 | | 49.5 | 61.8 | | mg/Kg | ☼ | 100 | 70 - 200 |

**Lab Sample ID: 280-68396-1 MSD** — **Client Sample ID: SB39-18-18.5-150423**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 275514** — **Prep Batch: 274813**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 8200 | | 188 | 21000 | 4 | mg/Kg | ☼ | 6794 | 50 - 200 | 4 | 20 |
| Antimony | 0.41 | U | 46.9 | 19.9 | | mg/Kg | ☼ | 42 | 20 - 200 | 10 | 20 |
| Arsenic | 1.4 | J | 93.8 | 78.6 | | mg/Kg | ☼ | 82 | 76 - 111 | 6 | 20 |
| Barium | 22 | B | 188 | 194 | | mg/Kg | ☼ | 92 | 52 - 159 | 3 | 20 |
| Beryllium | 0.27 | J | 4.69 | 4.37 | | mg/Kg | ☼ | 87 | 72 - 105 | 6 | 20 |
| Cadmium | 0.045 | U | 9.38 | 8.24 | | mg/Kg | ☼ | 88 | 40 - 130 | 6 | 20 |
| Chromium | 6.8 | | 18.8 | 26.2 | | mg/Kg | ☼ | 103 | 70 - 200 | 5 | 20 |
| Cobalt | 4.7 | | 46.9 | 46.4 | | mg/Kg | ☼ | 89 | 72 - 106 | 3 | 20 |
| Copper | 6.5 | | 23.5 | 31.0 | | mg/Kg | ☼ | 105 | 37 - 187 | 3 | 20 |
| Iron | 5900 | | 93.8 | 7890 | 4 | mg/Kg | ☼ | 2169 | 70 - 200 | 6 | 20 |
| Lead | 11 | | 46.9 | 55.6 | | mg/Kg | ☼ | 96 | 70 - 200 | 1 | 20 |
| Manganese | 150 | | 46.9 | 207 | | mg/Kg | ☼ | 124 | 40 - 200 | 0 | 20 |
| Nickel | 1.9 | J | 46.9 | 43.6 | | mg/Kg | ☼ | 89 | 61 - 126 | 5 | 20 |
| Selenium | 0.93 | U | 188 | 160 | | mg/Kg | ☼ | 85 | 76 - 104 | 6 | 20 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-68396-1 MSD** — **Client Sample ID: SB39-18-18.5-150423**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 275514** — **Prep Batch: 274813**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Silver | 0.17 | U | 4.69 | 4.27 | | mg/Kg | ☼ | 91 | 75 - 141 | 6 | 20 |
| Thallium | 0.71 | U | 188 | 158 | | mg/Kg | ☼ | 84 | 78 - 101 | 7 | 20 |
| Vanadium | 16 | | 46.9 | 61.8 | | mg/Kg | ☼ | 98 | 50 - 169 | 4 | 20 |
| Zinc | 12 | | 46.9 | 57.6 | | mg/Kg | ☼ | 97 | 70 - 200 | 7 | 20 |

## Method: 7471B - Mercury (CVAA)

**Lab Sample ID: MB 280-274827/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 275089** — **Prep Batch: 274827**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.5 | U | 17 | 5.5 | ug/Kg | | 04/28/15 12:00 | 04/28/15 18:09 | 1 |

**Lab Sample ID: LCS 280-274827/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 275089** — **Prep Batch: 274827**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 417 | 430 | | ug/Kg | | 103 | 87 - 111 |

**Lab Sample ID: 280-68396-1 MS** — **Client Sample ID: SB39-18-18.5-150423**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 275089** — **Prep Batch: 274827**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 13 | J | 499 | 513 | | ug/Kg | ☼ | 100 | 87 - 111 |

**Lab Sample ID: 280-68396-1 MSD** — **Client Sample ID: SB39-18-18.5-150423**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 275089** — **Prep Batch: 274827**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 13 | J | 508 | 520 | | ug/Kg | ☼ | 100 | 87 - 111 | 1 | 20 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MRL 280-276796/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 276796**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 2.50 | 2.39 | J | mg/L | | 96 | 50 - 150 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MB 280-276941/3-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 276796**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1.7 | U | 50 | 1.7 | mg/Kg | | | 05/11/15 19:43 | 1 |

**Lab Sample ID: LCS 280-276941/1-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 276796**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 1000 | 948 | | mg/Kg | | 95 | 90 - 110 |

**Lab Sample ID: LCSD 280-276941/2-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 276796**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1000 | 951 | | mg/Kg | | 95 | 90 - 110 | 0 | 10 |

**Lab Sample ID: 280-68396-5 MS** — **Client Sample ID: SB41-11.5-12-150423**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 276796**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 39 | J | 279 | 299 | | mg/Kg | ☼ | 93 | 80 - 120 |

**Lab Sample ID: 280-68396-5 MSD** — **Client Sample ID: SB41-11.5-12-150423**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 276796**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 39 | J | 279 | 299 | | mg/Kg | ☼ | 93 | 80 - 120 | 0 | 20 |

**Lab Sample ID: 280-68396-5 DU** — **Client Sample ID: SB41-11.5-12-150423**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 276796**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Sulfate | 39 | J | 39.6 | J | mg/Kg | ☼ | 1 | 10 |

## Method: Moisture - Percent Moisture

**Lab Sample ID: 280-68396-5 DU** — **Client Sample ID: SB41-11.5-12-150423**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 274955**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 12 | | 9.9 | | % | | 18 | 20 |
| Percent Solids | 88 | | 90 | | % | | 2 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## GC/MS Semi VOA

### Prep Batch: 275083

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Total/NA | Solid | 3546 | |
| 280-68396-2 | SB40-9-9.5-150423 | Total/NA | Solid | 3546 | |
| 280-68396-3 | SB940-9-9.5-150423 | Total/NA | Solid | 3546 | |
| 280-68396-4 - DL | SB38-19.5-20-150422 | Total/NA | Solid | 3546 | |
| 280-68396-4 | SB38-19.5-20-150422 | Total/NA | Solid | 3546 | |
| 280-68396-5 | SB41-11.5-12-150423 | Total/NA | Solid | 3546 | |
| 280-68396-6 | SB40-12-12.5-150423 | Total/NA | Solid | 3546 | |
| LCS 280-275083/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-275083/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Analysis Batch: 275826

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-275083/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 275083 |
| MB 280-275083/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 275083 |

### Analysis Batch: 275999

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Total/NA | Solid | 8270D SIM | 275083 |
| 280-68396-2 | SB40-9-9.5-150423 | Total/NA | Solid | 8270D SIM | 275083 |
| 280-68396-3 | SB940-9-9.5-150423 | Total/NA | Solid | 8270D SIM | 275083 |
| 280-68396-4 | SB38-19.5-20-150422 | Total/NA | Solid | 8270D SIM | 275083 |
| 280-68396-5 | SB41-11.5-12-150423 | Total/NA | Solid | 8270D SIM | 275083 |
| 280-68396-6 | SB40-12-12.5-150423 | Total/NA | Solid | 8270D SIM | 275083 |

### Analysis Batch: 276178

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-4 - DL | SB38-19.5-20-150422 | Total/NA | Solid | 8270D SIM | 275083 |

## Metals

### Prep Batch: 274813

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Total/NA | Solid | 3050B | |
| 280-68396-1 MS | SB39-18-18.5-150423 | Total/NA | Solid | 3050B | |
| 280-68396-1 MSD | SB39-18-18.5-150423 | Total/NA | Solid | 3050B | |
| 280-68396-2 | SB40-9-9.5-150423 | Total/NA | Solid | 3050B | |
| 280-68396-3 | SB940-9-9.5-150423 | Total/NA | Solid | 3050B | |
| 280-68396-4 | SB38-19.5-20-150422 | Total/NA | Solid | 3050B | |
| 280-68396-5 | SB41-11.5-12-150423 | Total/NA | Solid | 3050B | |
| 280-68396-6 | SB40-12-12.5-150423 | Total/NA | Solid | 3050B | |
| LCS 280-274813/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-274813/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Prep Batch: 274827

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Total/NA | Solid | 7471B | |
| 280-68396-1 MS | SB39-18-18.5-150423 | Total/NA | Solid | 7471B | |
| 280-68396-1 MSD | SB39-18-18.5-150423 | Total/NA | Solid | 7471B | |
| 280-68396-2 | SB40-9-9.5-150423 | Total/NA | Solid | 7471B | |
| 280-68396-3 | SB940-9-9.5-150423 | Total/NA | Solid | 7471B | |

## Metals (Continued)

### Prep Batch: 274827 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-4 | SB38-19.5-20-150422 | Total/NA | Solid | 7471B | |
| 280-68396-5 | SB41-11.5-12-150423 | Total/NA | Solid | 7471B | |
| 280-68396-6 | SB40-12-12.5-150423 | Total/NA | Solid | 7471B | |
| LCS 280-274827/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| MB 280-274827/1-A | Method Blank | Total/NA | Solid | 7471B | |

### Analysis Batch: 275089

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Total/NA | Solid | 7471B | 274827 |
| 280-68396-1 MS | SB39-18-18.5-150423 | Total/NA | Solid | 7471B | 274827 |
| 280-68396-1 MSD | SB39-18-18.5-150423 | Total/NA | Solid | 7471B | 274827 |
| 280-68396-2 | SB40-9-9.5-150423 | Total/NA | Solid | 7471B | 274827 |
| 280-68396-3 | SB940-9-9.5-150423 | Total/NA | Solid | 7471B | 274827 |
| 280-68396-4 | SB38-19.5-20-150422 | Total/NA | Solid | 7471B | 274827 |
| 280-68396-5 | SB41-11.5-12-150423 | Total/NA | Solid | 7471B | 274827 |
| 280-68396-6 | SB40-12-12.5-150423 | Total/NA | Solid | 7471B | 274827 |
| LCS 280-274827/2-A | Lab Control Sample | Total/NA | Solid | 7471B | 274827 |
| MB 280-274827/1-A | Method Blank | Total/NA | Solid | 7471B | 274827 |

### Analysis Batch: 275514

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Total/NA | Solid | 6010C | 274813 |
| 280-68396-1 MS | SB39-18-18.5-150423 | Total/NA | Solid | 6010C | 274813 |
| 280-68396-1 MSD | SB39-18-18.5-150423 | Total/NA | Solid | 6010C | 274813 |
| 280-68396-2 | SB40-9-9.5-150423 | Total/NA | Solid | 6010C | 274813 |
| 280-68396-3 | SB940-9-9.5-150423 | Total/NA | Solid | 6010C | 274813 |
| 280-68396-4 | SB38-19.5-20-150422 | Total/NA | Solid | 6010C | 274813 |
| 280-68396-5 | SB41-11.5-12-150423 | Total/NA | Solid | 6010C | 274813 |
| 280-68396-6 | SB40-12-12.5-150423 | Total/NA | Solid | 6010C | 274813 |
| LCS 280-274813/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 274813 |
| MB 280-274813/1-A | Method Blank | Total/NA | Solid | 6010C | 274813 |

## General Chemistry

### Analysis Batch: 274875

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-4 | SB38-19.5-20-150422 | Total/NA | Solid | Moisture | |

### Analysis Batch: 274955

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Total/NA | Solid | Moisture | |
| 280-68396-2 | SB40-9-9.5-150423 | Total/NA | Solid | Moisture | |
| 280-68396-3 | SB940-9-9.5-150423 | Total/NA | Solid | Moisture | |
| 280-68396-5 | SB41-11.5-12-150423 | Total/NA | Solid | Moisture | |
| 280-68396-5 DU | SB41-11.5-12-150423 | Total/NA | Solid | Moisture | |
| 280-68396-6 | SB40-12-12.5-150423 | Total/NA | Solid | Moisture | |

### Analysis Batch: 276796

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Soluble | Solid | 9056A | 276941 |

## General Chemistry (Continued)

### Analysis Batch: 276796 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-2 | SB40-9-9.5-150423 | Soluble | Solid | 9056A | 276941 |
| 280-68396-3 | SB940-9-9.5-150423 | Soluble | Solid | 9056A | 276941 |
| 280-68396-4 | SB38-19.5-20-150422 | Soluble | Solid | 9056A | 276941 |
| 280-68396-5 | SB41-11.5-12-150423 | Soluble | Solid | 9056A | 276941 |
| 280-68396-5 DU | SB41-11.5-12-150423 | Soluble | Solid | 9056A | 276941 |
| 280-68396-5 MS | SB41-11.5-12-150423 | Soluble | Solid | 9056A | 276941 |
| 280-68396-5 MSD | SB41-11.5-12-150423 | Soluble | Solid | 9056A | 276941 |
| 280-68396-6 | SB40-12-12.5-150423 | Soluble | Solid | 9056A | 276941 |
| LCS 280-276941/1-A | Lab Control Sample | Soluble | Solid | 9056A | 276941 |
| LCSD 280-276941/2-A | Lab Control Sample Dup | Soluble | Solid | 9056A | 276941 |
| MB 280-276941/3-A | Method Blank | Soluble | Solid | 9056A | 276941 |
| MRL 280-276796/3 | Lab Control Sample | Total/NA | Solid | 9056A | |

### Leach Batch: 276941

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68396-1 | SB39-18-18.5-150423 | Soluble | Solid | DI Leach | |
| 280-68396-2 | SB40-9-9.5-150423 | Soluble | Solid | DI Leach | |
| 280-68396-3 | SB940-9-9.5-150423 | Soluble | Solid | DI Leach | |
| 280-68396-4 | SB38-19.5-20-150422 | Soluble | Solid | DI Leach | |
| 280-68396-5 | SB41-11.5-12-150423 | Soluble | Solid | DI Leach | |
| 280-68396-5 DU | SB41-11.5-12-150423 | Soluble | Solid | DI Leach | |
| 280-68396-5 MS | SB41-11.5-12-150423 | Soluble | Solid | DI Leach | |
| 280-68396-5 MSD | SB41-11.5-12-150423 | Soluble | Solid | DI Leach | |
| 280-68396-6 | SB40-12-12.5-150423 | Soluble | Solid | DI Leach | |
| LCS 280-276941/1-A | Lab Control Sample | Soluble | Solid | DI Leach | |
| LCSD 280-276941/2-A | Lab Control Sample Dup | Soluble | Solid | DI Leach | |
| MB 280-276941/3-A | Method Blank | Soluble | Solid | DI Leach | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Client Sample ID: SB39-18-18.5-150423 — Lab Sample ID: 280-68396-1

**Date Collected: 04/23/15 15:30**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 274955 | 04/28/15 16:46 | CMS | TAL DEN |

## Client Sample ID: SB39-18-18.5-150423 — Lab Sample ID: 280-68396-1

**Date Collected: 04/23/15 15:30**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**
**Percent Solids: 91.1**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.5 g | 1 mL | 275083 | 04/29/15 15:54 | JRK | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.5 g | 1 mL | 275999 | 05/05/15 16:47 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.01 g | 100 mL | 274813 | 04/29/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.01 g | 100 mL | 275514 | 04/30/15 20:20 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.54 g | 50 mL | 274827 | 04/28/15 12:00 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.54 g | 50 mL | 275089 | 04/28/15 18:13 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.64 g | 100 mL | 276941 | 05/11/15 15:18 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276796 | 05/12/15 00:22 | TLP | TAL DEN |

## Client Sample ID: SB40-9-9.5-150423 — Lab Sample ID: 280-68396-2

**Date Collected: 04/23/15 15:40**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 274955 | 04/28/15 16:46 | CMS | TAL DEN |

## Client Sample ID: SB40-9-9.5-150423 — Lab Sample ID: 280-68396-2

**Date Collected: 04/23/15 15:40**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**
**Percent Solids: 96.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.6 g | 1 mL | 275083 | 04/29/15 15:54 | JRK | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.6 g | 1 mL | 275999 | 05/05/15 17:12 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.02 g | 100 mL | 274813 | 04/29/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.02 g | 100 mL | 275514 | 04/30/15 20:44 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.55 g | 50 mL | 274827 | 04/28/15 12:00 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.55 g | 50 mL | 275089 | 04/28/15 18:20 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.68 g | 100 mL | 276941 | 05/11/15 15:18 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276796 | 05/12/15 00:42 | TLP | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Client Sample ID: SB940-9-9.5-150423 — Lab Sample ID: 280-68396-3

**Date Collected: 04/23/15 15:40**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 274955 | 04/28/15 16:46 | CMS | TAL DEN |

## Client Sample ID: SB940-9-9.5-150423 — Lab Sample ID: 280-68396-3

**Date Collected: 04/23/15 15:40**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**
**Percent Solids: 96.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.4 g | 1 mL | 275083 | 04/29/15 15:54 | JRK | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.4 g | 1 mL | 275999 | 05/05/15 17:37 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.17 g | 100 mL | 274813 | 04/29/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.17 g | 100 mL | 275514 | 04/30/15 20:46 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.56 g | 50 mL | 274827 | 04/28/15 12:00 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.56 g | 50 mL | 275089 | 04/28/15 18:22 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.19 g | 100 mL | 276941 | 05/11/15 15:18 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276796 | 05/12/15 01:02 | TLP | TAL DEN |

## Client Sample ID: SB38-19.5-20-150422 — Lab Sample ID: 280-68396-4

**Date Collected: 04/22/15 17:20**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 274875 | 04/28/15 10:33 | SVC | TAL DEN |

## Client Sample ID: SB38-19.5-20-150422 — Lab Sample ID: 280-68396-4

**Date Collected: 04/22/15 17:20**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**
**Percent Solids: 75.5**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.2 g | 1 mL | 275083 | 04/29/15 15:54 | JRK | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.2 g | 1 mL | 275999 | 05/05/15 18:03 | NRC | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 31.2 g | 1 mL | 275083 | 04/29/15 15:54 | JRK | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 4 | 31.2 g | 1 mL | 276178 | 05/06/15 15:43 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.09 g | 100 mL | 274813 | 04/29/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.09 g | 100 mL | 275514 | 04/30/15 20:49 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.60 g | 50 mL | 274827 | 04/28/15 12:00 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.60 g | 50 mL | 275089 | 04/28/15 18:29 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.39 g | 100 mL | 276941 | 05/11/15 15:18 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276796 | 05/12/15 01:22 | TLP | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Client Sample ID: SB41-11.5-12-150423 — Lab Sample ID: 280-68396-5

**Date Collected: 04/23/15 16:15**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 274955 | 04/28/15 16:46 | CMS | TAL DEN |

## Client Sample ID: SB41-11.5-12-150423 — Lab Sample ID: 280-68396-5

**Date Collected: 04/23/15 16:15**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**
**Percent Solids: 88.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 32.8 g | 1 mL | 275083 | 04/29/15 15:54 | JRK | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 32.8 g | 1 mL | 275999 | 05/05/15 18:28 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.11 g | 100 mL | 274813 | 04/29/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.11 g | 100 mL | 275514 | 04/30/15 20:52 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.60 g | 50 mL | 274827 | 04/28/15 12:00 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.60 g | 50 mL | 275089 | 04/28/15 18:32 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.41 g | 100 mL | 276941 | 05/11/15 15:18 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276796 | 05/12/15 01:42 | TLP | TAL DEN |

## Client Sample ID: SB40-12-12.5-150423 — Lab Sample ID: 280-68396-6

**Date Collected: 04/23/15 16:00**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 274955 | 04/28/15 16:46 | CMS | TAL DEN |

## Client Sample ID: SB40-12-12.5-150423 — Lab Sample ID: 280-68396-6

**Date Collected: 04/23/15 16:00**
**Date Received: 04/24/15 09:30**
**Matrix: Solid**
**Percent Solids: 87.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.3 g | 1 mL | 275083 | 04/29/15 15:54 | JRK | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.3 g | 1 mL | 275999 | 05/05/15 18:53 | NRC | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.13 g | 100 mL | 274813 | 04/29/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.13 g | 100 mL | 275514 | 04/30/15 20:54 | LLB | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.53 g | 50 mL | 274827 | 04/28/15 12:00 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.53 g | 50 mL | 275089 | 04/28/15 18:34 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.69 g | 100 mL | 276941 | 05/11/15 15:22 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276796 | 05/12/15 03:41 | TLP | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68396-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

**H5D280409 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 26**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-68396-1

UNC Cogen

Lot #: H5D280409

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

May 8, 2015

# ANALYTICAL METHODS SUMMARY

**H5D280409**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |
| Percent Moisture | MCAWW 160.3 MOD |

**References:**

MCAWW "Methods for Chemical Analysis of Water and Wastes", EPA-600/4-79-020, March 1983 and subsequent revisions.

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H5D280409**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M6PHG | 001 | SB39-18-18.5-150423 | 04/23/15 | 15:30 |
| M6PHH | 002 | SB40-9-9.5-150423 | 04/23/15 | 15:40 |
| M6PHJ | 003 | SB940-9-9.5-150423 | 04/23/15 | 15:40 |
| M6PHK | 004 | SB38-19.5-20-150422 | 04/22/15 | 17:20 |
| M6PHL | 005 | SB41-11.5-12-150423 | 04/23/15 | 16:15 |
| M6PHM | 006 | SB40-12-12.5-150423 | 04/23/15 | 16:00 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H5D280409

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

For solid and sediments samples, when percent moisture is included in the report header field, the sample results are reported on a dry weight basis. When percent moisture is not contained in the header field, sample results are reported on an as received or wet weight basis.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

# PROJECT NARRATIVE
## H5D280409

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of ≥2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

# PROJECT NARRATIVE
## H5D280409

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |

# PROJECT NARRATIVE
## H5D280409

W = amount of sample extracted (grams or liters)
S = percent solids (optional, if results are requested to be reported on dry weight basis)

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA150004 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | TN02014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-14-7 |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00260 |
| TestAmerica Knoxville | Utah | NELAC | 8 | TN000092014-5 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 00165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |
| TestAmerica Knoxville | Wisconsin | State Program | 5 | 998044300 |

Accreditation may not be offered or required for all methods and analytes in this report. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: SB39-18-18.5-150423**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 001 | **Work Order #....:** | M6PHG1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/23/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/06/15 | **Percent Moisture** | 9.3 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.063 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.5 | 0.016 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.5 | 0.015 | pg/g |
| **1,2,3,6,7,8-HxCDD** | **0.19** | **J** | **5.5** | **0.015** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.43** | **B J** | **5.5** | **0.014** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **11** | **B** | **5.5** | **0.044** | **pg/g** |
| **OCDD** | **990** | **B** | **11** | **0.050** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.1 | 0.0050 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.5 | 0.0049 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.5 | 0.0052 | pg/g |
| 1,2,3,4,7,8-HxCDF | ND | | 5.5 | 0.0060 | pg/g |
| 1,2,3,6,7,8-HxCDF | ND | | 5.5 | 0.0057 | pg/g |
| **2,3,4,6,7,8-HxCDF** | **0.017** | **Q B J** | **5.5** | **0.0060** | **pg/g** |
| 1,2,3,7,8,9-HxCDF | ND | | 5.5 | 0.0077 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.14** | **B J** | **5.5** | **0.0051** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.076** | **Q B J** | **5.5** | **0.0072** | **pg/g** |
| **OCDF** | **0.26** | **Q B J** | **11** | **0.0059** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 64 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 66 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 64 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 72 | 40 - 135 |
| 13C-OCDD | 67 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 63 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 73 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 66 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 65 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 61 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 65 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 63 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 66 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 62 | 40 - 135 |
| 13C-OCDF | 57 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB39-18-18.5-150423**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 001 | **Work Order #....:** | M6PHG1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/23/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/06/15 | **Percent Moisture** | 9.3 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: SB40-9-9.5-150423

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| Lot - Sample #....: | H5D280409 - 002 | Work Order #....: | M6PHH1AC | Matrix....: | SOLID |
| Date Sampled....: | 04/23/15 | Date Received....: | 04/28/15 | Dilution Factor: | 1 |
| Prep Date....: | 04/29/15 | Analysis Date....: | 05/06/15 | Percent Moisture | 3.0 |
| Prep Batch # ....: | 5119012 | | | | |
| Initial Wgt/Vol : | 9.6 g | Instrument ID....: | D2A | Method: | SW846 8290 |
| Analyst ID....: | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.061 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.27** | **Q B J** | **5.4** | **0.015** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **0.22** | **J** | **5.4** | **0.010** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **0.098** | **Q J** | **5.4** | **0.010** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.15** | **Q B J** | **5.4** | **0.0099** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **5.4** | **B** | **5.4** | **0.029** | **pg/g** |
| **OCDD** | **250** | **B** | **11** | **0.035** | **pg/g** |
| **2,3,7,8-TCDF** | **0.051** | **Q J** | **1.1** | **0.0084** | **pg/g** |
| **1,2,3,7,8-PeCDF** | **0.025** | **Q J** | **5.4** | **0.0076** | **pg/g** |
| **2,3,4,7,8-PeCDF** | **0.050** | **Q J** | **5.4** | **0.0075** | **pg/g** |
| **1,2,3,4,7,8-HxCDF** | **0.081** | **Q B J** | **5.4** | **0.0061** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.073** | **Q B J** | **5.4** | **0.0057** | **pg/g** |
| 2,3,4,6,7,8-HxCDF | ND | | 5.4 | 0.0065 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.4 | 0.0076 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.27** | **B J** | **5.4** | **0.0039** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.023** | **Q B J** | **5.4** | **0.0054** | **pg/g** |
| **OCDF** | **0.64** | **Q B J** | **11** | **0.0043** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 64 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 68 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 66 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 73 | 40 - 135 |
| 13C-OCDD | 69 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 64 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 71 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 68 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 66 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 63 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 67 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 67 | 40 - 135 |
| 13C-OCDF | 56 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB40-9-9.5-150423**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 002 | **Work Order #....:** | M6PHH1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/23/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/06/15 | **Percent Moisture** | 3.0 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 9.6 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SB940-9-9.5-150423**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 003 | **Work Order #....:** | M6PHJ1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/23/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/06/15 | **Percent Moisture** | 4.5 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 9.9 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.1 | 0.079 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.067** | **Q B J** | **5.3** | **0.018** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **0.17** | **Q J** | **5.3** | **0.018** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **0.22** | **J** | **5.3** | **0.019** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.27** | **Q B J** | **5.3** | **0.017** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **5.3** | **B** | **5.3** | **0.040** | **pg/g** |
| **OCDD** | **280** | **B** | **11** | **0.059** | **pg/g** |
| **2,3,7,8-TCDF** | **0.063** | **Q J** | **1.1** | **0.0086** | **pg/g** |
| 1,2,3,7,8-PeCDF | ND | | 5.3 | 0.010 | pg/g |
| **2,3,4,7,8-PeCDF** | **0.058** | **Q J** | **5.3** | **0.0092** | **pg/g** |
| **1,2,3,4,7,8-HxCDF** | **0.072** | **Q B J** | **5.3** | **0.0078** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.092** | **Q B J** | **5.3** | **0.0077** | **pg/g** |
| 2,3,4,6,7,8-HxCDF | ND | | 5.3 | 0.0077 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.3 | 0.0096 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.27** | **Q B J** | **5.3** | **0.0062** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.042** | **Q B J** | **5.3** | **0.0083** | **pg/g** |
| **OCDF** | **0.73** | **Q B J** | **11** | **0.0035** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 64 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 68 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 64 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 72 | 40 - 135 |
| 13C-OCDD | 67 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 67 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 69 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 65 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 61 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 69 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 66 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 67 | 40 - 135 |
| 13C-OCDF | 57 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB940-9-9.5-150423**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 003 | **Work Order #....:** | M6PHJ1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/23/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/06/15 | **Percent Moisture** | 4.5 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 9.9 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SB38-19.5-20-150422**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 004 | **Work Order #....:** | M6PHK1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/22/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/07/15 | **Percent Moisture** | 23 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.3 | 0.076 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.18** | **Q B J** | **6.4** | **0.021** | **pg/g** |
| 1,2,3,4,7,8-HxCDD | ND | | 6.4 | 0.015 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 6.4 | 0.016 | pg/g |
| **1,2,3,7,8,9-HxCDD** | **0.13** | **Q B J** | **6.4** | **0.015** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **5.0** | **B J** | **6.4** | **0.058** | **pg/g** |
| **OCDD** | **570** | **B** | **13** | **0.076** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.3 | 0.0059 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 6.4 | 0.0096 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 6.4 | 0.0095 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.071** | **B J** | **6.4** | **0.010** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.035** | **Q B J** | **6.4** | **0.0098** | **pg/g** |
| 2,3,4,6,7,8-HxCDF | ND | | 6.4 | 0.011 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 6.4 | 0.014 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.15** | **Q B J** | **6.4** | **0.0057** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.083** | **Q B J** | **6.4** | **0.0079** | **pg/g** |
| **OCDF** | **0.40** | **Q B J** | **13** | **0.0080** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 69 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 68 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 60 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 68 | 40 - 135 |
| 13C-OCDD | 60 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 63 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 70 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 71 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 63 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 62 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 61 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 61 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 56 | 40 - 135 |
| 13C-OCDF | 48 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB38-19.5-20-150422**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 004 | **Work Order #....:** | M6PHK1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/22/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/07/15 | **Percent Moisture** | 23 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: SB41-11.5-12-150423

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| Lot - Sample #....: | H5D280409 - 005 | Work Order #....: | M6PHL1AC | Matrix....: | SOLID |
| Date Sampled....: | 04/23/15 | Date Received....: | 04/28/15 | Dilution Factor: | 1 |
| Prep Date....: | 04/29/15 | Analysis Date....: | 05/07/15 | Percent Moisture | 8.4 |
| Prep Batch # ....: | 5119012 | | | | |
| Initial Wgt/Vol : | 9.8 g | Instrument ID....: | D2A | Method: | SW846 8290 |
| Analyst ID....: | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.12 | J | 1.1 | 0.057 | pg/g |
| 1,2,3,7,8-PeCDD | 0.16 | Q B J | 5.6 | 0.023 | pg/g |
| 1,2,3,4,7,8-HxCDD | 0.16 | J | 5.6 | 0.026 | pg/g |
| 1,2,3,6,7,8-HxCDD | 0.25 | Q J | 5.6 | 0.026 | pg/g |
| 1,2,3,7,8,9-HxCDD | 0.46 | B J | 5.6 | 0.024 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | 18 | B | 5.6 | 0.085 | pg/g |
| OCDD | 2100 | B | 11 | 0.099 | pg/g |
| 2,3,7,8-TCDF | 0.077 | Q J | 1.1 | 0.019 | pg/g |
| 1,2,3,7,8-PeCDF | 0.080 | Q J | 5.6 | 0.019 | pg/g |
| 2,3,4,7,8-PeCDF | 0.25 | J | 5.6 | 0.018 | pg/g |
| 1,2,3,4,7,8-HxCDF | 0.16 | Q B J | 5.6 | 0.0065 | pg/g |
| 1,2,3,6,7,8-HxCDF | 0.38 | B J | 5.6 | 0.0058 | pg/g |
| 2,3,4,6,7,8-HxCDF | 0.22 | B J | 5.6 | 0.0058 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.6 | 0.0073 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | 0.45 | B J | 5.6 | 0.0069 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | 0.10 | B J | 5.6 | 0.0091 | pg/g |
| OCDF | 0.87 | B J | 11 | 0.0053 | pg/g |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 69 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 75 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 66 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 63 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 72 | 40 - 135 |
| 13C-OCDD | 70 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 68 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 72 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 71 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 59 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 62 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 63 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 63 | 40 - 135 |
| 13C-OCDF | 58 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB41-11.5-12-150423**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 005 | **Work Order #....:** | M6PHL1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/23/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/07/15 | **Percent Moisture** | 8.4 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 9.8 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SB40-12-12.5-150423**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 006 | **Work Order #....:** | M6PHM1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/23/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/07/15 | **Percent Moisture** | 13 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.2 | 0.062 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.052** | **Q B J** | **5.8** | **0.021** | **pg/g** |
| 1,2,3,4,7,8-HxCDD | ND | | 5.8 | 0.015 | pg/g |
| **1,2,3,6,7,8-HxCDD** | **0.12** | **Q J** | **5.8** | **0.014** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **0.17** | **Q B J** | **5.8** | **0.014** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **8.3** | **B** | **5.8** | **0.049** | **pg/g** |
| **OCDD** | **1200** | **B** | **12** | **0.064** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.2 | 0.0049 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.8 | 0.0073 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.8 | 0.0071 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.059** | **B J** | **5.8** | **0.0073** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.058** | **Q B J** | **5.8** | **0.0069** | **pg/g** |
| 2,3,4,6,7,8-HxCDF | ND | | 5.8 | 0.0076 | pg/g |
| **1,2,3,7,8,9-HxCDF** | **0.035** | **Q B J** | **5.8** | **0.0091** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDF** | **0.13** | **Q B J** | **5.8** | **0.0051** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.047** | **Q B J** | **5.8** | **0.0075** | **pg/g** |
| **OCDF** | **0.36** | **B J** | **12** | **0.010** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 68 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 70 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 65 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 68 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 73 | 40 - 135 |
| 13C-OCDD | 69 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 64 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 69 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 69 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 67 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 65 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 68 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 66 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 67 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 64 | 40 - 135 |
| 13C-OCDF | 58 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SB40-12-12.5-150423**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280409 - 006 | **Work Order #....:** | M6PHM1AC | **Matrix....:** | SOLID |
| **Date Sampled....:** | 04/23/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/07/15 | **Percent Moisture** | 13 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a dry weight basis and have been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D290000 - 012B | **Work Order #....:** | M6PN31AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/06/15 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.0 | 0.056 | pg/g |
| **1,2,3,7,8-PeCDD** | **0.069** | **Q J** | **5.0** | **0.014** | **pg/g** |
| 1,2,3,4,7,8-HxCDD | ND | | 5.0 | 0.0072 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.0 | 0.0080 | pg/g |
| **1,2,3,7,8,9-HxCDD** | **0.043** | **Q J** | **5.0** | **0.0072** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **0.18** | **J** | **5.0** | **0.0074** | **pg/g** |
| **OCDD** | **0.61** | **Q J** | **10** | **0.0058** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.0 | 0.0032 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.0 | 0.0037 | pg/g |
| 2,3,4,7,8-PeCDF | ND | | 5.0 | 0.0037 | pg/g |
| **1,2,3,4,7,8-HxCDF** | **0.046** | **Q J** | **5.0** | **0.0061** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **0.073** | **J** | **5.0** | **0.0055** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.041** | **Q J** | **5.0** | **0.0064** | **pg/g** |
| **1,2,3,7,8,9-HxCDF** | **0.038** | **Q J** | **5.0** | **0.0076** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDF** | **0.068** | **J** | **5.0** | **0.0053** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.085** | **Q J** | **5.0** | **0.0078** | **pg/g** |
| **OCDF** | **0.38** | **Q J** | **10** | **0.0017** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 65 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 68 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 64 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 71 | 40 - 135 |
| 13C-OCDD | 65 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 63 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 68 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 67 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 68 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 66 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 66 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 65 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 68 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 64 | 40 - 135 |
| 13C-OCDF | 55 | 40 - 135 |

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## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D290000 - 012B | **Work Order #....:** | M6PN31AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 04/29/15 | **Analysis Date....:** | 05/06/15 | **Percent Moisture:** | 0.0 |
| **Prep Batch # ....:** | 5119012 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

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# LABORATORY CONTROL SAMPLE DATA REPORT

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H5D280409 | **Work Order # ...:** | M6PN31AC-LCS | **Matrix .....:** | SOLID |
| **LCS Lot-Sample# :** | H5D290000 - 012 | | | | |
| **Prep Date .....:** | 04/29/15 | **Analysis Date ..:** | 05/06/15 | | |
| **Prep Batch # ...:** | 5119012 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Melissa A. Davidson | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 10 g | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **20.0** | **20.6** | **pg/g** | **103** | | **(79 - 129)** |
| **1,2,3,7,8-PeCDD** | **100** | **104** | **pg/g** | **104** | **B** | **(79 - 129)** |
| **1,2,3,4,7,8-HxCDD** | **100** | **102** | **pg/g** | **102** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **100** | **101** | **pg/g** | **101** | | **(74 - 124)** |
| **1,2,3,7,8,9-HxCDD** | **100** | **112** | **pg/g** | **112** | **B** | **(70 - 124)** |
| **1,2,3,4,6,7,8-HpCDD** | **100** | **95.8** | **pg/g** | **96** | **B** | **(73 - 123)** |
| **OCDD** | **200** | **187** | **pg/g** | **94** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **20.0** | **21.3** | **pg/g** | **106** | | **(75 - 125)** |
| **1,2,3,7,8-PeCDF** | **100** | **96.7** | **pg/g** | **97** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **100** | **101** | **pg/g** | **101** | | **(75 - 125)** |
| **1,2,3,4,7,8-HxCDF** | **100** | **99.1** | **pg/g** | **99** | **B** | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **100** | **96.5** | **pg/g** | **97** | **B** | **(76 - 126)** |
| **2,3,4,6,7,8-HxCDF** | **100** | **100** | **pg/g** | **100** | **B** | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **100** | **99.6** | **pg/g** | **100** | **B** | **(77 - 127)** |
| **1,2,3,4,6,7,8-HpCDF** | **100** | **98.9** | **pg/g** | **99** | **B** | **(77 - 127)** |
| **1,2,3,4,7,8,9-HpCDF** | **100** | **102** | **pg/g** | **102** | **B** | **(73 - 123)** |
| **OCDF** | **200** | **192** | **pg/g** | **96** | **B** | **(49 - 128)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 69 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 75 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 71 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 66 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 79 | (40 - 135) |
| 13C-OCDD | 70 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 67 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 70 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 71 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 68 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 66 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 68 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 68 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 68 | (40 - 135) |
| 13C-OCDF | 62 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

HSD 2804709

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-298340.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-68396-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 5/12/2015 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2SO3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - ph 4-5 |
| L - EDA | Z - other (specify) |

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| SB39-18-18.5-150423 (280-68396-1) | 4/23/15 | 15:30 Eastern | | Solid | | | X | 1 | |
| SB40-9-9.5-150423 (280-68396-2) | 4/23/15 | 15:40 Eastern | | Solid | | | X | 1 | |
| SB940-9-9.5-150423 (280-68396-3) | 4/23/15 | 15:40 Eastern | | Solid | | | X | 1 | |
| SB38-19.5-20-150422 (280-68396-4) | 4/22/15 | 17:20 Eastern | | Solid | | | X | 1 | |
| SB41-11.5-12-150423 (280-68396-5) | 4/23/15 | 16:15 Eastern | | Solid | | | X | 1 | |
| SB40-12-12.5-150423 (280-68396-6) | 4/23/15 | 16:00 Eastern | | Solid | | | X | 1 | |

1 X 4oz soil jar per sample. D.B. 4-27-15

RT CT
REC @ 1.1°c 1.1°c
CUSTODY SEAL INTACT
1 COOLER RH 4-28-15
FED EX #629115143577

**Possible Hazard Identification**
Unconfirmed

**Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)**
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 4/27/15 1530 | Company TA | Received by: Ryan Henry | Date/Time: 4/28/15 1030 | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** HSD280409

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : 5C57<br>Correction factor: 0 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: _____ | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**Labeling Verified by:** _____ **Date:** _____

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: Ryan Henry Date: 4/28/15

QA026R29.doc, 041115

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

280-68396 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information | Sampler: Rachel Donahue / Rohit Warrier | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-41673-16377.4 |
|---|---|---|---|---|
| Client Contact: ~~Lauren Wellborn~~ Rachel Donahue | Phone: 904-705-1346 | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page: 1 of 1 |
| Company: Geosyntec Consultants, Inc. | | | | Job #: |
| Address: 2501 Blue Ridge Rd Suite 430 ~~8380 Six Forks Road Suite 201~~ | Due Date Requested: | | | |
| City: Raleigh | TAT Requested (days): | | | |
| State, Zip: NC, ~~27615~~ 27607 | | | | |
| Phone: 919-870-0576(Tel) | PO #: GN5219 | | | |
| Email: ~~lwellborn~~ rdonahue@geosyntec.com | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Dioxins/Furans 8290 (TA-Knoxville) | Total Metals 6010C / 6010C / 7470A (Waters) | Total Metals 6010C / 7471B (solls) | PAHs 8270D_SIM | Sulfate 9056A | TDS 2540C | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | | |
| SB39-18-18.5-150423 | 4/23/15 | 1530 | G | S | N | N | X | | X | X | X | | 3 | |
| SB40-9-9.5-150423 | 4/23/15 | 1540 | G | S | N | N | X | | X | X | X | | 3 | |
| SB940-9-9.5-150423 | 4/23/15 | 1540 | G | S | N | N | X | | X | X | X | | 3 | |
| SB38-19.5-20-150422 | 4/22/15 | 1720 | G | S | N | N | X | | X | X | X | | 3 | |
| SB41-11.5-12-150423 | 4/23/15 | 1615 | G | S | N | N | X | | X | X | X | | 3 | |
| SB40-12-12.5-150423 | 4/23/15 | 1600 | G | S | N | N | X | | X | X | X | | 3 | |

**Possible Hazard Identification**
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

**Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)**
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 4/23/15 1800 | Geosyntec | [signature] | 930 4/24/15 | TAD |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 4.3 IR STOD 24Apr15 Transfer [signature]

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-68396-1

**Login Number: 68396**
**List Number: 1**
**Creator: Muniz, Ashley T**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# APPENDIX K

# Combined Parameter Calculation Tables

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-1 (19-20) | 10/23/2013 | 2,3,7,8-TCDD | 1 | 0.0067 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.062 | J | 0.062 | 0.062 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.018 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.065 | J | 0.065 | 0.0065 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.044 | J | 0.044 | 0.0044 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 2.2 | J | 2.2 | 0.022 |
| | | OCDD | 0.0003 | 360 | | 360 | 0.108 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.2029 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0084 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.015 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.014 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.027 | J | 0.027 | 0.0027 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.074 | J | 0.074 | 0.0074 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.049 | J | 0.049 | 0.0049 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.043 | J | 0.043 | 0.0043 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.18 | J | 0.18 | 0.0018 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.2 | J | 0.2 | 0.002 |
| | | OCDF | 0.0003 | 0.29 | J | 0.29 | 0.000087 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.023187 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.226087** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.109** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-2 (13-14) | 10/23/2013 | 2,3,7,8-TCDD | 1 | 0.004 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.0065 | J | 0.0065 | 0.0065 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.032 | J | 0.032 | 0.0032 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.028 | J | 0.028 | 0.0028 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.14 | J | 0.14 | 0.014 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 2.2 | J | 2.2 | 0.022 |
| | | OCDD | 0.0003 | 150 | | 150 | 0.045 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.0935 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0026 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.0037 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.0027 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0064 | J | 0.0064 | 0.00064 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.019 | J | 0.019 | 0.0019 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0067 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0028 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.11 | J | 0.11 | 0.0011 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.012 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.26 | J | 0.26 | 0.000078 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.003718 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.097218** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.2** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-5 (6-7) | 10/24/2013 | 2,3,7,8-TCDD | 1 | 0.0086 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.0055 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.014 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.016 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.049 | J | 0.049 | 0.0049 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 1.1 | J | 1.1 | 0.011 |
| | | OCDD | 0.0003 | 280 | | 280 | 0.084 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.0999 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0057 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.007 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.0059 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.05 | J | 0.05 | 0.005 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.011 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.016 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.031 | J | 0.031 | 0.0031 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.015 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.021 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.071 | J | 0.071 | 0.0000213 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0081213 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.1080213** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.049** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-8 (2-3) | 10/24/2013 | 2,3,7,8-TCDD | 1 | 2.1 | J,Q | 2.1 | 2 |
| | | 1,2,3,7,8-PeCDD | 1 | 11 | J | 11 | 11 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 230 | | 230 | 23 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 130 | | 130 | 13 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 36 | | 36 | 3.6 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 4,100 | | 4,100 | 41 |
| | | OCDD | 0.0003 | 56,000 | | 56,000 | 16.8 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 110.5 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.13 | J | 0.13 | 0.013 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.37 | J | 0.37 | 0.0111 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.31 | J | 0.31 | 0.093 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 24 | J | 24 | 2.4 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 71 | | 71 | 7.1 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.36 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 5.7 | J | 5.7 | 0.57 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 420 | | 420 | 4.2 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 44 | | 44 | 0.44 |
| | | OCDF | 0.0003 | 710 | | 710 | 0.213 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 15.0401 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **125.5401** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **396** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-9 (8-9) | 10/24/2013 | 2,3,7,8-TCDD | 1 | 0.016 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.023 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.87 | J | 0.87 | 0.087 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 1.5 | J | 1.5 | 0.15 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.78 | J | 0.78 | 0.078 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 64 | | 64 | 0.64 |
| | | OCDD | 0.0003 | 1,500 | | 1500 | 0.45 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 1.4 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.011 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.091 | J | 0.091 | 0.00273 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.025 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 1 | J | 1 | 0.1 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 1.1 | J | 1.1 | 0.11 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.055 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.22 | J | 0.22 | 0.022 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 9.1 | | 9.1 | 0.091 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 1.5 | J | 1.5 | 0.015 |
| | | OCDF | 0.0003 | 21 | | 21 | 0.0063 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.34703 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **1.75203** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **3.15** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-10 (3-4) | 10/25/2013 | 2,3,7,8-TCDD | 1 | 0.021 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.300 | J | 0.3 | 0.3 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 1.1 | J | 1.1 | 0.11 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 2.6 | J | 2.6 | 0.26 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 2.1 | J | 2.1 | 0.21 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 120 | | 120 | 1.2 |
| | | OCDD | 0.0003 | 4,500 | | 4500 | 1.35 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 3.43 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.02 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.046 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.042 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.66 | J | 0.66 | 0.066 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 1.4 | J | 1.4 | 0.14 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.36 | J | 0.36 | 0.036 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.33 | J | 0.33 | 0.033 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 14 | | 14 | 0.14 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 1.3 | J | 1.3 | 0.013 |
| | | OCDF | 0.0003 | 53 | | 53 | 0.0159 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.4439 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **3.8739** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **5.8** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-11 (3-4) | 10/25/2013 | 2,3,7,8-TCDD | 1 | 0.043 | J | 0.043 | 0.043 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.870 | J | 0.87 | 0.87 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 12 | | 12 | 1.2 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 20 | | 20 | 2 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 5.4 | J | 5.4 | 0.54 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 580 | | 580 | 5.80 |
| | | OCDD | 0.0003 | 8,900 | | 8,900 | 2.67 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 13.123 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.034 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.081 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.099 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 3.6 | J | 3.6 | 0.36 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 8.6 | | 8.6 | 0.86 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.14 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 1.6 | J | 1.6 | 0.16 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 91 | | 91 | 0.91 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 8.3 | | 8.3 | 0.083 |
| | | OCDF | 0.0003 | 230 | | 230 | 0.069 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 2.442 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **15.565** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **37.4** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-12 (2-3) | 10/25/2013 | 2,3,7,8-TCDD | 1 | 1.3 | | 1.3 | 1.3 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.910 | J | 0.91 | 0.91 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.71 | J | 0.71 | 0.071 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 1.1 | J | 1.1 | 0.11 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.53 | J | 0.53 | 0.053 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 40 | | 40 | 0.40 |
| | | OCDD | 0.0003 | 1,800 | | 1800 | 0.54 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 3.384 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.066 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.12 | J | 0.12 | 0.0036 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.073 | J | 0.073 | 0.0219 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.11 | J | 0.11 | 0.011 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.84 | J | 0.84 | 0.084 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.08 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.22 | J | 0.22 | 0.022 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 2.3 | J | 2.3 | 0.023 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.1 | U | 0 | 0 |
| | | OCDF | 0.0003 | 6.6 | J | 6.6 | 0.00198 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.16748 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **3.55148** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **2.34** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | 10/25/2013 (Dup) | 2,3,7,8-TCDD | 1 | 0.38 | J | 0.38 | 0.38 |
| | | 1,2,3,7,8-PeCDD | 1 | 1.2 | J | 1.2 | 1.2 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.93 | J | 0.93 | 0.093 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.62 | J | 0.62 | 0.062 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 1.2 | J | 1.2 | 0.12 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 44 | | 44 | 0.44 |
| | | OCDD | 0.0003 | 1,900 | | 1,900 | 0.57 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 2.865 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.04 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.035 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.033 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.23 | J | 0.23 | 0.023 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.69 | J | 0.69 | 0.069 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.045 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.17 | J | 0.17 | 0.017 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 1.6 | J | 1.6 | 0.016 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.042 | U | 0 | 0 |
| | | OCDF | 0.0003 | 6.5 | J | 6.5 | 0.00195 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.12695 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **2.99195** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **2.75** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-13 (7-8) | 10/25/2013 | 2,3,7,8-TCDD | 1 | 0.5 | J | 0.5 | 0.5 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.790 | J | 0.79 | 0.79 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 16 | | 16 | 1.6 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 42 | | 42 | 4.2 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 12 | | 12 | 1.2 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 1,100 | | 1,100 | 11 |
| | | OCDD | 0.0003 | 15,000 | | 15,000 | 4.5 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 23.79 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.19 | J | 0.19 | 0.019 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.17 | J | 0.17 | 0.0051 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.4 | J | 0.4 | 0.12 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 12 | | 12 | 1.2 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 28 | | 28 | 2.8 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.49 | J | 0.49 | 0.049 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 2.2 | J | 2.2 | 0.22 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 230 | | 230 | 2.3 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 23 | | 23 | 0.23 |
| | | OCDF | 0.0003 | 670 | | 670 | 0.201 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 7.1441 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **30.9341** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **70** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-13 (9-10) | 10/25/2013 | 2,3,7,8-TCDD | 1 | 0.015 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.020 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.23 | J | 0.23 | 0.023 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.046 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.62 | J | 0.62 | 0.062 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 32 | | 32 | 0.32 |
| | | OCDD | 0.0003 | 2,800 | | 2,800 | 0.84 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 1.25 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0065 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.013 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.01 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.033 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.097 | J | 0.097 | 0.0097 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.045 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.029 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 2.3 | J | 2.3 | 0.023 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.084 | U | 0 | 0 |
| | | OCDF | 0.0003 | 11 | J | 11 | 0.0033 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.036 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **1.281** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.85** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-14 (19-23) | 10/25/2013 | 2,3,7,8-TCDD | 1 | 0.13 | J | 0.13 | 0.13 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.570 | J | 0.57 | 0.57 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.26 | J | 0.26 | 0.026 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 1.2 | J | 1.2 | 0.12 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 1.4 | J | 1.4 | 0.14 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 18 | | 18 | 0.18 |
| | | OCDD | 0.0003 | 490 | | 490 | 0.147 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 1.313 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 1.3 | J | 1.3 | 0.13 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.54 | J | 0.54 | 0.0162 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.39 | J | 0.39 | 0.117 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 2.3 | J | 2.3 | 0.23 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.98 | J | 0.98 | 0.098 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.096 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.069 | J | 0.069 | 0.0069 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 5.4 | J | 5.4 | 0.054 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.095 | U | 0 | 0 |
| | | OCDF | 0.0003 | 9.6 | J | 9.6 | 0.00288 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.65498 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **1.96798** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **2.86** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-16 (11-12) | 10/28/2013 | 2,3,7,8-TCDD | 1 | 0.025 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.011 | J | 0.011 | 0.011 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.2 | J | 0.2 | 0.02 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.057 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.18 | J | 0.18 | 0.018 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 2.6 | J | 3 | 0.026 |
| | | OCDD | 0.0003 | 150 | | 150 | 0.045 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.12 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.042 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.048 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.047 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.048 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.053 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.066 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.048 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.19 | J | 0.19 | 0.0019 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.051 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.83 | J | 0.83 | 0.000249 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.002149 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.122149** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.38** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-17 (11-12) | 10/28/2013 | 2,3,7,8-TCDD | 1 | 0.035 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.017 | J | 0.017 | 0.017 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.067 | J | 0.067 | 0.0067 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.057 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.12 | J | 0.12 | 0.012 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 6.4 | J | 6.4 | 0.064 |
| | | OCDD | 0.0003 | 1,300 | | 1,300 | 0.39 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.4897 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.046 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.054 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.055 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.056 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.056 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.073 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.054 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.046 | J | 0.046 | 0.00046 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.065 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.93 | J | 0.93 | 0.000279 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.000739 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.490439** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.187** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-18 (4-5) | 10/28/2013 | 2,3,7,8-TCDD | 1 | 0.15 | J | 0.15 | 0.15 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.230 | J | 0.23 | 0.23 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.99 | J | 0.99 | 0.099 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 14 | | 14 | 1.4 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 2.5 | J | 2.5 | 0.25 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 310 | | 310 | 3.1 |
| | | OCDD | 0.0003 | 4,500 | | 4,500 | 1.35 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 6.579 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.35 | J | 0.35 | 0.035 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.11 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.12 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 2.5 | J | 2.5 | 0.25 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 3.5 | J | 3.5 | 0.35 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.099 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.97 | J | 0.97 | 0.097 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 69 | | 69 | 0.69 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 7.4 | | 7.4 | 0.074 |
| | | OCDF | 0.0003 | 150 | | 150 | 0.045 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 1.541 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **8.12** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **17.49** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-19 (16-17) | 10/29/2013 | 2,3,7,8-TCDD | 1 | 0.012 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.016 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.033 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.23 | J | 0.23 | 0.023 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.19 | J | 0.19 | 0.019 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 32 | | 32 | 0.32 |
| | | OCDD | 0.0003 | 6,300 | | 6,300 | 1.89 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 2.252 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0067 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.017 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.018 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.01 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.011 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.015 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.01 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.025 | | 0.025 | 0.00025 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.012 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.03 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.00025 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **2.25225** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.42** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-21 (12-13) | 10/29/2013 | 2,3,7,8-TCDD | 1 | 0.011 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.010 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.0087 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.0089 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.008 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 3.7 | J | 4 | 0.037 |
| | | OCDD | 0.0003 | 520 | | 520 | 0.156 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.193 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0089 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.012 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.011 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0099 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0097 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.014 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0098 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.01 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.017 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.068 | J | 0.068 | 0.0000204 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0000204 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.1930204** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-23 (12-13) | 10/29/2013 | 2,3,7,8-TCDD | 1 | 0.0062 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.015 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.064 | J | 0.064 | 0.0064 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.082 | J | 0.082 | 0.0082 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.33 | J | 0.33 | 0.033 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 29 | | 29 | 0.29 |
| | | OCDD | 0.0003 | 4,000 | | 4,000 | 1.2 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 1.5376 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0078 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.011 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.011 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0094 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0092 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.012 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0099 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0084 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.054 | J | 0.054 | 0.00054 |
| | | OCDF | 0.0003 | 0.21 | J | 0.21 | 0.000063 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0006030 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **1.538203** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.476** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-25 (1-2) | 10/30/2013 | 2,3,7,8-TCDD | 1 | 8.5 | J | 8.5 | 8.5 |
| | | 1,2,3,7,8-PeCDD | 1 | 60 | J | 60 | 60 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 410 | | 410 | 41 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 640 | | 640 | 64 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 650 | | 650 | 65 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 15,000 | | 15,000 | 150 |
| | | OCDD | 0.0003 | 24,000 | | 24,000 | 7.2 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 395.7 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 1.9 | J | 1.9 | 0.19 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 4.4 | J | 4.4 | 0.132 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.65 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 36 | J | 36 | 3.6 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 55 | J | 55 | 5.5 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 13 | J | 13 | 1.3 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 7.6 | J | 7.6 | 0.76 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 950 | | 950 | 9.5 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 130 | | 130 | 1.3 |
| | | OCDF | 0.0003 | 2,300 | | 2,300 | 0.69 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 22.972 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **418.672** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **1,700** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-26 (2-3) | 10/30/2013 | 2,3,7,8-TCDD | 1 | 0.086 | J | 0.086 | 0.086 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.34 | J | 0.34 | 0.34 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 7.5 | | 7.5 | 0.75 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 22 | | 22 | 2.2 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 8 | | 8 | 0.8 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 480 | | 480 | 4.8 |
| | | OCDD | 0.0003 | 6,100 | | 6,100 | 1.83 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 10.806 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.37 | J | 0.37 | 0.037 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.2 | J | 0.2 | 0.006 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.26 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 5.7 | J | 5.7 | 0.57 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 9.5 | J | 9.5 | 0.95 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.35 | J | 0.35 | 0.035 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 1.3 | J | 1.3 | 0.13 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 100 | | 100 | 1.0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 10 | | 10 | 0.1 |
| | | OCDF | 0.0003 | 280 | | 280 | 0.084 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 2.912 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **13.718** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **37.5** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-27 (2-3) | 10/30/2013 | 2,3,7,8-TCDD | 1 | 0.01 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.01 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.17 | J | 0.17 | 0.017 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.22 | J | 0.22 | 0.022 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.38 | J | 0.38 | 0.038 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 65 | | 65 | 0.65 |
| | | OCDD | 0.0003 | 11,000 | | 11,000 | 3.3 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 4.027 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.023 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.021 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.021 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.035 | J | 0.035 | 0.0035 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.033 | J | 0.033 | 0.0033 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.022 | J | 0.022 | 0.0022 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.03 | J | 0.03 | 0.003 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.19 | J | 0.19 | 0.0019 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.043 | J | 0.043 | 0.00043 |
| | | OCDF | 0.0003 | 0.41 | J | 0 | 0.000123 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.014453 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **4.041453** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.77** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-28 (3-4) | 10/14/2014 | 2,3,7,8-TCDD | 1 | 0.12 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.099 | J | 0.099 | 0.099 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.037 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.16 | J | 0.16 | 0.016 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.077 | J | 0.077 | 0.0077 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 5.6 | J | 6 | 0.056 |
| | | OCDD | 0.0003 | 330 | | 330 | 0.099 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.278 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.035 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.042 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.04 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.074 | J | 0.074 | 0.0074 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.12 | J | 0.12 | 0.012 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.029 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.14 | J | 0.14 | 0.014 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 1.5 | J | 1.5 | 0.015 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.039 | U | 0 | 0 |
| | | OCDF | 0.0003 | 2.4 | J | 2 | 0.00072 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.04912 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.32682** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.24** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-29 (3-4) | 10/14/2014 | 2,3,7,8-TCDD | 1 | 0.21 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.36 | J | 0.36 | 0.36 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 1.7 | J | 1.7 | 0.17 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 2.5 | J | 2.5 | 0.25 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 1 | J | 1 | 0.1 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 62 | | 62 | 0.62 |
| | | OCDD | 0.0003 | 750 | | 750 | 0.2 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 1.725 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.1 | J | 0.1 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.049 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.043 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.7 | J | 0.7 | 0.07 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 1.1 | J | 1.1 | 0.11 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.063 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.14 | J | 0.14 | 0.014 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 12 | | 12 | 0.12 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 1.2 | J | 1.2 | 0.012 |
| | | OCDF | 0.0003 | 36 | | 36 | 0.0108 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.3468 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **2.071800** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **5.20** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-30 (4-5) | 10/14/2014 | 2,3,7,8-TCDD | 1 | 0.12 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.03 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.033 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.035 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.032 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 1.9 | J | 2 | 0.02 |
| | | OCDD | 0.0003 | 83 | | 83 | 0.0249 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.044 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.039 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.035 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.036 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.026 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.11 | J | 0.11 | 0.011 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.034 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.025 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 2 | J | 2 | 0.02 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.038 | U | 0 | 0 |
| | | OCDF | 0.0003 | 2.2 | J | 2 | 0.00066 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.03166 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.07556** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-31 (7-8) | 10/14/2014 | 2,3,7,8-TCDD | 1 | 0.18 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.28 | J | 0.28 | 0.28 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.049 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.15 | J | 0.15 | 0.015 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.047 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 6.2 | J | 6 | 0.06 |
| | | OCDD | 0.0003 | 1,100 | | 1,100 | 0.33 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.687 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.041 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.048 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.046 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.03 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.03 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.047 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.034 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.099 | J | 0.099 | 0.00099 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.17 | J | 0.17 | 0.0017 |
| | | OCDF | 0.0003 | 0.5 | J | 1 | 0.00015 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.00284 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.68984** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.15** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-38 (19.5-20) | 04/22/2015 | 2,3,7,8-TCDD | 1 | 0.076 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.021 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.015 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.016 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.015 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.058 | U | 0 | 0 |
| | | OCDD | 0.0003 | 570 | | 570 | 0.17 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.171 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0059 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.0096 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.0095 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.010 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0098 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.014 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.011 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0057 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.0079 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0080 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.171** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-39 (18-18.5) | 04/23/2015 | 2,3,7,8-TCDD | 1 | 0.063 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.016 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.015 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.19 | J | 0.19 | 0.019 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.014 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 11 | | 11 | 0.11 |
| | | OCDD | 0.0003 | 990 | | 990 | 0.30 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.426 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.005 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.0049 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.0052 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.006 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0057 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0077 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.006 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0051 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.0072 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0059 | U | 0.00 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.426** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.19** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-40 (9-9.5) | 04/23/2015 | 2,3,7,8-TCDD | 1 | 0.061 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.015 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.22 | J | 0.22 | 0.022 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.098 | J | 0.098 | 0.0098 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.0099 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 5.4 | | 5 | 0.05 |
| | | OCDD | 0.0003 | 250 | | 250 | 0.08 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.161 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.051 | J | 0.051 | 0.0051 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.025 | J | 0.025 | 0.00075 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.05 | J | 0.05 | 0.015 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0061 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0057 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0076 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0065 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0039 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.0054 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0043 | U | 0.00 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.02085 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.18165** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.318** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | 4/23/2015 (Dup) | 2,3,7,8-TCDD | 1 | 0.079 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.018 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.018 | J | 0.018 | 0.0018 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.22 | J | 0.22 | 0.022 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.017 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 5.3 | | 5 | 0.05 |
| | | OCDD | 0.0003 | 280 | | 280 | 0.08 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.161 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.063 | Q,J | 0.063 | 0.0063 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.01 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.058 | J | 0.058 | 0.0174 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0078 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0077 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0096 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0077 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0062 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.0083 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0035 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0237 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.1845** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.24** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-40 (12-12.5) | 04/23/2015 | 2,3,7,8-TCDD | 1 | 0.062 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.021 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.015 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.12 | J | 0.12 | 0.012 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.014 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 8.3 | | 8.3 | 0.083 |
| | | OCDD | 0.0003 | 1,200 | | 1,200 | 0.36 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.455 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0049 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.0073 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.0071 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0073 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0069 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0091 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0076 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0051 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.0075 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.010 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.455** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.12** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Subsurface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SB-41 (11.5-12) | 04/23/2015 | 2,3,7,8-TCDD | 1 | 0.12 | J | 0.12 | 0.12 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.023 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.16 | J | 0.16 | 0.016 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.25 | J | 0.25 | 0.025 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.024 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 18 | | 18 | 0.18 |
| | | OCDD | 0.0003 | 2,100 | | 2,100 | 0.63 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.971 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.077 | J | 0.077 | 0.0077 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.080 | J | 0.08 | 0.0024 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.25 | J | 0.25 | 0.075 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0065 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0058 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0073 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.22 | B,J | 0.22 | 0.022 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0069 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.0091 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0053 | U | 0.00 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.1071 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **1.0781** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.41** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

**Notes:**

1. ng/kg indicates nanograms per kilogram.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.
5. The 2,3,7,8-TCDD Equivalent was calculated by multiplying each analyte's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans separately. The subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans were summed to derive the total 2,3,7,8-TCDD Equivalents for each sample. If none of the analytes were detected above the method detection limit, the total 2,3,7,8-TCDD Equivalent for the sample is reported as ND which indicates Non-Detect.
6. HxCDD mixture was calculated by summing HxCDD results assuming 0 for results less than the method detection limit.
7. Bold indicates the calculated concentration of total 2,3,7,8-TCDD equivalents and HxCDD, mixtures.
8. PSRG indicates NDENR's Preliminary Soil Remediation Goals.
9. TCDD indicates tetrachlorodibenzo-p-dioxin.
10. PeCDD indicates pentachlorodibenzo-p-dioxin.
11. HxCDD indicates hexachlorodibenzo-p-dioxin.
12. HpCDD indicates heptachlorodibenzo-p-dioxin.
13. OCDD indicates octachlorodibenzodioxin.
14. TCDF indicates tetrachlorodibenzofuran.
15. PeCDF indicates pentachlorodibenzofuran.
16. HxCDF indicates hexachlorodibenzofuran.
17. HpCDF indicates heptachlorodibenzofuran.
18. OCDF indicates octachlorodibenzofuran.

## Surface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| DU-01 (0-1) | 02/26/2014 | 2,3,7,8-TCDD | 1 | 0.11 | J | 0.11 | 0.11 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.91 | J | 0.91 | 0.91 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 8.7 | | 8.7 | 0.87 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 18 | | 18 | 1.8 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 5.7 | | 5.7 | 0.57 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 470 | | 470 | 4.7 |
| | | OCDD | 0.0003 | 5,800 | | 5,800 | 1.74 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 10.70 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.098 | J | 0.098 | 0.0098 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.045 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.33 | J | 0.33 | 0.099 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 4.3 | J | 4.3 | 0.43 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 5.7 | | 5.7 | 0.57 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.18 | J | 0.18 | 0.018 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.97 | J | 0.97 | 0.097 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 91 | | 91 | 0.91 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 9.4 | | 9.4 | 0.094 |
| | | OCDF | 0.0003 | 290 | | 290 | 0.087 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 2.3148 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **13.0148** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **32.4** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| DU-01 (0-1) | 02/27/2014 | 2,3,7,8-TCDD | 1 | 0.39 | J | 0.39 | 0.39 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.74 | J | 0.74 | 0.74 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 4.4 | J | 4.4 | 0.44 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 12 | | 12 | 1.2 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 3.6 | J | 3.6 | 0.36 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 290 | | 290 | 2.9 |
| | | OCDD | 0.0003 | 4,200 | | 4,200 | 1.26 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 7.29 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.29 | J | 0.29 | 0.029 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.13 | J | 0.13 | 0.0039 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.2 | J | 0.2 | 0.060 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 2.2 | J | 2.2 | 0.22 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 3.8 | J | 3.8 | 0.38 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.096 | J | 0.096 | 0.010 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.68 | J | 0.68 | 0.068 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 53 | | 53 | 0.53 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 5.1 | | 5.1 | 0.051 |
| | | OCDF | 0.0003 | 170 | | 170 | 0.051 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 1.4025 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **8.6925** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **20** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

## Surface Soil: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| DU-01 (0-1) | 02/27/2014 | 2,3,7,8-TCDD | 1 | 0.31 | J | 0.31 | 0.31 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.78 | J | 0.78 | 0.78 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 4.6 | J | 4.6 | 0.46 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 9.7 | | 9.7 | 0.97 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 4 | J | 4 | 0.40 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 250 | | 250 | 2.5 |
| | | OCDD | 0.0003 | 3,500 | | 3,500 | 1.05 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 6.47 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.076 | J | 0.076 | 0.0076 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.15 | J | 0.15 | 0.0045 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.19 | J | 0.19 | 0.057 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 1.8 | J | 1.8 | 0.18 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 2.9 | J | 2.9 | 0.29 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.12 | J | 0.12 | 0.012 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.65 | J | 0.65 | 0.065 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 48 | | 48 | 0.48 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 4.2 | J | 4.2 | 0.042 |
| | | OCDF | 0.0003 | 150 | | 150 | 0.045 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 1.1831 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **7.6531** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **18** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |

**Notes:**

1. ng/kg indicates nanograms per kilogram.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.
5. The 2,3,7,8-TCDD Equivalent was calculated by multiplying each analyte's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans separately. The subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans were summed to derive the total 2,3,7,8-TCDD Equivalents for each sample. If none of the analytes were detected above the method detection limit, the total 2,3,7,8-TCDD Equivalent for the sample is reported as ND which indicates Non-Detect.
6. HxCDD mixture was calculated by summing HxCDD results assuming 0 for results less than the method detection limit.
7. Bold indicates the calculated concentration of total 2,3,7,8-TCDD equivalents and HxCDD, mixtures.
8. PSRG indicates NDENR's Preliminary Soil Remediation Goals.
9. TCDD indicates tetrachlorodibenzo-p-dioxin.
10. PeCDD indicates pentachlorodibenzo-p-dioxin.
11. HxCDD indicates hexachlorodibenzo-p-dioxin.
12. HpCDD indicates heptachlorodibenzo-p-dioxin.
13. OCDD indicates octachlorodibenzodioxin.
14. TCDF indicates tetrachlorodibenzofuran.
15. PeCDF indicates pentachlorodibenzofuran.
16. HxCDF indicates hexachlorodibenzofuran.
17. HpCDF indicates heptachlorodibenzofuran.
18. OCDF indicates octachlorodibenzofuran.

**Groundwater: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| MW-1 | 03/10/2014 | 2,3,7,8-TCDD | 1 | 0.000059 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00036 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00047 | J | 0.00047 | 0.000047 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00045 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00029 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00240 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.000047 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000093 | J | 0.000093 | 0.0000093 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00033 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00028 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00038 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00023 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00053 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00033 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00032 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00033 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00044 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0000093 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.0000563** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **0.00005** |
| | 09/09/2014 | 2,3,7,8-TCDD | 1 | 0.000044 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00008 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00008 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00028 | J | 0.00028 | 0.000028 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00093 | J | 0.00093 | 0.0000093 |
| | | OCDD | 0.0003 | 0.00780 | J | 0.0078 | 0.00000234 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.00003964 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.00005 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.0001 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000095 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000096 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000096 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00048 | J | 0.00048 | 0.000048 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00034 | J | 0.00034 | 0.000034 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00048 | J | 0.00048 | 0.0000048 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00082 | J | 0.00082 | 0.0000082 |
| | | OCDF | 0.0003 | 0.0044 | J | 0.0044 | 0.00000132 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.00009632 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.00013596** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **0.00003** |
| | 04/21/2015 | 2,3,7,8-TCDD | 1 | 0.000013 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00032 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00078 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.01100 | J | 0.011 | 0.0000033 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.0000033 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000037 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000057 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000054 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000075 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00024 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.000087 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00043 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0012 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00026 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.017 | J | 0.017 | 0.0000051 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0000051 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.0000084** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 11/19/2015 | 2,3,7,8-TCDD | 1 | 0.000089 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00031 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.0015 | J | 0.0015 | 0.000015 |
| | | OCDD | 0.0003 | 0.014 | J | 0.014 | 0.0000042 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.0000192 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000099 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00037 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.0003 | J | 0.0003 | 0.00009 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000079 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000077 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000086 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0005 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00041 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0016 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.00009 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.0001092** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

**Groundwater: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| MW-2 | 03/11/2014 | 2,3,7,8-TCDD | 1 | 0.00017 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00034 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00032 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00110 | J | 0.0011 | 0.00011 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00028 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00820 | J | 0.0082 | 0.00000246 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.00011246 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.001 | J | 0.001 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00033 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00036 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00034 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00035 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00034 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0012 | J | 0.0012 | 0.000012 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00011 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00023 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.000042 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.00015446** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **0.00011** |
| | 09/09/2014 | 2,3,7,8-TCDD | 1 | 0.000041 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00005 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00062 | J | 0.00062 | 0.0000062 |
| | | OCDD | 0.0003 | 0.00700 | J | 0.007 | 0.0000021 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.0000083 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000065 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00012 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00021 | J | 0.00021 | 0.000063 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0004 | J | 0.0004 | 0.00004 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00079 | J | 0.00079 | 0.0000079 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00039 | J | 0.00039 | 0.0000039 |
| | | OCDF | 0.0003 | 0.0039 | J | 0.0039 | 0.00000117 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.00011597 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.00012427** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 04/21/2015 | 2,3,7,8-TCDD | 1 | 0.000013 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00045 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00072 | J | 0.00072 | 0.000072 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00039 | J | 0.00039 | 0.000039 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00066 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00330 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.000111 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000027 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000025 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000025 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00005 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00015 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.000059 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000054 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00047 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00014 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0092 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000111** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **0.000111** |
| | 11/21/2015 | 2,3,7,8-TCDD | 1 | 0.00019 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00086 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00036 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00036 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00034 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00054 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.0024 | J | 0.0024 | 0.00000072 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.00000072 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00018 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00016 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00026 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00057 | J | 0.00057 | 0.000057 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00031 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00027 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00058 | J | 0.00058 | 0.0000058 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00014 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0016 | J | 0.0016 | 0.00000048 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.00006328 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000064** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

**Groundwater: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| MW-3 | 03/10/2014 | 2,3,7,8-TCDD | 1 | 0.000055 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00004 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00009 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00010 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00042 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00038 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00051 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000038 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00058 | J | 0.00058 | 0.0000174 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00034 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00022 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00022 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00019 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000035 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00037 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00033 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00013 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0000174 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.0000174** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 03/10/2014 (Dup) | 2,3,7,8-TCDD | 1 | 0.000043 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00028 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00010 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00052 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000025 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000069 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00018 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000044 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000055 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00017 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000046 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00036 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00011 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00032 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **ND** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 09/10/2014 | 2,3,7,8-TCDD | 1 | 0.000059 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00220 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.01300 | UJ | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000046 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000066 | UJ | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000059 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00035 | J | 0.00035 | 0.000035 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000081 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.000093 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000084 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00035 | UJ | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.000071 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0014 | UJ | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.000035 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000035** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 09/10/2014 (Dup) | 2,3,7,8-TCDD | 1 | 0.000027 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00004 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00009 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00009 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00033 | UJ | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00045 | UJ | 0 | 0 |
| | | OCDD | 0.0003 | 0.00250 | UJ | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000062 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00028 | J | 0.00028 | 0.0000084 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000077 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000086 | UJ | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000082 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000089 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.000094 | UJ | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.000046 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0015 | UJ | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0000084 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.0000084** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

**Groundwater: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| MW-3 | 04/24/2015 | 2,3,7,8-TCDD | 1 | 0.000013 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00063 | J | 0.00063 | 0.00063 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00072 | J | 0.00072 | 0.000072 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00010 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.000750 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00370 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.000702 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000046 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000068 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000063 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000058 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.000072 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000066 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00017 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00021 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0081 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000702** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **0.000072** |
| | 4/24/2015 (Dup) | 2,3,7,8-TCDD | 1 | 0.000018 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00040 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00015 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.000240 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.007000 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000039 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00012 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000061 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000075 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000039 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.000089 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00048 | J | 0.00048 | 0.000048 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00080 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00094 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0062 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.000048 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000048** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 11/21/2015 | 2,3,7,8-TCDD | 1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00024 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00028 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00024 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00069 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.0015 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.00017 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00021 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00018 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0003 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00029 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00035 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0003 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.000088 | UJ | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00041 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00016 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **ND** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 11/21/2015 (Dup) | 2,3,7,8-TCDD | 1 | 0.000072 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00082 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00029 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.0031 | J | 0.0031 | 0.00000093 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.00000093 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00093 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000094 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00018 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00018 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00021 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0002 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00038 | J | 0.00038 | 0.0000038 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00012 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00093 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0000038 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000005** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

**Groundwater: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| PZ/MW-4 | 09/10/2014 | 2,3,7,8-TCDD | 1 | 0.000095 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00003 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00010 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00013 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00540 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000041 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000087 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00008 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00038 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00026 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.000053 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00019 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.002 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **ND** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 04/21/2015 | 2,3,7,8-TCDD | 1 | 0.000035 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00028 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00033 | J | 0.00033 | 0.000033 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00056 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00360 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.000033 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000028 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000047 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00005 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00007 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000071 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.000088 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00034 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.001 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00016 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0072 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000033** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **0.000033** |
| | 11/19/2015 | 2,3,7,8-TCDD | 1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.0001 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00041 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00017 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.0021 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000095 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000086 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00008 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00013 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00005 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00069 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00036 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **ND** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

**Groundwater: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| MW-5 | 09/10/2014 | 2,3,7,8-TCDD | 1 | 0.000026 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00002 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00022 | J | 0.00022 | 0.000022 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00026 | UJ | 0 | 0 |
| | | OCDD | 0.0003 | 0.00260 | J | 0.0026 | 0.00000078 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.00002278 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000028 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00006 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000052 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00005 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000048 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.000059 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00005 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00022 | UJ | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00029 | UJ | 0 | 0 |
| | | OCDF | 0.0003 | 0.0011 | UJ | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.00002278** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **0.000022** |
| | 04/20/2015 | 2,3,7,8-TCDD | 1 | 0.00001 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00024 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00014 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00065 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00580 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.00003 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000062 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.0003 | J | 0.0003 | 0.00003 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000063 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00016 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00041 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00016 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00021 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.007 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.00003 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.00003** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| | 11/19/2015 | 2,3,7,8-TCDD | 1 | 0.00014 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.000084 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00013 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.002 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000093 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.000089 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000081 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000078 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000082 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00022 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.000066 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00085 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **ND** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

**Groundwater: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| Equipment Rinsate | 03/10/2014 | 2,3,7,8-TCDD | 1 | 0.000075 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00022 | J | 0.00022 | 0.00022 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00036 | J | 0.00036 | 0.000036 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00049 | J | 0.00049 | 0.000049 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00068 | J | 0.00068 | 0.000068 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00058 | J | 0.00058 | 0.0000058 |
| | | OCDD | 0.0003 | 0.00200 | J | 0.002 | 0.0000006 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.0003794 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.00003 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00042 | J | 0.00042 | 0.0000126 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00051 | J | 0.00051 | 0.000153 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00011 | J | 0.00011 | 0.000011 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00027 | J | 0.00027 | 0.000027 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00008 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00030 | J | 0.0003 | 0.00003 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00047 | J | 0.00047 | 0.0000047 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00006 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00019 | J | 0.00019 | 0.000000057 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.000238357 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.00061776** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **0.001530** |
| | 09/11/2014 | 2,3,7,8-TCDD | 1 | 0.000037 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00004 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00011 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00140 | J | 0.0014 | 0.00000042 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.00000042 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000024 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000075 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00013 | J | 0.00013 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000086 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00013 | J | 0.00013 | 0.000013 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.000097 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000085 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00024 | J | 0.00024 | 0.0000024 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.000058 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00037 | J | 0.00037 | 0.000000111 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.000054511 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.00005493** |
| | | | 2L | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

**Notes:**

1. ng/L indicates nanograms per liter.
2. TEQ indicates World Health Organization toxic equivalency factor.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.

5. The 2,3,7,8-TCDD Equivalent was calculated by multiplying each analyte's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans separately. The subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans were summed to derive the total 2,3,7,8-TCDD Equivalents for each sample. If none of the analytes were detected above the method detection limit, the total 2,3,7,8-TCDD Equivalent for the sample is reported as ND which indicates Non-Detect.

6. HxCDD mixture was calculated by summing the HxCDD results assuming 0 for results less than the method detection limit.
7. Bold indicates the calculated concentration of total 2,3,7,8-TCDD equivalents.
8. Yellow shading indicates the value is above NCDEQ 2L Standard.
9. TCDD indicates tetrachlorodibenzo-p-dioxin.
10. PeCDD indicates pentachlorodibenzo-p-dioxin.
11. HxCDD indicates hexachlorodibenzo-p-dioxin.
12. HpCDD indicates heptachlorodibenzo-p-dioxin.
13. OCDD indicates octachlorodibenzodioxin.
14. TCDF indicates tetrachlorodibenzofuran.
15. PeCDF indicates pentachlorodibenzofuran.
16. HxCDF indicates hexachlorodibenzofuran.
17. HpCDF indicates heptachlorodibenzofuran.
18. OCDF indicates octachlorodibenzofuran.

**Sediment: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SED-1 (Upstream) | 09/11/2014 | 2,3,7,8-TCDD | 1 | 0.088 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.21 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.077 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.081 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.26 | J | 0.26 | 0.026 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 2.5 | U | 0 | 0 |
| | | OCDD | 0.0003 | 29 | | 29 | 0.0087 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.0347 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.024 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.047 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.1 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.068 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.068 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.086 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.07 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.55 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.084 | U | 0 | 0 |
| | | OCDF | 0.0003 | 2.4 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.0347** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological RiskScreening Level | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.26** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological RiskScreening Level | | | | |
| SED-2 (Middle) | 09/11/2014 | 2,3,7,8-TCDD | 1 | 0.072 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.04 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.19 | J | 0.19 | 0.019 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.27 | J | 0.27 | 0.027 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.28 | J | 0.28 | 0.028 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 6.6 | | 6.6 | 0.066 |
| | | OCDD | 0.0003 | 75 | | 75 | 0.0225 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.1625 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.076 | J | 0.076 | 0.0076 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.039 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.042 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.2 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.74 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.039 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.26 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 1.9 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.12 | U | 0 | 0 |
| | | OCDF | 0.0003 | 5 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.0076 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.1701** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological RiskScreening Level | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.74** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological RiskScreening Level | | | | |

**Sediment: Combined Dioxins and Dibenzofurans Parameters**
**UNC Cogeneration Facility - Chapel Hill, North Carolina**

| Location | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|
| SED-3 (Downstream) | 09/11/2014 | 2,3,7,8-TCDD | 1 | 0.059 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.012 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.097 | J | 0.097 | 0.0097 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.082 | J | 0.082 | 0.0082 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.22 | J | 0.22 | 0.022 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.33 | J | 0.33 | 0.003 |
| | | OCDD | 0.0003 | 35 | J | 35 | 0.011 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.0537 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.0094 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.023 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.02 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.12 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.11 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.021 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.092 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.48 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.33 | U | 0 | 0 |
| | | OCDF | 0.0003 | 1.7 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.0537** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological RiskScreening Level | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.40** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological RiskScreening Level | | | | |
| | 9/11/2014 (Dup) | 2,3,7,8-TCDD | 1 | 0.045 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.19 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.13 | J | 0.13 | 0.013 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.27 | J | 0.27 | 0.027 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.16 | J | 0.16 | 0.016 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 5.7 | J | 5.7 | 0.057 |
| | | OCDD | 0.0003 | 69 | J | 69 | 0.021 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.134 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.019 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.019 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.017 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.15 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.23 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.12 | J | 0.12 | 0.012 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.14 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.94 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.3 | U | 0 | 0 |
| | | OCDF | 0.0003 | 3.6 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.012 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/kg) | Total 2,3,7,8-TCDD Equivalents | | | | **0.14570** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological Risk Screening Level | | | | |
| | | HxCDD, Mixture | HxCDD, Mixture | | | | **0.56** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological RiskScreening Level | | | | |

## Sediment: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ng/kg) | Qualifier | Adjusted Result (ng/kg) | Weighted Result (ng/kg) |
|---|---|---|---|---|---|---|---|

**Notes:**

1. ng/kg indicates nanograms per kilogram.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.
5. The 2,3,7,8-TCDD Equivalent was calculated by multiplying each analyte's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans separately. The subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans were summed to derive the total 2,3,7,8-TCDD Equivalents for each sample. If none of the analytes were detected above the method detection limit, the total 2,3,7,8-TCDD Equivalent for the sample is reported as ND which indicates Non-Detect.
6. HxCDD mixture was calculated by summing HxCDD results assuming 0 for results less than the method detection limit.
7. Bold indicates the calculated concentration of total 2,3,7,8-TCDD equivalents and HxCDD, mixtures.
8. PSRG indicates NDENR's Preliminary Soil Remediation Goals.
9. TCDD indicates tetrachlorodibenzo-p-dioxin.
10. PeCDD indicates pentachlorodibenzo-p-dioxin.
11. HxCDD indicates hexachlorodibenzo-p-dioxin.
12. HpCDD indicates heptachlorodibenzo-p-dioxin.
13. OCDD indicates octachlorodibenzodioxin.
14. TCDF indicates tetrachlorodibenzofuran.
15. PeCDF indicates pentachlorodibenzofuran.
16. HxCDF indicates hexachlorodibenzofuran.
17. HpCDF indicates heptachlorodibenzofuran.
18. OCDF indicates octachlorodibenzofuran.

## Surface Water: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| SW-1 (Upstream) | 09/11/2014 | 2,3,7,8-TCDD | 1 | 0.000037 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00007 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00007 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00008 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00007 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00052 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.00980 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000029 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000081 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00008 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000095 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.000084 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000089 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00027 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00017 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.00098 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **ND** |
| | | | | | | | |
| | | HxCDD, Mixture | | | | | **ND** |
| SW-2 (Middle) | 09/11/2014 | 2,3,7,8-TCDD | 1 | 0.000027 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00016 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00017 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00016 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.00069 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.02600 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000075 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00012 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.000097 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00044 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00012 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.000098 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.00032 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00041 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.0017 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **ND** |
| | | | | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

## Surface Water: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| SW-3 (Downstream) | 09/11/2014 | 2,3,7,8-TCDD | 1 | 0.000046 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00013 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00027 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00150 | J | 0.0015 | 0.00015 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00440 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.04900 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.55 | | 0.55 | 0.000165 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.000315 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.00011 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.00016 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.00014 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.00012 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.0021 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00014 | U | 0 | 0 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.00068 | J | 0.00068 | 0.000068 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.0053 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00072 | U | 0 | 0 |
| | | OCDF | 0.0003 | 0.018 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.000068 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000383** |
| | | | | | | | |
| | | HxCDD, Mixture | | | | | **0.0015** |

## Surface Water: Combined Dioxins and Dibenzofurans Parameters
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ng/L) | Qualifier | Adjusted Result (ng/L) | Weighted Result (ng/L) |
|---|---|---|---|---|---|---|---|
| SW-3R (Downstream) | 01/29/2015 | 2,3,7,8-TCDD | 1 | 0.000021 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDD | 1 | 0.00003 | U | 0 | 0 |
| | | 1,2,3,4,7,8-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,7,8,9-HxCDD | 0.1 | 0.00006 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDD | 0.01 | 0.04700 | U | 0 | 0 |
| | | OCDD | 0.0003 | 0.095 | U | 0 | 0.000000 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dioxins) | | | | | 0.000000 |
| | | | | | | | |
| | | 2,3,7,8-TCDF | 0.1 | 0.000035 | U | 0 | 0 |
| | | 1,2,3,7,8-PeCDF | 0.03 | 0.000047 | U | 0 | 0 |
| | | 2,3,4,7,8-PeCDF | 0.3 | 0.0003 | J | 0.0003 | 0.000090 |
| | | 1,2,3,4,7,8-HxCDF | 0.1 | 0.047 | U | 0 | 0 |
| | | 1,2,3,6,7,8-HxCDF | 0.1 | 0.00017 | J | 0.00017 | 0.000017 |
| | | 1,2,3,7,8,9-HxCDF | 0.1 | 0.00044 | J | 0.00044 | 0.000044 |
| | | 2,3,4,6,7,8-HxCDF | 0.1 | 0.0001 | U | 0 | 0 |
| | | 1,2,3,4,6,7,8-HpCDF | 0.01 | 0.047 | U | 0 | 0 |
| | | 1,2,3,4,7,8,9-HpCDF | 0.01 | 0.00025 | J | 0.00025 | 0.000003 |
| | | OCDF | 0.0003 | 0.095 | U | 0 | 0 |
| | | Subtotal 2,3,7,8-TCDD EQUIVALENTS (dibenzofurans) | | | | | 0.000154 |
| | | | | | | | |
| | | 2,3,7,8-TCDD EQUIVALENTS (ng/L) | Total 2,3,7,8-TCDD Equivalents | | | | **0.000154** |
| | | | | | | | |
| | | HxCDD, Mixture | | | | | **ND** |

**Notes:**

1. ng/L indicates nanograms per liter.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.
5. The 2,3,7,8-TCDD Equivalent was calculated by multiplying each analyte's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans separately. The subtotal 2,3,7,8-TCDD equivalents for dioxins and dibenzofurans were summed to derive the total 2,3,7,8-TCDD Equivalents for each sample. If none of the analytes were detected above the method detection limit, the total 2,3,7,8-TCDD Equivalent for the sample is reported as ND which indicates Non-Detect.
6. HxCDD mixture was calculated by summing the HxCDD results assuming 0 for results less than the method detection limit.
7. Bold indicates the calculated concentration of total 2,3,7,8-TCDD equivalents.
8. Yellow shading indicates the value is above NCDENR 2L Standard.
9. TCDD indicates tetrachlorodibenzo-p-dioxin.
10. PeCDD indicates pentachlorodibenzo-p-dioxin.
11. HxCDD indicates hexachlorodibenzo-p-dioxin.
12. HpCDD indicates heptachlorodibenzo-p-dioxin.
13. OCDD indicates octachlorodibenzodioxin.
14. TCDF indicates tetrachlorodibenzofuran.
15. PeCDF indicates pentachlorodibenzofuran.
16. HxCDF indicates hexachlorodibenzofuran.
17. HpCDF indicates heptachlorodibenzofuran.
18. OCDF indicates octachlorodibenzofuran.

## Subsurface Soil: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ug/kg) | Qualifier | Adjusted Result (ug/kg) | Weighted Result (ug/kg) |
|---|---|---|---|---|---|---|---|
| SB-1 (19-20) | 10/23/2013 | Benzo(a) pyrene | 1 | 0.98 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.6 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.3 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1.2 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.3 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.7 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.5 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **ND** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| SB-2 (13-14) | 10/23/2013 | Benzo(a) pyrene | 1 | 0.8 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.3 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.1 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.97 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.1 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.2 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **ND** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| SB-5 (6-7) | 10/24/2013 | Benzo(a) pyrene | 1 | 0.77 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.3 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.94 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.1 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **ND** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| SB-8 (2-3) | 10/24/2013 | Benzo(a) pyrene | 1 | 140 | | 140 | 140 |
| | | Benzo(b)fluoranthene | 0.1 | 180 | | 180 | 18 |
| | | Benzo(k)fluoranthene | 0.01 | 69 | | 69 | 0.69 |
| | | Benz(a)anthracene | 0.1 | 120 | | 120 | 12 |
| | | Chrysene | 0.001 | 150 | | 150 | 0.15 |
| | | Dibenz(a,h)anthracene | 1 | 36 | | 36 | 36 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 96 | | 96 | 9.6 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **216.44** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| SB-9 (8-9) | 10/24/2013 | Benzo(a) pyrene | 1 | 0.76 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.7 | J | 1.7 | 0.17 |
| | | Benzo(k)fluoranthene | 0.01 | 1.6 | J | 1.6 | 0.016 |
| | | Benz(a)anthracene | 0.1 | 1.1 | J | 1.1 | 0.11 |
| | | Chrysene | 0.001 | 1.6 | J | 1.6 | 0.0016 |
| | | Dibenz(a,h)anthracene | 1 | 1.9 | J | 1.9 | 1.9 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.8 | J | 1.8 | 0.18 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **2.3776** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| SB-10 (3-4) | 10/25/2013 | Benzo(a) pyrene | 1 | 25 | | 25 | 25 |
| | | Benzo(b)fluoranthene | 0.1 | 30 | | 30 | 3 |
| | | Benzo(k)fluoranthene | 0.01 | 11 | | 11 | 0.11 |
| | | Benz(a)anthracene | 0.1 | 23 | | 23 | 2.3 |
| | | Chrysene | 0.001 | 30 | | 30 | 0.03 |
| | | Dibenz(a,h)anthracene | 1 | 5.4 | J | 5.4 | 5.4 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 15 | | 15 | 1.5 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **37.34** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| SB-11 (3-4) | 10/25/2013 | Benzo(a) pyrene | 1 | 35 | | 35 | 35 |
| | | Benzo(b)fluoranthene | 0.1 | 51 | | 51 | 5.1 |
| | | Benzo(k)fluoranthene | 0.01 | 18 | | 18 | 0.18 |
| | | Benz(a)anthracene | 0.1 | 34 | | 34 | 3.4 |
| | | Chrysene | 0.001 | 41 | | 41 | 0.041 |
| | | Dibenz(a,h)anthracene | 1 | 7.6 | | 7.6 | 7.6 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 21 | | 21 | 2.1 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **53.421** |
| | | | | | | Resdiential PSRG | |

## Subsurface Soil: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ug/kg) | Qualifier | Adjusted Result (ug/kg) | Weighted Result (ug/kg) |
|---|---|---|---|---|---|---|---|
| | | | Protection of Groundwater PSRG | | | | |
| SB-12 (2-3) | 10/25/2013 | Benzo(a) pyrene | 1 | 3.6 | J | 3.6 | 3.6 |
| | | Benzo(b)fluoranthene | 0.1 | 5.9 | J | 5.9 | 0.59 |
| | | Benzo(k)fluoranthene | 0.01 | 1.9 | J | 1.9 | 0.019 |
| | | Benz(a)anthracene | 0.1 | 3.6 | J | 3.6 | 0.36 |
| | | Chrysene | 0.001 | 5.8 | J | 5.8 | 0.0058 |
| | | Dibenz(a,h)anthracene | 1 | 1.5 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 2.4 | J | 2.4 | 0.24 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **4.8148** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | 10/25/2013 (Dup) | Benzo(a) pyrene | 1 | 4.3 | J | 4.3 | 4.3 |
| | | Benzo(b)fluoranthene | 0.1 | 7.2 | | 7.2 | 0.72 |
| | | Benzo(k)fluoranthene | 0.01 | 2 | J | 2 | 0.02 |
| | | Benz(a)anthracene | 0.1 | 4.4 | J | 4.4 | 0.44 |
| | | Chrysene | 0.001 | 6.7 | | 6.7 | 0.0067 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 2.7 | J | 2.7 | 0.27 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **5.7567** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-13 (7-8) | 10/25/2013 | Benzo(a) pyrene | 1 | 6.6 | | 6.6 | 6.6 |
| | | Benzo(b)fluoranthene | 0.1 | 10 | | 10 | 1 |
| | | Benzo(k)fluoranthene | 0.01 | 3.3 | J | 3.3 | 0.033 |
| | | Benz(a)anthracene | 0.1 | 6.9 | | 6.9 | 0.69 |
| | | Chrysene | 0.001 | 9.9 | | 9.9 | 0.0099 |
| | | Dibenz(a,h)anthracene | 1 | 1.7 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 3.7 | J | 3.7 | 0.37 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **8.7029** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-13 (9-10) | 10/25/2013 | Benzo(a) pyrene | 1 | 0.87 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.4 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.2 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1.1 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.2 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.5 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.3 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-14 (19-23) | 10/25/2013 | Benzo(a) pyrene | 1 | 1.1 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.9 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.5 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1.4 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.5 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 2 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.7 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-16 (11-12) | 10/28/2013 | Benzo(a) pyrene | 1 | 0.81 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.3 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.1 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.98 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.1 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.2 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-17 (11-12) | 10/28/2013 | Benzo(a) pyrene | 1 | 0.85 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.4 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.2 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.2 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.5 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.3 | U | 0 | 0 |
| | | | Total PAH TEQ | | | | **ND** |

## Subsurface Soil: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ug/kg) | Qualifier | Adjusted Result (ug/kg) | Weighted Result (ug/kg) |
|---|---|---|---|---|---|---|---|
| | | PAH TEQs (ug/kg) | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-18 (4-5) | 10/28/2013 | Benzo(a) pyrene | 1 | 56 | | 56 | 56 |
| | | Benzo(b)fluoranthene | 0.1 | 96 | | 96 | 9.6 |
| | | Benzo(k)fluoranthene | 0.01 | 35 | | 35 | 0.35 |
| | | Benz(a)anthracene | 0.1 | 58 | | 58 | 5.8 |
| | | Chrysene | 0.001 | 75 | | 75 | 0.075 |
| | | Dibenz(a,h)anthracene | 1 | 13 | | 13 | 13 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 35 | | 35 | 3.5 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **88.325** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-19 (16-17) | 10/29/2013 | Benzo(a) pyrene | 1 | 0.85 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.4 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.1 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.1 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.5 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.3 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-21 (12-13) | 10/29/2013 | Benzo(a) pyrene | 1 | 0.81 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.3 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.1 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.98 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.1 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.2 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-23 (12-13) | 10/29/2013 | Benzo(a) pyrene | 1 | 0.88 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.4 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.2 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1.1 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.2 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.6 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.3 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-25 (1-2) | 10/30/2013 | Benzo(a) pyrene | 1 | 2,400 | | 2,400 | 2,400 |
| | | Benzo(b)fluoranthene | 0.1 | 2,700 | | 2,700 | 270 |
| | | Benzo(k)fluoranthene | 0.01 | 950 | | 950 | 10 |
| | | Benz(a)anthracene | 0.1 | 2,700 | | 2,700 | 270 |
| | | Chrysene | 0.001 | 3,800 | | 3,800 | 4 |
| | | Dibenz(a,h)anthracene | 1 | 460 | | 460 | 460 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1,200 | | 1,200 | 120 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **3,533** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-26 (2-3) | 10/30/2013 | Benzo(a) pyrene | 1 | 360 | | 360 | 360 |
| | | Benzo(b)fluoranthene | 0.1 | 420 | | 420 | 42 |
| | | Benzo(k)fluoranthene | 0.01 | 150 | | 150 | 2 |
| | | Benz(a)anthracene | 0.1 | 360 | | 360 | 36 |
| | | Chrysene | 0.001 | 550 | | 550 | 1 |
| | | Dibenz(a,h)anthracene | 1 | 76 | | 76 | 76 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 190 | | 190 | 19 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **535** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-27 (2-3) | 10/30/2013 | Benzo(a) pyrene | 1 | 0.82 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.3 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.1 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.1 | J | 1.1 | 0.0011 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.2 | U | 0 | 0 |

## Subsurface Soil: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ug/kg) | Qualifier | Adjusted Result (ug/kg) | Weighted Result (ug/kg) |
|---|---|---|---|---|---|---|---|
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **0.0011** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-28 (3-4) | 10/14/2014 | Benzo(a) pyrene | 1 | 2.9 | J | 3 | 3 |
| | | Benzo(b)fluoranthene | 0.1 | 3.8 | J | 3.8 | 0.38 |
| | | Benzo(k)fluoranthene | 0.01 | 1.3 | J | 1.3 | 0.013 |
| | | Benz(a)anthracene | 0.1 | 2.8 | J | 2.8 | 0.28 |
| | | Chrysene | 0.001 | 4.6 | J | 4.6 | 0.0046 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.9 | J | 1.9 | 0.19 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **3.7676** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-29 (3-4) | 10/14/2014 | Benzo(a) pyrene | 1 | 7.3 | | 7.3 | 7.3 |
| | | Benzo(b)fluoranthene | 0.1 | 12 | | 12 | 1.2 |
| | | Benzo(k)fluoranthene | 0.01 | 3.6 | J | 3.6 | 0.036 |
| | | Benz(a)anthracene | 0.1 | 8.1 | | 8.1 | 0.81 |
| | | Chrysene | 0.001 | 12 | | 12 | 0.012 |
| | | Dibenz(a,h)anthracene | 1 | 1.6 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 5 | J | 5 | 0.5 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **9.858** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-30 (4-5) | 10/14/2014 | Benzo(a) pyrene | 1 | 15 | | 15 | 15 |
| | | Benzo(b)fluoranthene | 0.1 | 25 | | 25 | 2.5 |
| | | Benzo(k)fluoranthene | 0.01 | 8.2 | | 8.2 | 0.082 |
| | | Benz(a)anthracene | 0.1 | 15 | | 15 | 1.5 |
| | | Chrysene | 0.001 | 22 | | 22 | 0.022 |
| | | Dibenz(a,h)anthracene | 1 | 2.7 | J | 2.7 | 2.7 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 9.5 | | 9.5 | 0.95 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **22.754** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-31 (7-8) | 10/14/2014 | Benzo(a) pyrene | 1 | 0.91 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 1.5 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 1.2 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1.1 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.2 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.6 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.3 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **ND** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-32 (2.7-2.9) | 11/13/2014 | Benzo(a) pyrene | 1 | 5.4 | | 5.4 | 5.4 |
| | | Benzo(b)fluoranthene | 0.1 | 6.6 | | 7 | 0.7 |
| | | Benzo(k)fluoranthene | 0.01 | 1.8 | J | 1.8 | 0.018 |
| | | Benz(a)anthracene | 0.1 | 6 | | 6.0 | 0.6 |
| | | Chrysene | 0.001 | 8.7 | | 9 | 0.009 |
| | | Dibenz(a,h)anthracene | 1 | 1.7 | J | 2 | 2 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.2 | U | 0 | 0.0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **8.387** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-33 (1.5-2.5) | 11/13/2014 | Benzo(a) pyrene | 1 | 0.76 | U | 0.0 | 0.0 |
| | | Benzo(b)fluoranthene | 0.1 | 2 | J | 2 | 0.2 |
| | | Benzo(k)fluoranthene | 0.01 | 1 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.92 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.3 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.1 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **0.2** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-34 (1.5-2.5) | 11/13/2014 | Benzo(a) pyrene | 1 | 1.4 | J | 1.4 | 1.4 |
| | | Benzo(b)fluoranthene | 0.1 | 2 | J | 2 | 0.2 |
| | | Benzo(k)fluoranthene | 0.01 | 1.2 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 1.1 | U | 0 | 0 |
| | | Chrysene | 0.001 | 1.2 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 1.6 | U | 0 | 0 |

## Subsurface Soil: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ug/kg) | Qualifier | Adjusted Result (ug/kg) | Weighted Result (ug/kg) |
|---|---|---|---|---|---|---|---|
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.3 | U | 0 | 0 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **1.6** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-35 (0.5-1.0) | 11/13/2014 | Benzo(a) pyrene | 1 | 110 | | 110 | 110 |
| | | Benzo(b)fluoranthene | 0.1 | 150 | | 150 | 15 |
| | | Benzo(k)fluoranthene | 0.01 | 43 | | 43.0 | 0.43 |
| | | Benz(a)anthracene | 0.1 | 120 | | 120.0 | 12 |
| | | Chrysene | 0.001 | 160 | | 160 | 0.16 |
| | | Dibenz(a,h)anthracene | 1 | 22 | | 22 | 22 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 63 | | 63 | 6.3 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **165.89** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-36 (0.75-2) | 11/13/2014 | Benzo(a) pyrene | 1 | 3.8 | J | 3.8 | 3.8 |
| | | Benzo(b)fluoranthene | 0.1 | 4.8 | J | 5 | 0.5 |
| | | Benzo(k)fluoranthene | 0.01 | 1.2 | J | 1.2 | 0.012 |
| | | Benz(a)anthracene | 0.1 | 3.9 | J | 3.9 | 0.39 |
| | | Chrysene | 0.001 | 5.9 | | 6 | 0.006 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 2.2 | J | 2 | 0.2 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **4.908** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-38 (19.5-20) | 04/22/2015 | Benzo(a) pyrene | 1 | 52 | | 52 | 52 |
| | | Benzo(b)fluoranthene | 0.1 | 65 | | 65 | 6.5 |
| | | Benzo(k)fluoranthene | 0.01 | 23 | | 23 | 0.23 |
| | | Benz(a)anthracene | 0.1 | 97 | | 97 | 9.7 |
| | | Chrysene | 0.001 | 96 | | 96 | 0.096 |
| | | Dibenz(a,h)anthracene | 1 | 6.3 | J | 6 | 6.3 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 30 | | 30 | 3 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **77.826** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-39 (18-18.5) | 04/23/2015 | Benzo(a) pyrene | 1 | 4.1 | J | 4.1 | 4.1 |
| | | Benzo(b)fluoranthene | 0.1 | 4 | J | 4 | 0.4 |
| | | Benzo(k)fluoranthene | 0.01 | 1.4 | J | 1.4 | 0.014 |
| | | Benz(a)anthracene | 0.1 | 3.6 | J | 3.6 | 0.36 |
| | | Chrysene | 0.001 | 4.1 | J | 4.1 | 0.0041 |
| | | Dibenz(a,h)anthracene | 1 | 1.4 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 2.9 | J | 2.9 | 0.29 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **5.168** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-40 (9-9.5) | 04/23/2015 | Benzo(a) pyrene | 1 | 3.5 | J | 3.5 | 3.5 |
| | | Benzo(b)fluoranthene | 0.1 | 5.5 | | 5.5 | 0.55 |
| | | Benzo(k)fluoranthene | 0.01 | 1.7 | J | 1.7 | 0.017 |
| | | Benz(a)anthracene | 0.1 | 4 | J | 4 | 0.4 |
| | | Chrysene | 0.001 | 6.2 | | 6.2 | 0.0062 |
| | | Dibenz(a,h)anthracene | 1 | 1.3 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 2.4 | J | 2.4 | 0.24 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **4.713** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | 4/23/2015 (Dup) | Benzo(a) pyrene | 1 | 3.2 | J | 3.2 | 3.2 |
| | | Benzo(b)fluoranthene | 0.1 | 5.3 | | 5.3 | 0.53 |
| | | Benzo(k)fluoranthene | 0.01 | 1.7 | J | 1.7 | 0.017 |
| | | Benz(a)anthracene | 0.1 | 3.3 | J | 3.3 | 0.33 |
| | | Chrysene | 0.001 | 6.6 | | 6.6 | 0.0066 |
| | | Dibenz(a,h)anthracene | 1 | 1.3 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 2.4 | J | 2.4 | 0.24 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **4.324** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| SB-41 | 04/23/2015 | Benzo(a) pyrene | 1 | 2.1 | J | 2.1 | 2.1 |
| | | Benzo(b)fluoranthene | 0.1 | 2.8 | J | 2.8 | 0.28 |
| | | Benzo(k)fluoranthene | 0.01 | 1.1 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 2.5 | J | 2.5 | 0.25 |
| | | Chrysene | 0.001 | 2.9 | J | 2.9 | 0.0029 |

## Subsurface Soil: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ug/kg) | Qualifier | Adjusted Result (ug/kg) | Weighted Result (ug/kg) |
|---|---|---|---|---|---|---|---|
| (12-12.5) | 04/23/2015 | Dibenz(a,h)anthracene | 1 | 1.5 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 1.7 | J | 1.7 | 0.17 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **2.803** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| SB-41 (11.5-12) | 04/23/2015 | Benzo(a) pyrene | 1 | 13 | | 13 | 13 |
| | | Benzo(b)fluoranthene | 0.1 | 22 | | 22 | 2.2 |
| | | Benzo(k)fluoranthene | 0.01 | 6.3 | | 6.3 | 0.063 |
| | | Benz(a)anthracene | 0.1 | 14 | | 14 | 1.4 |
| | | Chrysene | 0.001 | 27 | | 27 | 0.027 |
| | | Dibenz(a,h)anthracene | 1 | 2.4 | J | 2 | 2.4 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 9.7 | | 9.7 | 0.97 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **20.060** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |

**Notes:**

1. ug/kg indicates micrograms per kilogram.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.
5. The PAH TEQ was calculated by multiplying carcinogenic PAH's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a total PAH TEQ. If none of the detection limits were found above the method detection limit, the total PAH TEQ for the sample is reported as ND which indicates Non-Detect.
6. Bold indicates the calculated concentration of PAH Equivalents.
7. PSRG indicates NDENR's Preliminary Soil Remediation Goals.
8. PAH indiates polyaromatic hydrocarbon.

## Surface Soil: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location (Sample Interval (ft BLS)) | Date | Parameter | TEF | Result (ug/kg) | Qualifier | Adjusted Result (ug/kg) | Weighted Result (ug/kg) |
|---|---|---|---|---|---|---|---|
| DU-01 (0-1) | 02/26/2014 | Benzo(a) pyrene | 1 | 360 | | 360 | 360 |
| | | Benzo(b)fluoranthene | 0.1 | 780 | | 780 | 78 |
| | | Benzo(k)fluoranthene | 0.01 | 270 | | 270 | 2.7 |
| | | Benz(a)anthracene | 0.1 | 710 | | 710 | 71 |
| | | Chrysene | 0.001 | 760 | | 760 | 0.76 |
| | | Dibenz(a,h)anthracene | 1 | 110 | | 110 | 110 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 380 | | 380 | 38 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **660** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| | 02/27/2014 | Benzo(a) pyrene | 1 | 69 | | 69 | 69 |
| | | Benzo(b)fluoranthene | 0.1 | 170 | | 170 | 17 |
| | | Benzo(k)fluoranthene | 0.01 | 56 | | 56 | 0.56 |
| | | Benz(a)anthracene | 0.1 | 130 | | 130 | 13 |
| | | Chrysene | 0.001 | 190 | | 190 | 0.19 |
| | | Dibenz(a,h)anthracene | 1 | 27 | | 27 | 27 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 76 | | 76 | 7.6 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **134** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| | 02/27/2014 | Benzo(a) pyrene | 1 | 97 | | 97 | 97 |
| | | Benzo(b)fluoranthene | 0.1 | 140 | | 140 | 14 |
| | | Benzo(k)fluoranthene | 0.01 | 41 | | 41 | 0.41 |
| | | Benz(a)anthracene | 0.1 | 120 | | 120 | 12 |
| | | Chrysene | 0.001 | 150 | | 150 | 0.15 |
| | | Dibenz(a,h)anthracene | 1 | 22 | | 22 | 22 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 67 | | 67 | 6.7 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **152** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |

**Notes:**

1. ug/kg indicates micrograms per kilogram.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.

5. The PAH TEQ was calculated by multiplying carcinogenic PAH's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a total PAH TEQ. If none of the detection limits were found above the method detection limit, the total PAH TEQ for the sample is reported as ND which indicates Non-Detect.

6. Bold indicates the calculated concentration of PAH Equivalents.
7. PSRG indicates NDENR's Preliminary Soil Remediation Goals.
8. PAH indiates polyaromatic hydrocarbon.

# Groundwater: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ug/L) | Qualifier | Adjusted Result (ug/L) | Weighted Result (ug/L) |
|---|---|---|---|---|---|---|---|
| MW-1 | 03/10/2014 | Benzo(a) pyrene | 1 | 0.005 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0049 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0047 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 09/09/2014 | Benzo(a) pyrene | 1 | 0.0052 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0035 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0051 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0032 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0049 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.015 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 04/21/2015 | Benzo(a) pyrene | 1 | 0.0051 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0034 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.005 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0032 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0032 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0048 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.015 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 11/19/2015 | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.04 | J | 0.04 | 0.004 |
| | | Benzo(k)fluoranthene | 0.01 | 0.013 | J | 0.013 | 0.00013 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.049 | J | 0.049 | 0.000049 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **0.00418** |
| | | | | | | 2L | |

# Groundwater: Carcinogenic PAH TEQs
# UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ug/L) | Qualifier | Adjusted Result (ug/L) | Weighted Result (ug/L) |
|---|---|---|---|---|---|---|---|
| MW-2 | 03/11/2014 | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.003 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.003 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 09/09/2014 | Benzo(a) pyrene | 1 | 0.0051 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0034 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.005 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0032 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0032 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0048 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.015 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 04/21/2015 | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.003 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 11/21/2015 | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |

# Groundwater: Carcinogenic PAH TEQs
# UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ug/L) | Qualifier | Adjusted Result (ug/L) | Weighted Result (ug/L) |
|---|---|---|---|---|---|---|---|
| MW-3 | 03/10/2014 | Benzo(a) pyrene | 1 | 0.005 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0049 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0047 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 03/10/2014 (Dup) | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.003 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 09/10/2014 | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.003 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 09/10/2014 (Dup) | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.003 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |

# Groundwater: Carcinogenic PAH TEQs
# UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ug/L) | Qualifier | Adjusted Result (ug/L) | Weighted Result (ug/L) |
|---|---|---|---|---|---|---|---|
| MW-3 | 04/24/2015 | Benzo(a) pyrene | 1 | 0.005 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0049 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0047 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 4/24/2015 (Dup) | Benzo(a) pyrene | 1 | 0.0051 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0034 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.005 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0032 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0048 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 11/21/2015 | Benzo(a) pyrene | 1 | 0.005 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0049 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0047 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 11/21/2015 (Dup) | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |

# Groundwater: Carcinogenic PAH TEQs
# UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ug/L) | Qualifier | Adjusted Result (ug/L) | Weighted Result (ug/L) |
|---|---|---|---|---|---|---|---|
| PZ/MW-4 | 09/10/2014 | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 04/21/2015 | Benzo(a) pyrene | 1 | 0.0051 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0034 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.005 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0032 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0048 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 11/19/2015 | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0031 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |

# Groundwater: Carcinogenic PAH TEQs
# UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ug/L) | Qualifier | Adjusted Result (ug/L) | Weighted Result (ug/L) |
|---|---|---|---|---|---|---|---|
| MW-5 | 09/10/2014 | Benzo(a) pyrene | 1 | 0.0049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.003 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.003 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.014 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 04/20/2015 | Benzo(a) pyrene | 1 | 0.0055 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.0037 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.0054 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.0034 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.0034 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.0051 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.016 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| | | | | | | 2L | |
| | 11/19/2015 | Benzo(a) pyrene | 1 | 0.036 | J | 0.036 | 0.036 |
| | | Benzo(b)fluoranthene | 0.1 | 0.049 | J | 0.049 | 0.0049 |
| | | Benzo(k)fluoranthene | 0.01 | 0.049 | J | 0.049 | 0.00049 |
| | | Benz(a)anthracene | 0.1 | 0.043 | J | 0.043 | 0.0043 |
| | | Chrysene | 0.001 | 0.048 | J | 0.048 | 0.000048 |
| | | Dibenz(a,h)anthracene | 1 | 0.07 | J | 0.07 | 0.07 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.061 | J | 0.061 | 0.0061 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **0.122** |
| | | | | | | 2L | |

**Notes:**

1. ug/L indicates micrograms per liter.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.
5. The PAH total equivalent (PAH TEQ) was calculated by multiplying carcinogenic PAH's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a total PAH TEQ. If none of the detection limits were found above the method detection limit, the total PAH TEQ for the sample is reported as ND which indicates Non-Detect.
6. Bold indicates the calculated concentration of PAH Equivalents.
7. 2L indicates NDEQ's 2L groundwater standards.
8. PAH indicates polyaromatic hydrocarbon.
9. Yellow shading indicates the PAH TEQ exceeds the NCDEQ 2L groundwater standard

## Sediment: Carcinogenic PAH TEQs
## UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Result (ug/kg) | Qualifier | Adjusted Result (ug/kg) | Weighted Result (ug/kg) |
|---|---|---|---|---|---|---|---|
| SED-1 (Upstream) | 09/11/2014 | Benzo(a) pyrene | 1 | 210 | | 210 | 210 |
| | | Benzo(b)fluoranthene | 0.1 | 230 | | 230 | 23 |
| | | Benzo(k)fluoranthene | 0.01 | 64 | | 64 | 0.64 |
| | | Benz(a)anthracene | 0.1 | 220 | | 220 | 22 |
| | | Chrysene | 0.001 | 280 | | 280 | 0.28 |
| | | Dibenz(a,h)anthracene | 1 | 33 | J | 33 | 33 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 130 | | 130 | 13 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **301.92** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| | | | | | | USEPA Region 4 Ecological Risk Screening Level | |
| SED-2 (Middle) | 09/11/2014 | Benzo(a) pyrene | 1 | 220 | | 220 | 220 |
| | | Benzo(b)fluoranthene | 0.1 | 260 | | 260 | 26 |
| | | Benzo(k)fluoranthene | 0.01 | 92 | J | 92 | 0.92 |
| | | Benz(a)anthracene | 0.1 | 190 | J | 190 | 19 |
| | | Chrysene | 0.001 | 220 | | 220 | 0.22 |
| | | Dibenz(a,h)anthracene | 1 | 41 | J | 41 | 41 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 170 | J | 170 | 17 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **324.14** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| | | | | | | USEPA Region 4 Ecological Risk Screening Level | |
| SED-3 (Downstream) | 09/11/2014 | Benzo(a) pyrene | 1 | 17 | J | 17 | 17 |
| | | Benzo(b)fluoranthene | 0.1 | 21 | J | 21 | 2.1 |
| | | Benzo(k)fluoranthene | 0.01 | 7.6 | J | 7.6 | 0.076 |
| | | Benz(a)anthracene | 0.1 | 17 | J | 17 | 1.7 |
| | | Chrysene | 0.001 | 22 | J | 22 | 0.022 |
| | | Dibenz(a,h)anthracene | 1 | 2.5 | J | 2.5 | 2.5 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 11 | J | 11 | 1.1 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **24.50** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| | | | | | | USEPA Region 4 Ecological Risk Screening Level | |
| | 09/11/2014 (Dup) | Benzo(a) pyrene | 1 | 28 | J | 28 | 28 |
| | | Benzo(b)fluoranthene | 0.1 | 33 | J | 33 | 3.3 |
| | | Benzo(k)fluoranthene | 0.01 | 12 | J | 12 | 0.12 |
| | | Benz(a)anthracene | 0.1 | 27 | J | 27 | 2.7 |
| | | Chrysene | 0.001 | 34 | J | 34 | 0.034 |
| | | Dibenz(a,h)anthracene | 1 | 4.7 | J | 4.7 | 4.7 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 19 | J | 19 | 1.9 |
| | | PAH TEQs (ug/kg) | | | | Total PAH TEQ | **40.75** |
| | | | | | | Resdiential PSRG | |
| | | | | | | Protection of Groundwater PSRG | |
| | | | | | | USEPA Region 4 Ecological Risk Screening Level | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SED-3R (Downstream) | 01/29/2015 | Benzo(a) pyrene | 1 | 150 | | 150 | 150 |
| | | Benzo(b)fluoranthene | 0.1 | 160 | | 160 | 16 |
| | | Benzo(k)fluoranthene | 0.01 | 50 | | 50 | 0.5 |
| | | Benz(a)anthracene | 0.1 | 160 | | 160 | 16 |
| | | Chrysene | 0.001 | 190 | | 190 | 0.19 |
| | | Dibenz(a,h)anthracene | 1 | 21 | | 21 | 21 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 84 | | 84 | 8 |
| | | PAH TEQs (ug/kg) | Total PAH TEQ | | | | **212.09** |
| | | | Resdiential PSRG | | | | |
| | | | Protection of Groundwater PSRG | | | | |
| | | | USEPA Region 4 Ecological Risk Screening Level | | | | |

**Notes:**

1. ug/kg indicates micrograms per kilogram.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.
5. The PAH TEQ was calculated by multiplying carcinogenic PAH's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a total PAH TEQ. If none of the detection limits were found above the method detection limit, the total PAH TEQ for the sample is reported as ND which indicates Non-Detect.
6. Bold indicates the calculated concentration of PAH Equivalents.
7. PSRG indicates NDENR's Preliminary Soil Remediation Goals.
8. PAH indiates polyaromatic hydrocarbon.

# Surface Water: Carcinogenic PAH TEQs
# UNC Cogeneration Facility - Chapel Hill, North Carolina

| Location | Date | Parameter | TEF | Reslt (ug/L) | Qualifier | Adjusted Result (ug/L) | Weighted Result (ug/L) |
|---|---|---|---|---|---|---|---|
| SW-1 (Upstream) | 09/11/2014 | Benzo(a) pyrene | 1 | 0.12 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.079 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.12 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.074 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.073 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.11 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.34 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| SW-2 (Middle) | 09/11/2014 | Benzo(a) pyrene | 1 | 0.049 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.033 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.048 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.031 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.03 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.046 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.14 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |
| SW-3 (Downstream) | 09/11/2014 | Benzo(a) pyrene | 1 | 0.059 | U | 0 | 0 |
| | | Benzo(b)fluoranthene | 0.1 | 0.04 | U | 0 | 0 |
| | | Benzo(k)fluoranthene | 0.01 | 0.058 | U | 0 | 0 |
| | | Benz(a)anthracene | 0.1 | 0.037 | U | 0 | 0 |
| | | Chrysene | 0.001 | 0.037 | U | 0 | 0 |
| | | Dibenz(a,h)anthracene | 1 | 0.055 | U | 0 | 0 |
| | | Indeno(1,2,3-c,d)pyrene | 0.1 | 0.17 | U | 0 | 0 |
| | | PAH TEQs (ug/L) | | | | Total PAH TEQ | **ND** |

**Notes:**

1. ug/L indicates micrograms per liter.
2. TEF indicates World Health Organization toxic equivalency factors.
3. J indicates an estimated value.
4. U indicates the result is less than the method detection limit.
5. The PAH TEQ was calculated by multiplying carcinogenic PAH's TEF by either the detected concentration or 0 if the result was less than the method detection limit. The individual equivalents were summed to derive a total PAH TEQ. If none of the detection limits were found above the method detection limit, the total PAH TEQ for the sample is reported as ND which indicates Non-Detect.
6. Bold indicates the calculated concentration of PAH Equivalents.
7. PAH indiates polyaromatic hydrocarbon.

# APPENDIX L

# Laboratory Analytical Reports – Surface Soil

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-52668-2
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 6:10:26 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Job ID: 280-52668-2

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-52668-2

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**

The samples were received on 2/28/2014 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.5º C.

This data packge represents EPA SW-846 Method 8290 only. All other analysis requested on the COC is reported under separate cover (280-52668-1).
Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrooke Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 3/20/2014 09:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.1º C.

**ISM PREP**

The samples requiring ISM were processed according to the ISM Laboratory Processing Options Summary Tables provided with quotation.

Samples SSS-DU01A-0.0-1.0-140226 (280-52668-2), SSS-DU01B-0.0-1.0-140227 (280-52668-4), SSS-DU01C-0.0-1.0-140227 (280-52668-6) were 10 mesh seived, rocks removed, and the rocks were crushed with a sledge hammer per client requirements. The rocks were put in a seperate ball mill can to evaluate the effectiveness of the grinding. After 8 hours grinding, the rocks were removed and evaluated. The rocks/ground rock material was seived to remove the fully ground material. The rocks were returned to the ball mill can and ground an additional 6 hours. The ball mill was unable to fully grind the samples rocks. The rocks were again sieved and the rocks weighed back. Sample SSS-DU01A-0.0-1.0-140226 (280-52668-2) had 43.71g unground rocks, sample SSS-DU01B-0.0-1.0-140227 (280-52668-4) had 174.11g rocks unground and sample SSS-DU01C-0.0-1.0-140227 (280-52668-6) had 69.80g unground rocks. The soil portion of these samples were completely ground in the first 8 hour grind period. Majority of the rocks in all the samples was ground to completion in the first 8 hour period.

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-2

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Solid | 02/26/14 17:00 | 02/28/14 09:45 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Solid | 02/27/14 12:00 | 02/28/14 09:45 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Solid | 02/27/14 15:00 | 02/28/14 09:45 |

**H4C200412 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 20**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-52668-1

UNC Cogen

Lot #: H4C200412

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

April 8, 2014

# ANALYTICAL METHODS SUMMARY

H4C200412

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H4C200412**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M296F | 001 | SSS-DU01A-0.0-1.0-140226 | 02/26/14 | 17:00 |
| M296G | 002 | SSS-DU01B-0.0-1.0-140227 | 02/27/14 | 12:00 |
| M296H | 003 | SSS-DU01C-0.0-1.0-140227 | 02/27/14 | 15:00 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H4C200412

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

For solid and sediments samples, when percent moisture is included in the report header field, the sample results are reported on a dry weight basis. When percent moisture is not contained in the header field, sample results are reported on an as received or wet weight basis.

The 12-hour shift closing standard 140402s1 did not meet the 13C-12378-PeCDD response factor (RF) acceptance criterion of +/-35 percent difference from the ICAL (%D). The observed value was +41%D. The change in the response was due to high boiling sample residue deposited in the GC injector port during the analysis. This was confirmed by installing a clean injector port liner and repeating the standard analysis. The second standard met the 13C-12378-PeCDD RF acceptance criteria. The % recoveries for 13C-12378-PeCDD were calculated using the average of the opening and closing standard RFs instead of the ICAL mean RF. The results for the native analogue were not similarly affected.

Samples SSS-DU01A-0.0-1.0-140226 and SSS-DU01B-0.0-1.0-140227 exhibited native OCDD above the upper calibration range. The method does not require further action be taken; therefore, the results were reported as is with an "E" qualifier.

The following flags are used to qualify results for chlorinated dioxin and furan results:

> **J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:
>
> **Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

# PROJECT NARRATIVE
## H4C200412

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.

# PROJECT NARRATIVE
## H4C200412

- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated

# PROJECT NARRATIVE
## H4C200412

population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

In sample data, peaks must have an intensity of $\geq$2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: SSS-DU01A-0.0-1.0-140226**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C200412 - 001 | **Work Order #....:** | M296F1AA | **Matrix....:** | SOLID |
| **Date Sampled....:** | 02/26/14 | **Date Received....:** | 03/20/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/21/14 | **Analysis Date....:** | 04/02/14 | | |
| **Prep Batch # ....:** | 4080017 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **0.11** | **Q J** | **1.0** | **0.057** | **pg/g** |
| **1,2,3,7,8-PeCDD** | **0.91** | **J** | **5.0** | **0.047** | **pg/g** |
| **1,2,3,4,7,8-HxCDD** | **8.7** | | **5.0** | **0.075** | **pg/g** |
| **1,2,3,6,7,8-HxCDD** | **18** | | **5.0** | **0.074** | **pg/g** |
| **1,2,3,7,8,9-HxCDD** | **5.7** | **C** | **5.0** | **0.073** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDD** | **470** | | **5.0** | **0.24** | **pg/g** |
| **OCDD** | **5800** | **B E** | **10** | **0.63** | **pg/g** |
| **2,3,7,8-TCDF** | **0.098** | **Q J** | **1.0** | **0.032** | **pg/g** |
| 1,2,3,7,8-PeCDF | ND | | 5.0 | 0.045 | pg/g |
| **2,3,4,7,8-PeCDF** | **0.33** | **Q B J** | **5.0** | **0.042** | **pg/g** |
| **1,2,3,4,7,8-HxCDF** | **4.3** | **Q B J** | **5.0** | **0.050** | **pg/g** |
| **1,2,3,6,7,8-HxCDF** | **5.7** | **Q** | **5.0** | **0.046** | **pg/g** |
| **2,3,4,6,7,8-HxCDF** | **0.97** | **Q J** | **5.0** | **0.049** | **pg/g** |
| **1,2,3,7,8,9-HxCDF** | **0.18** | **Q J** | **5.0** | **0.065** | **pg/g** |
| **1,2,3,4,6,7,8-HpCDF** | **91** | **B** | **5.0** | **0.10** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **9.4** | **B** | **5.0** | **0.15** | **pg/g** |
| **OCDF** | **290** | **Q B** | **10** | **0.13** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 67 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 67 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 60 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 62 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 69 | 40 - 135 |
| 13C-OCDD | 67 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 57 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 73 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 50 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 48 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 53 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 52 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 51 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 54 | 40 - 135 |
| 13C-OCDF | 62 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SSS-DU01A-0.0-1.0-140226**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C200412 - 001 | **Work Order #....:** | M296F1AA | **Matrix....:** | SOLID |
| **Date Sampled....:** | 02/26/14 | **Date Received....:** | 03/20/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/21/14 | **Analysis Date....:** | 04/02/14 | | |
| **Prep Batch # ....:** | 4080017 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a wet weight (as received) basis and have not been adjusted for percent moisture.

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

C Co-eluting isomer.

E Estimated result. Result concentration exceeds the calibration range.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: SSS-DU01B-0.0-1.0-140227**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C200412 - 002 | **Work Order #....:** | M296G1AA | **Matrix....:** | SOLID |
| **Date Sampled....:** | 02/27/14 | **Date Received....:** | 03/20/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/21/14 | **Analysis Date....:** | 04/02/14 | | |
| **Prep Batch # ....:** | 4080017 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.39 | J | 0.99 | 0.037 | pg/g |
| 1,2,3,7,8-PeCDD | 0.74 | J | 5.0 | 0.038 | pg/g |
| 1,2,3,4,7,8-HxCDD | 4.4 | J | 5.0 | 0.055 | pg/g |
| 1,2,3,6,7,8-HxCDD | 12 | | 5.0 | 0.057 | pg/g |
| 1,2,3,7,8,9-HxCDD | 3.6 | C J | 5.0 | 0.055 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | 290 | | 5.0 | 0.098 | pg/g |
| OCDD | 4200 | B E | 9.9 | 0.20 | pg/g |
| 2,3,7,8-TCDF | 0.29 | J | 0.99 | 0.030 | pg/g |
| 1,2,3,7,8-PeCDF | 0.13 | Q J | 5.0 | 0.034 | pg/g |
| 2,3,4,7,8-PeCDF | 0.20 | B J | 5.0 | 0.031 | pg/g |
| 1,2,3,4,7,8-HxCDF | 2.2 | Q B J | 5.0 | 0.035 | pg/g |
| 1,2,3,6,7,8-HxCDF | 3.8 | Q J | 5.0 | 0.034 | pg/g |
| 2,3,4,6,7,8-HxCDF | 0.68 | Q J | 5.0 | 0.036 | pg/g |
| 1,2,3,7,8,9-HxCDF | 0.096 | Q J | 5.0 | 0.043 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | 53 | B | 5.0 | 0.053 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | 5.1 | B | 5.0 | 0.072 | pg/g |
| OCDF | 170 | B | 9.9 | 0.078 | pg/g |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 68 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 66 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 63 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 57 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 70 | 40 - 135 |
| 13C-OCDD | 78 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 57 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 72 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 50 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 45 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 51 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 51 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 52 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 55 | 40 - 135 |
| 13C-OCDF | 59 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SSS-DU01B-0.0-1.0-140227**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C200412 - 002 | **Work Order #....:** | M296G1AA | **Matrix....:** | SOLID |
| **Date Sampled....:** | 02/27/14 | **Date Received....:** | 03/20/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/21/14 | **Analysis Date....:** | 04/02/14 | | |
| **Prep Batch # ....:** | 4080017 | | | | |
| **Initial Wgt/Vol :** | 10.1 g | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a wet weight (as received) basis and have not been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| C | Co-eluting isomer. |
| E | Estimated result. Result concentration exceeds the calibration range. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

**TestAmerica Denver**

**Sample ID: SSS-DU01C-0.0-1.0-140227**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C200412 - 003 | **Work Order #....:** | M296H1AA | **Matrix....:** | SOLID |
| **Date Sampled....:** | 02/27/14 | **Date Received....:** | 03/20/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/21/14 | **Analysis Date....:** | 04/02/14 | | |
| **Prep Batch # ....:** | 4080017 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | 0.31 | J | 1.0 | 0.033 | pg/g |
| 1,2,3,7,8-PeCDD | 0.78 | J | 5.0 | 0.042 | pg/g |
| 1,2,3,4,7,8-HxCDD | 4.6 | J | 5.0 | 0.057 | pg/g |
| 1,2,3,6,7,8-HxCDD | 9.7 | | 5.0 | 0.057 | pg/g |
| 1,2,3,7,8,9-HxCDD | 4.0 | C J | 5.0 | 0.056 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | 250 | | 5.0 | 0.14 | pg/g |
| OCDD | 3500 | B | 10 | 0.26 | pg/g |
| 2,3,7,8-TCDF | 0.076 | Q J | 1.0 | 0.024 | pg/g |
| 1,2,3,7,8-PeCDF | 0.15 | Q J | 5.0 | 0.032 | pg/g |
| 2,3,4,7,8-PeCDF | 0.19 | B J | 5.0 | 0.027 | pg/g |
| 1,2,3,4,7,8-HxCDF | 1.8 | Q B J | 5.0 | 0.035 | pg/g |
| 1,2,3,6,7,8-HxCDF | 2.9 | Q J | 5.0 | 0.033 | pg/g |
| 2,3,4,6,7,8-HxCDF | 0.65 | Q J | 5.0 | 0.035 | pg/g |
| 1,2,3,7,8,9-HxCDF | 0.12 | Q J | 5.0 | 0.043 | pg/g |
| 1,2,3,4,6,7,8-HpCDF | 48 | B | 5.0 | 0.071 | pg/g |
| 1,2,3,4,7,8,9-HpCDF | 4.2 | B J | 5.0 | 0.094 | pg/g |
| OCDF | 150 | B | 10 | 0.10 | pg/g |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 67 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 66 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 55 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 53 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 65 | 40 - 135 |
| 13C-OCDD | 57 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 55 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 72 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 47 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 41 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 47 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 48 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 48 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 53 | 40 - 135 |
| 13C-OCDF | 53 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: SSS-DU01C-0.0-1.0-140227**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C200412 - 003 | **Work Order #....:** | M296H1AA | **Matrix....:** | SOLID |
| **Date Sampled....:** | 02/27/14 | **Date Received....:** | 03/20/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/21/14 | **Analysis Date....:** | 04/02/14 | | |
| **Prep Batch # ....:** | 4080017 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

Sample results, minimum levels, and estimated detection limits are reported on a wet weight (as received) basis and have not been adjusted for percent moisture.

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| C | Co-eluting isomer. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C210000 - 017B | **Work Order #....:** | M3AFA1AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/21/14 | **Analysis Date....:** | 04/02/14 | **Percent Moisture:** | 100 |
| **Prep Batch # ....:** | 4080017 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 1.0 | 0.055 | pg/g |
| 1,2,3,7,8-PeCDD | ND | | 5.0 | 0.054 | pg/g |
| 1,2,3,4,7,8-HxCDD | ND | | 5.0 | 0.11 | pg/g |
| 1,2,3,6,7,8-HxCDD | ND | | 5.0 | 0.11 | pg/g |
| 1,2,3,7,8,9-HxCDD | ND | | 5.0 | 0.11 | pg/g |
| 1,2,3,4,6,7,8-HpCDD | ND | | 5.0 | 0.22 | pg/g |
| **OCDD** | **2.9** | **J** | **10** | **0.067** | **pg/g** |
| 2,3,7,8-TCDF | ND | | 1.0 | 0.088 | pg/g |
| 1,2,3,7,8-PeCDF | ND | | 5.0 | 0.16 | pg/g |
| **2,3,4,7,8-PeCDF** | **0.13** | **Q J** | **5.0** | **0.14** | **pg/g** |
| **1,2,3,4,7,8-HxCDF** | **0.30** | **Q J** | **5.0** | **0.14** | **pg/g** |
| 1,2,3,6,7,8-HxCDF | ND | | 5.0 | 0.14 | pg/g |
| 2,3,4,6,7,8-HxCDF | ND | | 5.0 | 0.17 | pg/g |
| 1,2,3,7,8,9-HxCDF | ND | | 5.0 | 0.18 | pg/g |
| **1,2,3,4,6,7,8-HpCDF** | **0.21** | **Q J** | **5.0** | **0.046** | **pg/g** |
| **1,2,3,4,7,8,9-HpCDF** | **0.14** | **Q J** | **5.0** | **0.084** | **pg/g** |
| **OCDF** | **0.93** | **Q J** | **10** | **0.048** | **pg/g** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 63 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 51 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 71 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 70 | 40 - 135 |
| 13C-OCDD | 70 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 63 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 56 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 60 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 53 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 55 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 58 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 58 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 52 | 40 - 135 |
| 13C-OCDF | 51 | 40 - 135 |

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## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C210000 - 017B | **Work Order #....:** | M3AFA1AA | **Matrix....:** | SOLID |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/21/14 | **Analysis Date....:** | 04/02/14 | **Percent Moisture:** | 100 |
| **Prep Batch # ....:** | 4080017 | | | | |
| **Initial Wgt/Vol :** | 10 g | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# LABORATORY CONTROL SAMPLE DATA REPORT

## Trace Level Organic Compounds

**Client Lot # ...:** H4C200412 **Work Order # ...:** M3AFA1AC-LCS **Matrix .....:** SOLID
**LCS Lot-Sample# :** H4C210000 - 017
**Prep Date .....:** 03/21/14 **Analysis Date ..:** 04/01/14
**Prep Batch # ...:** 4080017
**Dilution Factor :** 1
**Analyst ID.....:** Linda K. McWhirter **Instrument ID..:** D11A **Method.....:** SW846 8290
**Initial Wgt/Vol:** 10 g

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **20.0** | **17.2** | **pg/g** | **86** | | **(79 - 129)** |
| **1,2,3,7,8-PeCDD** | **100** | **92.0** | **pg/g** | **92** | | **(79 - 129)** |
| **1,2,3,4,7,8-HxCDD** | **100** | **88.6** | **pg/g** | **89** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **100** | **84.6** | **pg/g** | **85** | | **(74 - 124)** |
| **1,2,3,7,8,9-HxCDD** | **100** | **88.3** | **pg/g** | **88** | | **(70 - 124)** |
| **1,2,3,4,6,7,8-HpCDD** | **100** | **84.8** | **pg/g** | **85** | | **(73 - 123)** |
| **OCDD** | **200** | **167** | **pg/g** | **84** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **20.0** | **17.1** | **pg/g** | **85** | | **(75 - 125)** |
| **1,2,3,7,8-PeCDF** | **100** | **84.4** | **pg/g** | **84** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **100** | **89.2** | **pg/g** | **89** | **B** | **(75 - 125)** |
| **1,2,3,4,7,8-HxCDF** | **100** | **92.6** | **pg/g** | **93** | **B** | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **100** | **89.7** | **pg/g** | **90** | | **(76 - 126)** |
| **2,3,4,6,7,8-HxCDF** | **100** | **91.4** | **pg/g** | **91** | | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **100** | **89.9** | **pg/g** | **90** | | **(77 - 127)** |
| **1,2,3,4,6,7,8-HpCDF** | **100** | **87.3** | **pg/g** | **87** | **B** | **(77 - 127)** |
| **1,2,3,4,7,8,9-HpCDF** | **100** | **91.0** | **pg/g** | **91** | **B** | **(73 - 123)** |
| **OCDF** | **200** | **170** | **pg/g** | **85** | **B** | **(49 - 128)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 65 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 63 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 66 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 68 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 77 | (40 - 135) |
| 13C-OCDD | 88 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 60 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 71 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 66 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 53 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 52 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 54 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 57 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 61 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 62 | (40 - 135) |
| 13C-OCDF | 72 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H4C200N112

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-236339.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving- John Reynolds | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-52668-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 3/18/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| SSS-DU01A-0.0-1.0-140226 (280-52668-2) | 2/26/14 | 17:00 Eastern | | Solid | | | X | 2 | |
| SSS-DU01B-0.0-1.0-140227 (280-52668-4) | 2/27/14 | 12:00 Eastern | | Solid | | | X | 2 | |
| SSS-DU01C-0.0-1.0-140227 (280-52668-6) | 2/27/14 | 15:00 Eastern | | Solid | | | X | 2 | |

CUSTODY SEALS INTACT
RECEIVED AT 0.1°C
BKD 3-20-14
1 COOLER FEDX # 5986 2751 9718

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 3/19/14 16:00 | TA-D | [signature] | 3-20-14 09:50 | TA KNOX |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H4C200412

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : SC60 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | ✓ | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____ | ✓ | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | ✓ | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | ✓ | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: NA

Sample Receiving Associate: [signature] Date: 3-20-14

QA026R27.doc, 123013

280-52668 Chain of Custody

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT All relevant fields must be completed accurately.

0.3 IRS+0.2
JK 2-28-14

Page: 1 of 1

1786495

**Section A** Required Client Information:
Company: Geosyntec Consultants
Address: 4601 Six Forks Rd Ste 340, Raleigh, NC
Email To:
Phone: 919-424-1812 Fax:
Requested Due Date/TAT: Standard

**Section B** Required Project Information:
Report To: of NC, PC Beau Hodge
Copy To: Mike Schott
Purchase Order No.:
Project Name: UNC Cogen
Project Number: GN5219

**Section C** Invoice Information:
Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #

**REGULATORY AGENCY**
☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☒ OTHER

Site Location STATE: NC

**Section D** Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED Composite Start DATE | COLLECTED Composite Start TIME | COLLECTED Composite End/Grab DATE | COLLECTED Composite End/Grab TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test (Y/N): ISM 6010C | ISM 7470A | ISM 8270D SIM | ISM 8290 | pH & 6010 | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SSS-DU01A-0.0-1.0-140226 | SL | C | 2/26/14 | 1800 | 2/26/14 | 1700 | | 1 | X | | | | | | | | X | X | X | X | | | |
| 2 | SSS-DU01B-0.0-1.0-140227 | SL | C | 2/27/14 | 0800 | 2/27/14 | 1200 | | 1 | X | | | | | | | | X | X | X | X | | | |
| 3 | SSS-DU01C-0.0-1.0-140227 | SL | C | 2/27/14 | 1300 | 2/27/14 | 1800 | | 1 | X | | | | | | | | X | X | X | X | | | |
| 4 | MW-3-3 | SL | G | | | 2/26/14 | 1030 | | 1 | X | | | | | | | | | | | | X X | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS |
|---|---|---|---|---|---|---|---|
| ISM samples to be processed as agreed previously | Caitlin Collins/Geosyn | 2/27/14 | 1609 | | 2-28-14 | 945 | |

ORIGINAL

SAMPLER NAME AND SIGNATURE
PRINT Name of SAMPLER: Caitlin Collins
SIGNATURE of SAMPLER:
DATE Signed (MM/DD/YY): 02/27/14

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-52668-2

**Login Number: 52668**
**List Number: 1**
**Creator: Dedio, Michael T**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-52668-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 6:12:36 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| X | Surrogate is outside control limits |
| D | Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples. |
| B | Compound was found in the blank and sample. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| E | Result exceeded calibration range. |
| * | ISTD response or retention time outside acceptable limits |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |
| F2 | MS/MSD RPD exceeds control limits |
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |
| U | Indicates the analyte was analyzed for but not detected. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-52668-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-52668-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**

The samples were received on 2/28/2014 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.5º C.

Except:

Per client request, the samples were logged for 8270D SIM Light PAHs, in addition to the analyses listed on the COC.

Method ISM 8290 requested on the COC is reported under separate cover (280-52668-2).

**ISM PREP**

The samples requiring ISM were processed according to the ISM Laboratory Processing Options Summary Tables provided with quotation.

Samples SSS-DU01A-0.0-1.0-140226 (280-52668-2), SSS-DU01B-0.0-1.0-140227 (280-52668-4), SSS-DU01C-0.0-1.0-140227 (280-52668-6) were 10 mesh seived, rocks removed, and the rocks were crushed with a sledge hammer per client requirements. The rocks were put in a seperate ball mill can to evaluate the effectiveness of the grinding. After 8 hours grinding, the rocks were removed and evaluated. The rocks/ground rock material was seived to remove the fully ground material. The rocks were returned to the ball mill can and ground an additional 6 hours. The ball mill was unable to fully grind the samples rocks. The rocks were again sieved and the rocks weighed back. Sample SSS-DU01A-0.0-1.0-140226 (280-52668-2) had 43.71g unground rocks, sample SSS-DU01B-0.0-1.0-140227 (280-52668-4) had 174.11g rocks unground and sample SSS-DU01C-0.0-1.0-140227 (280-52668-6) had 69.80g unground rocks. The soil portion of these samples were completely ground in the first 8 hour grind period. Majority of the rocks in all the samples was ground to completion in the first 8 hour period.

**8270D SIM**

Samples SSS-DU01A-0.0-1.0-140226 (280-52668-2)[20X], SSS-DU01B-0.0-1.0-140227 (280-52668-4)[5X], SSS-DU01C-0.0-1.0-140227 (280-52668-5)[4X] and SSS-DU01C-0.0-1.0-140227 (280-52668-6)[4X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Internal standard responses were outside of acceptance limits for the following sample(s): (280-52668-5 MS). The sample(s) shows evidence of matrix interference.

## Job ID: 280-52668-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

Acenaphthylene was detected in method blank MB 280-216464/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Nitrobenzene-d5 and Terphenyl-d14 failed the surrogate recovery criteria high for for SSS-DU01A-0.0-1.0-140226 (280-52668-2). Nitrobenzene-d5 failed the surrogate recovery criteria high for SSS-DU01B-0.0-1.0-140227 (280-52668-4). Nitrobenzene-d5 failed the surrogate recovery criteria high for SSS-DU01C-0.0-1.0-140227 (280-52668-6). Terphenyl-d14 failed the surrogate recovery criteria high for SSS-DU01C-0.0-1.0-140227MS (280-52668-5MS).Nitrobenzene-d5 failed the surrogate recovery criteria high for SSS-DU01A-0.0-1.0-140226MS (280-52668-2MS). Nitrobenzene-d5 and Terphenyl-d14 failed the surrogate recovery criteria high for SSS-DU01A-0.0-1.0-140226MSD (280-52668-2MSD). Refer to the QC report for details. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

2-Fluorobiphenyl, Nitrobenzene-d5 and Terphenyl-d14 failed the surrogate recovery criteria low for the 20x dilution of SSS-DU01A-0.0-1.0-140226 (280-52668-2). Nitrobenzene-d5 failed the surrogate recovery criteria high for the 3x dilution of SSS-DU01B-0.0-1.0-140227 (280-52668-3). Nitrobenzene-d5 failed the surrogate recovery criteria low for the 5x dilution of SSS-DU01B-0.0-1.0-140227 (280-52668-4). Nitrobenzene-d5 failed the surrogate recovery criteria low for 4 x dilution of SSS-DU01C-0.0-1.0-140227 (280-52668-6). Refer to the QC report for details. Recoveries are calculated from a diluted extract.

Terphenyl-d14 failed the surrogate recovery criteria high for LCS 280-216464/2-A. Refer to the QC report for details. All target compounds are within control limits; therefore, re-extraction and/or re-analysis was not performed.

Several analytes failed the recovery criteria low for the MS of sample SSS-DU01A-0.0-1.0-140226MS (280-52668-2) in batch 280-217084. Several analytes failed the recovery criteria high. Benzo[b]fluoranthene and Phenanthrene failed the recovery criteria low for the MSD of sample SSS-DU01A-0.0-1.0-140226MSD (280-52668-2) in batch 280-217084. Benzo[a]pyrene failed the recovery criteria high. Refer to the QC report for details.

Acenaphthene, Acenaphthylene and Naphthalene failed the recovery criteria high for the MS of sample SSS-DU01C-0.0-1.0-140227MS (280-52668-5) in batch 280-216169. For the MSD of sample SSS-DU01C-0.0-1.0-140227MSD (280-52668-5) in batch 280-216169, Naphthalene failed the recovery criteria low. Acenaphthylene failed the recovery criteria high. Also, Acenaphthene, Acenaphthylene and Naphthalene exceeded the RPD limit. Refer to the QC report for details.

No other difficulties were encountered during the 8270D SIM analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL METALS (ICP)**

Zinc was detected in method blank MB 280-215574/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Cobalt, Iron and Thallium failed the recovery criteria low for the MS of sample MW-3-3MS (280-52668-7) in batch 280-215887. Aluminum failed the recovery criteria high. Cobalt, Iron and Thallium failed the recovery criteria low for the MSD of sample MW-3-3MSD (280-52668-7) in batch 280-215887. Aluminum failed the recovery criteria high. Refer to the QC report for details.

The Post Digestion Spike associated with batch 280-215574 was outside of control limits for Barium, Cobalt, Copper, Silver and Vandium. The Serial Dilution was outside of control limits for multiple elements. Refer to the QC report for details.

Aluminum was detected in method blank MB 280-216506/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Several analytes failed the recovery criteria low for the MS of sample SSS-DU01A-0.0-1.0-140226MS (280-52668-2) in batch 280-217407. Aluminum and Iron failed the recovery criteria high. Several analytes failed the recovery criteria low for the MSD of sample SSS-DU01A-0.0-1.0-140226MSD (280-52668-2) in batch 280-217407. Aluminum and Iron failed the recovery criteria high. Refer to the QC

## Job ID: 280-52668-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

report for details.

The Post Digestion Spike associated with batch 280-216506 was outside of control limits for Silver, Lead and Zinc. The Serial Dilution was outside of control limits for multiple elements. Refer to the QC report for details

The continuing calibration verification (CCVL) associated with batch 280-216870 recovered above the upper control limit for Iron. The samples associated with this CCV were >10x the level of the CCVL for the affected analytes; therefore, the data have been reported.

The instrument blank for analytical batch 280-217407 contained Antimony greater than one-half the reporting limit (RL), and were not re-analyzed because the sample results are less than the RL.

No other difficulties were encountered during the metals analysis.

All other quality control parameters were within the acceptance limits.

**MERCURY**
No difficulties were encountered during the Mercury analysis.

All quality control parameters were within the acceptance limits.

**PH (CORROSIVITY)**
No difficulties were encountered during the pH analysis.

All quality control parameters were within the acceptance limits.

**PERCENT SOLIDS**
No difficulties were encountered during the % solids analysis.

All quality control parameters were within the acceptance limits.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Client Sample ID: SSS-DU01A-0.0-1.0-140226 — Lab Sample ID: 280-52668-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 17000 | | 5700 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 120000 | | 5700 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene | 95000 | | 5700 | 300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 110000 | | 5700 | 350 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 64000 | | 5700 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

## Client Sample ID: SSS-DU01A-0.0-1.0-140226 — Lab Sample ID: 280-52668-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 89000 | | 5000 | 160 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 110000 | | 5000 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene - DL | 350000 | | 100000 | 5200 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene - DL | 410000 | | 100000 | 6200 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene - DL | 300000 | B | 100000 | 3400 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Anthracene - DL | 460000 | | 100000 | 15000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene - DL | 710000 | | 100000 | 18000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene - DL | 360000 | | 100000 | 15000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene - DL | 780000 | | 100000 | 24000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene - DL | 370000 | | 100000 | 22000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene - DL | 270000 | | 100000 | 20000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Chrysene - DL | 760000 | | 100000 | 20000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene - DL | 1800000 | | 100000 | 20000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Fluorene - DL | 390000 | | 100000 | 9500 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene - DL | 380000 | | 100000 | 22000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Naphthalene - DL | 310000 | | 100000 | 6600 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene - DL | 2100000 | | 100000 | 22000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 1500000 | | 100000 | 22000 | ng/Kg | 20 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 13000 | B | 9.7 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.5 | | 1.9 | 0.64 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 59 | | 0.97 | 0.074 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.37 | J | 0.49 | 0.032 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.11 | J | 0.49 | 0.040 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 19 | | 1.5 | 0.056 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 7.0 | | 0.97 | 0.097 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 22 | | 1.9 | 0.21 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 17000 | ^ | 15 | 3.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 13 | | 0.78 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Magnesium | 3000 | | 19 | 3.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 380 | | 0.97 | 0.097 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 12 | | 3.9 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 33 | | 1.9 | 0.092 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 58 | | 2.9 | 0.39 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 30 | | 17 | 5.6 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SSS-DU01B-0.0-1.0-140227 — Lab Sample ID: 280-52668-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 21000 | | 5800 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 130000 | | 5800 | 200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 250000 | | 5800 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Client Sample ID: SSS-DU01B-0.0-1.0-140227 (Continued) — Lab Sample ID: 280-52668-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 150000 | | 5800 | 380 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene - DL | 260000 | | 23000 | 1200 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |

## Client Sample ID: SSS-DU01B-0.0-1.0-140227 — Lab Sample ID: 280-52668-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 290000 | | 4600 | 290 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 14000 | | 4600 | 150 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 64000 | B | 4600 | 160 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 70000 | | 4600 | 670 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 130000 | | 4600 | 840 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 69000 | | 4600 | 690 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 110000 | | 4600 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 56000 | | 4600 | 930 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 27000 | | 4600 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 33000 | | 4600 | 440 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 76000 | | 4600 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene - DL | 280000 | | 23000 | 1200 | ng/Kg | 5 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene - DL | 170000 | | 23000 | 5600 | ng/Kg | 5 | ☼ | 8270D SIM | Total/NA |
| Chrysene - DL | 190000 | | 23000 | 4600 | ng/Kg | 5 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene - DL | 300000 | | 23000 | 4600 | ng/Kg | 5 | ☼ | 8270D SIM | Total/NA |
| Naphthalene - DL | 180000 | | 23000 | 1500 | ng/Kg | 5 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene - DL | 350000 | | 23000 | 5100 | ng/Kg | 5 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 340000 | | 23000 | 5100 | ng/Kg | 5 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 13000 | B | 9.5 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 3.0 | | 1.9 | 0.63 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 61 | | 0.95 | 0.072 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.33 | J | 0.48 | 0.031 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.13 | J | 0.48 | 0.039 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 28 | | 1.4 | 0.055 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 9.0 | | 0.95 | 0.095 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 25 | | 1.9 | 0.21 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 19000 | ^ | 14 | 3.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 11 | | 0.76 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Magnesium | 4100 | | 19 | 3.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 450 | | 0.95 | 0.095 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 18 | | 3.8 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 36 | | 1.9 | 0.090 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 67 | | 2.9 | 0.38 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 36 | | 17 | 5.5 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: SSS-DU01C-0.0-1.0-140227 — Lab Sample ID: 280-52668-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 11000 | | 5600 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 65000 | | 5600 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 260000 | | 5600 | 350 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 160000 | | 5600 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 1-Methylnaphthalene - DL | 240000 | | 23000 | 1200 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Client Sample ID: SSS-DU01C-0.0-1.0-140227 — Lab Sample ID: 280-52668-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 150000 | | 4700 | 240 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 170000 | | 4700 | 290 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 12000 | | 4700 | 150 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 64000 | B | 4700 | 160 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 66000 | | 4700 | 670 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 120000 | | 4700 | 840 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 97000 | | 4700 | 690 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 140000 | | 4700 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 84000 | | 4700 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 41000 | | 4700 | 930 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 150000 | | 4700 | 930 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 22000 | | 4700 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 220000 | | 4700 | 930 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 33000 | | 4700 | 440 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 67000 | | 4700 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 100000 | | 4700 | 300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene - DL | 270000 | | 19000 | 4100 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 270000 | | 19000 | 4100 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 12000 | B | 9.9 | 1.5 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 2.6 | | 2.0 | 0.66 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 58 | | 0.99 | 0.076 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.27 | J | 0.50 | 0.033 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.13 | J | 0.50 | 0.041 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 33 | | 1.5 | 0.058 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 8.5 | | 0.99 | 0.099 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 26 | | 2.0 | 0.22 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 19000 | ^ | 15 | 3.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 11 | | 0.80 | 0.27 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Magnesium | 4800 | | 20 | 3.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 470 | | 0.99 | 0.099 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 19 | | 4.0 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 34 | | 2.0 | 0.094 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 66 | | 3.0 | 0.40 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 30 | | 16 | 5.3 | ug/Kg | 1 | ☼ | 7471B | Total/NA |

## Client Sample ID: MW-3-3 — Lab Sample ID: 280-52668-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18000 | | 14 | 2.2 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 19 | | 2.8 | 0.93 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 120 | | 1.4 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 2.5 | | 0.71 | 0.047 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.19 | J | 0.71 | 0.058 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 13 | | 2.1 | 0.082 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 62 | | 1.4 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 32 | | 2.8 | 0.31 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 21000 | | 21 | 5.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 24 | | 1.1 | 0.38 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 100 | | 1.4 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 16 | | 5.7 | 0.17 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Client Sample ID: MW-3-3 (Continued) — Lab Sample ID: 280-52668-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Selenium | 3.7 | | 1.8 | 1.2 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Thallium | 1.3 | J | 1.7 | 0.92 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 40 | | 2.8 | 0.13 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 32 | B | 4.2 | 0.56 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| pH adj. to 25 deg C | 7.21 | | 0.100 | 0.100 | SU | 1 | | 9045D | Soluble |
| Temperature | 21.3 | | 1.00 | 1.00 | Degrees C | 1 | | 9045D | Soluble |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7471B | Mercury (CVAA) | SW846 | TAL DEN |
| 9045D | pH | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-52668-1 | SSS-DU01A-0.0-1.0-140226 | Solid | 02/26/14 17:00 | 02/28/14 09:45 |
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Solid | 02/26/14 17:00 | 02/28/14 09:45 |
| 280-52668-3 | SSS-DU01B-0.0-1.0-140227 | Solid | 02/27/14 12:00 | 02/28/14 09:45 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Solid | 02/27/14 12:00 | 02/28/14 09:45 |
| 280-52668-5 | SSS-DU01C-0.0-1.0-140227 | Solid | 02/27/14 15:00 | 02/28/14 09:45 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Solid | 02/27/14 15:00 | 02/28/14 09:45 |
| 280-52668-7 | MW-3-3 | Solid | 02/26/14 10:30 | 02/28/14 09:45 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SSS-DU01A-0.0-1.0-140226** — **Lab Sample ID: 280-52668-1**
**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 83.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 17000 | | 5700 | 180 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 18:30 | 1 |
| Acenaphthylene | 120000 | | 5700 | 190 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 18:30 | 1 |
| 1-Methylnaphthalene | 95000 | | 5700 | 300 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 18:30 | 1 |
| 2-Methylnaphthalene | 110000 | | 5700 | 350 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 18:30 | 1 |
| Naphthalene | 64000 | | 5700 | 370 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 18:30 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *78* | | *39 - 120* | *03/06/14 16:10* | *03/10/14 18:30* | *1* |
| *Nitrobenzene-d5* | *90* | | *42 - 120* | *03/06/14 16:10* | *03/10/14 18:30* | *1* |
| *Terphenyl-d14* | *88* | | *35 - 124* | *03/06/14 16:10* | *03/10/14 18:30* | *1* |

**Client Sample ID: SSS-DU01A-0.0-1.0-140226** — **Lab Sample ID: 280-52668-2**
**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 89000 | | 5000 | 160 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 17:22 | 1 |
| Dibenz(a,h)anthracene | 110000 | | 5000 | 1300 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 17:22 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *71* | | *39 - 120* | *03/12/14 13:38* | *03/17/14 17:22* | *1* |
| *Nitrobenzene-d5* | *150* | *X* | *42 - 120* | *03/12/14 13:38* | *03/17/14 17:22* | *1* |
| *Terphenyl-d14* | *165* | *X* | *35 - 124* | *03/12/14 13:38* | *03/17/14 17:22* | *1* |

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-3**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 84.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 21000 | | 5800 | 190 | ng/Kg | ☼ | 03/06/14 16:10 | 03/17/14 15:06 | 1 |
| Acenaphthylene | 130000 | | 5800 | 200 | ng/Kg | ☼ | 03/06/14 16:10 | 03/17/14 15:06 | 1 |
| 2-Methylnaphthalene | 250000 | | 5800 | 360 | ng/Kg | ☼ | 03/06/14 16:10 | 03/17/14 15:06 | 1 |
| Naphthalene | 150000 | | 5800 | 380 | ng/Kg | ☼ | 03/06/14 16:10 | 03/17/14 15:06 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *66* | | *39 - 120* | *03/06/14 16:10* | *03/17/14 15:06* | *1* |
| *Nitrobenzene-d5* | *98* | | *42 - 120* | *03/06/14 16:10* | *03/17/14 15:06* | *1* |
| *Terphenyl-d14* | *76* | | *35 - 124* | *03/06/14 16:10* | *03/17/14 15:06* | *1* |

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-4**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 2-Methylnaphthalene | 290000 | | 4600 | 290 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Acenaphthene | 14000 | | 4600 | 150 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Acenaphthylene | 64000 | B | 4600 | 160 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Anthracene | 70000 | | 4600 | 670 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Benzo[a]anthracene | 130000 | | 4600 | 840 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Benzo[a]pyrene | 69000 | | 4600 | 690 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Benzo[g,h,i]perylene | 110000 | | 4600 | 1000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Benzo[k]fluoranthene | 56000 | | 4600 | 930 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Dibenz(a,h)anthracene | 27000 | | 4600 | 1200 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Fluorene | 33000 | | 4600 | 440 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-4**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Indeno[1,2,3-cd]pyrene | 76000 | | 4600 | 1000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 18:45 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 66 | | 39 - 120 | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Nitrobenzene-d5 | 165 | X | 42 - 120 | 03/12/14 13:38 | 03/17/14 18:45 | 1 |
| Terphenyl-d14 | 95 | | 35 - 124 | 03/12/14 13:38 | 03/17/14 18:45 | 1 |

**Client Sample ID: SSS-DU01C-0.0-1.0-140227** — **Lab Sample ID: 280-52668-5**
**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 84.3**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 11000 | | 5600 | 180 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 19:25 | 1 |
| Acenaphthylene | 65000 | | 5600 | 190 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 19:25 | 1 |
| 2-Methylnaphthalene | 260000 | | 5600 | 350 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 19:25 | 1 |
| Naphthalene | 160000 | | 5600 | 370 | ng/Kg | ☼ | 03/06/14 16:10 | 03/10/14 19:25 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 64 | | 39 - 120 | 03/06/14 16:10 | 03/10/14 19:25 | 1 |
| Nitrobenzene-d5 | 84 | | 42 - 120 | 03/06/14 16:10 | 03/10/14 19:25 | 1 |
| Terphenyl-d14 | 77 | | 35 - 124 | 03/06/14 16:10 | 03/10/14 19:25 | 1 |

**Client Sample ID: SSS-DU01C-0.0-1.0-140227** — **Lab Sample ID: 280-52668-6**
**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 150000 | | 4700 | 240 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| 2-Methylnaphthalene | 170000 | | 4700 | 290 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Acenaphthene | 12000 | | 4700 | 150 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Acenaphthylene | 64000 | B | 4700 | 160 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Anthracene | 66000 | | 4700 | 670 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Benzo[a]anthracene | 120000 | | 4700 | 840 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Benzo[a]pyrene | 97000 | | 4700 | 690 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Benzo[b]fluoranthene | 140000 | | 4700 | 1100 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Benzo[g,h,i]perylene | 84000 | | 4700 | 1000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Benzo[k]fluoranthene | 41000 | | 4700 | 930 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Chrysene | 150000 | | 4700 | 930 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Dibenz(a,h)anthracene | 22000 | | 4700 | 1200 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Fluoranthene | 220000 | | 4700 | 930 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Fluorene | 33000 | | 4700 | 440 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Indeno[1,2,3-cd]pyrene | 67000 | | 4700 | 1000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Naphthalene | 100000 | | 4700 | 300 | ng/Kg | ☼ | 03/12/14 13:38 | 03/17/14 19:12 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|
| 2-Fluorobiphenyl | 63 | | 39 - 120 | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Nitrobenzene-d5 | 143 | X | 42 - 120 | 03/12/14 13:38 | 03/17/14 19:12 | 1 |
| Terphenyl-d14 | 82 | | 35 - 124 | 03/12/14 13:38 | 03/17/14 19:12 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

**Client Sample ID: SSS-DU01A-0.0-1.0-140226** — **Lab Sample ID: 280-52668-2**
**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 350000 | | 100000 | 5200 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| 2-Methylnaphthalene | 410000 | | 100000 | 6200 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Acenaphthylene | 300000 | B | 100000 | 3400 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Anthracene | 460000 | | 100000 | 15000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Benzo[a]anthracene | 710000 | | 100000 | 18000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Benzo[a]pyrene | 360000 | | 100000 | 15000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Benzo[b]fluoranthene | 780000 | | 100000 | 24000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Benzo[g,h,i]perylene | 370000 | | 100000 | 22000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Benzo[k]fluoranthene | 270000 | | 100000 | 20000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Chrysene | 760000 | | 100000 | 20000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Fluoranthene | 1800000 | | 100000 | 20000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Fluorene | 390000 | | 100000 | 9500 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Indeno[1,2,3-cd]pyrene | 380000 | | 100000 | 22000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Naphthalene | 310000 | | 100000 | 6600 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Phenanthrene | 2100000 | | 100000 | 22000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |
| Pyrene | 1500000 | | 100000 | 22000 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 15:36 | 20 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *0* | *X D* | *39 - 120* | *03/12/14 13:38* | *03/18/14 15:36* | *20* |
| *Nitrobenzene-d5* | *0* | *X D* | *42 - 120* | *03/12/14 13:38* | *03/18/14 15:36* | *20* |
| *Terphenyl-d14* | *0* | *X D* | *35 - 124* | *03/12/14 13:38* | *03/18/14 15:36* | *20* |

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-3**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 84.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 260000 | | 23000 | 1200 | ng/Kg | ☼ | 03/06/14 16:10 | 03/17/14 15:33 | 4 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *77* | *D* | *39 - 120* | *03/06/14 16:10* | *03/17/14 15:33* | *4* |
| *Nitrobenzene-d5* | *130* | *D X* | *42 - 120* | *03/06/14 16:10* | *03/17/14 15:33* | *4* |
| *Terphenyl-d14* | *93* | *D* | *35 - 124* | *03/06/14 16:10* | *03/17/14 15:33* | *4* |

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-4**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 280000 | | 23000 | 1200 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:03 | 5 |
| Benzo[b]fluoranthene | 170000 | | 23000 | 5600 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:03 | 5 |
| Chrysene | 190000 | | 23000 | 4600 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:03 | 5 |
| Fluoranthene | 300000 | | 23000 | 4600 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:03 | 5 |
| Naphthalene | 180000 | | 23000 | 1500 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:03 | 5 |
| Phenanthrene | 350000 | | 23000 | 5100 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:03 | 5 |
| Pyrene | 340000 | | 23000 | 5100 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:03 | 5 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *73* | *D* | *39 - 120* | *03/12/14 13:38* | *03/18/14 16:03* | *5* |
| *Nitrobenzene-d5* | *0* | *X D* | *42 - 120* | *03/12/14 13:38* | *03/18/14 16:03* | *5* |
| *Terphenyl-d14* | *90* | *D* | *35 - 124* | *03/12/14 13:38* | *03/18/14 16:03* | *5* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

**Client Sample ID: SSS-DU01C-0.0-1.0-140227** — **Lab Sample ID: 280-52668-5**
**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 84.3**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 240000 | | 23000 | 1200 | ng/Kg | ☼ | 03/06/14 16:10 | 03/17/14 16:00 | 4 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *69* | *D* | *39 - 120* | *03/06/14 16:10* | *03/17/14 16:00* | *4* |
| *Nitrobenzene-d5* | *95* | *D* | *42 - 120* | *03/06/14 16:10* | *03/17/14 16:00* | *4* |
| *Terphenyl-d14* | *85* | *D* | *35 - 124* | *03/06/14 16:10* | *03/17/14 16:00* | *4* |

**Client Sample ID: SSS-DU01C-0.0-1.0-140227** — **Lab Sample ID: 280-52668-6**
**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 270000 | | 19000 | 4100 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:30 | 4 |
| Pyrene | 270000 | | 19000 | 4100 | ng/Kg | ☼ | 03/12/14 13:38 | 03/18/14 16:30 | 4 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *67* | *D* | *39 - 120* | *03/12/14 13:38* | *03/18/14 16:30* | *4* |
| *Nitrobenzene-d5* | *0* | *X D* | *42 - 120* | *03/12/14 13:38* | *03/18/14 16:30* | *4* |
| *Terphenyl-d14* | *83* | *D* | *35 - 124* | *03/12/14 13:38* | *03/18/14 16:30* | *4* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: SSS-DU01A-0.0-1.0-140226** — **Lab Sample ID: 280-52668-2**
**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 13000 | B | 9.7 | 1.5 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Antimony | 0.37 | U | 1.5 | 0.37 | mg/Kg | ☼ | 03/12/14 10:19 | 03/18/14 18:26 | 1 |
| Arsenic | 2.5 | | 1.9 | 0.64 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Barium | 59 | | 0.97 | 0.074 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Beryllium | 0.37 | J | 0.49 | 0.032 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Cadmium | 0.11 | J | 0.49 | 0.040 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Chromium | 19 | | 1.5 | 0.056 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Cobalt | 7.0 | | 0.97 | 0.097 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Copper | 22 | | 1.9 | 0.21 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Iron | 17000 | ^ | 15 | 3.7 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Lead | 13 | | 0.78 | 0.26 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 20:28 | 1 |
| Magnesium | 3000 | | 19 | 3.6 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Manganese | 380 | | 0.97 | 0.097 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Nickel | 12 | | 3.9 | 0.12 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Selenium | 0.84 | U | 1.3 | 0.84 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Silver | 0.16 | U | 0.97 | 0.16 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Thallium | 0.63 | U | 1.2 | 0.63 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Vanadium | 33 | | 1.9 | 0.092 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:45 | 1 |
| Zinc | 58 | | 2.9 | 0.39 | mg/Kg | ☼ | 03/12/14 10:19 | 03/18/14 18:26 | 1 |

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-4**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 13000 | B | 9.5 | 1.5 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Antimony | 0.36 | U | 1.4 | 0.36 | mg/Kg | ☼ | 03/12/14 10:19 | 03/18/14 18:40 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-4**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 3.0 | | 1.9 | 0.63 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Barium | 61 | | 0.95 | 0.072 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Beryllium | 0.33 | J | 0.48 | 0.031 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Cadmium | 0.13 | J | 0.48 | 0.039 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Chromium | 28 | | 1.4 | 0.055 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Cobalt | 9.0 | | 0.95 | 0.095 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Copper | 25 | | 1.9 | 0.21 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Iron | 19000 | ^ | 14 | 3.6 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Lead | 11 | | 0.76 | 0.26 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 20:42 | 1 |
| Magnesium | 4100 | | 19 | 3.5 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Manganese | 450 | | 0.95 | 0.095 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Nickel | 18 | | 3.8 | 0.12 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Selenium | 0.82 | U | 1.2 | 0.82 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Silver | 0.15 | U | 0.95 | 0.15 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Thallium | 0.62 | U | 1.1 | 0.62 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Vanadium | 36 | | 1.9 | 0.090 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 00:59 | 1 |
| Zinc | 67 | | 2.9 | 0.38 | mg/Kg | ☼ | 03/12/14 10:19 | 03/18/14 18:40 | 1 |

**Client Sample ID: SSS-DU01C-0.0-1.0-140227** — **Lab Sample ID: 280-52668-6**
**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 12000 | B | 9.9 | 1.5 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | ☼ | 03/12/14 10:19 | 03/18/14 18:43 | 1 |
| Arsenic | 2.6 | | 2.0 | 0.66 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Barium | 58 | | 0.99 | 0.076 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Beryllium | 0.27 | J | 0.50 | 0.033 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Cadmium | 0.13 | J | 0.50 | 0.041 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Chromium | 33 | | 1.5 | 0.058 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Cobalt | 8.5 | | 0.99 | 0.099 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Copper | 26 | | 2.0 | 0.22 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Iron | 19000 | ^ | 15 | 3.8 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Lead | 11 | | 0.80 | 0.27 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 20:45 | 1 |
| Magnesium | 4800 | | 20 | 3.7 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Manganese | 470 | | 0.99 | 0.099 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Nickel | 19 | | 4.0 | 0.12 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Silver | 0.16 | U | 0.99 | 0.16 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Vanadium | 34 | | 2.0 | 0.094 | mg/Kg | ☼ | 03/12/14 10:19 | 03/14/14 01:02 | 1 |
| Zinc | 66 | | 3.0 | 0.40 | mg/Kg | ☼ | 03/12/14 10:19 | 03/18/14 18:43 | 1 |

**Client Sample ID: MW-3-3** — **Lab Sample ID: 280-52668-7**
**Date Collected: 02/26/14 10:30** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 70.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18000 | | 14 | 2.2 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Antimony | 0.54 | U | 2.1 | 0.54 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Arsenic | 19 | | 2.8 | 0.93 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Barium | 120 | | 1.4 | 0.11 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-3-3** — **Lab Sample ID: 280-52668-7**
**Date Collected: 02/26/14 10:30** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 70.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Beryllium | 2.5 | | 0.71 | 0.047 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Cadmium | 0.19 | J | 0.71 | 0.058 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Chromium | 13 | | 2.1 | 0.082 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Cobalt | 62 | | 1.4 | 0.14 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Copper | 32 | | 2.8 | 0.31 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Iron | 21000 | | 21 | 5.4 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Lead | 24 | | 1.1 | 0.38 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Manganese | 100 | | 1.4 | 0.14 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Nickel | 16 | | 5.7 | 0.17 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Selenium | 3.7 | | 1.8 | 1.2 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Silver | 0.23 | U | 1.4 | 0.23 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Thallium | 1.3 | J | 1.7 | 0.92 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Vanadium | 40 | | 2.8 | 0.13 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |
| Zinc | 32 | B | 4.2 | 0.56 | mg/Kg | ☼ | 03/06/14 12:45 | 03/06/14 23:07 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SSS-DU01A-0.0-1.0-140226** — **Lab Sample ID: 280-52668-2**
**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 30 | | 17 | 5.6 | ug/Kg | ☼ | 03/19/14 13:00 | 03/19/14 16:52 | 1 |

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-4**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 36 | | 17 | 5.5 | ug/Kg | ☼ | 03/19/14 13:00 | 03/19/14 16:55 | 1 |

**Client Sample ID: SSS-DU01C-0.0-1.0-140227** — **Lab Sample ID: 280-52668-6**
**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 30 | | 16 | 5.3 | ug/Kg | ☼ | 03/19/14 13:00 | 03/19/14 17:01 | 1 |

## General Chemistry

**Client Sample ID: SSS-DU01A-0.0-1.0-140226** — **Lab Sample ID: 280-52668-1**
**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 83.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 17 | | 0.10 | 0.10 | % | | | 03/07/14 14:13 | 1 |
| Percent Solids | 83 | | 0.10 | 0.10 | % | | | 03/07/14 14:13 | 1 |

**Client Sample ID: SSS-DU01A-0.0-1.0-140226** — **Lab Sample ID: 280-52668-2**
**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 1.0 | | 0.10 | 0.10 | % | | | 03/17/14 14:32 | 1 |
| Percent Solids | 99 | | 0.10 | 0.10 | % | | | 03/17/14 14:32 | 1 |

## General Chemistry

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-3**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 84.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 16 | | 0.10 | 0.10 | % | | | 03/07/14 14:13 | 1 |
| Percent Solids | 84 | | 0.10 | 0.10 | % | | | 03/07/14 14:13 | 1 |

**Client Sample ID: SSS-DU01B-0.0-1.0-140227** — **Lab Sample ID: 280-52668-4**
**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 0.99 | | 0.10 | 0.10 | % | | | 03/17/14 14:32 | 1 |
| Percent Solids | 99 | | 0.10 | 0.10 | % | | | 03/17/14 14:32 | 1 |

**Client Sample ID: SSS-DU01C-0.0-1.0-140227** — **Lab Sample ID: 280-52668-5**
**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 84.3**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 16 | | 0.10 | 0.10 | % | | | 03/07/14 14:17 | 1 |
| Percent Solids | 84 | | 0.10 | 0.10 | % | | | 03/07/14 14:17 | 1 |

**Client Sample ID: SSS-DU01C-0.0-1.0-140227** — **Lab Sample ID: 280-52668-6**
**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 0.78 | | 0.10 | 0.10 | % | | | 03/17/14 14:32 | 1 |
| Percent Solids | 99 | | 0.10 | 0.10 | % | | | 03/17/14 14:32 | 1 |

**Client Sample ID: MW-3-3** — **Lab Sample ID: 280-52668-7**
**Date Collected: 02/26/14 10:30** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 70.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 30 | | 0.10 | 0.10 | % | | | 03/07/14 14:13 | 1 |
| Percent Solids | 70 | | 0.10 | 0.10 | % | | | 03/07/14 14:13 | 1 |

## General Chemistry - Soluble

**Client Sample ID: MW-3-3** — **Lab Sample ID: 280-52668-7**
**Date Collected: 02/26/14 10:30** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 70.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 7.21 | | 0.100 | 0.100 | SU | | | 03/05/14 19:56 | 1 |
| Temperature | 21.3 | | 1.00 | 1.00 | Degrees C | | | 03/05/14 19:56 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-52668-1 | SSS-DU01A-0.0-1.0-140226 | 78 | 90 | 88 |
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | 71 | 150 X | 165 X |
| 280-52668-2 - DL | SSS-DU01A-0.0-1.0-140226 | 0 X D | 0 X D | 0 X D |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | 65 | 144 X | 107 |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | 68 | 124 X | 156 X |
| 280-52668-3 - DL | SSS-DU01B-0.0-1.0-140227 | 77 D | 130 D X | 93 D |
| 280-52668-3 | SSS-DU01B-0.0-1.0-140227 | 66 | 98 | 76 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | 66 | 165 X | 95 |
| 280-52668-4 - DL | SSS-DU01B-0.0-1.0-140227 | 73 D | 0 X D | 90 D |
| 280-52668-5 | SSS-DU01C-0.0-1.0-140227 | 64 | 84 | 77 |
| 280-52668-5 - DL | SSS-DU01C-0.0-1.0-140227 | 69 D | 95 D | 85 D |
| 280-52668-5 MS | SSS-DU01C-0.0-1.0-140227 | 48 * | 65 * | 184 X |
| 280-52668-5 MSD | SSS-DU01C-0.0-1.0-140227 | 77 | 107 | 90 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | 63 | 143 X | 82 |
| 280-52668-6 - DL | SSS-DU01C-0.0-1.0-140227 | 67 D | 0 X D | 83 D |
| LCS 280-215768/2-A | Lab Control Sample | 86 | 88 | 89 |
| LCS 280-216464/2-A | Lab Control Sample | 89 | 96 | 260 X |
| MB 280-215768/1-A | Method Blank | 86 | 87 | 90 |
| MB 280-216464/1-A | Method Blank | 90 | 96 | 93 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

# QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-215768/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 216169** — **Prep Batch: 215768**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 160 | U | 5000 | 160 | ng/Kg | | 03/06/14 16:10 | 03/10/14 17:35 | 1 |
| Acenaphthylene | 170 | U | 5000 | 170 | ng/Kg | | 03/06/14 16:10 | 03/10/14 17:35 | 1 |
| 1-Methylnaphthalene | 260 | U | 5000 | 260 | ng/Kg | | 03/06/14 16:10 | 03/10/14 17:35 | 1 |
| 2-Methylnaphthalene | 310 | U | 5000 | 310 | ng/Kg | | 03/06/14 16:10 | 03/10/14 17:35 | 1 |
| Naphthalene | 330 | U | 5000 | 330 | ng/Kg | | 03/06/14 16:10 | 03/10/14 17:35 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *86* | | *39 - 120* | *03/06/14 16:10* | *03/10/14 17:35* | *1* |
| *Nitrobenzene-d5* | *87* | | *42 - 120* | *03/06/14 16:10* | *03/10/14 17:35* | *1* |
| *Terphenyl-d14* | *90* | | *35 - 120* | *03/06/14 16:10* | *03/10/14 17:35* | *1* |

**Lab Sample ID: LCS 280-215768/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217084** — **Prep Batch: 215768**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 30000 | 30500 | | ng/Kg | | 102 | 35 - 120 |
| Acenaphthylene | 30000 | 29400 | | ng/Kg | | 98 | 41 - 120 |
| Naphthalene | 30000 | 31300 | | ng/Kg | | 104 | 44 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *86* | | *39 - 120* |
| *Nitrobenzene-d5* | *88* | | *42 - 120* |
| *Terphenyl-d14* | *89* | | *35 - 120* |

**Lab Sample ID: 280-52668-5 MS** — **Client Sample ID: SSS-DU01C-0.0-1.0-140227**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 216169** — **Prep Batch: 215768**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 11000 | | 34800 | 1080000 | E * F1 | ng/Kg | ☼ | 3083 | 35 - 120 |
| Acenaphthylene | 65000 | | 34800 | 1710000 | E * F1 | ng/Kg | ☼ | 4735 | 41 - 120 |
| Naphthalene | 160000 | | 34800 | 2220000 | E * 4 | ng/Kg | ☼ | 5929 | 44 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *48* | *** | *39 - 120* |
| *Nitrobenzene-d5* | *65* | *** | *42 - 120* |
| *Terphenyl-d14* | *184* | *X* | *35 - 124* |

**Lab Sample ID: 280-52668-5 MSD** — **Client Sample ID: SSS-DU01C-0.0-1.0-140227**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 216169** — **Prep Batch: 215768**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 11000 | | 34000 | 47500 | F2 | ng/Kg | ☼ | 106 | 35 - 120 | 183 | 50 |
| Acenaphthylene | 65000 | | 34000 | 157000 | F1 F2 | ng/Kg | ☼ | 271 | 41 - 120 | 166 | 50 |
| Naphthalene | 160000 | | 34000 | 139000 | 4 F2 | ng/Kg | ☼ | -73 | 44 - 120 | 177 | 50 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: 280-52668-5 MSD**
**Matrix: Solid**
**Analysis Batch: 216169**

**Client Sample ID: SSS-DU01C-0.0-1.0-140227**
**Prep Type: Total/NA**
**Prep Batch: 215768**

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *77* | | *39 - 120* |
| *Nitrobenzene-d5* | *107* | | *42 - 120* |
| *Terphenyl-d14* | *90* | | *35 - 124* |

**Lab Sample ID: MB 280-216464/1-A**
**Matrix: Solid**
**Analysis Batch: 217084**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 216464**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 160 | U | 5000 | 160 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Acenaphthylene | 676 | J | 5000 | 170 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| 1-Methylnaphthalene | 260 | U | 5000 | 260 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Anthracene | 720 | U | 5000 | 720 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| 2-Methylnaphthalene | 310 | U | 5000 | 310 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Benzo[a]anthracene | 900 | U | 5000 | 900 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Benzo[a]pyrene | 740 | U | 5000 | 740 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Benzo[b]fluoranthene | 1200 | U | 5000 | 1200 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Benzo[g,h,i]perylene | 1100 | U | 5000 | 1100 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Benzo[k]fluoranthene | 1000 | U | 5000 | 1000 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Chrysene | 1000 | U | 5000 | 1000 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Dibenz(a,h)anthracene | 1300 | U | 5000 | 1300 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Fluoranthene | 1000 | U | 5000 | 1000 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Fluorene | 470 | U | 5000 | 470 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Indeno[1,2,3-cd]pyrene | 1100 | U | 5000 | 1100 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Naphthalene | 330 | U | 5000 | 330 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Phenanthrene | 1100 | U | 5000 | 1100 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |
| Pyrene | 1100 | U | 5000 | 1100 | ng/Kg | | 03/12/14 13:38 | 03/17/14 16:28 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *90* | | *39 - 120* | *03/12/14 13:38* | *03/17/14 16:28* | *1* |
| *Nitrobenzene-d5* | *96* | | *42 - 120* | *03/12/14 13:38* | *03/17/14 16:28* | *1* |
| *Terphenyl-d14* | *93* | | *35 - 124* | *03/12/14 13:38* | *03/17/14 16:28* | *1* |

**Lab Sample ID: LCS 280-216464/2-A**
**Matrix: Solid**
**Analysis Batch: 217084**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 216464**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 30000 | 29200 | | ng/Kg | | 97 | 35 - 120 |
| Acenaphthylene | 30000 | 28900 | | ng/Kg | | 96 | 41 - 120 |
| Anthracene | 30000 | 28700 | | ng/Kg | | 96 | 43 - 120 |
| Benzo[a]anthracene | 30000 | 29400 | | ng/Kg | | 98 | 36 - 120 |
| Benzo[a]pyrene | 30000 | 30400 | | ng/Kg | | 101 | 20 - 120 |
| Benzo[b]fluoranthene | 30000 | 30300 | | ng/Kg | | 101 | 37 - 120 |
| Benzo[g,h,i]perylene | 30000 | 29600 | | ng/Kg | | 99 | 20 - 123 |
| Benzo[k]fluoranthene | 30000 | 30800 | | ng/Kg | | 103 | 46 - 120 |
| Chrysene | 30000 | 27700 | | ng/Kg | | 92 | 34 - 120 |
| Dibenz(a,h)anthracene | 30000 | 29000 | | ng/Kg | | 97 | 20 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-216464/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217084** — **Prep Batch: 216464**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Fluoranthene | 30000 | 28700 | | ng/Kg | | 96 | 45 - 120 |
| Fluorene | 30000 | 28300 | | ng/Kg | | 94 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 30000 | 28600 | | ng/Kg | | 95 | 20 - 127 |
| Naphthalene | 30000 | 31400 | | ng/Kg | | 105 | 44 - 120 |
| Phenanthrene | 30000 | 27700 | | ng/Kg | | 92 | 44 - 120 |
| Pyrene | 30000 | 28500 | | ng/Kg | | 95 | 43 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *89* | | *39 - 120* |
| *Nitrobenzene-d5* | *96* | | *42 - 120* |
| *Terphenyl-d14* | *260* | *X* | *35 - 124* |

**Lab Sample ID: 280-52668-2 MS** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217084** — **Prep Batch: 216464**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 89000 | | 29900 | 116000 | | ng/Kg | ☼ | 90 | 35 - 120 |
| Acenaphthylene | 230000 | E B | 29900 | 295000 | E 4 | ng/Kg | ☼ | 211 | 41 - 120 |
| Anthracene | 400000 | E | 29900 | 464000 | E 4 | ng/Kg | ☼ | 218 | 43 - 120 |
| Benzo[a]anthracene | 680000 | E | 29900 | 686000 | E 4 | ng/Kg | ☼ | 24 | 36 - 120 |
| Benzo[a]pyrene | 320000 | E | 29900 | 505000 | E 4 | ng/Kg | ☼ | 610 | 20 - 120 |
| Benzo[b]fluoranthene | 720000 | E | 29900 | 691000 | E 4 | ng/Kg | ☼ | -111 | 37 - 120 |
| Benzo[g,h,i]perylene | 320000 | E | 29900 | 330000 | E 4 | ng/Kg | ☼ | 22 | 20 - 123 |
| Benzo[k]fluoranthene | 270000 | E | 29900 | 290000 | E 4 | ng/Kg | ☼ | 70 | 46 - 120 |
| Chrysene | 710000 | E | 29900 | 702000 | E 4 | ng/Kg | ☼ | -11 | 34 - 120 |
| Dibenz(a,h)anthracene | 110000 | | 29900 | 116000 | | ng/Kg | ☼ | 36 | 20 - 120 |
| Fluoranthene | 1700000 | E | 29900 | 1780000 | E 4 | ng/Kg | ☼ | 343 | 45 - 120 |
| Fluorene | 320000 | E | 29900 | 355000 | E 4 | ng/Kg | ☼ | 107 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 340000 | E | 29900 | 344000 | E 4 | ng/Kg | ☼ | 16 | 20 - 127 |
| Naphthalene | 270000 | E | 29900 | 280000 | E 4 | ng/Kg | ☼ | 33 | 44 - 120 |
| Phenanthrene | 2100000 | E | 29900 | 2160000 | E 4 | ng/Kg | ☼ | 178 | 44 - 120 |
| Pyrene | 1400000 | E | 29900 | 1580000 | E 4 | ng/Kg | ☼ | 446 | 43 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *65* | | *39 - 120* |
| *Nitrobenzene-d5* | *144* | *X* | *42 - 120* |
| *Terphenyl-d14* | *107* | | *35 - 124* |

**Lab Sample ID: 280-52668-2 MSD** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217084** — **Prep Batch: 216464**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 89000 | | 30100 | 111000 | | ng/Kg | ☼ | 75 | 35 - 120 | 4 | 50 |
| Acenaphthylene | 230000 | E B | 30100 | 260000 | E 4 | ng/Kg | ☼ | 96 | 41 - 120 | 12 | 50 |
| Anthracene | 400000 | E | 30100 | 426000 | E 4 | ng/Kg | ☼ | 90 | 43 - 120 | 9 | 50 |
| Benzo[a]anthracene | 680000 | E | 30100 | 707000 | E 4 | ng/Kg | ☼ | 93 | 36 - 120 | 3 | 40 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: 280-52668-2 MSD** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217084** — **Prep Batch: 216464**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Benzo[a]pyrene | 320000 | E | 30100 | 483000 | E 4 | ng/Kg | ☼ | 533 | 20 - 120 | 4 | 30 |
| Benzo[b]fluoranthene | 720000 | E | 30100 | 707000 | E 4 | ng/Kg | ☼ | -58 | 37 - 120 | 2 | 28 |
| Benzo[g,h,i]perylene | 320000 | E | 30100 | 347000 | E 4 | ng/Kg | ☼ | 76 | 20 - 123 | 5 | 30 |
| Benzo[k]fluoranthene | 270000 | E | 30100 | 293000 | E 4 | ng/Kg | ☼ | 77 | 46 - 120 | 1 | 28 |
| Chrysene | 710000 | E | 30100 | 729000 | E 4 | ng/Kg | ☼ | 78 | 34 - 120 | 4 | 41 |
| Dibenz(a,h)anthracene | 110000 | | 30100 | 126000 | | ng/Kg | ☼ | 68 | 20 - 120 | 8 | 25 |
| Fluoranthene | 1700000 | E | 30100 | 1690000 | E 4 | ng/Kg | ☼ | 46 | 45 - 120 | 5 | 30 |
| Fluorene | 320000 | E | 30100 | 347000 | E 4 | ng/Kg | ☼ | 79 | 44 - 120 | 2 | 50 |
| Indeno[1,2,3-cd]pyrene | 340000 | E | 30100 | 364000 | E 4 | ng/Kg | ☼ | 82 | 20 - 127 | 6 | 50 |
| Naphthalene | 270000 | E | 30100 | 292000 | E 4 | ng/Kg | ☼ | 72 | 44 - 120 | 4 | 50 |
| Phenanthrene | 2100000 | E | 30100 | 2120000 | E 4 | ng/Kg | ☼ | 43 | 44 - 120 | 2 | 42 |
| Pyrene | 1400000 | E | 30100 | 1470000 | E 4 | ng/Kg | ☼ | 90 | 43 - 120 | 7 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *68* | | *39 - 120* |
| *Nitrobenzene-d5* | *124* | *X* | *42 - 120* |
| *Terphenyl-d14* | *156* | *X* | *35 - 124* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-215574/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 215887** — **Prep Batch: 215574**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.6 | U | 10 | 1.6 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Barium | 0.076 | U | 1.0 | 0.076 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Iron | 3.8 | U | 15 | 3.8 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |
| Zinc | 0.478 | J | 3.0 | 0.40 | mg/Kg | | 03/06/14 12:45 | 03/06/14 23:02 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-215574/2-A**
**Matrix: Solid**
**Analysis Batch: 215887**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 215574**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 188 | | mg/Kg | | 94 | 82 - 116 |
| Antimony | 50.0 | 50.6 | | mg/Kg | | 101 | 82 - 110 |
| Arsenic | 100 | 103 | | mg/Kg | | 103 | 85 - 110 |
| Barium | 200 | 206 | | mg/Kg | | 103 | 87 - 112 |
| Beryllium | 5.00 | 4.80 | | mg/Kg | | 96 | 84 - 114 |
| Cadmium | 10.0 | 10.2 | | mg/Kg | | 102 | 87 - 110 |
| Chromium | 20.0 | 20.4 | | mg/Kg | | 102 | 84 - 114 |
| Cobalt | 50.0 | 49.1 | | mg/Kg | | 98 | 87 - 110 |
| Copper | 25.0 | 24.2 | | mg/Kg | | 97 | 88 - 110 |
| Iron | 100 | 98.7 | | mg/Kg | | 99 | 87 - 120 |
| Lead | 50.0 | 51.3 | | mg/Kg | | 103 | 86 - 110 |
| Manganese | 50.0 | 46.2 | | mg/Kg | | 92 | 88 - 110 |
| Nickel | 50.0 | 50.5 | | mg/Kg | | 101 | 87 - 110 |
| Selenium | 200 | 209 | | mg/Kg | | 104 | 83 - 110 |
| Silver | 5.00 | 4.89 | | mg/Kg | | 98 | 87 - 114 |
| Thallium | 200 | 197 | | mg/Kg | | 99 | 84 - 110 |
| Vanadium | 50.0 | 49.0 | | mg/Kg | | 98 | 88 - 110 |
| Zinc | 50.0 | 46.2 | | mg/Kg | | 92 | 76 - 114 |

**Lab Sample ID: 280-52668-7 MS**
**Matrix: Solid**
**Analysis Batch: 215887**

**Client Sample ID: MW-3-3**
**Prep Type: Total/NA**
**Prep Batch: 215574**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18000 | | 262 | 29100 | 4 | mg/Kg | ☼ | 4194 | 50 - 200 |
| Antimony | 0.54 | U | 65.5 | 22.6 | | mg/Kg | ☼ | 34 | 20 - 200 |
| Arsenic | 19 | | 131 | 126 | | mg/Kg | ☼ | 82 | 76 - 111 |
| Barium | 120 | | 262 | 392 | | mg/Kg | ☼ | 104 | 52 - 159 |
| Beryllium | 2.5 | | 6.55 | 8.44 | | mg/Kg | ☼ | 91 | 72 - 105 |
| Cadmium | 0.19 | J | 13.1 | 10.9 | | mg/Kg | ☼ | 82 | 40 - 130 |
| Chromium | 13 | | 26.2 | 38.8 | | mg/Kg | ☼ | 97 | 70 - 200 |
| Cobalt | 62 | | 65.5 | 94.9 | F1 | mg/Kg | ☼ | 50 | 72 - 106 |
| Copper | 32 | | 32.8 | 67.4 | | mg/Kg | ☼ | 107 | 37 - 187 |
| Iron | 21000 | | 131 | 19200 | 4 | mg/Kg | ☼ | -1340 | 70 - 200 |
| Lead | 24 | | 65.5 | 74.5 | | mg/Kg | ☼ | 77 | 70 - 200 |
| Manganese | 100 | | 65.5 | 155 | | mg/Kg | ☼ | 80 | 40 - 200 |
| Nickel | 16 | | 65.5 | 70.7 | | mg/Kg | ☼ | 83 | 61 - 126 |
| Selenium | 3.7 | | 262 | 217 | | mg/Kg | ☼ | 81 | 76 - 104 |
| Silver | 0.23 | U | 6.55 | 5.25 | | mg/Kg | ☼ | 80 | 75 - 141 |
| Thallium | 1.3 | J | 262 | 193 | F1 | mg/Kg | ☼ | 73 | 78 - 101 |
| Vanadium | 40 | | 65.5 | 97.9 | | mg/Kg | ☼ | 88 | 50 - 169 |
| Zinc | 32 | B | 65.5 | 85.3 | | mg/Kg | ☼ | 82 | 70 - 200 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-52668-7 MSD** — **Client Sample ID: MW-3-3**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 215887** — **Prep Batch: 215574**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18000 | | 283 | 28900 | 4 | mg/Kg | ☼ | 3824 | 50 - 200 | 1 | 20 |
| Antimony | 0.54 | U | 70.7 | 27.4 | | mg/Kg | ☼ | 39 | 20 - 200 | 19 | 20 |
| Arsenic | 19 | | 141 | 139 | | mg/Kg | ☼ | 85 | 76 - 111 | 10 | 20 |
| Barium | 120 | | 283 | 423 | | mg/Kg | ☼ | 107 | 52 - 159 | 8 | 20 |
| Beryllium | 2.5 | | 7.07 | 9.11 | | mg/Kg | ☼ | 94 | 72 - 105 | 8 | 20 |
| Cadmium | 0.19 | J | 14.1 | 11.9 | | mg/Kg | ☼ | 83 | 40 - 130 | 9 | 20 |
| Chromium | 13 | | 28.3 | 41.7 | | mg/Kg | ☼ | 100 | 70 - 200 | 7 | 20 |
| Cobalt | 62 | | 70.7 | 97.9 | F1 | mg/Kg | ☼ | 50 | 72 - 106 | 3 | 20 |
| Copper | 32 | | 35.4 | 72.4 | | mg/Kg | ☼ | 113 | 37 - 187 | 7 | 20 |
| Iron | 21000 | | 141 | 20200 | 4 | mg/Kg | ☼ | -588 | 70 - 200 | 5 | 20 |
| Lead | 24 | | 70.7 | 81.8 | | mg/Kg | ☼ | 82 | 70 - 200 | 9 | 20 |
| Manganese | 100 | | 70.7 | 163 | | mg/Kg | ☼ | 87 | 40 - 200 | 5 | 20 |
| Nickel | 16 | | 70.7 | 75.4 | | mg/Kg | ☼ | 83 | 61 - 126 | 6 | 20 |
| Selenium | 3.7 | | 283 | 240 | | mg/Kg | ☼ | 84 | 76 - 104 | 10 | 20 |
| Silver | 0.23 | U | 7.07 | 5.69 | | mg/Kg | ☼ | 80 | 75 - 141 | 8 | 20 |
| Thallium | 1.3 | J | 283 | 211 | F1 | mg/Kg | ☼ | 74 | 78 - 101 | 9 | 20 |
| Vanadium | 40 | | 70.7 | 106 | | mg/Kg | ☼ | 92 | 50 - 169 | 8 | 20 |
| Zinc | 32 | B | 70.7 | 89.6 | | mg/Kg | ☼ | 82 | 70 - 200 | 5 | 20 |

**Lab Sample ID: MB 280-216506/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 216870** — **Prep Batch: 216506**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 3.51 | J | 10 | 1.6 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Barium | 0.076 | U | 1.0 | 0.076 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Iron | 3.8 | U ^ | 15 | 3.8 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Magnesium | 3.7 | U | 20 | 3.7 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Manganese | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 03/12/14 10:19 | 03/14/14 00:40 | 1 |

**Lab Sample ID: MB 280-216506/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217110** — **Prep Batch: 216506**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 03/12/14 10:19 | 03/14/14 20:23 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-216506/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217407** — **Prep Batch: 216506**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 03/12/14 10:19 | 03/18/14 18:21 | 1 |
| Zinc | 0.40 | U | 3.0 | 0.40 | mg/Kg | | 03/12/14 10:19 | 03/18/14 18:21 | 1 |

**Lab Sample ID: LCS 280-216506/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 216870** — **Prep Batch: 216506**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 100 | 103 | | mg/Kg | | 103 | 82 - 116 |
| Arsenic | 50.0 | 49.6 | | mg/Kg | | 99 | 85 - 110 |
| Barium | 100 | 109 | | mg/Kg | | 109 | 87 - 112 |
| Beryllium | 2.50 | 2.56 | | mg/Kg | | 102 | 84 - 114 |
| Cadmium | 5.00 | 5.06 | | mg/Kg | | 101 | 87 - 110 |
| Chromium | 10.0 | 10.7 | | mg/Kg | | 107 | 84 - 114 |
| Cobalt | 25.0 | 25.6 | | mg/Kg | | 102 | 87 - 110 |
| Copper | 12.5 | 12.6 | | mg/Kg | | 101 | 88 - 110 |
| Iron | 50.0 | 53.1 | ^ | mg/Kg | | 106 | 87 - 120 |
| Magnesium | 2500 | 2560 | | mg/Kg | | 103 | 90 - 110 |
| Manganese | 25.0 | 25.7 | | mg/Kg | | 103 | 88 - 110 |
| Nickel | 25.0 | 25.7 | | mg/Kg | | 103 | 87 - 110 |
| Selenium | 100 | 100 | | mg/Kg | | 100 | 83 - 110 |
| Silver | 2.50 | 2.63 | | mg/Kg | | 105 | 87 - 114 |
| Thallium | 100 | 103 | | mg/Kg | | 103 | 84 - 110 |
| Vanadium | 25.0 | 26.1 | | mg/Kg | | 105 | 88 - 110 |

**Lab Sample ID: LCS 280-216506/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217110** — **Prep Batch: 216506**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Lead | 25.0 | 24.5 | | mg/Kg | | 98 | 86 - 110 |

**Lab Sample ID: LCS 280-216506/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217407** — **Prep Batch: 216506**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 25.0 | 24.8 | | mg/Kg | | 99 | 82 - 110 |
| Zinc | 25.0 | 24.8 | | mg/Kg | | 99 | 76 - 114 |

**Lab Sample ID: 280-52668-2 MS** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 216870** — **Prep Batch: 216506**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 13000 | B | 97.1 | 21800 | 4 | mg/Kg | ☼ | 9445 | 50 - 200 |
| Arsenic | 2.5 | | 48.5 | 33.2 | F1 | mg/Kg | ☼ | 63 | 76 - 111 |
| Barium | 59 | | 97.1 | 137 | | mg/Kg | ☼ | 80 | 52 - 159 |
| Beryllium | 0.37 | J | 2.43 | 2.16 | | mg/Kg | ☼ | 74 | 72 - 105 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-52668-2 MS** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 216870** — **Prep Batch: 216506**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.11 | J | 4.85 | 3.55 | | mg/Kg | ☼ | 71 | 40 - 130 |
| Chromium | 19 | | 9.71 | 33.0 | | mg/Kg | ☼ | 144 | 70 - 200 |
| Cobalt | 7.0 | | 24.3 | 23.7 | F1 | mg/Kg | ☼ | 69 | 72 - 106 |
| Copper | 22 | | 12.1 | 32.0 | | mg/Kg | ☼ | 81 | 37 - 187 |
| Iron | 17000 | ^ | 48.5 | 17900 | ^ 4 | mg/Kg | ☼ | 2206 | 70 - 200 |
| Magnesium | 3000 | | 2430 | 4900 | | mg/Kg | ☼ | 78 | 64 - 145 |
| Manganese | 380 | | 24.3 | 399 | 4 | mg/Kg | ☼ | 61 | 40 - 200 |
| Nickel | 12 | | 24.3 | 32.2 | | mg/Kg | ☼ | 82 | 61 - 126 |
| Selenium | 0.84 | U | 97.1 | 62.8 | F1 | mg/Kg | ☼ | 65 | 76 - 104 |
| Silver | 0.16 | U | 2.43 | 1.93 | | mg/Kg | ☼ | 79 | 75 - 141 |
| Thallium | 0.63 | U | 97.1 | 61.8 | F1 | mg/Kg | ☼ | 64 | 78 - 101 |
| Vanadium | 33 | | 24.3 | 53.8 | | mg/Kg | ☼ | 87 | 50 - 169 |

**Lab Sample ID: 280-52668-2 MS** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217110** — **Prep Batch: 216506**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 13 | | 24.3 | 28.6 | F1 | mg/Kg | ☼ | 65 | 70 - 200 |

**Lab Sample ID: 280-52668-2 MS** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217407** — **Prep Batch: 216506**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.37 | U | 24.3 | 2.80 | F1 | mg/Kg | ☼ | 12 | 20 - 200 |
| Zinc | 58 | | 24.3 | 77.4 | | mg/Kg | ☼ | 79 | 70 - 200 |

**Lab Sample ID: 280-52668-2 MSD** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 216870** — **Prep Batch: 216506**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 13000 | B | 95.1 | 20900 | 4 | mg/Kg | ☼ | 8598 | 50 - 200 | 5 | 20 |
| Arsenic | 2.5 | | 47.6 | 31.2 | F1 | mg/Kg | ☼ | 60 | 76 - 111 | 6 | 20 |
| Barium | 59 | | 95.1 | 130 | | mg/Kg | ☼ | 75 | 52 - 159 | 5 | 20 |
| Beryllium | 0.37 | J | 2.38 | 2.02 | F1 | mg/Kg | ☼ | 69 | 72 - 105 | 7 | 20 |
| Cadmium | 0.11 | J | 4.76 | 3.37 | | mg/Kg | ☼ | 69 | 40 - 130 | 5 | 20 |
| Chromium | 19 | | 9.51 | 27.9 | | mg/Kg | ☼ | 93 | 70 - 200 | 17 | 20 |
| Cobalt | 7.0 | | 23.8 | 22.5 | F1 | mg/Kg | ☼ | 65 | 72 - 106 | 5 | 20 |
| Copper | 22 | | 11.9 | 30.7 | | mg/Kg | ☼ | 72 | 37 - 187 | 4 | 20 |
| Iron | 17000 | ^ | 47.6 | 17100 | ^ 4 | mg/Kg | ☼ | 607 | 70 - 200 | 4 | 20 |
| Magnesium | 3000 | | 2380 | 4680 | | mg/Kg | ☼ | 71 | 64 - 145 | 4 | 20 |
| Manganese | 380 | | 23.8 | 389 | 4 | mg/Kg | ☼ | 18 | 40 - 200 | 3 | 20 |
| Nickel | 12 | | 23.8 | 29.1 | | mg/Kg | ☼ | 70 | 61 - 126 | 10 | 20 |
| Selenium | 0.84 | U | 95.1 | 58.6 | F1 | mg/Kg | ☼ | 62 | 76 - 104 | 7 | 20 |
| Silver | 0.16 | U | 2.38 | 1.78 | | mg/Kg | ☼ | 75 | 75 - 141 | 8 | 20 |
| Thallium | 0.63 | U | 95.1 | 58.5 | F1 | mg/Kg | ☼ | 61 | 78 - 101 | 6 | 20 |
| Vanadium | 33 | | 23.8 | 51.1 | | mg/Kg | ☼ | 77 | 50 - 169 | 5 | 20 |

**Lab Sample ID: 280-52668-2 MSD** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217110** — **Prep Batch: 216506**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Lead | 13 | | 23.8 | 27.0 | F1 | mg/Kg | ☼ | 60 | 70 - 200 | 6 | 20 |

**Lab Sample ID: 280-52668-2 MSD** — **Client Sample ID: SSS-DU01A-0.0-1.0-140226**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217407** — **Prep Batch: 216506**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 0.37 | U | 23.8 | 2.68 | F1 | mg/Kg | ☼ | 11 | 20 - 200 | 4 | 20 |
| Zinc | 58 | | 23.8 | 74.8 | | mg/Kg | ☼ | 70 | 70 - 200 | 3 | 20 |

## Method: 7471B - Mercury (CVAA)

**Lab Sample ID: MB 280-217447/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217680** — **Prep Batch: 217447**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.6 | U | 17 | 5.6 | ug/Kg | | 03/19/14 13:00 | 03/19/14 16:48 | 1 |

**Lab Sample ID: LCS 280-217447/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217680** — **Prep Batch: 217447**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 415 | 454 | | ug/Kg | | 109 | 87 - 111 |

**Lab Sample ID: 280-52668-4 MS** — **Client Sample ID: SSS-DU01B-0.0-1.0-140227**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217680** — **Prep Batch: 217447**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 36 | | 409 | 451 | | ug/Kg | ☼ | 102 | 87 - 111 |

**Lab Sample ID: 280-52668-4 MSD** — **Client Sample ID: SSS-DU01B-0.0-1.0-140227**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 217680** — **Prep Batch: 217447**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 36 | | 406 | 444 | | ug/Kg | ☼ | 101 | 87 - 111 | 2 | 20 |

## Method: 9045D - pH

**Lab Sample ID: LCS 280-215606/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 215606**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 7.00 | 7.050 | | SU | | 101 | 97 - 103 |

## Method: 9045D - pH (Continued)

**Lab Sample ID: LCSD 280-215606/5**
**Matrix: Solid**
**Analysis Batch: 215606**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | | | 7.00 | 7.040 | | SU | | 101 | 97 - 103 | 0 | 5 |

## Method: Moisture - Percent Moisture

**Lab Sample ID: 280-52668-4 DU**
**Matrix: Solid**
**Analysis Batch: 217138**

**Client Sample ID: SSS-DU01B-0.0-1.0-140227**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Percent Moisture | 0.99 | | | 0.97 | | % | | | | 2 | 20 |
| Percent Solids | 99 | | | 99 | | % | | | | 0.02 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## GC/MS Semi VOA

### ISM Prep Batch: 215758

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-1 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment,Prep | |
| 280-52668-3 - DL | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment,Prep | |
| 280-52668-3 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment,Prep | |
| 280-52668-5 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment,Prep | |
| 280-52668-5 - DL | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment,Prep | |
| 280-52668-5 MS | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment,Prep | |
| 280-52668-5 MSD | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment,Prep | |

### ISM Prep Batch: 215759

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment, Prep | |
| 280-52668-2 - DL | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment, Prep | |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment, Prep | |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment, Prep | |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |
| 280-52668-4 - DL | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |
| 280-52668-6 - DL | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |

### Prep Batch: 215768

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-1 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 3546 | 215758 |
| 280-52668-3 - DL | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215758 |
| 280-52668-3 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215758 |
| 280-52668-5 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215758 |
| 280-52668-5 - DL | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215758 |
| 280-52668-5 MS | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215758 |
| 280-52668-5 MSD | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215758 |
| LCS 280-215768/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-215768/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Analysis Batch: 216169

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-1 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 8270D SIM | 215768 |
| 280-52668-5 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 215768 |
| 280-52668-5 MS | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 215768 |
| 280-52668-5 MSD | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 215768 |
| MB 280-215768/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 215768 |

### Prep Batch: 216464

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 - DL | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 3546 | 215759 |
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 3546 | 215759 |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 3546 | 215759 |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 3546 | 215759 |
| 280-52668-4 - DL | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215759 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215759 |
| 280-52668-6 - DL | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215759 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 3546 | 215759 |
| LCS 280-216464/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-216464/1-A | Method Blank | Total/NA | Solid | 3546 | |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

### Analysis Batch: 217084

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 8270D SIM | 216464 |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 8270D SIM | 216464 |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 8270D SIM | 216464 |
| 280-52668-3 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 215768 |
| 280-52668-3 - DL | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 215768 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 216464 |
| 280-52668-5 - DL | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 215768 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 216464 |
| LCS 280-215768/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 215768 |
| LCS 280-216464/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 216464 |
| MB 280-216464/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 216464 |

### Analysis Batch: 217224

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 - DL | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 8270D SIM | 216464 |
| 280-52668-4 - DL | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 216464 |
| 280-52668-6 - DL | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 8270D SIM | 216464 |

## Metals

### Prep Batch: 215574

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-7 | MW-3-3 | Total/NA | Solid | 3050B | |
| 280-52668-7 MS | MW-3-3 | Total/NA | Solid | 3050B | |
| 280-52668-7 MSD | MW-3-3 | Total/NA | Solid | 3050B | |
| LCS 280-215574/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-215574/1-A | Method Blank | Total/NA | Solid | 3050B | |

### ISM Prep Batch: 215759

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment, Prep | |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment, Prep | |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment, Prep | |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |
| 280-52668-4 MS | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |
| 280-52668-4 MSD | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |

### Analysis Batch: 215887

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-7 | MW-3-3 | Total/NA | Solid | 6010C | 215574 |
| 280-52668-7 MS | MW-3-3 | Total/NA | Solid | 6010C | 215574 |
| 280-52668-7 MSD | MW-3-3 | Total/NA | Solid | 6010C | 215574 |
| LCS 280-215574/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 215574 |
| MB 280-215574/1-A | Method Blank | Total/NA | Solid | 6010C | 215574 |

### Prep Batch: 216506

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 3050B MOD | 215759 |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 3050B MOD | 215759 |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 3050B MOD | 215759 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 3050B MOD | 215759 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 3050B MOD | 215759 |

## Metals (Continued)

### Prep Batch: 216506 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-216506/2-A | Lab Control Sample | Total/NA | Solid | 3050B MOD | |
| MB 280-216506/1-A | Method Blank | Total/NA | Solid | 3050B MOD | |

### Analysis Batch: 216870

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 6010C | 216506 |
| LCS 280-216506/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 216506 |
| MB 280-216506/1-A | Method Blank | Total/NA | Solid | 6010C | 216506 |

### Analysis Batch: 217110

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 6010C | 216506 |
| LCS 280-216506/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 216506 |
| MB 280-216506/1-A | Method Blank | Total/NA | Solid | 6010C | 216506 |

### Analysis Batch: 217407

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-2 MS | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-2 MSD | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 6010C | 216506 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 6010C | 216506 |
| LCS 280-216506/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 216506 |
| MB 280-216506/1-A | Method Blank | Total/NA | Solid | 6010C | 216506 |

### Prep Batch: 217447

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 7471B | 215759 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 7471B | 215759 |
| 280-52668-4 MS | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 7471B | 215759 |
| 280-52668-4 MSD | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 7471B | 215759 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 7471B | 215759 |
| LCS 280-217447/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| MB 280-217447/1-A | Method Blank | Total/NA | Solid | 7471B | |

### Analysis Batch: 217680

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | 7471B | 217447 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 7471B | 217447 |
| 280-52668-4 MS | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 7471B | 217447 |
| 280-52668-4 MSD | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | 7471B | 217447 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | 7471B | 217447 |
| LCS 280-217447/2-A | Lab Control Sample | Total/NA | Solid | 7471B | 217447 |

## Metals (Continued)

### Analysis Batch: 217680 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 280-217447/1-A | Method Blank | Total/NA | Solid | 7471B | 217447 |

## General Chemistry

### Leach Batch: 215590

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-7 | MW-3-3 | Soluble | Solid | DI Leach | |

### Analysis Batch: 215606

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-7 | MW-3-3 | Soluble | Solid | 9045D | 215590 |
| LCS 280-215606/4 | Lab Control Sample | Total/NA | Solid | 9045D | |
| LCSD 280-215606/5 | Lab Control Sample Dup | Total/NA | Solid | 9045D | |

### ISM Prep Batch: 215758

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-1 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment,Prep | |
| 280-52668-3 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment,Prep | |
| 280-52668-5 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment,Prep | |

### ISM Prep Batch: 215759

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Increment, Prep | |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |
| 280-52668-4 DU | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Increment, Prep | |

### Analysis Batch: 215978

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-1 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Moisture | 215758 |
| 280-52668-3 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Moisture | 215758 |
| 280-52668-5 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Moisture | 215758 |
| 280-52668-7 | MW-3-3 | Total/NA | Solid | Moisture | |

### Analysis Batch: 217138

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52668-2 | SSS-DU01A-0.0-1.0-140226 | Total/NA | Solid | Moisture | 215759 |
| 280-52668-4 | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Moisture | 215759 |
| 280-52668-4 DU | SSS-DU01B-0.0-1.0-140227 | Total/NA | Solid | Moisture | 215759 |
| 280-52668-6 | SSS-DU01C-0.0-1.0-140227 | Total/NA | Solid | Moisture | 215759 |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Client Sample ID: SSS-DU01A-0.0-1.0-140226 — Lab Sample ID: 280-52668-1

**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment,Prep | | | | 1.0 g | 215758 | 03/06/14 13:31 | ACF | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 215978 | 03/07/14 14:13 | AJS | TAL DEN |

## Client Sample ID: SSS-DU01A-0.0-1.0-140226 — Lab Sample ID: 280-52668-1

**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 83.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment,Prep | | | | 1.0 g | 215758 | 03/06/14 13:31 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | | | 31.44 g | 1 mL | 215768 | 03/06/14 16:10 | RJM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.44 g | 1 mL | 216169 | 03/10/14 18:30 | KGV | TAL DEN |

## Client Sample ID: SSS-DU01A-0.0-1.0-140226 — Lab Sample ID: 280-52668-2

**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 217138 | 03/17/14 14:32 | AFB | TAL DEN |

## Client Sample ID: SSS-DU01A-0.0-1.0-140226 — Lab Sample ID: 280-52668-2

**Date Collected: 02/26/14 17:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | | | 30.07 g | 1 mL | 216464 | 03/12/14 13:38 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.07 g | 1 mL | 217084 | 03/17/14 17:22 | AGCM | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | DL | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 30.07 g | 1 mL | 216464 | 03/12/14 13:38 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 20 | 30.07 g | 1 mL | 217224 | 03/18/14 15:36 | KGV | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3050B MOD | | | 10.38 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.38 g | 500 mL | 216870 | 03/14/14 00:45 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3050B MOD | | | 10.38 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.38 g | 500 mL | 217110 | 03/14/14 20:28 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3050B MOD | | | 10.38 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.38 g | 500 mL | 217407 | 03/18/14 18:26 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 7471B | | | 3.00 g | 250 mL | 217447 | 03/19/14 13:00 | WAW | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 3.00 g | 250 mL | 217680 | 03/19/14 16:52 | WAW | TAL DEN |

## Client Sample ID: SSS-DU01B-0.0-1.0-140227 — Lab Sample ID: 280-52668-3

**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment,Prep | | | | 1.0 g | 215758 | 03/06/14 13:31 | ACF | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 215978 | 03/07/14 14:13 | AJS | TAL DEN |

## Client Sample ID: SSS-DU01B-0.0-1.0-140227 — Lab Sample ID: 280-52668-3

**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 84.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment,Prep | | | | 1.0 g | 215758 | 03/06/14 13:31 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | | | 30.63 g | 1 mL | 215768 | 03/06/14 16:10 | RJM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.63 g | 1 mL | 217084 | 03/17/14 15:06 | AGCM | TAL DEN |
| Total/NA | ISM Prep | Increment,Prep | DL | | | 1.0 g | 215758 | 03/06/14 13:31 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 30.63 g | 1 mL | 215768 | 03/06/14 16:10 | RJM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 4 | 30.63 g | 1 mL | 217084 | 03/17/14 15:33 | AGCM | TAL DEN |

## Client Sample ID: SSS-DU01B-0.0-1.0-140227 — Lab Sample ID: 280-52668-4

**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 217138 | 03/17/14 14:32 | AFB | TAL DEN |

## Client Sample ID: SSS-DU01B-0.0-1.0-140227 — Lab Sample ID: 280-52668-4

**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | | | 32.60 g | 1 mL | 216464 | 03/12/14 13:38 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 32.60 g | 1 mL | 217084 | 03/17/14 18:45 | AGCM | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | DL | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 32.60 g | 1 mL | 216464 | 03/12/14 13:38 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 5 | 32.60 g | 1 mL | 217224 | 03/18/14 16:03 | KGV | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3050B MOD | | | 10.60 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.60 g | 500 mL | 216870 | 03/14/14 00:59 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3050B MOD | | | 10.60 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.60 g | 500 mL | 217110 | 03/14/14 20:42 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3050B MOD | | | 10.60 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.60 g | 500 mL | 217407 | 03/18/14 18:40 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Client Sample ID: SSS-DU01B-0.0-1.0-140227 — Lab Sample ID: 280-52668-4

**Date Collected: 02/27/14 12:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 7471B | | | 3.04 g | 250 mL | 217447 | 03/19/14 13:00 | WAW | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 3.04 g | 250 mL | 217680 | 03/19/14 16:55 | WAW | TAL DEN |

## Client Sample ID: SSS-DU01C-0.0-1.0-140227 — Lab Sample ID: 280-52668-5

**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment,Prep | | | | 1.0 g | 215758 | 03/06/14 13:31 | ACF | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 215978 | 03/07/14 14:17 | AJS | TAL DEN |

## Client Sample ID: SSS-DU01C-0.0-1.0-140227 — Lab Sample ID: 280-52668-5

**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 84.3**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment,Prep | | | | 1.0 g | 215758 | 03/06/14 13:31 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | | | 31.61 g | 1 mL | 215768 | 03/06/14 16:10 | RJM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.61 g | 1 mL | 216169 | 03/10/14 19:25 | KGV | TAL DEN |
| Total/NA | ISM Prep | Increment,Prep | DL | | | 1.0 g | 215758 | 03/06/14 13:31 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 31.61 g | 1 mL | 215768 | 03/06/14 16:10 | RJM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 4 | 31.61 g | 1 mL | 217084 | 03/17/14 16:00 | AGCM | TAL DEN |

## Client Sample ID: SSS-DU01C-0.0-1.0-140227 — Lab Sample ID: 280-52668-6

**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 217138 | 03/17/14 14:32 | AFB | TAL DEN |

## Client Sample ID: SSS-DU01C-0.0-1.0-140227 — Lab Sample ID: 280-52668-6

**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | | | 32.39 g | 1 mL | 216464 | 03/12/14 13:38 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 32.39 g | 1 mL | 217084 | 03/17/14 19:12 | AGCM | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | DL | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 32.39 g | 1 mL | 216464 | 03/12/14 13:38 | BMS | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 4 | 32.39 g | 1 mL | 217224 | 03/18/14 16:30 | KGV | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Client Sample ID: SSS-DU01C-0.0-1.0-140227 — Lab Sample ID: 280-52668-6

**Date Collected: 02/27/14 15:00** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 99.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B MOD | | | 10.13 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.13 g | 500 mL | 216870 | 03/14/14 01:02 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3050B MOD | | | 10.13 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.13 g | 500 mL | 217110 | 03/14/14 20:45 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 3050B MOD | | | 10.13 g | 500 mL | 216506 | 03/12/14 10:19 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 10.13 g | 500 mL | 217407 | 03/18/14 18:43 | SJS | TAL DEN |
| Total/NA | ISM Prep | Increment, Prep | | | | 1.0 g | 215759 | 03/06/14 13:34 | ACF | TAL DEN |
| Total/NA | Prep | 7471B | | | 3.15 g | 250 mL | 217447 | 03/19/14 13:00 | WAW | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 3.15 g | 250 mL | 217680 | 03/19/14 17:01 | WAW | TAL DEN |

## Client Sample ID: MW-3-3 — Lab Sample ID: 280-52668-7

**Date Collected: 02/26/14 10:30** — **Matrix: Solid**
**Date Received: 02/28/14 09:45**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 40.04 g | 40 mL | 215590 | 03/05/14 16:53 | MRB | TAL DEN |
| Soluble | Analysis | 9045D | | 1 | 1 mL | 1 mL | 215606 | 03/05/14 19:56 | MRB | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 215978 | 03/07/14 14:13 | AJS | TAL DEN |

## Client Sample ID: MW-3-3 — Lab Sample ID: 280-52668-7

**Date Collected: 02/26/14 10:30** — **Matrix: Solid**
**Date Received: 02/28/14 09:45** — **Percent Solids: 70.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.01 g | 100 mL | 215574 | 03/06/14 12:45 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.01 g | 100 mL | 215887 | 03/06/14 23:07 | JKH | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52668-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Colorado | State Program | 8 | N/A | 09-30-14 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Maryland | State Program | 3 | 268 | 03-31-14 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

Pace Analytical®
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280-52668 Chain of Custody

# CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT All relevant fields must be completed accurately.

0.3 IRS+0.2
JK 2-28-14

Page: 1 of 1

1786495

**Section A** Required Client Information:

Company: Geosyntec Consultants
Address: 4601 Six Forks Rd Ste 340, Raleigh, NC
Email To:
Phone: 919-424-1812 Fax:
Requested Due Date/TAT: Standard

**Section B** Required Project Information:

Report To: of NC, PC Beau Hodge
Copy To: Mike Schott
Purchase Order No.:
Project Name: UNC Cogen
Project Number: GN5219

**Section C** Invoice Information:

Attention:
Company Name:
Address:
Pace Quote Reference:
Pace Project Manager:
Pace Profile #

**REGULATORY AGENCY**

☐ NPDES ☐ GROUND WATER ☐ DRINKING WATER
☐ UST ☐ RCRA ☒ OTHER

Site Location STATE: NC

**Section D** Required Client Information

Matrix Codes (MATRIX / CODE): Drinking Water DW; Water WT; Waste Water WW; Product P; Soil/Solid SL; Oil OL; Wipe WP; Air AR; Tissue TS; Other OT

SAMPLE ID (A-Z, 0-9 / ,-) Sample IDs MUST BE UNIQUE

Requested Analysis Filtered (Y/N)

| ITEM # | SAMPLE ID | MATRIX CODE (see valid codes to left) | SAMPLE TYPE (G=GRAB C=COMP) | COLLECTED Composite Start DATE | COLLECTED Composite Start TIME | COLLECTED Composite End/Grab DATE | COLLECTED Composite End/Grab TIME | SAMPLE TEMP AT COLLECTION | # OF CONTAINERS | Preservatives: Unpreserved | $H_2SO_4$ | $HNO_3$ | HCl | NaOH | $Na_2S_2O_3$ | Methanol | Other | Analysis Test (Y/N): ISM 6010C | ISM 7470A | ISM 8270D SIM | ISM 8290 | pH & 6010 | Residual Chlorine (Y/N) | Pace Project No./ Lab I.D. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | SSS-DU01A-0.0-1.0-140226 | SL | C | 2/26/14 | 1800 | 2/26/14 | 1700 | | 1 | X | | | | | | | | X | X | X | X | | | |
| 2 | SSS-DU01B-0.0-1.0-140227 | SL | C | 2/27/14 | 0800 | 2/27/14 | 1200 | | 1 | X | | | | | | | | X | X | X | X | | | |
| 3 | SSS-DU01C-0.0-1.0-140227 | SL | C | 2/27/14 | 1300 | 2/27/14 | 1800 | | 1 | X | | | | | | | | X | X | X | X | | | |
| 4 | MW-3-3 | SL | G | | | 2/26/14 | 1030 | | 1 | X | | | | | | | | | | | | X X | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | | | | | | | | | | | | | | | | | | | | | | | | |

| ADDITIONAL COMMENTS | RELINQUISHED BY / AFFILIATION | DATE | TIME | ACCEPTED BY / AFFILIATION | DATE | TIME | SAMPLE CONDITIONS |
|---|---|---|---|---|---|---|---|
| ISM samples to be processed as agreed previously | Caitlin Collins/Geosyn | 2/27/14 | 1609 | [signature] | 2-28-14 | 945 | |

ORIGINAL

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Caitlin Collins

SIGNATURE of SAMPLER: [signature] DATE Signed (MM/DD/YY): 02/27/14

Temp in °C | Received on Ice (Y/N) | Custody Sealed Cooler (Y/N) | Samples Intact (Y/N)

*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

F-ALL-Q-020rev.07, 15-May-2007

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-52668-1

**Login Number: 52668**
**List Number: 1**
**Creator: Dedio, Michael T**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# APPENDIX M

# Laboratory Analytical Reports - Groundwater

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-52940-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 6:04:37 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |
| X | Surrogate is outside control limits |
| H | Sample was prepped or analyzed beyond the specified holding time |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-52940-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-52940-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**
The samples were received on 3/11/2014 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 1.0º C, 1.8º C, 4.3º C and 4.5º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrooke Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 3/14/2014 09:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.9º C.

**8270D SIM GCMS**
Samples ER01-140310 (280-52940-1), GWA-MW01-140310 (280-52940-2), GWA-MW03-140310 (280-52940-3) and GWA-MW99-140310 (280-52940-4) were analyzed for 8270D SIM GCMS in accordance with SW-846 8270D_SIM. The samples were prepared on 03/13/2014 and 03/20/2014 and analyzed on 03/19/2014 and 03/24/2014.

2-Fluorobiphenyl failed the surrogate recovery criteria low for GWA-MW99-140310 (280-52940-4). Refer to the QC report for details. Matrix interference was not evident; therefore the sample was re-extracted in prep batch 280-217728. All surrogates were in control in the re-extraction/reanalysis. Both sets of data are reported as re-extraction was performed 3 days outside of the recommended holding time of 7 days.

The Method Blank (MB) for re-extraction prep batch 280-217728 could not be analyzed. The analyst noted that the cap on the extract vial was not tight allowing the extract to evaporate completely before a sample aliquot was taken. The LCS/LCSD associated with the batch was in control.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with batch 280-217728.

No other difficulties were encountered during the 8270D SIM analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL METALS (ICP)**
Samples ER01-140310 (280-52940-1), GWA-MW01-140310 (280-52940-2), GWA-MW03-140310 (280-52940-3) and GWA-MW99-140310 (280-52940-4) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on

## Job ID: 280-52940-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

03/12/2014 and 03/13/2014 and analyzed on 03/15/2014 and 03/19/2014.

Selenium, Sodium and Zinc were detected in method blank MB 280-216411/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

The continuing calibration verification (CCVL) associated with analysis batch 280-217114 recovered above the upper control limit for Selenium. The samples associated with this CCV were less than the RL for the affected analytes; therefore, the data have been reported.

The instrument blank for analytical batch 280-217114 contained Antimony greater than one-half the reporting limit (RL) and were not re-analyzed because the associated sample results were less than the RL.

Zinc was detected in method blank MB 280-216639/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Manganese failed the recovery criteria low for the MS of sample GWA-MW99-140310MS (280-52940-4) in batch 280-217604. Manganese failed the recovery criteria low for the MSD of sample GWA-MW99-140310MSD (280-52940-4) in batch 280-217604. Refer to the QC report for details.

No other difficulties were encountered during the metals analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL MERCURY**
Samples ER01-140310 (280-52940-1), GWA-MW01-140310 (280-52940-2), GWA-MW03-140310 (280-52940-3) and GWA-MW99-140310 (280-52940-4) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 03/13/2014 and 03/14/2014.

Mercury was detected in method blank MB 280-216601/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No other difficulties were encountered during the mercury analysis.

All other quality control parameters were within the acceptance limits.

**ALKALINITY**
Samples GWA-MW01-140310 (280-52940-2) and GWA-MW03-140310 (280-52940-3) were analyzed for Alkalinity in accordance with SM20 2320B. The samples were analyzed on 03/14/2014.

No difficulties were encountered during the alkalinity analysis.

All quality control parameters were within the acceptance limits.

**TOTAL DISSOLVED SOLIDS**
Samples GWA-MW01-140310 (280-52940-2) and GWA-MW03-140310 (280-52940-3) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 03/17/2014.

No difficulties were encountered during the TDS analysis.

All quality control parameters were within the acceptance limits.

**TOTAL SUSPENDED SOLIDS**
Samples GWA-MW01-140310 (280-52940-2) and GWA-MW03-140310 (280-52940-3) were analyzed for total suspended solids in

## Job ID: 280-52940-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

accordance with SM20 2540D. The samples were analyzed on 03/14/2014.

Constant weight was not achieved after 3 drying cycles for the following sample in batch 217061 for TDS: GWA-MW03-140310 (280-52940-3). Per the laboratory SOP, no further drying was required.

No other difficulties were encountered during the TSS analysis.

All quality control parameters were within the acceptance limits.

**SULFIDE**
Samples GWA-MW01-140310 (280-52940-2) and GWA-MW03-140310 (280-52940-3) were analyzed for sulfide in accordance with EPA SW-846 Method 9034. The samples were prepared and analyzed on 03/15/2014.

No difficulties were encountered during the sulfide analysis.

All quality control parameters were within the acceptance limits.

**ANIONS (28 DAYS)**
Samples GWA-MW01-140310 (280-52940-2) and GWA-MW03-140310 (280-52940-3) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056. The samples were analyzed on 03/26/2014 and 03/27/2014.

Samples GWA-MW01-140310 (280-52940-2)[5X] and GWA-MW03-140310 (280-52940-3)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No other difficulties were encountered during the anions analysis.

All other quality control parameters were within the acceptance limits.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

## Client Sample ID: ER01-140310 — Lab Sample ID: 280-52940-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 21 | J | 97 | 5.5 | ng/L | 1 | | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 30 | J | 97 | 5.0 | ng/L | 1 | | 8270D SIM | Total/NA |
| Naphthalene | 48 | J | 97 | 5.1 | ng/L | 1 | | 8270D SIM | Total/NA |
| Phenanthrene | 12 | J | 97 | 9.4 | ng/L | 1 | | 8270D SIM | Total/NA |
| Barium | 0.67 | J | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 0.86 | J | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 8.8 | J B | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Mercury | 0.040 | J B | 0.20 | 0.027 | ug/L | 1 | | 7470A | Total/NA |

## Client Sample ID: GWA-MW01-140310 — Lab Sample ID: 280-52940-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 130 | | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 24000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 5700 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 3400 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 42 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 57000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 0.74 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 140 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 190 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 14 | J B | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Chloride | 27 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 69 | | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Bicarbonate Alkalinity as CaCO3 | 76 | | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Total Dissolved Solids | 260 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |
| Total Suspended Solids | 6.0 | | 4.0 | 1.1 | mg/L | 1 | | SM 2540D | Total/NA |

## Client Sample ID: GWA-MW03-140310 — Lab Sample ID: 280-52940-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 120 | | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 61000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 16000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 9200 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 22 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 100000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Beryllium | 0.53 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | Total/NA |
| Cadmium | 0.67 | J | 5.0 | 0.45 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 1.5 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 150 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 200 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 8500 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 31 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 52 | B | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Chloride | 45 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 330 | | 50 | 2.3 | mg/L | 10 | | 9056A | Total/NA |
| Bicarbonate Alkalinity as CaCO3 | 55 | | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Total Dissolved Solids | 600 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

## Client Sample ID: GWA-MW99-140310 — Lab Sample ID: 280-52940-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[a]anthracene | 13 | J H | 100 | 3.3 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 13 | J H | 100 | 5.2 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 16 | J H | 100 | 3.5 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 29 | J H | 100 | 3.6 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 14 | J H | 100 | 5.1 | ng/L | 1 | | 8270D SIM | Total/NA |
| Chrysene | 12 | J H | 100 | 3.3 | ng/L | 1 | | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 17 | J H | 100 | 4.9 | ng/L | 1 | | 8270D SIM | Total/NA |
| Fluoranthene | 14 | J H | 100 | 4.6 | ng/L | 1 | | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 34 | J H | 100 | 15 | ng/L | 1 | | 8270D SIM | Total/NA |
| Phenanthrene | 11 | J H | 100 | 9.9 | ng/L | 1 | | 8270D SIM | Total/NA |
| Pyrene | 11 | J H | 100 | 8.2 | ng/L | 1 | | 8270D SIM | Total/NA |
| Barium | 21 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Beryllium | 0.55 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | Total/NA |
| Cadmium | 0.91 | J | 5.0 | 0.45 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 150 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 67 | J | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 8500 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 32 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 52 | B | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 9034 | Sulfide, Acid Soluble and Insoluble (Titrimetric) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL DEN |
| SM 2540D | Solids, Total Suspended (TSS) | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-52940-1 | ER01-140310 | Water | 03/10/14 10:45 | 03/11/14 09:20 |
| 280-52940-2 | GWA-MW01-140310 | Water | 03/10/14 13:30 | 03/11/14 09:20 |
| 280-52940-3 | GWA-MW03-140310 | Water | 03/10/14 14:05 | 03/11/14 09:20 |
| 280-52940-4 | GWA-MW99-140310 | Water | 03/10/14 14:05 | 03/11/14 09:20 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: ER01-140310**
**Date Collected: 03/10/14 10:45**
**Date Received: 03/11/14 09:20**

**Lab Sample ID: 280-52940-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **1-Methylnaphthalene** | **21** | **J** | 97 | 5.5 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| **2-Methylnaphthalene** | **30** | **J** | 97 | 5.0 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Acenaphthene | 10 | U | 97 | 10 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Acenaphthylene | 9.6 | U | 97 | 9.6 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Anthracene | 14 | U | 97 | 14 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Benzo[a]anthracene | 3.1 | U | 97 | 3.1 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Benzo[a]pyrene | 5.0 | U | 97 | 5.0 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Benzo[b]fluoranthene | 3.3 | U | 97 | 3.3 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U | 97 | 3.4 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Benzo[k]fluoranthene | 4.9 | U | 97 | 4.9 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Chrysene | 3.1 | U | 97 | 3.1 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Dibenz(a,h)anthracene | 4.7 | U | 97 | 4.7 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Fluoranthene | 4.4 | U | 97 | 4.4 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Fluorene | 18 | U | 97 | 18 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 97 | 14 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| **Naphthalene** | **48** | **J** | 97 | 5.1 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| **Phenanthrene** | **12** | **J** | 97 | 9.4 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |
| Pyrene | 7.8 | U | 97 | 7.8 | ng/L | | 03/13/14 20:46 | 03/19/14 12:51 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *66* | | *42 - 120* | *03/13/14 20:46* | *03/19/14 12:51* | *1* |
| *Nitrobenzene-d5* | *84* | | *43 - 120* | *03/13/14 20:46* | *03/19/14 12:51* | *1* |
| *Terphenyl-d14* | *98* | | *47 - 120* | *03/13/14 20:46* | *03/19/14 12:51* | *1* |

**Client Sample ID: GWA-MW01-140310**
**Date Collected: 03/10/14 13:30**
**Date Received: 03/11/14 09:20**

**Lab Sample ID: 280-52940-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.5 | U | 97 | 5.5 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| 2-Methylnaphthalene | 5.0 | U | 97 | 5.0 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Acenaphthene | 10 | U | 97 | 10 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Acenaphthylene | 9.7 | U | 97 | 9.7 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Anthracene | 14 | U | 97 | 14 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Benzo[a]anthracene | 3.1 | U | 97 | 3.1 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Benzo[a]pyrene | 5.0 | U | 97 | 5.0 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Benzo[b]fluoranthene | 3.3 | U | 97 | 3.3 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U | 97 | 3.4 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Benzo[k]fluoranthene | 4.9 | U | 97 | 4.9 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Chrysene | 3.1 | U | 97 | 3.1 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Dibenz(a,h)anthracene | 4.7 | U | 97 | 4.7 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Fluoranthene | 4.4 | U | 97 | 4.4 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Fluorene | 18 | U | 97 | 18 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 97 | 14 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Naphthalene | 5.2 | U | 97 | 5.2 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Phenanthrene | 9.5 | U | 97 | 9.5 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |
| Pyrene | 7.8 | U | 97 | 7.8 | ng/L | | 03/13/14 20:46 | 03/19/14 13:18 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *67* | | *42 - 120* | *03/13/14 20:46* | *03/19/14 13:18* | *1* |
| *Nitrobenzene-d5* | *70* | | *43 - 120* | *03/13/14 20:46* | *03/19/14 13:18* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: GWA-MW01-140310** — **Lab Sample ID: 280-52940-2**
**Date Collected: 03/10/14 13:30** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *80* | | *47 - 120* | *03/13/14 20:46* | *03/19/14 13:18* | *1* |

**Client Sample ID: GWA-MW03-140310** — **Lab Sample ID: 280-52940-3**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.5 | U | 97 | 5.5 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| 2-Methylnaphthalene | 5.0 | U | 97 | 5.0 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Acenaphthene | 11 | U | 97 | 11 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Acenaphthylene | 9.7 | U | 97 | 9.7 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Anthracene | 14 | U | 97 | 14 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Benzo[a]anthracene | 3.1 | U | 97 | 3.1 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Benzo[a]pyrene | 5.0 | U | 97 | 5.0 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Benzo[b]fluoranthene | 3.3 | U | 97 | 3.3 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Benzo[g,h,i]perylene | 3.5 | U | 97 | 3.5 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Benzo[k]fluoranthene | 4.9 | U | 97 | 4.9 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Chrysene | 3.1 | U | 97 | 3.1 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Dibenz(a,h)anthracene | 4.7 | U | 97 | 4.7 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Fluoranthene | 4.4 | U | 97 | 4.4 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Fluorene | 18 | U | 97 | 18 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 97 | 14 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Naphthalene | 5.2 | U | 97 | 5.2 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Phenanthrene | 9.5 | U | 97 | 9.5 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |
| Pyrene | 7.9 | U | 97 | 7.9 | ng/L | | 03/13/14 20:46 | 03/19/14 13:45 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *57* | | *42 - 120* | *03/13/14 20:46* | *03/19/14 13:45* | *1* |
| *Nitrobenzene-d5* | *55* | | *43 - 120* | *03/13/14 20:46* | *03/19/14 13:45* | *1* |
| *Terphenyl-d14* | *73* | | *47 - 120* | *03/13/14 20:46* | *03/19/14 13:45* | *1* |

**Client Sample ID: GWA-MW99-140310** — **Lab Sample ID: 280-52940-4**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 95 | 5.4 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| 1-Methylnaphthalene | 5.8 | U H | 100 | 5.8 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| 2-Methylnaphthalene | 4.9 | U | 95 | 4.9 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| 2-Methylnaphthalene | 5.2 | U H | 100 | 5.2 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Acenaphthene | 10 | U | 95 | 10 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| Acenaphthene | 11 | U H | 100 | 11 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Acenaphthylene | 9.5 | U | 95 | 9.5 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| Acenaphthylene | 10 | U H | 100 | 10 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Anthracene | 13 | U | 95 | 13 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| Anthracene | 14 | U H | 100 | 14 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Benzo[a]anthracene | 3.1 | U | 95 | 3.1 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Benzo[a]anthracene** | **13** | **J H** | 100 | 3.3 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Benzo[a]pyrene | 4.9 | U | 95 | 4.9 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Benzo[a]pyrene** | **13** | **J H** | 100 | 5.2 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Benzo[b]fluoranthene | 3.3 | U | 95 | 3.3 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Benzo[b]fluoranthene** | **16** | **J H** | 100 | 3.5 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: GWA-MW99-140310** — **Lab Sample ID: 280-52940-4**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[g,h,i]perylene | 3.4 | U | 95 | 3.4 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Benzo[g,h,i]perylene** | **29** | **J H** | 100 | 3.6 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Benzo[k]fluoranthene | 4.8 | U | 95 | 4.8 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Benzo[k]fluoranthene** | **14** | **J H** | 100 | 5.1 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Chrysene | 3.0 | U | 95 | 3.0 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Chrysene** | **12** | **J H** | 100 | 3.3 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U | 95 | 4.6 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Dibenz(a,h)anthracene** | **17** | **J H** | 100 | 4.9 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Fluoranthene | 4.3 | U | 95 | 4.3 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Fluoranthene** | **14** | **J H** | 100 | 4.6 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Fluorene | 18 | U | 95 | 18 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| Fluorene | 19 | U H | 100 | 19 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 95 | 14 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **34** | **J H** | 100 | 15 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Naphthalene | 5.1 | U | 95 | 5.1 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| Naphthalene | 5.4 | U H | 100 | 5.4 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Phenanthrene | 9.3 | U | 95 | 9.3 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Phenanthrene** | **11** | **J H** | 100 | 9.9 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |
| Pyrene | 7.7 | U | 95 | 7.7 | ng/L | | 03/13/14 20:46 | 03/19/14 14:12 | 1 |
| **Pyrene** | **11** | **J H** | 100 | 8.2 | ng/L | | 03/20/14 20:28 | 03/24/14 12:37 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *41* | *X* | *42 - 120* | *03/13/14 20:46* | *03/19/14 14:12* | *1* |
| *2-Fluorobiphenyl* | *61* | | *42 - 120* | *03/20/14 20:28* | *03/24/14 12:37* | *1* |
| *Nitrobenzene-d5* | *43* | | *43 - 120* | *03/13/14 20:46* | *03/19/14 14:12* | *1* |
| *Nitrobenzene-d5* | *69* | | *43 - 120* | *03/20/14 20:28* | *03/24/14 12:37* | *1* |
| *Terphenyl-d14* | *57* | | *47 - 120* | *03/13/14 20:46* | *03/19/14 14:12* | *1* |
| *Terphenyl-d14* | *107* | | *47 - 120* | *03/20/14 20:28* | *03/24/14 12:37* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: ER01-140310** — **Lab Sample ID: 280-52940-1**
**Date Collected: 03/10/14 10:45** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| **Barium** | **0.67** | **J** | 10 | 0.58 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| **Manganese** | **0.86** | **J** | 10 | 0.25 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: ER01-140310** — **Lab Sample ID: 280-52940-1**
**Date Collected: 03/10/14 10:45** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| **Zinc** | **8.8** | **J B** | 20 | 4.5 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 03/12/14 07:30 | 03/15/14 01:40 | 1 |

**Client Sample ID: GWA-MW01-140310** — **Lab Sample ID: 280-52940-2**
**Date Collected: 03/10/14 13:30** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **130** | | 100 | 18 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Calcium** | **24000** | | 200 | 35 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Magnesium** | **5700** | | 200 | 11 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Potassium** | **3400** | | 3000 | 240 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Barium** | **42** | | 10 | 0.58 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Sodium** | **57000** | **B** | 1000 | 92 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Chromium** | **0.74** | **J** | 10 | 0.66 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Iron** | **140** | | 100 | 22 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Manganese** | **190** | | 10 | 0.25 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| **Zinc** | **14** | **J B** | 20 | 4.5 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 03/12/14 07:30 | 03/15/14 01:42 | 1 |

**Client Sample ID: GWA-MW03-140310** — **Lab Sample ID: 280-52940-3**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **120** | | 100 | 18 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Calcium** | **61000** | | 200 | 35 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Magnesium** | **16000** | | 200 | 11 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Potassium** | **9200** | | 3000 | 240 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Barium** | **22** | | 10 | 0.58 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Sodium** | **100000** | **B** | 1000 | 92 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Beryllium** | **0.53** | **J** | 1.0 | 0.47 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Cadmium** | **0.67** | **J** | 5.0 | 0.45 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Copper** | **1.5** | **J** | 15 | 1.4 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Cobalt** | **150** | | 10 | 1.2 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Iron** | **200** | | 100 | 22 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: GWA-MW03-140310** — **Lab Sample ID: 280-52940-3**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Manganese** | **8500** | | 10 | 0.25 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Nickel** | **31** | **J** | 40 | 1.3 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| **Zinc** | **52** | **B** | 20 | 4.5 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 03/12/14 07:30 | 03/15/14 01:47 | 1 |

**Client Sample ID: GWA-MW99-140310** — **Lab Sample ID: 280-52940-4**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| **Barium** | **21** | | 10 | 0.58 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| **Beryllium** | **0.55** | **J** | 1.0 | 0.47 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| **Cadmium** | **0.91** | **J** | 5.0 | 0.45 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| **Cobalt** | **150** | | 10 | 1.2 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| **Iron** | **67** | **J** | 100 | 22 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| **Manganese** | **8500** | | 10 | 0.25 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| **Nickel** | **32** | **J** | 40 | 1.3 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| **Zinc** | **52** | **B** | 20 | 4.5 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 03/13/14 13:00 | 03/19/14 19:19 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: ER01-140310** — **Lab Sample ID: 280-52940-1**
**Date Collected: 03/10/14 10:45** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **0.040** | **J B** | 0.20 | 0.027 | ug/L | | 03/13/14 11:40 | 03/13/14 20:10 | 1 |

**Client Sample ID: GWA-MW01-140310** — **Lab Sample ID: 280-52940-2**
**Date Collected: 03/10/14 13:30** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 03/14/14 11:20 | 03/14/14 17:57 | 1 |

**Client Sample ID: GWA-MW03-140310** — **Lab Sample ID: 280-52940-3**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 03/14/14 11:20 | 03/14/14 17:59 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: GWA-MW99-140310** — **Lab Sample ID: 280-52940-4**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 03/14/14 11:20 | 03/14/14 18:01 | 1 |

## General Chemistry

**Client Sample ID: GWA-MW01-140310** — **Lab Sample ID: 280-52940-2**
**Date Collected: 03/10/14 13:30** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Sulfide | 0.79 | U | 4.0 | 0.79 | mg/L | | 03/15/14 09:45 | 03/15/14 13:30 | 1 |
| **Chloride** | **27** | | 3.0 | 0.25 | mg/L | | | 03/26/14 20:48 | 1 |
| **Sulfate** | **69** | | 25 | 1.2 | mg/L | | | 03/27/14 03:05 | 5 |
| **Bicarbonate Alkalinity as CaCO3** | **76** | | 5.0 | 1.1 | mg/L | | | 03/14/14 19:48 | 1 |
| **Total Dissolved Solids** | **260** | | 10 | 4.7 | mg/L | | | 03/17/14 09:12 | 1 |
| **Total Suspended Solids** | **6.0** | | 4.0 | 1.1 | mg/L | | | 03/14/14 15:37 | 1 |

**Client Sample ID: GWA-MW03-140310** — **Lab Sample ID: 280-52940-3**
**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Sulfide | 0.79 | U | 4.0 | 0.79 | mg/L | | 03/15/14 09:45 | 03/15/14 13:30 | 1 |
| **Chloride** | **45** | | 3.0 | 0.25 | mg/L | | | 03/26/14 21:04 | 1 |
| **Sulfate** | **330** | | 50 | 2.3 | mg/L | | | 03/27/14 03:21 | 10 |
| **Bicarbonate Alkalinity as CaCO3** | **55** | | 5.0 | 1.1 | mg/L | | | 03/14/14 19:52 | 1 |
| **Total Dissolved Solids** | **600** | | 10 | 4.7 | mg/L | | | 03/17/14 09:12 | 1 |
| Total Suspended Solids | 1.1 | U | 4.0 | 1.1 | mg/L | | | 03/14/14 15:37 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| **Lab Sample ID** | **Client Sample ID** | **(42-120)** | **(43-120)** | **(47-120)** |
| 280-52940-1 | ER01-140310 | 66 | 84 | 98 |
| 280-52940-2 | GWA-MW01-140310 | 67 | 70 | 80 |
| 280-52940-3 | GWA-MW03-140310 | 57 | 55 | 73 |
| 280-52940-4 | GWA-MW99-140310 | 41 X | 43 | 57 |
| 280-52940-4 | GWA-MW99-140310 | 61 | 69 | 107 |
| LCS 280-216749/2-A | Lab Control Sample | 78 | 77 | 87 |
| LCS 280-217728/2-A | Lab Control Sample | 76 | 90 | 94 |
| LCSD 280-217728/3-A | Lab Control Sample Dup | 86 | 99 | 105 |
| MB 280-216749/1-A | Method Blank | 88 | 90 | 95 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-216749/1-A**
**Matrix: Water**
**Analysis Batch: 217224**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 216749**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *42 - 120* | *03/13/14 17:51* | *03/18/14 10:04* | *1* |
| *Nitrobenzene-d5* | *90* | | *43 - 120* | *03/13/14 17:51* | *03/18/14 10:04* | *1* |
| *Terphenyl-d14* | *95* | | *47 - 120* | *03/13/14 17:51* | *03/18/14 10:04* | *1* |

**Lab Sample ID: LCS 280-216749/2-A**
**Matrix: Water**
**Analysis Batch: 217224**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 216749**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 791 | | ng/L | | 88 | 47 - 120 |
| Acenaphthylene | 900 | 759 | | ng/L | | 84 | 39 - 120 |
| Anthracene | 900 | 789 | | ng/L | | 88 | 28 - 120 |
| Benzo[a]anthracene | 900 | 841 | | ng/L | | 93 | 42 - 120 |
| Benzo[a]pyrene | 900 | 912 | | ng/L | | 101 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 893 | | ng/L | | 99 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 1010 | | ng/L | | 112 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 925 | | ng/L | | 103 | 43 - 120 |
| Chrysene | 900 | 831 | | ng/L | | 92 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 966 | | ng/L | | 107 | 27 - 126 |
| Fluoranthene | 900 | 807 | | ng/L | | 90 | 46 - 120 |
| Fluorene | 900 | 786 | | ng/L | | 87 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 946 | | ng/L | | 105 | 38 - 120 |
| Naphthalene | 900 | 775 | | ng/L | | 86 | 37 - 120 |
| Phenanthrene | 900 | 746 | | ng/L | | 83 | 46 - 120 |
| Pyrene | 900 | 789 | | ng/L | | 88 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-216749/2-A**
**Matrix: Water**
**Analysis Batch: 217224**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 216749**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *78* | | *42 - 120* |
| *Nitrobenzene-d5* | *77* | | *43 - 120* |
| *Terphenyl-d14* | *87* | | *47 - 120* |

**Lab Sample ID: LCS 280-217728/2-A**
**Matrix: Water**
**Analysis Batch: 218039**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 217728**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 786 | | ng/L | | 87 | 47 - 120 |
| Acenaphthylene | 900 | 801 | | ng/L | | 89 | 39 - 120 |
| Anthracene | 900 | 805 | | ng/L | | 89 | 28 - 120 |
| Benzo[a]anthracene | 900 | 801 | | ng/L | | 89 | 42 - 120 |
| Benzo[a]pyrene | 900 | 787 | | ng/L | | 87 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 805 | | ng/L | | 89 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 827 | | ng/L | | 92 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 830 | | ng/L | | 92 | 43 - 120 |
| Chrysene | 900 | 789 | | ng/L | | 88 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 773 | | ng/L | | 86 | 27 - 126 |
| Fluoranthene | 900 | 827 | | ng/L | | 92 | 46 - 120 |
| Fluorene | 900 | 803 | | ng/L | | 89 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 928 | | ng/L | | 103 | 38 - 120 |
| Naphthalene | 900 | 758 | | ng/L | | 84 | 37 - 120 |
| Phenanthrene | 900 | 748 | | ng/L | | 83 | 46 - 120 |
| Pyrene | 900 | 814 | | ng/L | | 90 | 49 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *76* | | *42 - 120* |
| *Nitrobenzene-d5* | *90* | | *43 - 120* |
| *Terphenyl-d14* | *94* | | *47 - 120* |

**Lab Sample ID: LCSD 280-217728/3-A**
**Matrix: Water**
**Analysis Batch: 218039**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 217728**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 838 | | ng/L | | 93 | 47 - 120 | 6 | 50 |
| Acenaphthylene | 900 | 843 | | ng/L | | 94 | 39 - 120 | 5 | 50 |
| Anthracene | 900 | 903 | | ng/L | | 100 | 28 - 120 | 11 | 50 |
| Benzo[a]anthracene | 900 | 930 | | ng/L | | 103 | 42 - 120 | 15 | 40 |
| Benzo[a]pyrene | 900 | 936 | | ng/L | | 104 | 38 - 120 | 17 | 21 |
| Benzo[b]fluoranthene | 900 | 932 | | ng/L | | 104 | 44 - 120 | 15 | 28 |
| Benzo[g,h,i]perylene | 900 | 1000 | | ng/L | | 111 | 39 - 120 | 19 | 23 |
| Benzo[k]fluoranthene | 900 | 1020 | | ng/L | | 113 | 43 - 120 | 20 | 28 |
| Chrysene | 900 | 902 | | ng/L | | 100 | 35 - 120 | 13 | 41 |
| Dibenz(a,h)anthracene | 900 | 906 | | ng/L | | 101 | 27 - 126 | 16 | 25 |
| Fluoranthene | 900 | 954 | | ng/L | | 106 | 46 - 120 | 14 | 24 |
| Fluorene | 900 | 897 | | ng/L | | 100 | 49 - 120 | 11 | 50 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCSD 280-217728/3-A**
**Matrix: Water**
**Analysis Batch: 218039**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 217728**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Indeno[1,2,3-cd]pyrene | | | 900 | 946 | | ng/L | | 105 | 38 - 120 | 2 | 25 |
| Naphthalene | | | 900 | 825 | | ng/L | | 92 | 37 - 120 | 8 | 50 |
| Phenanthrene | | | 900 | 843 | | ng/L | | 94 | 46 - 120 | 12 | 42 |
| Pyrene | | | 900 | 930 | | ng/L | | 103 | 49 - 120 | 13 | 22 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *86* | | *42 - 120* |
| *Nitrobenzene-d5* | *99* | | *43 - 120* |
| *Terphenyl-d14* | *105* | | *47 - 120* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-216411/1-A**
**Matrix: Water**
**Analysis Batch: 217114**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 216411**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Sodium | 159 | J | 1000 | 92 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Selenium | 5.11 | J ^ | 15 | 4.9 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Zinc | 7.31 | J | 20 | 4.5 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 03/12/14 07:30 | 03/15/14 01:09 | 1 |

**Lab Sample ID: LCS 280-216411/2-A**
**Matrix: Water**
**Analysis Batch: 217114**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 216411**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | | | 2000 | 2040 | | ug/L | | 102 | 87 - 111 | | |
| Calcium | | | 50000 | 51800 | | ug/L | | 104 | 90 - 111 | | |
| Antimony | | | 500 | 526 | | ug/L | | 105 | 88 - 110 | | |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-216411/2-A**
**Matrix: Water**
**Analysis Batch: 217114**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 216411**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Magnesium | 50000 | 51200 | | ug/L | | 102 | 90 - 113 |
| Arsenic | 1000 | 1030 | | ug/L | | 103 | 88 - 110 |
| Potassium | 50000 | 53400 | | ug/L | | 107 | 89 - 114 |
| Barium | 2000 | 2140 | | ug/L | | 107 | 90 - 112 |
| Sodium | 50000 | 56000 | | ug/L | | 112 | 90 - 115 |
| Beryllium | 50.0 | 51.7 | | ug/L | | 103 | 89 - 113 |
| Cadmium | 100 | 106 | | ug/L | | 106 | 88 - 111 |
| Chromium | 200 | 214 | | ug/L | | 107 | 90 - 113 |
| Copper | 250 | 264 | | ug/L | | 106 | 86 - 112 |
| Cobalt | 500 | 517 | | ug/L | | 103 | 89 - 111 |
| Iron | 1000 | 1030 | | ug/L | | 103 | 89 - 115 |
| Lead | 500 | 522 | | ug/L | | 104 | 89 - 110 |
| Manganese | 500 | 506 | | ug/L | | 101 | 90 - 110 |
| Nickel | 500 | 514 | | ug/L | | 103 | 89 - 111 |
| Selenium | 2000 | 2130 | ^ | ug/L | | 106 | 85 - 112 |
| Silver | 50.0 | 52.6 | | ug/L | | 105 | 86 - 115 |
| Thallium | 2000 | 2110 | | ug/L | | 106 | 88 - 110 |
| Zinc | 500 | 510 | | ug/L | | 102 | 85 - 111 |
| Vanadium | 500 | 526 | | ug/L | | 105 | 90 - 111 |

**Lab Sample ID: MB 280-216639/1-A**
**Matrix: Water**
**Analysis Batch: 217604**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 216639**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Zinc | 6.18 | J | 20 | 4.5 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 03/13/14 13:00 | 03/19/14 19:15 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-216639/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217604** — **Prep Batch: 216639**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1940 | | ug/L | | 97 | 87 - 111 |
| Antimony | 500 | 511 | | ug/L | | 102 | 88 - 110 |
| Arsenic | 1000 | 1010 | | ug/L | | 101 | 88 - 110 |
| Barium | 2000 | 2010 | | ug/L | | 101 | 90 - 112 |
| Beryllium | 50.0 | 49.3 | | ug/L | | 99 | 89 - 113 |
| Cadmium | 100 | 102 | | ug/L | | 102 | 88 - 111 |
| Chromium | 200 | 205 | | ug/L | | 102 | 90 - 113 |
| Copper | 250 | 250 | | ug/L | | 100 | 86 - 112 |
| Cobalt | 500 | 494 | | ug/L | | 99 | 89 - 111 |
| Iron | 1000 | 999 | | ug/L | | 100 | 89 - 115 |
| Lead | 500 | 510 | | ug/L | | 102 | 89 - 110 |
| Manganese | 500 | 494 | | ug/L | | 99 | 90 - 110 |
| Nickel | 500 | 502 | | ug/L | | 100 | 89 - 111 |
| Selenium | 2000 | 2040 | | ug/L | | 102 | 85 - 112 |
| Silver | 50.0 | 51.6 | | ug/L | | 103 | 86 - 115 |
| Thallium | 2000 | 2010 | | ug/L | | 100 | 88 - 110 |
| Zinc | 500 | 501 | | ug/L | | 100 | 85 - 111 |
| Vanadium | 500 | 505 | | ug/L | | 101 | 90 - 111 |

**Lab Sample ID: 280-52940-4 MS** — **Client Sample ID: GWA-MW99-140310**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217604** — **Prep Batch: 216639**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 2000 | 1920 | | ug/L | | 96 | 83 - 119 |
| Antimony | 3.1 | U | 500 | 510 | | ug/L | | 102 | 81 - 124 |
| Arsenic | 4.4 | U | 1000 | 1020 | | ug/L | | 102 | 84 - 124 |
| Barium | 21 | | 2000 | 2020 | | ug/L | | 100 | 85 - 120 |
| Beryllium | 0.55 | J | 50.0 | 49.4 | | ug/L | | 98 | 79 - 121 |
| Cadmium | 0.91 | J | 100 | 103 | | ug/L | | 102 | 82 - 119 |
| Chromium | 0.66 | U | 200 | 202 | | ug/L | | 101 | 73 - 135 |
| Copper | 1.4 | U | 250 | 249 | | ug/L | | 100 | 82 - 129 |
| Cobalt | 150 | | 500 | 632 | | ug/L | | 96 | 82 - 119 |
| Iron | 67 | J | 1000 | 1060 | | ug/L | | 100 | 52 - 155 |
| Lead | 2.6 | U | 500 | 502 | | ug/L | | 100 | 89 - 121 |
| Manganese | 8500 | | 500 | 8500 | 4 | ug/L | | 6 | 79 - 121 |
| Nickel | 32 | J | 500 | 526 | | ug/L | | 99 | 84 - 120 |
| Selenium | 4.9 | U | 2000 | 2050 | | ug/L | | 102 | 71 - 140 |
| Silver | 0.93 | U | 50.0 | 50.6 | | ug/L | | 101 | 75 - 141 |
| Thallium | 4.9 | U | 2000 | 1930 | | ug/L | | 96 | 90 - 116 |
| Zinc | 52 | B | 500 | 544 | | ug/L | | 99 | 60 - 137 |
| Vanadium | 1.1 | U | 500 | 506 | | ug/L | | 101 | 85 - 120 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-52940-4 MSD** — **Client Sample ID: GWA-MW99-140310**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217604** — **Prep Batch: 216639**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 2000 | 1930 | | ug/L | | 96 | 83 - 119 | 0 | 20 |
| Antimony | 3.1 | U | 500 | 515 | | ug/L | | 103 | 81 - 124 | 1 | 20 |
| Arsenic | 4.4 | U | 1000 | 1030 | | ug/L | | 103 | 84 - 124 | 1 | 20 |
| Barium | 21 | | 2000 | 2040 | | ug/L | | 101 | 85 - 120 | 1 | 20 |
| Beryllium | 0.55 | J | 50.0 | 49.7 | | ug/L | | 98 | 79 - 121 | 1 | 20 |
| Cadmium | 0.91 | J | 100 | 104 | | ug/L | | 103 | 82 - 119 | 1 | 20 |
| Chromium | 0.66 | U | 200 | 204 | | ug/L | | 102 | 73 - 135 | 1 | 20 |
| Copper | 1.4 | U | 250 | 249 | | ug/L | | 100 | 82 - 129 | 0 | 20 |
| Cobalt | 150 | | 500 | 634 | | ug/L | | 97 | 82 - 119 | 0 | 20 |
| Iron | 67 | J | 1000 | 1080 | | ug/L | | 101 | 52 - 155 | 2 | 20 |
| Lead | 2.6 | U | 500 | 506 | | ug/L | | 101 | 89 - 121 | 1 | 20 |
| Manganese | 8500 | | 500 | 8630 | 4 | ug/L | | 30 | 79 - 121 | 1 | 20 |
| Nickel | 32 | J | 500 | 531 | | ug/L | | 100 | 84 - 120 | 1 | 20 |
| Selenium | 4.9 | U | 2000 | 2060 | | ug/L | | 103 | 71 - 140 | 1 | 20 |
| Silver | 0.93 | U | 50.0 | 51.1 | | ug/L | | 102 | 75 - 141 | 1 | 20 |
| Thallium | 4.9 | U | 2000 | 1940 | | ug/L | | 97 | 90 - 116 | 1 | 20 |
| Zinc | 52 | B | 500 | 542 | | ug/L | | 98 | 60 - 137 | 0 | 20 |
| Vanadium | 1.1 | U | 500 | 503 | | ug/L | | 101 | 85 - 120 | 1 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-216601/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216899** — **Prep Batch: 216601**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.0420 | J | 0.20 | 0.027 | ug/L | | 03/13/14 11:40 | 03/13/14 19:07 | 1 |

**Lab Sample ID: LCS 280-216601/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216899** — **Prep Batch: 216601**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.03 | | ug/L | | 101 | 84 - 120 |

**Lab Sample ID: MB 280-216837/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216970** — **Prep Batch: 216837**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 03/14/14 11:20 | 03/14/14 17:06 | 1 |

**Lab Sample ID: LCS 280-216837/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216970** — **Prep Batch: 216837**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.97 | | ug/L | | 99 | 84 - 120 |

# QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

## Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric)

**Lab Sample ID: MB 280-217004/3-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217016** — **Prep Batch: 217004**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Sulfide | 0.79 | U | 4.0 | 0.79 | mg/L | | 03/15/14 09:45 | 03/15/14 13:30 | 1 |

**Lab Sample ID: LCS 280-217004/1-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217016** — **Prep Batch: 217004**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Sulfide | 19.0 | 14.5 | | mg/L | | 76 | 48 - 100 |

**Lab Sample ID: LCSD 280-217004/2-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217016** — **Prep Batch: 217004**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Total Sulfide | 19.0 | 13.0 | | mg/L | | 68 | 48 - 100 | 11 | 20 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-218499/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 218499**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.25 | U | 3.0 | 0.25 | mg/L | | | 03/26/14 18:41 | 1 |
| Sulfate | 0.23 | U | 5.0 | 0.23 | mg/L | | | 03/26/14 18:41 | 1 |

**Lab Sample ID: LCS 280-218499/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 218499**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 25.0 | 25.2 | | mg/L | | 101 | 90 - 110 |
| Sulfate | 25.0 | 23.5 | | mg/L | | 94 | 90 - 110 |

**Lab Sample ID: LCSD 280-218499/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 218499**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 25.0 | 25.1 | | mg/L | | 101 | 90 - 110 | 0 | 10 |
| Sulfate | 25.0 | 23.1 | | mg/L | | 93 | 90 - 110 | 1 | 10 |

**Lab Sample ID: MRL 280-218499/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 218499**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 1.00 | 1.05 | J | mg/L | | 105 | 50 - 150 |
| Sulfate | 1.00 | 1.08 | J | mg/L | | 108 | 50 - 150 |

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-217002/33** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217002**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Bicarbonate Alkalinity as CaCO3 | 1.1 | U | 5.0 | 1.1 | mg/L | | | 03/14/14 18:45 | 1 |

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 280-217061/1** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217061**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 4.7 | U | 10 | 4.7 | mg/L | | | 03/17/14 09:12 | 1 |

**Lab Sample ID: LCS 280-217061/2** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217061**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 500 | 468 | | mg/L | | 94 | 86 - 110 |

**Lab Sample ID: LCSD 280-217061/3** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217061**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 500 | 472 | | mg/L | | 94 | 86 - 110 | 1 | 20 |

## Method: SM 2540D - Solids, Total Suspended (TSS)

**Lab Sample ID: MB 280-216949/3** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216949**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 1.1 | U | 4.0 | 1.1 | mg/L | | | 03/14/14 15:37 | 1 |

**Lab Sample ID: LCS 280-216949/1** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216949**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 100 | 89.0 | | mg/L | | 89 | 86 - 114 |

**Lab Sample ID: LCSD 280-216949/2** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216949**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 100 | 92.0 | | mg/L | | 92 | 86 - 114 | 3 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

## GC/MS Semi VOA

### Prep Batch: 216749

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-1 | ER01-140310 | Total/NA | Water | 3510C | |
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 3510C | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 3510C | |
| 280-52940-4 | GWA-MW99-140310 | Total/NA | Water | 3510C | |
| LCS 280-216749/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| MB 280-216749/1-A | Method Blank | Total/NA | Water | 3510C | |

### Analysis Batch: 217224

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-216749/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 216749 |
| MB 280-216749/1-A | Method Blank | Total/NA | Water | 8270D SIM | 216749 |

### Analysis Batch: 217436

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-1 | ER01-140310 | Total/NA | Water | 8270D SIM | 216749 |
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 8270D SIM | 216749 |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 8270D SIM | 216749 |
| 280-52940-4 | GWA-MW99-140310 | Total/NA | Water | 8270D SIM | 216749 |

### Prep Batch: 217728

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-4 | GWA-MW99-140310 | Total/NA | Water | 3510C | |
| LCS 280-217728/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 280-217728/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |

### Analysis Batch: 218039

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-4 | GWA-MW99-140310 | Total/NA | Water | 8270D SIM | 217728 |
| LCS 280-217728/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 217728 |
| LCSD 280-217728/3-A | Lab Control Sample Dup | Total/NA | Water | 8270D SIM | 217728 |

## Metals

### Prep Batch: 216411

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-1 | ER01-140310 | Total/NA | Water | 3010A | |
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 3010A | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 3010A | |
| LCS 280-216411/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-216411/1-A | Method Blank | Total/NA | Water | 3010A | |

### Prep Batch: 216601

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-1 | ER01-140310 | Total/NA | Water | 7470A | |
| LCS 280-216601/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| MB 280-216601/1-A | Method Blank | Total/NA | Water | 7470A | |

### Prep Batch: 216639

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-4 | GWA-MW99-140310 | Total/NA | Water | 3010A | |

## Metals (Continued)

### Prep Batch: 216639 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-4 MS | GWA-MW99-140310 | Total/NA | Water | 3010A | |
| 280-52940-4 MSD | GWA-MW99-140310 | Total/NA | Water | 3010A | |
| LCS 280-216639/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-216639/1-A | Method Blank | Total/NA | Water | 3010A | |

### Prep Batch: 216837

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 7470A | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 7470A | |
| 280-52940-4 | GWA-MW99-140310 | Total/NA | Water | 7470A | |
| LCS 280-216837/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| MB 280-216837/1-A | Method Blank | Total/NA | Water | 7470A | |

### Analysis Batch: 216899

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-1 | ER01-140310 | Total/NA | Water | 7470A | 216601 |
| LCS 280-216601/2-A | Lab Control Sample | Total/NA | Water | 7470A | 216601 |
| MB 280-216601/1-A | Method Blank | Total/NA | Water | 7470A | 216601 |

### Analysis Batch: 216970

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 7470A | 216837 |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 7470A | 216837 |
| 280-52940-4 | GWA-MW99-140310 | Total/NA | Water | 7470A | 216837 |
| LCS 280-216837/2-A | Lab Control Sample | Total/NA | Water | 7470A | 216837 |
| MB 280-216837/1-A | Method Blank | Total/NA | Water | 7470A | 216837 |

### Analysis Batch: 217114

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-1 | ER01-140310 | Total/NA | Water | 6010C | 216411 |
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 6010C | 216411 |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 6010C | 216411 |
| LCS 280-216411/2-A | Lab Control Sample | Total/NA | Water | 6010C | 216411 |
| MB 280-216411/1-A | Method Blank | Total/NA | Water | 6010C | 216411 |

### Analysis Batch: 217604

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-4 | GWA-MW99-140310 | Total/NA | Water | 6010C | 216639 |
| 280-52940-4 MS | GWA-MW99-140310 | Total/NA | Water | 6010C | 216639 |
| 280-52940-4 MSD | GWA-MW99-140310 | Total/NA | Water | 6010C | 216639 |
| LCS 280-216639/2-A | Lab Control Sample | Total/NA | Water | 6010C | 216639 |
| MB 280-216639/1-A | Method Blank | Total/NA | Water | 6010C | 216639 |

## General Chemistry

### Analysis Batch: 216949

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | SM 2540D | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | SM 2540D | |
| LCS 280-216949/1 | Lab Control Sample | Total/NA | Water | SM 2540D | |

## General Chemistry (Continued)

### Analysis Batch: 216949 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCSD 280-216949/2 | Lab Control Sample Dup | Total/NA | Water | SM 2540D | |
| MB 280-216949/3 | Method Blank | Total/NA | Water | SM 2540D | |

### Analysis Batch: 217002

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | SM 2320B | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | SM 2320B | |
| MB 280-217002/33 | Method Blank | Total/NA | Water | SM 2320B | |

### Prep Batch: 217004

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 9030B | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 9030B | |
| LCS 280-217004/1-A | Lab Control Sample | Total/NA | Water | 9030B | |
| LCSD 280-217004/2-A | Lab Control Sample Dup | Total/NA | Water | 9030B | |
| MB 280-217004/3-A | Method Blank | Total/NA | Water | 9030B | |

### Analysis Batch: 217016

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 9034 | 217004 |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 9034 | 217004 |
| LCS 280-217004/1-A | Lab Control Sample | Total/NA | Water | 9034 | 217004 |
| LCSD 280-217004/2-A | Lab Control Sample Dup | Total/NA | Water | 9034 | 217004 |
| MB 280-217004/3-A | Method Blank | Total/NA | Water | 9034 | 217004 |

### Analysis Batch: 217061

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | SM 2540C | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | SM 2540C | |
| LCS 280-217061/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| LCSD 280-217061/3 | Lab Control Sample Dup | Total/NA | Water | SM 2540C | |
| MB 280-217061/1 | Method Blank | Total/NA | Water | SM 2540C | |

### Analysis Batch: 218499

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 9056A | |
| 280-52940-2 | GWA-MW01-140310 | Total/NA | Water | 9056A | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 9056A | |
| 280-52940-3 | GWA-MW03-140310 | Total/NA | Water | 9056A | |
| LCS 280-218499/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-218499/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-218499/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-218499/3 | Lab Control Sample | Total/NA | Water | 9056A | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

## Client Sample ID: ER01-140310 — Lab Sample ID: 280-52940-1

**Date Collected: 03/10/14 10:45** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1035.6 mL | 1 mL | 216749 | 03/13/14 20:46 | IBM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1035.6 mL | 1 mL | 217436 | 03/19/14 12:51 | AGCM | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 216411 | 03/12/14 07:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 217114 | 03/15/14 01:40 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 216601 | 03/13/14 11:40 | LLB | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 216899 | 03/13/14 20:10 | LLB | TAL DEN |

## Client Sample ID: GWA-MW01-140310 — Lab Sample ID: 280-52940-2

**Date Collected: 03/10/14 13:30** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1029.4 mL | 1 mL | 216749 | 03/13/14 20:46 | IBM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1029.4 mL | 1 mL | 217436 | 03/19/14 13:18 | AGCM | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 216411 | 03/12/14 07:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 217114 | 03/15/14 01:42 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 216837 | 03/14/14 11:20 | LLB | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 216970 | 03/14/14 17:57 | LLB | TAL DEN |
| Total/NA | Prep | 9030B | | | 250 mL | 250 mL | 217004 | 03/15/14 09:45 | AJS | TAL DEN |
| Total/NA | Analysis | 9034 | | 1 | 250 mL | 250 mL | 217016 | 03/15/14 13:30 | AJS | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 218499 | 03/26/14 20:48 | TLP | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 218499 | 03/27/14 03:05 | TLP | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 217002 | 03/14/14 19:48 | AFH | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 217061 | 03/17/14 09:12 | AFB | TAL DEN |
| Total/NA | Analysis | SM 2540D | | 1 | 250 mL | 250 mL | 216949 | 03/14/14 15:37 | MW1 | TAL DEN |

## Client Sample ID: GWA-MW03-140310 — Lab Sample ID: 280-52940-3

**Date Collected: 03/10/14 14:05** — **Matrix: Water**
**Date Received: 03/11/14 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1028.4 mL | 1 mL | 216749 | 03/13/14 20:46 | IBM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1028.4 mL | 1 mL | 217436 | 03/19/14 13:45 | AGCM | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 216411 | 03/12/14 07:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 217114 | 03/15/14 01:47 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 216837 | 03/14/14 11:20 | LLB | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 216970 | 03/14/14 17:59 | LLB | TAL DEN |
| Total/NA | Prep | 9030B | | | 250 mL | 250 mL | 217004 | 03/15/14 09:45 | AJS | TAL DEN |
| Total/NA | Analysis | 9034 | | 1 | 250 mL | 250 mL | 217016 | 03/15/14 13:30 | AJS | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 218499 | 03/26/14 21:04 | TLP | TAL DEN |
| Total/NA | Analysis | 9056A | | 10 | 5 mL | 5 mL | 218499 | 03/27/14 03:21 | TLP | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 217002 | 03/14/14 19:52 | AFH | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

## Client Sample ID: GWA-MW03-140310

**Lab Sample ID: 280-52940-3**

**Date Collected: 03/10/14 14:05**
**Matrix: Water**
**Date Received: 03/11/14 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 217061 | 03/17/14 09:12 | AFB | TAL DEN |
| Total/NA | Analysis | SM 2540D | | 1 | 250 mL | 250 mL | 216949 | 03/14/14 15:37 | MW1 | TAL DEN |

## Client Sample ID: GWA-MW99-140310

**Lab Sample ID: 280-52940-4**

**Date Collected: 03/10/14 14:05**
**Matrix: Water**
**Date Received: 03/11/14 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1052.1 mL | 1 mL | 216749 | 03/13/14 20:46 | IBM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1052.1 mL | 1 mL | 217436 | 03/19/14 14:12 | AGCM | TAL DEN |
| Total/NA | Prep | 3510C | | | 981.2 mL | 1 mL | 217728 | 03/20/14 20:28 | NRC | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 981.2 mL | 1 mL | 218039 | 03/24/14 12:37 | AGCM | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 216639 | 03/13/14 13:00 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 217604 | 03/19/14 19:19 | JKH | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 216837 | 03/14/14 11:20 | LLB | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 216970 | 03/14/14 18:01 | LLB | TAL DEN |

**Laboratory References:**
TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52940-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Colorado | State Program | 8 | N/A | 09-30-14 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Maryland | State Program | 3 | 268 | 03-31-14 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

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**Sample Receipt Documentation ..... 22**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-52940-1

UNC Cogen

Lot #: H4C140410

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry
Project Manager

April 2, 2014

# ANALYTICAL METHODS SUMMARY

**H4C140410**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H4C140410**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M280M | 001 | ER01-140310 | 03/10/14 | 10:45 |
| M280N | 002 | GWA-MW01-140310 | 03/10/14 | 13:30 |
| M280P | 003 | GWA-MW03-140310 | 03/10/14 | 14:05 |
| M280Q | 004 | GWA-MW99-140310 | 03/10/14 | 14:05 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H4C140410

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

All QC criteria were met with the following exceptions:

The laboratory control sample duplicate associated with batch 4081010 had recoveries below the control limits for 1,2,3,7,8,9-HxCDD at 73%. The lower control limit for 1,2,3,7,8,9-HxCDD is 76%. The laboratory control sample was acceptable for this analyte. After consultation with the client it was decided to report the data as is.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

# PROJECT NARRATIVE
## H4C140410

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

# PROJECT NARRATIVE
## H4C140410

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

# PROJECT NARRATIVE
## H4C140410

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

TestAmerica Denver

Sample ID: ER01-140310

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C140410 - 001 | **Work Order #....:** | M280M1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/10/14 | **Date Received....:** | 03/14/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 983 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.075 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.22** | **Q B J** | **51** | **0.030** | **pg/L** |
| **1,2,3,4,7,8-HxCDD** | **0.36** | **Q J** | **51** | **0.096** | **pg/L** |
| **1,2,3,6,7,8-HxCDD** | **0.49** | **B J** | **51** | **0.11** | **pg/L** |
| **1,2,3,7,8,9-HxCDD** | **0.68** | **B J** | **51** | **0.096** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **0.58** | **B J** | **51** | **0.10** | **pg/L** |
| **OCDD** | **2.0** | **Q B J** | **100** | **0.10** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.033 | pg/L |
| **1,2,3,7,8-PeCDF** | **0.42** | **Q B J** | **51** | **0.091** | **pg/L** |
| **2,3,4,7,8-PeCDF** | **0.51** | **Q B J** | **51** | **0.080** | **pg/L** |
| **1,2,3,4,7,8-HxCDF** | **0.11** | **Q B J** | **51** | **0.072** | **pg/L** |
| **1,2,3,6,7,8-HxCDF** | **0.27** | **Q B J** | **51** | **0.079** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.30** | **Q B J** | **51** | **0.071** | **pg/L** |
| 1,2,3,7,8,9-HxCDF | ND | | 51 | 0.084 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.47** | **Q B J** | **51** | **0.042** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 51 | 0.058 | pg/L |
| **OCDF** | **0.19** | **Q B J** | **100** | **0.035** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 81 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 98 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 85 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 94 | 40 - 135 |
| 13C-OCDD | 90 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 86 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 88 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 86 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 88 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 93 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 88 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 92 | 40 - 135 |
| 13C-OCDF | 83 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: ER01-140310**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C140410 - 001 | **Work Order #....:** | M280M1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/10/14 | **Date Received....:** | 03/14/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 983 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: GWA-MW01-140310**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C140410 - 002 | **Work Order #....:** | M280N1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/10/14 | **Date Received....:** | 03/14/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 1039 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.6 | 0.059 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.36** | **Q B J** | **48** | **0.060** | **pg/L** |
| **1,2,3,4,7,8-HxCDD** | **0.47** | **Q J** | **48** | **0.071** | **pg/L** |
| **1,2,3,6,7,8-HxCDD** | **0.12** | **Q B J** | **48** | **0.072** | **pg/L** |
| **1,2,3,7,8,9-HxCDD** | **0.45** | **B J** | **48** | **0.068** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **0.29** | **Q B J** | **48** | **0.10** | **pg/L** |
| **OCDD** | **2.4** | **Q B J** | **96** | **0.087** | **pg/L** |
| **2,3,7,8-TCDF** | **0.093** | **Q B J** | **9.6** | **0.038** | **pg/L** |
| **1,2,3,7,8-PeCDF** | **0.33** | **Q B J** | **48** | **0.053** | **pg/L** |
| **2,3,4,7,8-PeCDF** | **0.28** | **Q B J** | **48** | **0.054** | **pg/L** |
| **1,2,3,4,7,8-HxCDF** | **0.38** | **Q B J** | **48** | **0.062** | **pg/L** |
| **1,2,3,6,7,8-HxCDF** | **0.23** | **Q B J** | **48** | **0.059** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.33** | **Q B J** | **48** | **0.062** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.53** | **B J** | **48** | **0.068** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.32** | **Q B J** | **48** | **0.033** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.33** | **Q B J** | **48** | **0.046** | **pg/L** |
| **OCDF** | **0.44** | **Q B J** | **96** | **0.029** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 94 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 87 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 89 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 102 | 40 - 135 |
| 13C-OCDD | 97 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 86 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 89 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 84 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 88 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 95 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 90 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 97 | 40 - 135 |
| 13C-OCDF | 91 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: GWA-MW01-140310**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C140410 - 002 | **Work Order #....:** | M280N1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/10/14 | **Date Received....:** | 03/14/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 1039 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: GWA-MW03-140310**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C140410 - 003 | **Work Order #....:** | M280P1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/10/14 | **Date Received....:** | 03/14/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 968 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.055 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 52 | 0.041 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 52 | 0.087 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 52 | 0.095 | pg/L |
| **1,2,3,7,8,9-HxCDD** | **0.42** | **Q B J** | **52** | **0.086** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **0.38** | **Q B J** | **52** | **0.11** | **pg/L** |
| **OCDD** | **0.51** | **Q B J** | **100** | **0.086** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.038 | pg/L |
| **1,2,3,7,8-PeCDF** | **0.58** | **Q B J** | **52** | **0.077** | **pg/L** |
| **2,3,4,7,8-PeCDF** | **0.34** | **Q B J** | **52** | **0.073** | **pg/L** |
| **1,2,3,4,7,8-HxCDF** | **0.22** | **Q B J** | **52** | **0.052** | **pg/L** |
| **1,2,3,6,7,8-HxCDF** | **0.22** | **Q B J** | **52** | **0.056** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.035** | **Q B J** | **52** | **0.051** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.19** | **B J** | **52** | **0.063** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.37** | **B J** | **52** | **0.030** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.33** | **Q B J** | **52** | **0.042** | **pg/L** |
| **OCDF** | **0.13** | **Q B J** | **100** | **0.028** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 77 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 95 | 40 - 135 |
| 13C-OCDD | 90 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 84 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 78 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 85 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 89 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 92 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 88 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 92 | 40 - 135 |
| 13C-OCDF | 87 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: GWA-MW03-140310**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C140410 - 003 | **Work Order #....:** | M280P1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/10/14 | **Date Received....:** | 03/14/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 968 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: GWA-MW99-140310

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| Lot - Sample #....: | H4C140410 - 004 | Work Order #....: | M280Q1AA | Matrix....: | WATER |
| Date Sampled....: | 03/10/14 | Date Received....: | 03/14/14 | Dilution Factor: | 1 |
| Prep Date....: | 03/22/14 | Analysis Date....: | 03/31/14 | | |
| Prep Batch # ....: | 4081010 | | | | |
| Initial Wgt/Vol : | 999 mL | Instrument ID....: | D2A | Method: | SW846 8290 |
| Analyst ID....: | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.043 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.11** | **Q B J** | **50** | **0.052** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.11 | pg/L |
| **1,2,3,6,7,8-HxCDD** | **0.28** | **Q B J** | **50** | **0.12** | **pg/L** |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.11 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 50 | 0.098 | pg/L |
| **OCDD** | **0.52** | **Q B J** | **100** | **0.063** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.025 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.069 | pg/L |
| **2,3,4,7,8-PeCDF** | **0.18** | **Q B J** | **50** | **0.065** | **pg/L** |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.044 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.055** | **Q B J** | **50** | **0.044** | **pg/L** |
| 2,3,4,6,7,8-HxCDF | ND | | 50 | 0.046 | pg/L |
| **1,2,3,7,8,9-HxCDF** | **0.17** | **Q B J** | **50** | **0.053** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.36** | **Q B J** | **50** | **0.077** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 50 | 0.11 | pg/L |
| **OCDF** | **0.32** | **B J** | **100** | **0.040** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 83 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 91 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 86 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 84 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 96 | 40 - 135 |
| 13C-OCDD | 91 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 80 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 85 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 83 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 87 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 89 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 92 | 40 - 135 |
| 13C-OCDF | 80 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: GWA-MW99-140310**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C140410 - 004 | **Work Order #....:** | M280Q1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/10/14 | **Date Received....:** | 03/14/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 999 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C220000 - 010B | **Work Order #....:** | M3ANL1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.063 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.82** | **Q J** | **50** | **0.071** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.10 | pg/L |
| **1,2,3,6,7,8-HxCDD** | **0.70** | **J** | **50** | **0.11** | **pg/L** |
| **1,2,3,7,8,9-HxCDD** | **0.37** | **Q J** | **50** | **0.10** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **0.84** | **Q J** | **50** | **0.12** | **pg/L** |
| **OCDD** | **2.6** | **J** | **100** | **0.096** | **pg/L** |
| **2,3,7,8-TCDF** | **0.077** | **Q J** | **10** | **0.047** | **pg/L** |
| **1,2,3,7,8-PeCDF** | **0.49** | **Q J** | **50** | **0.088** | **pg/L** |
| **2,3,4,7,8-PeCDF** | **0.60** | **Q J** | **50** | **0.086** | **pg/L** |
| **1,2,3,4,7,8-HxCDF** | **0.44** | **Q J** | **50** | **0.081** | **pg/L** |
| **1,2,3,6,7,8-HxCDF** | **0.73** | **Q J** | **50** | **0.081** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.57** | **Q J** | **50** | **0.081** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.83** | **Q J** | **50** | **0.11** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.58** | **Q J** | **50** | **0.038** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.70** | **J** | **50** | **0.057** | **pg/L** |
| **OCDF** | **2.2** | **J** | **100** | **0.056** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 72 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 84 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 87 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 88 | 40 - 135 |
| 13C-OCDD | 80 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 77 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 84 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 77 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 79 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 81 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 80 | 40 - 135 |
| 13C-OCDF | 59 | 40 - 135 |

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C220000 - 010B | **Work Order #....:** | M3ANL1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/22/14 | **Analysis Date....:** | 03/31/14 | | |
| **Prep Batch # ....:** | 4081010 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H4C140410 | **Work Order # ...:** | M3ANL1AC-LCS<br>M3ANL1AD-LCSD | **Matrix .....:** | WATER |
| **LCS Lot-Sample# :** | H4C220000 - 010 | | | | |
| **Prep Date .....:** | 03/22/14 | **Analysis Date ..:** | 03/31/14 | | |
| **Prep Batch # ...:** | 4081010 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Melissa A. Davidson | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1000 mL | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS | RPD | RPD LIMITS |
|---|---|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | 200 | 195 | pg/L | 97 | | (77 - 127) | | |
| | 200 | 208 | pg/L | 104 | | (77 - 127) | 6.6 | (0 - 15) |
| **1,2,3,7,8-PeCDD** | 1000 | 940 | pg/L | 94 | B | (78 - 128) | | |
| | 1000 | 956 | pg/L | 96 | B | (78 - 128) | 1.6 | (0 - 15) |
| **1,2,3,4,7,8-HxCDD** | 1000 | 913 | pg/L | 91 | | (73 - 123) | | |
| | 1000 | 945 | pg/L | 94 | | (73 - 123) | 3.4 | (0 - 15) |
| **1,2,3,6,7,8-HxCDD** | 1000 | 922 | pg/L | 92 | B | (72 - 127) | | |
| | 1000 | 1030 | pg/L | 103 | B | (72 - 127) | 11 | (0 - 15) |
| **1,2,3,7,8,9-HxCDD** | 1000 | 820 | pg/L | 82 | B | (76 - 126) | | |
| | 1000 | 729 | pg/L | 73 | a B | (76 - 126) | 12 | (0 - 15) |
| **1,2,3,4,6,7,8-HpCDD** | 1000 | 960 | pg/L | 96 | B | (73 - 123) | | |
| | 1000 | 946 | pg/L | 95 | B | (73 - 123) | 1.4 | (0 - 15) |
| **OCDD** | 2000 | 1830 | pg/L | 91 | B | (75 - 125) | | |
| | 2000 | 1940 | pg/L | 97 | B | (75 - 125) | 6.1 | (0 - 15) |
| **2,3,7,8-TCDF** | 200 | 202 | pg/L | 101 | B | (74 - 124) | | |
| | 200 | 200 | pg/L | 100 | B | (74 - 124) | 0.90 | (0 - 15) |
| **1,2,3,7,8-PeCDF** | 1000 | 947 | pg/L | 95 | B | (74 - 124) | | |
| | 1000 | 977 | pg/L | 98 | B | (74 - 124) | 3.1 | (0 - 15) |
| **2,3,4,7,8-PeCDF** | 1000 | 986 | pg/L | 99 | B | (74 - 124) | | |
| | 1000 | 984 | pg/L | 98 | B | (74 - 124) | 0.23 | (0 - 15) |
| **1,2,3,4,7,8-HxCDF** | 1000 | 960 | pg/L | 96 | B | (75 - 125) | | |
| | 1000 | 981 | pg/L | 98 | B | (75 - 125) | 2.2 | (0 - 15) |
| **1,2,3,6,7,8-HxCDF** | 1000 | 1000 | pg/L | 100 | B | (75 - 125) | | |
| | 1000 | 997 | pg/L | 100 | B | (75 - 125) | 0.50 | (0 - 15) |
| **2,3,4,6,7,8-HxCDF** | 1000 | 991 | pg/L | 99 | B | (76 - 126) | | |
| | 1000 | 1010 | pg/L | 101 | B | (76 - 126) | 2.3 | (0 - 15) |
| **1,2,3,7,8,9-HxCDF** | 1000 | 948 | pg/L | 95 | B | (76 - 126) | | |
| | 1000 | 973 | pg/L | 97 | B | (76 - 126) | 2.6 | (0 - 15) |
| **1,2,3,4,6,7,8-HpCDF** | 1000 | 937 | pg/L | 94 | B | (71 - 121) | | |
| | 1000 | 954 | pg/L | 95 | B | (71 - 121) | 1.8 | (0 - 15) |
| **1,2,3,4,7,8,9-HpCDF** | 1000 | 934 | pg/L | 93 | B | (73 - 123) | | |
| | 1000 | 1000 | pg/L | 100 | B | (73 - 123) | 6.9 | (0 - 15) |
| **OCDF** | 2000 | 1840 | pg/L | 92 | B | (68 - 132) | | |
| | 2000 | 1910 | pg/L | 95 | B | (68 - 132) | 3.5 | (0 - 15) |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 66 | (40 - 135) |
| | 51 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 85 | (40 - 135) |
| | 67 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 89 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Client Lot # ...:** H4C140410
**LCS Lot-Sample# :** H4C220000 - 010

**Work Order # ...:** M3ANL1AC-LCS
M3ANL1AD-LCSD

**Matrix .....:** WATER

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| | 98 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 94 | (40 - 135) |
| | 96 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 89 | (40 - 135) |
| | 101 | (40 - 135) |
| 13C-OCDD | 83 | (40 - 135) |
| | 79 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 70 | (40 - 135) |
| | 57 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 79 | (40 - 135) |
| | 62 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 78 | (40 - 135) |
| | 69 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 85 | (40 - 135) |
| | 98 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 85 | (40 - 135) |
| | 97 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 83 | (40 - 135) |
| | 94 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 70 | (40 - 135) |
| | 56 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 89 | (40 - 135) |
| | 105 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 74 | (40 - 135) |
| | 78 | (40 - 135) |
| 13C-OCDF | 61 | (40 - 135) |
| | 60 | (40 - 135) |

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

1446140410

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-235238.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving-John Reynolds | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-52940-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 3/27/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| ER01-140310 (280-52940-1) | 3/10/14 | 10:45 Eastern | | Water | | | X | 2 | |
| GWA-MW01-140310 (280-52940-2) | 3/10/14 | 13:30 Eastern | | Water | | | X | 2 | |
| GWA-MW03-140310 (280-52940-3) | 3/10/14 | 14:05 Eastern | | Water | | | X | 2 | |
| GWA-MW99-140310 (280-52940-4) | 3/10/14 | 14:05 Eastern | | Water | | | X | 2 | |

REC. @ 0.9°C
CUSTODY SEAL INTACT
1 COOLER RA 3-14-14
FED EX # 5986 2751 6535

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 3/13/14 16:00 | TA-D | Ryan Henry | 3/14/14 0925 | |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H4C140410

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : SC60 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: NA

Sample Receiving Associate: Ryan Henry Date: 3/14/14

QA026R27.doc, 123013

**Chain of Custody R**

280-52940 Chain of Custody

TAL-4124-280 (0508)

Sampler ID _____

Temperature on Receipt 4.1 7.6 IR5108 SR 4.3 0.8 3-11-14

Drinking Water? Yes ☐ No ☐

**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

| | | | |
|---|---|---|---|
| Client: Geosyntec Consultants | Project Manager: Beau Hodge | Date: 3/10/14 | Chain of Custody Number: 188351 |
| Address: 4601 Six Forks RD Suite 340 | Telephone Number (Area Code)/Fax Number: 919-412-5118 | Lab Number | Page 1 of 1 |
| City: Raleigh; State: NC; Zip Code: 27609 | Site Contact: Rachel 919-705-1340 | Lab Contact: Patrick McEntee | |
| Project Name and Location (State): UNC Cogen Facility, NC | Carrier/Waybill Number | | |
| Contract/Purchase Order/Quote No.: ~~GWS~~ | | | |

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Air | Aqueous | Sed. | Soil | Other | Unpres | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | Other | PAHs-8270SIM | pH-8290 | Cd10C-metals+Hg | Cd10C-Cd+Pb | Cd10C/9034 | 2320B/9050A | 9034 | 2540D | 2540C | | | | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GROI-140310 | 3/10/14 | 1045 | | X | | | | 4 | | 1 | | | | | 2 | 2 | 1 | | | | | | | | | | |
| GWA-MW01-140310 | 3/10/14 | 1330 | | X | | | | 7 | | 3 | | | 1 | | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | HOLD 6010C/9034 for metals |
| GWA-MW03-140310 | 3/10/14 | 1405 | | X | | | | 7 | | 3 | | | 1 | | 2 | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | | | " " |
| GWA-MW99-140310 | 3/10/14 | 1405 | | X | | | | 4 | | 2 | | | | | 2 | 2 | 1 | | 1 | | | | | | | | " " |

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

| | Date | Time | | Date | Time |
|---|---|---|---|---|---|
| 1. Relinquished By: [signature] | 3/10/14 | 1800 | 1. Received By: [signature] | 3/11/14 | 920 |
| 2. Relinquished By: FEDEX | | | 2. Received By | | |
| 3. Relinquished By | | | 3. Received By | | |

Comments: Please HOLD all filtered metal samples. Samples shipped in 4 coolers

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-52940-1

**Login Number: 52940**
**List Number: 1**
**Creator: Broander, Laura L**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Field on COC is blank. |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-52997-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 6:00:28 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
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LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| B | Compound was found in the blank and sample. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-52997-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-52997-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**REVISION CHANGES**
The Dioxin/Furan report, located in the Subcontract section, was revised to have the associated sample reported from the D2A instrument.

**RECEIPT**
The samples were received on 3/12/2014 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.5º C, 2.2º C and 3.1º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrooke Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The sample was received at TA Knoxville on 3/18/2014 10:05 AM. Five of six containers were received broken. The temperature of the cooler at receipt was 0.5º C. Additional sample containers were shipped from TA Denver and arrived at TA Knoxville on 3/25/2014 09:30 AM. The temperature of the cooler at receipt was 0.7º C.

**8270D SIM GCMS**
Sample GWA-MW02-140311 (280-52997-1) was analyzed for 8270D SIM GCMS in accordance with SW-846 8270D_SIM. The samples were prepared on 03/13/2014 and analyzed on 03/19/2014.

No difficulties were encountered during the 8270D SIM analysis.

All quality control parameters were within the acceptance limits.

**TOTAL METALS (ICP)**
Sample GWA-MW02-140311 (280-52997-1) was analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 03/14/2014 and analyzed on 03/19/2014.

Sodium and Zinc was detected in method blank MB 280-216823/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged.

The continuing calibration verification (CCV and CCVL) associated with analysis batch 280-217623 recovered above the upper control limit for low line Sodium. The sample associated with this CCV (MB) was less than 1/2 the RL for the affected analytes; therefore, the data have been reported.

## Job ID: 280-52997-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

No other difficulties were encountered during the metals analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL MERCURY**
Sample GWA-MW02-140311 (280-52997-1) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 03/14/2014.

No difficulties were encountered during the mercury analysis.

All quality control parameters were within the acceptance limits.

**ALKALINITY**
Sample GWA-MW02-140311 (280-52997-1) was analyzed for Alkalinity in accordance with SM20 2320B. The samples were analyzed on 03/15/2014.

Bicarbonate Alkalinity as CaCO3 was detected in method blank MB 280-217068/33 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No other difficulties were encountered during the alkalinity analysis.

All other quality control parameters were within the acceptance limits.

**TOTAL DISSOLVED SOLIDS**
Sample GWA-MW02-140311 (280-52997-1) was analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 03/17/2014.

No difficulties were encountered during the TDS analysis.

All quality control parameters were within the acceptance limits.

**TOTAL SUSPENDED SOLIDS**
Sample GWA-MW02-140311 (280-52997-1) was analyzed for total suspended solids in accordance with SM20 2540D. The samples were analyzed on 03/14/2014.

No difficulties were encountered during the TSS analysis.

All quality control parameters were within the acceptance limits.

**SULFIDE**
Sample GWA-MW02-140311 (280-52997-1) was analyzed for sulfide in accordance with EPA SW-846 Method 9034. The samples were prepared and analyzed on 03/15/2014.

No difficulties were encountered during the sulfide analysis.

All quality control parameters were within the acceptance limits.

**ANIONS (28 DAYS)**
Sample GWA-MW02-140311 (280-52997-1) was analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056. The samples were analyzed on 03/27/2014 and 03/28/2014.

Sample GWA-MW02-140311 (280-52997-1)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

## Job ID: 280-52997-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

No other difficulties were encountered during the anions analysis.

All other quality control parameters were within the acceptance limits.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## Client Sample ID: GWA-MW02-140311 — Lab Sample ID: 280-52997-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 31000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 7000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 3500 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 87 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 99000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 32 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 6400 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 5.5 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Silver | 1.2 | J | 10 | 0.93 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 12 | J B | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Chloride | 19 | | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 170 | | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Bicarbonate Alkalinity as CaCO3 | 140 | B | 5.0 | 1.1 | mg/L | 1 | | SM 2320B | Total/NA |
| Total Dissolved Solids | 400 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 9034 | Sulfide, Acid Soluble and Insoluble (Titrimetric) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| SM 2320B | Alkalinity | SM | TAL DEN |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL DEN |
| SM 2540D | Solids, Total Suspended (TSS) | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Water | 03/11/14 10:25 | 03/12/14 09:50 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: GWA-MW02-140311**
**Date Collected: 03/11/14 10:25**
**Date Received: 03/12/14 09:50**

**Lab Sample ID: 280-52997-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 95 | 5.4 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| 2-Methylnaphthalene | 4.9 | U | 95 | 4.9 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Acenaphthene | 10 | U | 95 | 10 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Acenaphthylene | 9.5 | U | 95 | 9.5 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Anthracene | 13 | U | 95 | 13 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Benzo[a]anthracene | 3.0 | U | 95 | 3.0 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Benzo[a]pyrene | 4.9 | U | 95 | 4.9 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Benzo[b]fluoranthene | 3.3 | U | 95 | 3.3 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U | 95 | 3.4 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Benzo[k]fluoranthene | 4.8 | U | 95 | 4.8 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Chrysene | 3.0 | U | 95 | 3.0 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U | 95 | 4.6 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Fluoranthene | 4.3 | U | 95 | 4.3 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Fluorene | 18 | U | 95 | 18 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 95 | 14 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Naphthalene | 5.1 | U | 95 | 5.1 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Phenanthrene | 9.3 | U | 95 | 9.3 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |
| Pyrene | 7.7 | U | 95 | 7.7 | ng/L | | 03/13/14 20:46 | 03/19/14 14:40 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *66* | | *42 - 120* | *03/13/14 20:46* | *03/19/14 14:40* | *1* |
| *Nitrobenzene-d5* | *70* | | *43 - 120* | *03/13/14 20:46* | *03/19/14 14:40* | *1* |
| *Terphenyl-d14* | *82* | | *47 - 120* | *03/13/14 20:46* | *03/19/14 14:40* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: GWA-MW02-140311**
**Date Collected: 03/11/14 10:25**
**Date Received: 03/12/14 09:50**

**Lab Sample ID: 280-52997-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Calcium** | **31000** | | 200 | 35 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Magnesium** | **7000** | | 200 | 11 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Potassium** | **3500** | | 3000 | 240 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Barium** | **87** | | 10 | 0.58 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Sodium** | **99000** | **B** | 1000 | 92 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Cobalt** | **32** | | 10 | 1.2 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Manganese** | **6400** | | 10 | 0.25 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Nickel** | **5.5** | **J** | 40 | 1.3 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| **Silver** | **1.2** | **J** | 10 | 0.93 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: GWA-MW02-140311** **Lab Sample ID: 280-52997-1**
**Date Collected: 03/11/14 10:25** **Matrix: Water**
**Date Received: 03/12/14 09:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Zinc** | **12** | **J B** | 20 | 4.5 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 03/14/14 13:00 | 03/19/14 22:18 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: GWA-MW02-140311** **Lab Sample ID: 280-52997-1**
**Date Collected: 03/11/14 10:25** **Matrix: Water**
**Date Received: 03/12/14 09:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 03/14/14 11:20 | 03/14/14 18:04 | 1 |

## General Chemistry

**Client Sample ID: GWA-MW02-140311** **Lab Sample ID: 280-52997-1**
**Date Collected: 03/11/14 10:25** **Matrix: Water**
**Date Received: 03/12/14 09:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Sulfide | 0.79 | U | 4.0 | 0.79 | mg/L | | 03/15/14 09:45 | 03/15/14 13:30 | 1 |
| **Chloride** | **19** | | 3.0 | 0.25 | mg/L | | | 03/27/14 21:49 | 1 |
| **Sulfate** | **170** | | 25 | 1.2 | mg/L | | | 03/28/14 05:20 | 5 |
| **Bicarbonate Alkalinity as CaCO3** | **140** | **B** | 5.0 | 1.1 | mg/L | | | 03/15/14 19:43 | 1 |
| **Total Dissolved Solids** | **400** | | 10 | 4.7 | mg/L | | | 03/17/14 09:12 | 1 |
| Total Suspended Solids | 1.1 | U | 4.0 | 1.1 | mg/L | | | 03/14/14 15:37 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| **Lab Sample ID** | **Client Sample ID** | **(42-120)** | **(43-120)** | **(47-120)** |
| 280-52997-1 | GWA-MW02-140311 | 66 | 70 | 82 |
| 280-52997-1 MS | GWA-MW02-140311 | 62 | 63 | 70 |
| 280-52997-1 MSD | GWA-MW02-140311 | 62 | 64 | 77 |
| LCS 280-216749/2-A | Lab Control Sample | 78 | 77 | 87 |
| MB 280-216749/1-A | Method Blank | 88 | 90 | 95 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-216749/1-A**
**Matrix: Water**
**Analysis Batch: 217224**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 216749**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 03/13/14 17:51 | 03/18/14 10:04 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *42 - 120* | *03/13/14 17:51* | *03/18/14 10:04* | *1* |
| *Nitrobenzene-d5* | *90* | | *43 - 120* | *03/13/14 17:51* | *03/18/14 10:04* | *1* |
| *Terphenyl-d14* | *95* | | *47 - 120* | *03/13/14 17:51* | *03/18/14 10:04* | *1* |

**Lab Sample ID: LCS 280-216749/2-A**
**Matrix: Water**
**Analysis Batch: 217224**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 216749**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 791 | | ng/L | | 88 | 47 - 120 |
| Acenaphthylene | 900 | 759 | | ng/L | | 84 | 39 - 120 |
| Anthracene | 900 | 789 | | ng/L | | 88 | 28 - 120 |
| Benzo[a]anthracene | 900 | 841 | | ng/L | | 93 | 42 - 120 |
| Benzo[a]pyrene | 900 | 912 | | ng/L | | 101 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 893 | | ng/L | | 99 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 1010 | | ng/L | | 112 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 925 | | ng/L | | 103 | 43 - 120 |
| Chrysene | 900 | 831 | | ng/L | | 92 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 966 | | ng/L | | 107 | 27 - 126 |
| Fluoranthene | 900 | 807 | | ng/L | | 90 | 46 - 120 |
| Fluorene | 900 | 786 | | ng/L | | 87 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 946 | | ng/L | | 105 | 38 - 120 |
| Naphthalene | 900 | 775 | | ng/L | | 86 | 37 - 120 |
| Phenanthrene | 900 | 746 | | ng/L | | 83 | 46 - 120 |
| Pyrene | 900 | 789 | | ng/L | | 88 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-216749/2-A**
**Matrix: Water**
**Analysis Batch: 217224**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 216749**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *78* | | *42 - 120* |
| *Nitrobenzene-d5* | *77* | | *43 - 120* |
| *Terphenyl-d14* | *87* | | *47 - 120* |

**Lab Sample ID: 280-52997-1 MS**
**Matrix: Water**
**Analysis Batch: 217436**

**Client Sample ID: GWA-MW02-140311**
**Prep Type: Total/NA**
**Prep Batch: 216749**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 10 | U | 860 | 653 | | ng/L | | 76 | 47 - 120 |
| Acenaphthylene | 9.5 | U | 860 | 625 | | ng/L | | 73 | 39 - 120 |
| Anthracene | 13 | U | 860 | 621 | | ng/L | | 72 | 28 - 120 |
| Benzo[a]anthracene | 3.0 | U | 860 | 645 | | ng/L | | 75 | 42 - 120 |
| Benzo[a]pyrene | 4.9 | U | 860 | 676 | | ng/L | | 79 | 38 - 120 |
| Benzo[b]fluoranthene | 3.3 | U | 860 | 674 | | ng/L | | 78 | 44 - 120 |
| Benzo[g,h,i]perylene | 3.4 | U | 860 | 784 | | ng/L | | 91 | 39 - 120 |
| Benzo[k]fluoranthene | 4.8 | U | 860 | 697 | | ng/L | | 81 | 43 - 120 |
| Chrysene | 3.0 | U | 860 | 632 | | ng/L | | 73 | 35 - 120 |
| Dibenz(a,h)anthracene | 4.6 | U | 860 | 723 | | ng/L | | 84 | 27 - 126 |
| Fluoranthene | 4.3 | U | 860 | 638 | | ng/L | | 74 | 46 - 120 |
| Fluorene | 18 | U | 860 | 622 | | ng/L | | 72 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 860 | 756 | | ng/L | | 88 | 38 - 120 |
| Naphthalene | 5.1 | U | 860 | 603 | | ng/L | | 70 | 37 - 120 |
| Phenanthrene | 9.3 | U | 860 | 607 | | ng/L | | 71 | 46 - 120 |
| Pyrene | 7.7 | U | 860 | 636 | | ng/L | | 74 | 49 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *62* | | *42 - 120* |
| *Nitrobenzene-d5* | *63* | | *43 - 120* |
| *Terphenyl-d14* | *70* | | *47 - 120* |

**Lab Sample ID: 280-52997-1 MSD**
**Matrix: Water**
**Analysis Batch: 217436**

**Client Sample ID: GWA-MW02-140311**
**Prep Type: Total/NA**
**Prep Batch: 216749**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 10 | U | 857 | 652 | | ng/L | | 76 | 47 - 120 | 0 | 50 |
| Acenaphthylene | 9.5 | U | 857 | 610 | | ng/L | | 71 | 39 - 120 | 2 | 50 |
| Anthracene | 13 | U | 857 | 651 | | ng/L | | 76 | 28 - 120 | 5 | 50 |
| Benzo[a]anthracene | 3.0 | U | 857 | 659 | | ng/L | | 77 | 42 - 120 | 2 | 40 |
| Benzo[a]pyrene | 4.9 | U | 857 | 700 | | ng/L | | 82 | 38 - 120 | 4 | 21 |
| Benzo[b]fluoranthene | 3.3 | U | 857 | 689 | | ng/L | | 80 | 44 - 120 | 2 | 28 |
| Benzo[g,h,i]perylene | 3.4 | U | 857 | 808 | | ng/L | | 94 | 39 - 120 | 3 | 23 |
| Benzo[k]fluoranthene | 4.8 | U | 857 | 726 | | ng/L | | 85 | 43 - 120 | 4 | 28 |
| Chrysene | 3.0 | U | 857 | 646 | | ng/L | | 75 | 35 - 120 | 2 | 41 |
| Dibenz(a,h)anthracene | 4.6 | U | 857 | 745 | | ng/L | | 87 | 27 - 126 | 3 | 25 |
| Fluoranthene | 4.3 | U | 857 | 680 | | ng/L | | 79 | 46 - 120 | 6 | 24 |
| Fluorene | 18 | U | 857 | 625 | | ng/L | | 73 | 49 - 120 | 0 | 50 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: 280-52997-1 MSD** — **Client Sample ID: GWA-MW02-140311**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217436** — **Prep Batch: 216749**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Indeno[1,2,3-cd]pyrene | 14 | U | 857 | 796 | | ng/L | | 93 | 38 - 120 | 5 | 25 |
| Naphthalene | 5.1 | U | 857 | 588 | | ng/L | | 69 | 37 - 120 | 3 | 50 |
| Phenanthrene | 9.3 | U | 857 | 626 | | ng/L | | 73 | 46 - 120 | 3 | 42 |
| Pyrene | 7.7 | U | 857 | 680 | | ng/L | | 79 | 49 - 120 | 7 | 22 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *62* | | *42 - 120* |
| *Nitrobenzene-d5* | *64* | | *43 - 120* |
| *Terphenyl-d14* | *77* | | *47 - 120* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-216823/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217623** — **Prep Batch: 216823**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Antimony | 3.1 | U | 10 | 3.1 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Sodium | 255 | J ^ | 1000 | 92 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Zinc | 7.28 | J | 20 | 4.5 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 03/14/14 13:00 | 03/19/14 22:13 | 1 |

**Lab Sample ID: LCS 280-216823/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217623** — **Prep Batch: 216823**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1990 | | ug/L | | 100 | 87 - 111 |
| Calcium | 50000 | 51900 | | ug/L | | 104 | 90 - 111 |
| Antimony | 500 | 531 | | ug/L | | 106 | 88 - 110 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-216823/2-A**
**Matrix: Water**
**Analysis Batch: 217623**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 216823**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Magnesium | 50000 | 50400 | | ug/L | | 101 | 90 - 113 |
| Arsenic | 1000 | 991 | | ug/L | | 99 | 88 - 110 |
| Potassium | 50000 | 52400 | | ug/L | | 105 | 89 - 114 |
| Barium | 2000 | 2110 | | ug/L | | 105 | 90 - 112 |
| Sodium | 50000 | 55600 | | ug/L | | 111 | 90 - 115 |
| Beryllium | 50.0 | 50.2 | | ug/L | | 100 | 89 - 113 |
| Cadmium | 100 | 99.9 | | ug/L | | 100 | 88 - 111 |
| Chromium | 200 | 200 | | ug/L | | 100 | 90 - 113 |
| Copper | 250 | 248 | | ug/L | | 99 | 86 - 112 |
| Cobalt | 500 | 491 | | ug/L | | 98 | 89 - 111 |
| Iron | 1000 | 1040 | | ug/L | | 104 | 89 - 115 |
| Lead | 500 | 507 | | ug/L | | 101 | 89 - 110 |
| Manganese | 500 | 481 | | ug/L | | 96 | 90 - 110 |
| Nickel | 500 | 490 | | ug/L | | 98 | 89 - 111 |
| Selenium | 2000 | 2090 | | ug/L | | 105 | 85 - 112 |
| Silver | 50.0 | 50.2 | | ug/L | | 100 | 86 - 115 |
| Thallium | 2000 | 2030 | | ug/L | | 102 | 88 - 110 |
| Zinc | 500 | 517 | | ug/L | | 103 | 85 - 111 |
| Vanadium | 500 | 519 | | ug/L | | 104 | 90 - 111 |

**Lab Sample ID: 280-52997-1 MS**
**Matrix: Water**
**Analysis Batch: 217623**

**Client Sample ID: GWA-MW02-140311**
**Prep Type: Total/NA**
**Prep Batch: 216823**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 2000 | 1960 | | ug/L | | 98 | 83 - 119 |
| Antimony | 3.1 | U | 500 | 534 | | ug/L | | 107 | 81 - 124 |
| Arsenic | 4.4 | U | 1000 | 1030 | | ug/L | | 103 | 84 - 124 |
| Barium | 87 | | 2000 | 2220 | | ug/L | | 107 | 85 - 120 |
| Beryllium | 0.47 | U | 50.0 | 50.2 | | ug/L | | 100 | 79 - 121 |
| Cadmium | 0.45 | U | 100 | 102 | | ug/L | | 102 | 82 - 119 |
| Chromium | 0.66 | U | 200 | 202 | | ug/L | | 101 | 73 - 135 |
| Copper | 1.4 | U | 250 | 257 | | ug/L | | 103 | 82 - 129 |
| Cobalt | 32 | | 500 | 524 | | ug/L | | 98 | 82 - 119 |
| Iron | 22 | U | 1000 | 1040 | | ug/L | | 104 | 52 - 155 |
| Lead | 2.6 | U | 500 | 505 | | ug/L | | 101 | 89 - 121 |
| Manganese | 6400 | | 500 | 6990 | 4 | ug/L | | 110 | 79 - 121 |
| Nickel | 5.5 | J | 500 | 501 | | ug/L | | 99 | 84 - 120 |
| Selenium | 4.9 | U | 2000 | 2080 | | ug/L | | 104 | 71 - 140 |
| Silver | 1.2 | J | 50.0 | 50.7 | | ug/L | | 99 | 75 - 141 |
| Thallium | 4.9 | U | 2000 | 1970 | | ug/L | | 98 | 90 - 116 |
| Zinc | 12 | J B | 500 | 521 | | ug/L | | 102 | 60 - 137 |
| Vanadium | 1.1 | U | 500 | 516 | | ug/L | | 103 | 85 - 120 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-52997-1 MSD** — **Client Sample ID: GWA-MW02-140311**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217623** — **Prep Batch: 216823**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 2000 | 1950 | | ug/L | | 98 | 83 - 119 | 0 | 20 |
| Antimony | 3.1 | U | 500 | 529 | | ug/L | | 106 | 81 - 124 | 1 | 20 |
| Arsenic | 4.4 | U | 1000 | 1020 | | ug/L | | 102 | 84 - 124 | 1 | 20 |
| Barium | 87 | | 2000 | 2210 | | ug/L | | 106 | 85 - 120 | 0 | 20 |
| Beryllium | 0.47 | U | 50.0 | 50.0 | | ug/L | | 100 | 79 - 121 | 1 | 20 |
| Cadmium | 0.45 | U | 100 | 101 | | ug/L | | 101 | 82 - 119 | 2 | 20 |
| Chromium | 0.66 | U | 200 | 200 | | ug/L | | 100 | 73 - 135 | 1 | 20 |
| Copper | 1.4 | U | 250 | 255 | | ug/L | | 102 | 82 - 129 | 1 | 20 |
| Cobalt | 32 | | 500 | 519 | | ug/L | | 97 | 82 - 119 | 1 | 20 |
| Iron | 22 | U | 1000 | 1030 | | ug/L | | 103 | 52 - 155 | 0 | 20 |
| Lead | 2.6 | U | 500 | 498 | | ug/L | | 100 | 89 - 121 | 1 | 20 |
| Manganese | 6400 | | 500 | 6940 | 4 | ug/L | | 99 | 79 - 121 | 1 | 20 |
| Nickel | 5.5 | J | 500 | 496 | | ug/L | | 98 | 84 - 120 | 1 | 20 |
| Selenium | 4.9 | U | 2000 | 2070 | | ug/L | | 103 | 71 - 140 | 1 | 20 |
| Silver | 1.2 | J | 50.0 | 50.9 | | ug/L | | 99 | 75 - 141 | 0 | 20 |
| Thallium | 4.9 | U | 2000 | 1940 | | ug/L | | 97 | 90 - 116 | 1 | 20 |
| Zinc | 12 | J B | 500 | 515 | | ug/L | | 101 | 60 - 137 | 1 | 20 |
| Vanadium | 1.1 | U | 500 | 510 | | ug/L | | 102 | 85 - 120 | 1 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-216837/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216970** — **Prep Batch: 216837**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 03/14/14 11:20 | 03/14/14 17:06 | 1 |

**Lab Sample ID: LCS 280-216837/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216970** — **Prep Batch: 216837**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.97 | | ug/L | | 99 | 84 - 120 |

**Lab Sample ID: 280-52997-1 MS** — **Client Sample ID: GWA-MW02-140311**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216970** — **Prep Batch: 216837**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 5.00 | 4.98 | | ug/L | | 100 | 75 - 125 |

**Lab Sample ID: 280-52997-1 MSD** — **Client Sample ID: GWA-MW02-140311**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 216970** — **Prep Batch: 216837**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 5.00 | 4.97 | | ug/L | | 99 | 75 - 125 | 0 | 20 |

# QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## Method: 9034 - Sulfide, Acid Soluble and Insoluble (Titrimetric)

**Lab Sample ID: MB 280-217004/3-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217016** — **Prep Batch: 217004**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Sulfide | 0.79 | U | 4.0 | 0.79 | mg/L | | 03/15/14 09:45 | 03/15/14 13:30 | 1 |

**Lab Sample ID: LCS 280-217004/1-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217016** — **Prep Batch: 217004**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Sulfide | 19.0 | 14.5 | | mg/L | | 76 | 48 - 100 |

**Lab Sample ID: LCSD 280-217004/2-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 217016** — **Prep Batch: 217004**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Total Sulfide | 19.0 | 13.0 | | mg/L | | 68 | 48 - 100 | 11 | 20 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-218655/13** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 218655**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.25 | U | 3.0 | 0.25 | mg/L | | | 03/27/14 17:06 | 1 |
| Sulfate | 0.23 | U | 5.0 | 0.23 | mg/L | | | 03/27/14 17:06 | 1 |

**Lab Sample ID: LCS 280-218655/11** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 218655**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 25.0 | 25.1 | | mg/L | | 100 | 90 - 110 |
| Sulfate | 25.0 | 23.5 | | mg/L | | 94 | 90 - 110 |

**Lab Sample ID: LCSD 280-218655/12** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 218655**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 25.0 | 25.8 | | mg/L | | 103 | 90 - 110 | 3 | 10 |
| Sulfate | 25.0 | 24.1 | | mg/L | | 97 | 90 - 110 | 3 | 10 |

**Lab Sample ID: MRL 280-218655/10** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 218655**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 1.00 | 1.05 | J | mg/L | | 105 | 50 - 150 |
| Sulfate | 1.00 | 1.10 | J | mg/L | | 110 | 50 - 150 |

# QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## Method: SM 2320B - Alkalinity

**Lab Sample ID: MB 280-217068/33**
**Matrix: Water**
**Analysis Batch: 217068**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Bicarbonate Alkalinity as CaCO3 | 2.12 | J | 5.0 | 1.1 | mg/L | | | 03/15/14 18:22 | 1 |

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 280-217061/1**
**Matrix: Water**
**Analysis Batch: 217061**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 4.7 | U | 10 | 4.7 | mg/L | | | 03/17/14 09:12 | 1 |

**Lab Sample ID: LCS 280-217061/2**
**Matrix: Water**
**Analysis Batch: 217061**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 500 | 468 | | mg/L | | 94 | 86 - 110 |

**Lab Sample ID: LCSD 280-217061/3**
**Matrix: Water**
**Analysis Batch: 217061**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 500 | 472 | | mg/L | | 94 | 86 - 110 | 1 | 20 |

## Method: SM 2540D - Solids, Total Suspended (TSS)

**Lab Sample ID: MB 280-216949/3**
**Matrix: Water**
**Analysis Batch: 216949**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 1.1 | U | 4.0 | 1.1 | mg/L | | | 03/14/14 15:37 | 1 |

**Lab Sample ID: LCS 280-216949/1**
**Matrix: Water**
**Analysis Batch: 216949**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 100 | 89.0 | | mg/L | | 89 | 86 - 114 |

**Lab Sample ID: LCSD 280-216949/2**
**Matrix: Water**
**Analysis Batch: 216949**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Total Suspended Solids | 100 | 92.0 | | mg/L | | 92 | 86 - 114 | 3 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## GC/MS Semi VOA

### Prep Batch: 216749

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 3510C | |
| 280-52997-1 MS | GWA-MW02-140311 | Total/NA | Water | 3510C | |
| 280-52997-1 MSD | GWA-MW02-140311 | Total/NA | Water | 3510C | |
| LCS 280-216749/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| MB 280-216749/1-A | Method Blank | Total/NA | Water | 3510C | |

### Analysis Batch: 217224

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-216749/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 216749 |
| MB 280-216749/1-A | Method Blank | Total/NA | Water | 8270D SIM | 216749 |

### Analysis Batch: 217436

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 8270D SIM | 216749 |
| 280-52997-1 MS | GWA-MW02-140311 | Total/NA | Water | 8270D SIM | 216749 |
| 280-52997-1 MSD | GWA-MW02-140311 | Total/NA | Water | 8270D SIM | 216749 |

## Metals

### Prep Batch: 216823

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 3010A | |
| 280-52997-1 MS | GWA-MW02-140311 | Total/NA | Water | 3010A | |
| 280-52997-1 MSD | GWA-MW02-140311 | Total/NA | Water | 3010A | |
| LCS 280-216823/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-216823/1-A | Method Blank | Total/NA | Water | 3010A | |

### Prep Batch: 216837

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 7470A | |
| 280-52997-1 MS | GWA-MW02-140311 | Total/NA | Water | 7470A | |
| 280-52997-1 MSD | GWA-MW02-140311 | Total/NA | Water | 7470A | |
| LCS 280-216837/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| MB 280-216837/1-A | Method Blank | Total/NA | Water | 7470A | |

### Analysis Batch: 216970

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 7470A | 216837 |
| 280-52997-1 MS | GWA-MW02-140311 | Total/NA | Water | 7470A | 216837 |
| 280-52997-1 MSD | GWA-MW02-140311 | Total/NA | Water | 7470A | 216837 |
| LCS 280-216837/2-A | Lab Control Sample | Total/NA | Water | 7470A | 216837 |
| MB 280-216837/1-A | Method Blank | Total/NA | Water | 7470A | 216837 |

### Analysis Batch: 217623

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 6010C | 216823 |
| 280-52997-1 MS | GWA-MW02-140311 | Total/NA | Water | 6010C | 216823 |
| 280-52997-1 MSD | GWA-MW02-140311 | Total/NA | Water | 6010C | 216823 |
| LCS 280-216823/2-A | Lab Control Sample | Total/NA | Water | 6010C | 216823 |
| MB 280-216823/1-A | Method Blank | Total/NA | Water | 6010C | 216823 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## General Chemistry

### Analysis Batch: 216949

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | SM 2540D | |
| LCS 280-216949/1 | Lab Control Sample | Total/NA | Water | SM 2540D | |
| LCSD 280-216949/2 | Lab Control Sample Dup | Total/NA | Water | SM 2540D | |
| MB 280-216949/3 | Method Blank | Total/NA | Water | SM 2540D | |

### Prep Batch: 217004

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 9030B | |
| LCS 280-217004/1-A | Lab Control Sample | Total/NA | Water | 9030B | |
| LCSD 280-217004/2-A | Lab Control Sample Dup | Total/NA | Water | 9030B | |
| MB 280-217004/3-A | Method Blank | Total/NA | Water | 9030B | |

### Analysis Batch: 217016

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 9034 | 217004 |
| LCS 280-217004/1-A | Lab Control Sample | Total/NA | Water | 9034 | 217004 |
| LCSD 280-217004/2-A | Lab Control Sample Dup | Total/NA | Water | 9034 | 217004 |
| MB 280-217004/3-A | Method Blank | Total/NA | Water | 9034 | 217004 |

### Analysis Batch: 217061

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | SM 2540C | |
| LCS 280-217061/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| LCSD 280-217061/3 | Lab Control Sample Dup | Total/NA | Water | SM 2540C | |
| MB 280-217061/1 | Method Blank | Total/NA | Water | SM 2540C | |

### Analysis Batch: 217068

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | SM 2320B | |
| MB 280-217068/33 | Method Blank | Total/NA | Water | SM 2320B | |

### Analysis Batch: 218655

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 9056A | |
| 280-52997-1 | GWA-MW02-140311 | Total/NA | Water | 9056A | |
| LCS 280-218655/11 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-218655/12 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-218655/13 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-218655/10 | Lab Control Sample | Total/NA | Water | 9056A | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## Client Sample ID: GWA-MW02-140311

**Date Collected: 03/11/14 10:25**
**Date Received: 03/12/14 09:50**

## Lab Sample ID: 280-52997-1

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1053 mL | 1 mL | 216749 | 03/13/14 20:46 | IBM | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1053 mL | 1 mL | 217436 | 03/19/14 14:40 | AGCM | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 216823 | 03/14/14 13:00 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 217623 | 03/19/14 22:18 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 216837 | 03/14/14 11:20 | LLB | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 216970 | 03/14/14 18:04 | LLB | TAL DEN |
| Total/NA | Prep | 9030B | | | 250 mL | 250 mL | 217004 | 03/15/14 09:45 | AJS | TAL DEN |
| Total/NA | Analysis | 9034 | | 1 | 250 mL | 250 mL | 217016 | 03/15/14 13:30 | AJS | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 10 mL | 10 mL | 218655 | 03/27/14 21:49 | TLP | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 10 mL | 10 mL | 218655 | 03/28/14 05:20 | TLP | TAL DEN |
| Total/NA | Analysis | SM 2320B | | 1 | | | 217068 | 03/15/14 19:43 | AFH | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 217061 | 03/17/14 09:12 | AFB | TAL DEN |
| Total/NA | Analysis | SM 2540D | | 1 | 250 mL | 250 mL | 216949 | 03/14/14 15:37 | MW1 | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-52997-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Colorado | State Program | 8 | N/A | 09-30-14 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Maryland | State Program | 3 | 268 | 03-31-14 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

**H4C250403 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 21**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

REVISED

PROJECT NO. 280-52997-1

UNC Cogen

Lot #: H4C250403

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

April 18, 2014

# ANALYTICAL METHODS SUMMARY

**H4C250403**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H4C250403**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M3AXK | 001 | GWA-MW02-140311 | 03/11/14 | 10:25 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H4C250403
## Revised

***This report was revised to have the associated sample reported from the D2A instrument.***

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation was included with the original report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

For solid and sediments samples, when percent moisture is included in the report header field, the sample results are reported on a dry weight basis. When percent moisture is not contained in the header field, sample results are reported on an as received or wet weight basis.

Sample GWA-MW02-140311 was reanalyzed on the HRMS, D2A, to achieve lower estimated detection limits (EDLs). The blank was also reanalyzed under a new work order name (M3H5H-1AA), both blank runs are reported. The original laboratory control sample, matrix spike and duplicate are reported from the original HRMS, M2A.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample

extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is

# PROJECT NARRATIVE
## H4C250403

often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

In sample data, peaks must have an intensity of $\geq$2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: GWA-MW02-140311**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C250403 - 001 | **Work Order #....:** | M3AXK2AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/11/14 | **Date Received....:** | 03/25/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/30/14 | **Analysis Date....:** | 04/18/14 | | |
| **Prep Batch # ....:** | 4107050 | | | | |
| **Initial Wgt/Vol :** | 1049 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.5 | 0.17 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.12 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.34 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.32 | pg/L |
| **1,2,3,7,8,9-HxCDD** | **1.1** | **Q J** | **48** | **0.31** | **pg/L** |
| 1,2,3,4,6,7,8-HpCDD | ND | | 48 | 0.28 | pg/L |
| **OCDD** | **8.2** | **Q B J** | **95** | **0.28** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.5 | 0.10 | pg/L |
| **1,2,3,7,8-PeCDF** | **1.0** | **Q J** | **48** | **0.29** | **pg/L** |
| 2,3,4,7,8-PeCDF | ND | | 48 | 0.33 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.36 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.34 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 48 | 0.34 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 48 | 0.35 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **1.2** | **Q B J** | **48** | **0.087** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 48 | 0.11 | pg/L |
| **OCDF** | **0.23** | **Q B J** | **95** | **0.090** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 85 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 84 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 96 | 40 - 135 |
| 13C-OCDD | 92 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 79 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 87 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 72 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 78 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 102 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 98 | 40 - 135 |
| 13C-OCDF | 87 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: GWA-MW02-140311**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C250403 - 001 | **Work Order #....:** | M3AXK2AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 03/11/14 | **Date Received....:** | 03/25/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 03/30/14 | **Analysis Date....:** | 04/18/14 | | |
| **Prep Batch # ....:** | 4107050 | | | | |
| **Initial Wgt/Vol :** | 1049 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4D170000 - 050B | **Work Order #....:** | M3H5H1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/30/14 | **Analysis Date....:** | 04/18/14 | | |
| **Prep Batch # ....:** | 4107050 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.062 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 0.032 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.098 | pg/L |
| **1,2,3,6,7,8-HxCDD** | **0.45** | **Q J** | **50** | **0.11** | **pg/L** |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.097 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.96** | **Q J** | **50** | **0.12** | **pg/L** |
| **OCDD** | **6.3** | **J** | **100** | **0.15** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.050 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.086 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.084 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.088 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.30** | **Q J** | **50** | **0.097** | **pg/L** |
| 2,3,4,6,7,8-HxCDF | ND | | 50 | 0.090 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 50 | 0.096 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.30** | **Q J** | **50** | **0.034** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.42** | **Q J** | **50** | **0.041** | **pg/L** |
| **OCDF** | **1.8** | **J** | **100** | **0.044** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 92 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 127 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 89 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 96 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 96 | 40 - 135 |
| 13C-OCDD | 93 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 112 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 101 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 82 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 89 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 103 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 85 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 101 | 40 - 135 |
| 13C-OCDF | 96 | 40 - 135 |

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# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4D170000 - 050B | **Work Order #....:** | M3H5H1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/30/14 | **Analysis Date....:** | 04/18/14 | | |
| **Prep Batch # ....:** | 4107050 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

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# Method Blank Report

## Trace Level Organic Compounds

**Lot - Sample #....:** H4C280000 - 012B **Work Order #....:** M3C031AA **Matrix....:** WATER
**Dilution Factor:** 1
**Prep Date....:** 03/30/14 **Analysis Date....:** 04/01/14
**Prep Batch # ....:** 4087012
**Initial Wgt/Vol :** 1000 mL **Instrument ID....:** M2A **Method:** SW846 8290
**Analyst ID....:** Kathryn B. Lay

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 3.5 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 1.3 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 1.7 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 50 | 1.8 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 1.6 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **2.8** | **J** | **50** | **1.2** | **pg/L** |
| **OCDD** | **21** | **J** | **100** | **1.9** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 2.4 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 1.1 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.99 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.82 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 50 | 0.82 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 50 | 0.78 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 50 | 0.93 | pg/L |
| 1,2,3,4,6,7,8-HpCDF | ND | | 50 | 1.3 | pg/L |
| 1,2,3,4,7,8,9-HpCDF | ND | | 50 | 1.4 | pg/L |
| **OCDF** | **6.5** | **J** | **100** | **2.2** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 90 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 94 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 84 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 80 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 96 | 40 - 135 |
| 13C-OCDD | 68 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 85 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 83 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 71 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 71 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 72 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 77 | 40 - 135 |
| 13C-OCDF | 58 | 40 - 135 |

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# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4C280000 - 012B | **Work Order #....:** | M3C031AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 03/30/14 | **Analysis Date....:** | 04/01/14 | | |
| **Prep Batch # ....:** | 4087012 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | M2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Kathryn B. Lay | | | | |

**QUALIFIERS**

J Estimated Result.

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Client Lot # ...:** H4C250403 **Work Order # ...:** M3C031AC-LCS **Matrix .....:** WATER
**LCS Lot-Sample# :** H4C280000 - 012
**Prep Date .....:** 03/30/14 **Analysis Date ..:** 04/01/14
**Prep Batch # ...:** 4087012
**Dilution Factor :** 1
**Analyst ID.....:** Kathryn B. Lay **Instrument ID..:** M2A **Method.....:** SW846 8290
**Initial Wgt/Vol:** 1000 mL

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **200** | **195** | **pg/L** | **97** | | **(77 - 127)** |
| **1,2,3,7,8-PeCDD** | **1000** | **926** | **pg/L** | **93** | | **(78 - 128)** |
| **1,2,3,4,7,8-HxCDD** | **1000** | **943** | **pg/L** | **94** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **1000** | **899** | **pg/L** | **90** | | **(72 - 127)** |
| **1,2,3,7,8,9-HxCDD** | **1000** | **1010** | **pg/L** | **101** | | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDD** | **1000** | **927** | **pg/L** | **93** | **B** | **(73 - 123)** |
| **OCDD** | **2000** | **1750** | **pg/L** | **88** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **200** | **199** | **pg/L** | **99** | | **(74 - 124)** |
| **1,2,3,7,8-PeCDF** | **1000** | **899** | **pg/L** | **90** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **1000** | **911** | **pg/L** | **91** | | **(74 - 124)** |
| **1,2,3,4,7,8-HxCDF** | **1000** | **910** | **pg/L** | **91** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **1000** | **931** | **pg/L** | **93** | | **(75 - 125)** |
| **2,3,4,6,7,8-HxCDF** | **1000** | **945** | **pg/L** | **95** | | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **1000** | **899** | **pg/L** | **90** | | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDF** | **1000** | **873** | **pg/L** | **87** | | **(71 - 121)** |
| **1,2,3,4,7,8,9-HpCDF** | **1000** | **905** | **pg/L** | **91** | | **(73 - 123)** |
| **OCDF** | **2000** | **1750** | **pg/L** | **87** | **B** | **(68 - 132)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 87 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 110 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 87 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 83 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 95 | (40 - 135) |
| 13C-OCDD | 75 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 85 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 93 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 96 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 71 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 70 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 80 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 85 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 83 | (40 - 135) |
| 13C-OCDF | 61 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

**MATRIX/MATRIX SPIKE DATA REPORT**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H4C250403 | **Work Order # ...:** | M3AXK1AC-MS | **Matrix .....:** | WATER |
| **OS Lot-Sample# :** | H4C250403 - 001 | | M3AXK1AD-MSD | | |
| **Prep Date .....:** | 03/30/14 | **Analysis Date ..:** | 04/18/14 | | |
| **Prep Batch # ...:** | 4107050 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Kathryn B. Lay | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1049 mL | | | | |

| PARAMETER | SAMPLE AMOUNT | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | RECOVERY LIMITS | RPD | RPD LIMITS |
|---|---|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | ND | 190 | 186 | pg/L | 98 | (77 - 127) | | |
| | ND | 190 | 185 | pg/L | 97 | (77 - 127) | 0.67 | (0 - 15) |
| **2,3,7,8-TCDD** | ND | 190 | 186 | pg/L | 98 | (77 - 127) | | |
| | ND | 190 | 185 | pg/L | 97 | (77 - 127) | 0.67 | (0 - 15) |
| **1,2,3,7,8-PeCDD** | ND | 952 | 934 | pg/L | 98 | (78 - 128) | | |
| | ND | 952 | 936 | pg/L | 98 | (78 - 128) | 0.24 | (0 - 15) |
| **1,2,3,7,8-PeCDD** | ND | 952 | 934 | pg/L | 98 | (78 - 128) | | |
| | ND | 952 | 936 | pg/L | 98 | (78 - 128) | 0.24 | (0 - 15) |
| **1,2,3,4,7,8-HxCDD** | ND | 952 | 876 | pg/L | 92 | (73 - 123) | | |
| | ND | 952 | 882 | pg/L | 93 | (73 - 123) | 0.64 | (0 - 15) |
| **1,2,3,4,7,8-HxCDD** | ND | 952 | 876 | pg/L | 92 | (73 - 123) | | |
| | ND | 952 | 882 | pg/L | 93 | (73 - 123) | 0.64 | (0 - 15) |
| **1,2,3,6,7,8-HxCDD** | ND | 952 | 870 | pg/L | 91 | (72 - 127) | | |
| | ND | 952 | 896 | pg/L | 94 | (72 - 127) | 2.9 | (0 - 15) |
| **1,2,3,6,7,8-HxCDD** | ND | 952 | 870 | pg/L | 91 | (72 - 127) | | |
| | ND | 952 | 896 | pg/L | 94 | (72 - 127) | 2.9 | (0 - 15) |
| **1,2,3,7,8,9-HxCDD** | 1.1 | 952 | 1070 | pg/L | 113 | (76 - 126) | | |
| | 1.1 | 952 | 1070 | pg/L | 112 | (76 - 126) | 0.28 | (0 - 15) |
| **1,2,3,7,8,9-HxCDD** | ND | 952 | 1070 | pg/L | 113 | (76 - 126) | | |
| | ND | 952 | 1070 | pg/L | 112 | (76 - 126) | 0.28 | (0 - 15) |
| **1,2,3,4,6,7,8-HpCDD** | ND | 952 | 892 | pg/L | 94 B | (73 - 123) | | |
| | ND | 952 | 907 | pg/L | 95 B | (73 - 123) | 1.6 | (0 - 15) |
| **1,2,3,4,6,7,8-HpCDD** | ND | 952 | 892 | pg/L | 94 B | (73 - 123) | | |
| | ND | 952 | 907 | pg/L | 95 B | (73 - 123) | 1.6 | (0 - 15) |
| **OCDD** | 8.2 | 1900 | 1660 | pg/L | 86 B | (75 - 125) | | |
| | 8.2 | 1900 | 1720 | pg/L | 89 B | (75 - 125) | 3.0 | (0 - 15) |
| **OCDD** | 19 | 1900 | 1660 | pg/L | 86 B | (75 - 125) | | |
| | 19 | 1900 | 1720 | pg/L | 89 B | (75 - 125) | 3.0 | (0 - 15) |
| **2,3,7,8-TCDF** | ND | 190 | 191 | pg/L | 100 | (74 - 124) | | |
| | ND | 190 | 184 | pg/L | 97 | (74 - 124) | 3.7 | (0 - 15) |
| **2,3,7,8-TCDF** | ND | 190 | 191 | pg/L | 100 | (74 - 124) | | |
| | ND | 190 | 184 | pg/L | 97 | (74 - 124) | 3.7 | (0 - 15) |
| **1,2,3,7,8-PeCDF** | 1.0 | 952 | 864 | pg/L | 91 | (74 - 124) | | |
| | 1.0 | 952 | 866 | pg/L | 91 | (74 - 124) | 0.14 | (0 - 15) |
| **1,2,3,7,8-PeCDF** | ND | 952 | 864 | pg/L | 91 | (74 - 124) | | |
| | ND | 952 | 866 | pg/L | 91 | (74 - 124) | 0.14 | (0 - 15) |
| **2,3,4,7,8-PeCDF** | ND | 952 | 923 | pg/L | 97 | (74 - 124) | | |

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**MATRIX/MATRIX SPIKE DATA REPORT**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H4C250403 | **Work Order # ...:** | M3AXK1AC-MS | **Matrix .....:** | WATER |
| **OS Lot-Sample# :** | H4C250403 - 001 | | M3AXK1AD-MSD | | |
| **Prep Date .....:** | 03/30/14 | **Analysis Date ..:** | 04/18/14 | | |
| **Prep Batch # ...:** | 4107050 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Kathryn B. Lay | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1049 mL | | | | |

| PARAMETER | SAMPLE AMOUNT | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS | RPD | RPD LIMITS |
|---|---|---|---|---|---|---|---|---|---|
| | ND | 952 | 901 | pg/L | 95 | | (74 - 124) | 2.5 | (0 - 15) |
| 2,3,4,7,8-PeCDF | ND | 952 | 923 | pg/L | 97 | | (74 - 124) | | |
| | ND | 952 | 901 | pg/L | 95 | | (74 - 124) | 2.5 | (0 - 15) |
| 1,2,3,4,7,8-HxCDF | ND | 952 | 891 | pg/L | 94 | | (75 - 125) | | |
| | ND | 952 | 896 | pg/L | 94 | | (75 - 125) | 0.65 | (0 - 15) |
| 1,2,3,4,7,8-HxCDF | ND | 952 | 891 | pg/L | 94 | | (75 - 125) | | |
| | ND | 952 | 896 | pg/L | 94 | | (75 - 125) | 0.65 | (0 - 15) |
| 1,2,3,6,7,8-HxCDF | ND | 952 | 885 | pg/L | 93 | | (75 - 125) | | |
| | ND | 952 | 901 | pg/L | 95 | | (75 - 125) | 1.8 | (0 - 15) |
| 1,2,3,6,7,8-HxCDF | ND | 952 | 885 | pg/L | 93 | | (75 - 125) | | |
| | ND | 952 | 901 | pg/L | 95 | | (75 - 125) | 1.8 | (0 - 15) |
| 2,3,4,6,7,8-HxCDF | ND | 952 | 892 | pg/L | 94 | | (76 - 126) | | |
| | ND | 952 | 881 | pg/L | 93 | | (76 - 126) | 1.2 | (0 - 15) |
| 2,3,4,6,7,8-HxCDF | ND | 952 | 892 | pg/L | 94 | | (76 - 126) | | |
| | ND | 952 | 881 | pg/L | 93 | | (76 - 126) | 1.2 | (0 - 15) |
| 1,2,3,7,8,9-HxCDF | ND | 952 | 873 | pg/L | 92 | | (76 - 126) | | |
| | ND | 952 | 877 | pg/L | 92 | | (76 - 126) | 0.50 | (0 - 15) |
| 1,2,3,7,8,9-HxCDF | ND | 952 | 873 | pg/L | 92 | | (76 - 126) | | |
| | ND | 952 | 877 | pg/L | 92 | | (76 - 126) | 0.50 | (0 - 15) |
| 1,2,3,4,6,7,8-HpCDF | 1.2 | 952 | 852 | pg/L | 89 | | (71 - 121) | | |
| | 1.2 | 952 | 850 | pg/L | 89 | | (71 - 121) | 0.30 | (0 - 15) |
| 1,2,3,4,6,7,8-HpCDF | ND | 952 | 852 | pg/L | 89 | | (71 - 121) | | |
| | ND | 952 | 850 | pg/L | 89 | | (71 - 121) | 0.30 | (0 - 15) |
| 1,2,3,4,7,8,9-HpCDF | ND | 952 | 882 | pg/L | 93 | | (73 - 123) | | |
| | ND | 952 | 898 | pg/L | 94 | | (73 - 123) | 1.9 | (0 - 15) |
| 1,2,3,4,7,8,9-HpCDF | ND | 952 | 882 | pg/L | 93 | | (73 - 123) | | |
| | ND | 952 | 898 | pg/L | 94 | | (73 - 123) | 1.9 | (0 - 15) |
| OCDF | 0.23 | 1900 | 1680 | pg/L | 88 | B | (49 - 134) | | |
| | 0.23 | 1900 | 1720 | pg/L | 90 | B | (49 - 134) | 2.5 | (0 - 15) |
| OCDF | ND | 1900 | 1680 | pg/L | 88 | B | (49 - 134) | | |
| | ND | 1900 | 1720 | pg/L | 90 | B | (49 - 134) | 2.5 | (0 - 15) |

SOG_Stnd_msmsd_rev1.rpt 4/18/2014

**MATRIX/MATRIX SPIKE DATA REPORT**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H4C250403 | **Work Order # ...:** | M3AXK1AC-MS | **Matrix .....:** | WATER |
| **OS Lot-Sample# :** | H4C250403 - 001 | | M3AXK1AD-MSD | | |
| **Prep Date .....:** | 03/30/14 | **Analysis Date ..:** | 04/18/14 | | |
| **Prep Batch # ...:** | 4107050 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Kathryn B. Lay | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1049 mL | | | | |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 94 | (40 - 135) |
| | 91 | (40 - 135) |
| 13C-2,3,7,8-TCDD | 94 | (40 - 135) |
| | 91 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 94 | (40 - 135) |
| | 88 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 94 | (40 - 135) |
| | 88 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 77 | (40 - 135) |
| | 80 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 77 | (40 - 135) |
| | 80 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 77 | (40 - 135) |
| | 76 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 77 | (40 - 135) |
| | 76 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 90 | (40 - 135) |
| | 87 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 90 | (40 - 135) |
| | 87 | (40 - 135) |
| 13C-OCDD | 73 | (40 - 135) |
| | 68 | (40 - 135) |
| 13C-OCDD | 73 | (40 - 135) |
| | 68 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 87 | (40 - 135) |
| | 88 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 87 | (40 - 135) |
| | 88 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 88 | (40 - 135) |
| | 87 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 88 | (40 - 135) |
| | 87 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 83 | (40 - 135) |
| | 82 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 83 | (40 - 135) |
| | 82 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 68 | (40 - 135) |
| | 70 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 68 | (40 - 135) |
| | 70 | (40 - 135) |

SOG_Stnd_msmsd_rev1.rpt 4/18/2014

**MATRIX/MATRIX SPIKE DATA REPORT**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H4C250403 | **Work Order # ...:** | M3AXK1AC-MS | **Matrix .....:** | WATER |
| **OS Lot-Sample# :** | H4C250403 - 001 | | M3AXK1AD-MSD | | |
| **Prep Date .....:** | 03/30/14 | **Analysis Date ..:** | 04/18/14 | | |
| **Prep Batch # ...:** | 4107050 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Kathryn B. Lay | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1049 mL | | | | |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-1,2,3,6,7,8-HxCDF | 68 | (40 - 135) |
| | 66 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 68 | (40 - 135) |
| | 66 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 78 | (40 - 135) |
| | 78 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 78 | (40 - 135) |
| | 78 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 79 | (40 - 135) |
| | 80 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 79 | (40 - 135) |
| | 80 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | (40 - 135) |
| | 70 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | (40 - 135) |
| | 70 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 75 | (40 - 135) |
| | 73 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 75 | (40 - 135) |
| | 73 | (40 - 135) |
| 13C-OCDF | 62 | (40 - 135) |
| | 57 | (40 - 135) |
| 13C-OCDF | 62 | (40 - 135) |
| | 57 | (40 - 135) |

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

SOG_Stnd_msmsd_rev1.rpt 4/18/2014

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H4C250403

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-235657.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-52997-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 3/28/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of Containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| GWA-MW02-140311 (280-52997-1) | 3/11/14 | 10:25 Eastern | | Water | | | X | 2 | |
| GWA-MW02-140311 (280-52997-1MS) | 3/11/14 | 10:25 Eastern | MS | Water | | | X | 2 | |
| GWA-MW02-140311 (280-52997-1MSD) | 3/11/14 | 10:25 Eastern | MSD | Water | | | X | 2 | |
| CUSTODY SEALS INTACT | | | | | | | | | |
| RECEIVED AT 0.5°C | | | | | | | | | |
| BRD 3-18-14 | | | | | | | | | |
| COOLER (EA) #5986273185600 | | | | | | | | | |

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: 3/17/14 | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 3-17-14 16:00 | Company TA-D | Received by: | Date/Time: 3-18-14 10:05 | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: 3-18-14 | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H4C2SD403

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : SC6b | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | | ✓ | | ☐ **6a** Leaking<br>☑ **6b** Broken |
| 7. Were VOA samples received without headspace? | ✓ | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

6B, 5 OF 6 CONTAINERS RECEIVED BROKEN

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: [signature] Date: 3-18-14

QA026R27.doc, 123013

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H4C250403

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-236930.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving-John Reynolds | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-52997-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 3/28/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2SO3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - ph 4-5
Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| GWA-MW02-140311 (280-52997-1) | 3/11/14 | 10:25 Eastern | | Water | | | X | 2 | |
| CUSTODY SEALS INTACT | | | | | | | | | |
| RECEIVED AT 0.7°C | | | | | | | | | |
| BKD 3-25-14 | | | | | | | | | |
| COOLER FED-X # 5986 2752 2130 | | | | | | | | | |

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 3/12/14 16:00 | Company TAD | Received by: | Date/Time: 3-25-14 09:50 | Company TA KNOX |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H4G250403

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C) Thermometer ID : 5610 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | ✓ | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668) Chlorine test strip lot number: _____ | ✓ | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | ✓ | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: _____ PM Instructions: _____

Sample Receiving Associate: [signature] Date: 3-25-14

QA026R27.doc, 123013

**Chain of Custody R**

280-52997 Chain of Custody

TAL-4124-280 (0506)

Sampler ID _____

Temperature on Receipt 2.0 1.3 2.4 IR5102 SK 3-12-14

Drinking Water? Yes ☐ No ☐

**TestAmerica** THE LEADER IN ENVIRONMENTAL TESTING

Cooler 1 of 3

| | | | |
|---|---|---|---|
| Client: Geosyntec | Project Manager: Beau Hodge/Mike Schott | Date: 3/11/14 | Chain of Custody Number: 188354 |
| Address: 4601 Six Forks Rd. Suite 340 | Telephone Number (Area Code)/Fax Number: 919-424-1824 | Lab Number: | Page 1 of 1 |
| City: Raleigh; State: NC; Zip Code: 27609 | Site Contact: | Lab Contact: Pat McEntee | |
| Project Name and Location (State): UNC Cogen, Chapel Hill (NC) | Carrier/Waybill Number: | | |
| Contract/Purchase Order/Quote No.: | | | |

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Matrix: Air | Aqueous | Sed. | Soil | Containers & Preservatives: Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | 8270 SIM PAH | 8290 D/F | 2540D TSS | 2540C TDS | 2320 Alk/1056 Chloride | 9034 Sulfide | 6010C+Hg | 6010C+Hg Field filtered | 6010 K, Mg, Ca, Na | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| GWA-MW02-140311 | 3/11/14 | 1025 | | X | | | 7 | | 3 | | | 1 | X | X | X | X | X | X | X | X | X | Hold field-filtered metals |
| GWA-MW02-140311-MS | 3/11/14 | 1025 | | X | | | 4 | | 1 | | | | X | X | | | | | X | | | |
| GWA-MW02-140311-MSD | 3/11/14 | 1025 | | X | | | 4 | | 1 | | | | X | X | | | | | X | | | |

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☒ Other Standard

QC Requirements (Specify):

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By: Caitlin Collins | Date: 3/11/14 | Time: 1330 | 1. Received By: | Date: 3-12-14 | Time: ~~920~~ 950 |
| 2. Relinquished By: | Date: | Time: | 2. Received By: | Date: | Time: |
| 3. Relinquished By: | Date: | Time: | 3. Received By: | Date: | Time: |

Comments:

**DISTRIBUTION:** WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-52997-1

**Login Number: 52997**
**List Number: 1**
**Creator: Knauf, James R**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | FIELD LEFT BLANK |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-59833-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 5:58:23 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
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LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| * | LCS or LCSD is outside acceptance limits. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-59833-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-59833-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**
The samples were received on 9/10/2014 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.1º C and 4.9º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 9/12/2014 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.8º C.

**8270D SIM GCMS**
Samples MW-1-090914 (280-59833-1) and MW-2-090914 (280-59833-2) were analyzed for 8270D SIM GCMS in accordance with SW-846 8270D_SIM. The samples were prepared on 09/12/2014 and analyzed on 09/18/2014.

Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene and Indeno[1,2,3-cd]pyrene failed the recovery criteria high for LCS 280-243122/2-A. Several analytes failed the recovery criteria high for LCSD 280-243122/3-A. Refer to the QC report for details. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported.

Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD/DUP) associated with batch 280-243122.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**
Samples MW-1-090914 (280-59833-1) and MW-2-090914 (280-59833-2) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/15/2014 and analyzed on 09/16/2014 and 09/17/2014.

Aluminum failed the recovery criteria high for the MS of sample MW-1-090914MS (280-59833-1) in batch 280-243607. Aluminum failed the recovery criteria high for the MSD of sample MW-1-090914MSD (280-59833-1) in batch 280-243607. Aluminum and Barium were outside of the control limit in the Serial Dilution. Refer to the QC report for details.

The continuing calibration verification (CCVL 280-243607/45) associated with batch 243607 recovered above the upper control limit for As. The samples associated with this CCVL were below the RL for the affected analytes; therefore, the data have been reported. Associated

## Job ID: 280-59833-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

results are qualified ^.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY**
Samples MW-1-090914 (280-59833-1) and MW-2-090914 (280-59833-2) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 09/17/2014.

MS/MSD analyses were not requested.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL DISSOLVED SOLIDS**
Samples MW-1-090914 (280-59833-1) and MW-2-090914 (280-59833-2) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 09/11/2014.

Duplicate analysis was not requested.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS)**
Samples MW-1-090914 (280-59833-1) and MW-2-090914 (280-59833-2) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 09/20/2014.

MS/MSD analyses were not requested.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59833-1

## Client Sample ID: MW-1-090914 — Lab Sample ID: 280-59833-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1200 | | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 15000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 3300 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 8.3 | J ^ | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2800 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 36 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 42000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 2.8 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 2.4 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 1200 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 50 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 13 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Vanadium | 3.0 | J | 10 | 1.1 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 77 | | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 200 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-2-090914 — Lab Sample ID: 280-59833-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Naphthalene | 31 | J | 99 | 5.3 | ng/L | 1 | | 8270D SIM | Total/NA |
| Calcium | 24000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 5900 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 6.5 | J ^ | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 3000 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 53 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 69000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 1.4 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 28 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 340 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 5700 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 4.1 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Silver | 2.3 | J | 10 | 0.93 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 6.2 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 140 | | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 320 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59833-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59833-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Water | 09/09/14 13:25 | 09/10/14 09:20 |
| 280-59833-2 | MW-2-090914 | Water | 09/09/14 16:07 | 09/10/14 09:20 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: MW-1-090914**
**Date Collected: 09/09/14 13:25**
**Date Received: 09/10/14 09:20**

**Lab Sample ID: 280-59833-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.8 | U | 100 | 5.8 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Benzo[a]anthracene | 3.3 | U | 100 | 3.3 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Benzo[a]pyrene | 5.2 | U | 100 | 5.2 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Benzo[b]fluoranthene | 3.5 | U * | 100 | 3.5 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U * | 100 | 3.6 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Benzo[k]fluoranthene | 5.1 | U * | 100 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Chrysene | 3.2 | U * | 100 | 3.2 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Dibenz(a,h)anthracene | 4.9 | U * | 100 | 4.9 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Fluoranthene | 4.6 | U * | 100 | 4.6 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U * | 100 | 15 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Naphthalene | 5.4 | U | 100 | 5.4 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Phenanthrene | 9.9 | U | 100 | 9.9 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |
| Pyrene | 8.2 | U * | 100 | 8.2 | ng/L | | 09/12/14 17:37 | 09/18/14 19:20 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *42 - 120* | *09/12/14 17:37* | *09/18/14 19:20* | *1* |
| *Nitrobenzene-d5* | *66* | | *43 - 120* | *09/12/14 17:37* | *09/18/14 19:20* | *1* |
| *Terphenyl-d14* | *103* | | *47 - 120* | *09/12/14 17:37* | *09/18/14 19:20* | *1* |

**Client Sample ID: MW-2-090914**
**Date Collected: 09/09/14 16:07**
**Date Received: 09/10/14 09:20**

**Lab Sample ID: 280-59833-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.6 | U | 99 | 5.6 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| 2-Methylnaphthalene | 5.1 | U | 99 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Acenaphthene | 11 | U | 99 | 11 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Acenaphthylene | 9.9 | U | 99 | 9.9 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Anthracene | 14 | U | 99 | 14 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Benzo[a]anthracene | 3.2 | U | 99 | 3.2 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Benzo[a]pyrene | 5.1 | U | 99 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Benzo[b]fluoranthene | 3.4 | U * | 99 | 3.4 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Benzo[g,h,i]perylene | 3.5 | U * | 99 | 3.5 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Benzo[k]fluoranthene | 5.0 | U * | 99 | 5.0 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Chrysene | 3.2 | U * | 99 | 3.2 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U * | 99 | 4.8 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Fluoranthene | 4.5 | U * | 99 | 4.5 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Fluorene | 19 | U | 99 | 19 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U * | 99 | 15 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| **Naphthalene** | **31** | **J** | 99 | 5.3 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Phenanthrene | 9.6 | U | 99 | 9.6 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |
| Pyrene | 8.0 | U * | 99 | 8.0 | ng/L | | 09/12/14 17:37 | 09/18/14 18:52 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *42 - 120* | *09/12/14 17:37* | *09/18/14 18:52* | *1* |
| *Nitrobenzene-d5* | *67* | | *43 - 120* | *09/12/14 17:37* | *09/18/14 18:52* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: MW-2-090914**
**Date Collected: 09/09/14 16:07**
**Date Received: 09/10/14 09:20**

**Lab Sample ID: 280-59833-2**
**Matrix: Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *97* | | *47 - 120* | *09/12/14 17:37* | *09/18/14 18:52* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: MW-1-090914**
**Date Collected: 09/09/14 13:25**
**Date Received: 09/10/14 09:20**

**Lab Sample ID: 280-59833-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **1200** | | 100 | 18 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Calcium** | **15000** | | 200 | 35 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 09:15 | 09/17/14 14:31 | 1 |
| **Magnesium** | **3300** | | 200 | 11 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Arsenic** | **8.3** | **J ^** | 15 | 4.4 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Potassium** | **2800** | **J** | 3000 | 240 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Barium** | **36** | | 10 | 0.58 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Sodium** | **42000** | | 1000 | 92 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Chromium** | **2.8** | **J** | 10 | 0.66 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Copper** | **2.4** | **J** | 15 | 1.4 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Iron** | **1200** | | 100 | 22 | ug/L | | 09/15/14 09:15 | 09/17/14 14:31 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Manganese** | **50** | | 10 | 0.25 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Zinc** | **13** | **J** | 20 | 4.5 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |
| **Vanadium** | **3.0** | **J** | 10 | 1.1 | ug/L | | 09/15/14 09:15 | 09/16/14 13:02 | 1 |

**Client Sample ID: MW-2-090914**
**Date Collected: 09/09/14 16:07**
**Date Received: 09/10/14 09:20**

**Lab Sample ID: 280-59833-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Calcium** | **24000** | | 200 | 35 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 09:15 | 09/17/14 14:44 | 1 |
| **Magnesium** | **5900** | | 200 | 11 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Arsenic** | **6.5** | **J ^** | 15 | 4.4 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Potassium** | **3000** | | 3000 | 240 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Barium** | **53** | | 10 | 0.58 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Sodium** | **69000** | | 1000 | 92 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Copper** | **1.4** | **J** | 15 | 1.4 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Cobalt** | **28** | | 10 | 1.2 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Iron** | **340** | | 100 | 22 | ug/L | | 09/15/14 09:15 | 09/17/14 14:44 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-2-090914** — **Lab Sample ID: 280-59833-2**
**Date Collected: 09/09/14 16:07** — **Matrix: Water**
**Date Received: 09/10/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Manganese** | **5700** | | 10 | 0.25 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Nickel** | **4.1** | **J** | 40 | 1.3 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Silver** | **2.3** | **J** | 10 | 0.93 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| **Zinc** | **6.2** | **J** | 20 | 4.5 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 09:15 | 09/16/14 13:14 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-1-090914** — **Lab Sample ID: 280-59833-1**
**Date Collected: 09/09/14 13:25** — **Matrix: Water**
**Date Received: 09/10/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 20:50 | 1 |

**Client Sample ID: MW-2-090914** — **Lab Sample ID: 280-59833-2**
**Date Collected: 09/09/14 16:07** — **Matrix: Water**
**Date Received: 09/10/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 20:52 | 1 |

## General Chemistry

**Client Sample ID: MW-1-090914** — **Lab Sample ID: 280-59833-1**
**Date Collected: 09/09/14 13:25** — **Matrix: Water**
**Date Received: 09/10/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Sulfate** | **77** | | 5.0 | 0.23 | mg/L | | | 09/20/14 16:26 | 1 |
| **Total Dissolved Solids** | **200** | | 10 | 4.7 | mg/L | | | 09/11/14 08:51 | 1 |

**Client Sample ID: MW-2-090914** — **Lab Sample ID: 280-59833-2**
**Date Collected: 09/09/14 16:07** — **Matrix: Water**
**Date Received: 09/10/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Sulfate** | **140** | | 5.0 | 0.23 | mg/L | | | 09/20/14 16:43 | 1 |
| **Total Dissolved Solids** | **320** | | 10 | 4.7 | mg/L | | | 09/11/14 08:51 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59833-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| **Lab Sample ID** | **Client Sample ID** | **(42-120)** | **(43-120)** | **(47-120)** |
| 280-59833-1 | MW-1-090914 | 88 | 66 | 103 |
| 280-59833-2 | MW-2-090914 | 85 | 67 | 97 |
| LCS 280-243122/2-A | Lab Control Sample | 89 | 74 | 98 |
| LCSD 280-243122/3-A | Lab Control Sample Dup | 96 | 79 | 109 |
| MB 280-243122/1-A | Method Blank | 85 | 85 | 104 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-243122/1-A**
**Matrix: Water**
**Analysis Batch: 243757**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 243122**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *42 - 120* | *09/12/14 17:37* | *09/18/14 10:05* | *1* |
| *Nitrobenzene-d5* | *85* | | *43 - 120* | *09/12/14 17:37* | *09/18/14 10:05* | *1* |
| *Terphenyl-d14* | *104* | | *47 - 120* | *09/12/14 17:37* | *09/18/14 10:05* | *1* |

**Lab Sample ID: LCS 280-243122/2-A**
**Matrix: Water**
**Analysis Batch: 243757**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243122**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 873 | | ng/L | | 97 | 47 - 120 |
| Acenaphthylene | 900 | 853 | | ng/L | | 95 | 39 - 120 |
| Anthracene | 900 | 938 | | ng/L | | 104 | 28 - 120 |
| Benzo[a]anthracene | 900 | 957 | | ng/L | | 106 | 42 - 120 |
| Benzo[a]pyrene | 900 | 1000 | | ng/L | | 111 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 1010 | | ng/L | | 112 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 1140 | * | ng/L | | 127 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 1180 | * | ng/L | | 131 | 43 - 120 |
| Chrysene | 900 | 1130 | * | ng/L | | 125 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 1090 | | ng/L | | 121 | 27 - 126 |
| Fluoranthene | 900 | 980 | | ng/L | | 109 | 46 - 120 |
| Fluorene | 900 | 909 | | ng/L | | 101 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 1110 | * | ng/L | | 124 | 38 - 120 |
| Naphthalene | 900 | 777 | | ng/L | | 86 | 37 - 120 |
| Phenanthrene | 900 | 930 | | ng/L | | 103 | 46 - 120 |
| Pyrene | 900 | 964 | | ng/L | | 107 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-243122/2-A**
**Matrix: Water**
**Analysis Batch: 243757**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243122**

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 89 | | 42 - 120 |
| Nitrobenzene-d5 | 74 | | 43 - 120 |
| Terphenyl-d14 | 98 | | 47 - 120 |

**Lab Sample ID: LCSD 280-243122/3-A**
**Matrix: Water**
**Analysis Batch: 243757**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 243122**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 893 | | ng/L | | 99 | 47 - 120 | 2 | 50 |
| Acenaphthylene | 900 | 887 | | ng/L | | 99 | 39 - 120 | 4 | 50 |
| Anthracene | 900 | 1020 | | ng/L | | 113 | 28 - 120 | 8 | 50 |
| Benzo[a]anthracene | 900 | 1040 | | ng/L | | 116 | 42 - 120 | 9 | 40 |
| Benzo[a]pyrene | 900 | 1070 | | ng/L | | 119 | 38 - 120 | 7 | 21 |
| Benzo[b]fluoranthene | 900 | 1100 | * | ng/L | | 122 | 44 - 120 | 8 | 28 |
| Benzo[g,h,i]perylene | 900 | 1190 | * | ng/L | | 132 | 39 - 120 | 4 | 23 |
| Benzo[k]fluoranthene | 900 | 1250 | * | ng/L | | 139 | 43 - 120 | 5 | 28 |
| Chrysene | 900 | 1220 | * | ng/L | | 135 | 35 - 120 | 8 | 41 |
| Dibenz(a,h)anthracene | 900 | 1140 | * | ng/L | | 127 | 27 - 126 | 5 | 25 |
| Fluoranthene | 900 | 1090 | * | ng/L | | 121 | 46 - 120 | 11 | 24 |
| Fluorene | 900 | 953 | | ng/L | | 106 | 49 - 120 | 5 | 50 |
| Indeno[1,2,3-cd]pyrene | 900 | 1180 | * | ng/L | | 131 | 38 - 120 | 6 | 25 |
| Naphthalene | 900 | 742 | | ng/L | | 82 | 37 - 120 | 5 | 50 |
| Phenanthrene | 900 | 1000 | | ng/L | | 112 | 46 - 120 | 8 | 42 |
| Pyrene | 900 | 1090 | * | ng/L | | 121 | 49 - 120 | 12 | 22 |

| Surrogate | LCSD %Recovery | LCSD Qualifier | Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 96 | | 42 - 120 |
| Nitrobenzene-d5 | 79 | | 43 - 120 |
| Terphenyl-d14 | 109 | | 47 - 120 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-242978/1-A**
**Matrix: Water**
**Analysis Batch: 243607**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 242978**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Sodium | 92 | U | 1000 | 92 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-242978/1-A**
**Matrix: Water**
**Analysis Batch: 243607**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 242978**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 09:15 | 09/16/14 12:56 | 1 |

**Lab Sample ID: MB 280-242978/1-A**
**Matrix: Water**
**Analysis Batch: 243796**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 242978**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 09:15 | 09/17/14 14:26 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 09/15/14 09:15 | 09/17/14 14:26 | 1 |

**Lab Sample ID: LCS 280-242978/2-A**
**Matrix: Water**
**Analysis Batch: 243607**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 242978**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 2050 | | ug/L | | 103 | 87 - 111 |
| Calcium | 50000 | 49200 | | ug/L | | 98 | 90 - 111 |
| Magnesium | 50000 | 50200 | | ug/L | | 100 | 90 - 113 |
| Arsenic | 1000 | 1020 | ^ | ug/L | | 102 | 88 - 110 |
| Potassium | 50000 | 50900 | | ug/L | | 102 | 89 - 114 |
| Barium | 2000 | 1990 | | ug/L | | 100 | 90 - 112 |
| Sodium | 50000 | 54000 | | ug/L | | 108 | 90 - 115 |
| Beryllium | 50.0 | 49.3 | | ug/L | | 99 | 89 - 113 |
| Cadmium | 100 | 103 | | ug/L | | 103 | 88 - 111 |
| Chromium | 200 | 205 | | ug/L | | 102 | 90 - 113 |
| Copper | 250 | 263 | | ug/L | | 105 | 86 - 112 |
| Cobalt | 500 | 505 | | ug/L | | 101 | 89 - 111 |
| Lead | 500 | 515 | | ug/L | | 103 | 89 - 110 |
| Manganese | 500 | 491 | | ug/L | | 98 | 90 - 110 |
| Nickel | 500 | 499 | | ug/L | | 100 | 89 - 111 |
| Selenium | 2000 | 2060 | | ug/L | | 103 | 85 - 112 |
| Silver | 50.0 | 55.6 | | ug/L | | 111 | 86 - 115 |
| Thallium | 2000 | 2050 | | ug/L | | 102 | 88 - 110 |
| Zinc | 500 | 494 | | ug/L | | 99 | 85 - 111 |
| Vanadium | 500 | 488 | | ug/L | | 98 | 90 - 111 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-242978/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243796** — **Prep Batch: 242978**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 500 | 486 | | ug/L | | 97 | 88 - 110 |
| Iron | 1000 | 941 | | ug/L | | 94 | 89 - 115 |

**Lab Sample ID: 280-59833-1 MS** — **Client Sample ID: MW-1-090914**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243607** — **Prep Batch: 242978**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1200 | | 2000 | 4970 | F1 | ug/L | | 190 | 83 - 119 |
| Calcium | 15000 | | 50000 | 64400 | | ug/L | | 98 | 48 - 153 |
| Magnesium | 3300 | | 50000 | 52900 | | ug/L | | 99 | 62 - 146 |
| Arsenic | 8.3 | J ^ | 1000 | 1030 | ^ | ug/L | | 102 | 84 - 124 |
| Potassium | 2800 | J | 50000 | 53800 | | ug/L | | 102 | 76 - 132 |
| Barium | 36 | | 2000 | 2020 | | ug/L | | 99 | 85 - 120 |
| Sodium | 42000 | | 50000 | 94900 | | ug/L | | 105 | 70 - 203 |
| Beryllium | 0.47 | U | 50.0 | 49.5 | | ug/L | | 99 | 79 - 121 |
| Cadmium | 0.45 | U | 100 | 102 | | ug/L | | 102 | 82 - 119 |
| Chromium | 2.8 | J | 200 | 206 | | ug/L | | 102 | 73 - 135 |
| Copper | 2.4 | J | 250 | 263 | | ug/L | | 104 | 82 - 129 |
| Cobalt | 1.2 | U | 500 | 504 | | ug/L | | 101 | 82 - 119 |
| Lead | 2.6 | U | 500 | 512 | | ug/L | | 102 | 89 - 121 |
| Manganese | 50 | | 500 | 541 | | ug/L | | 98 | 79 - 121 |
| Nickel | 1.3 | U | 500 | 496 | | ug/L | | 99 | 84 - 120 |
| Selenium | 4.9 | U | 2000 | 2060 | | ug/L | | 103 | 71 - 140 |
| Silver | 0.93 | U | 50.0 | 56.3 | | ug/L | | 113 | 75 - 141 |
| Thallium | 4.9 | U | 2000 | 2020 | | ug/L | | 101 | 90 - 116 |
| Zinc | 13 | J | 500 | 505 | | ug/L | | 98 | 60 - 137 |
| Vanadium | 3.0 | J | 500 | 493 | | ug/L | | 98 | 85 - 120 |

**Lab Sample ID: 280-59833-1 MS** — **Client Sample ID: MW-1-090914**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243796** — **Prep Batch: 242978**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 500 | 494 | | ug/L | | 99 | 81 - 124 |
| Iron | 1200 | | 1000 | 2290 | | ug/L | | 107 | 52 - 155 |

**Lab Sample ID: 280-59833-1 MSD** — **Client Sample ID: MW-1-090914**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243607** — **Prep Batch: 242978**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1200 | | 2000 | 4840 | F1 | ug/L | | 184 | 83 - 119 | 3 | 20 |
| Calcium | 15000 | | 50000 | 63800 | | ug/L | | 97 | 48 - 153 | 1 | 20 |
| Magnesium | 3300 | | 50000 | 52300 | | ug/L | | 98 | 62 - 146 | 1 | 20 |
| Arsenic | 8.3 | J ^ | 1000 | 1020 | ^ | ug/L | | 101 | 84 - 124 | 1 | 20 |
| Potassium | 2800 | J | 50000 | 53400 | | ug/L | | 101 | 76 - 132 | 1 | 20 |
| Barium | 36 | | 2000 | 2010 | | ug/L | | 99 | 85 - 120 | 1 | 20 |
| Sodium | 42000 | | 50000 | 93900 | | ug/L | | 103 | 70 - 203 | 1 | 20 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-59833-1 MSD** — **Client Sample ID: MW-1-090914**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243607** — **Prep Batch: 242978**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Beryllium | 0.47 | U | 50.0 | 49.4 | | ug/L | | 99 | 79 - 121 | 0 | 20 |
| Cadmium | 0.45 | U | 100 | 101 | | ug/L | | 101 | 82 - 119 | 1 | 20 |
| Chromium | 2.8 | J | 200 | 204 | | ug/L | | 101 | 73 - 135 | 1 | 20 |
| Copper | 2.4 | J | 250 | 259 | | ug/L | | 103 | 82 - 129 | 2 | 20 |
| Cobalt | 1.2 | U | 500 | 497 | | ug/L | | 99 | 82 - 119 | 1 | 20 |
| Lead | 2.6 | U | 500 | 502 | | ug/L | | 100 | 89 - 121 | 2 | 20 |
| Manganese | 50 | | 500 | 534 | | ug/L | | 97 | 79 - 121 | 1 | 20 |
| Nickel | 1.3 | U | 500 | 489 | | ug/L | | 98 | 84 - 120 | 1 | 20 |
| Selenium | 4.9 | U | 2000 | 2030 | | ug/L | | 101 | 71 - 140 | 1 | 20 |
| Silver | 0.93 | U | 50.0 | 55.8 | | ug/L | | 112 | 75 - 141 | 1 | 20 |
| Thallium | 4.9 | U | 2000 | 1980 | | ug/L | | 99 | 90 - 116 | 2 | 20 |
| Zinc | 13 | J | 500 | 500 | | ug/L | | 97 | 60 - 137 | 1 | 20 |
| Vanadium | 3.0 | J | 500 | 487 | | ug/L | | 97 | 85 - 120 | 1 | 20 |

**Lab Sample ID: 280-59833-1 MSD** — **Client Sample ID: MW-1-090914**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243796** — **Prep Batch: 242978**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 500 | 487 | | ug/L | | 97 | 81 - 124 | 1 | 20 |
| Iron | 1200 | | 1000 | 2240 | | ug/L | | 102 | 52 - 155 | 2 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-243195/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243777** — **Prep Batch: 243195**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 20:38 | 1 |

**Lab Sample ID: LCS 280-243195/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243777** — **Prep Batch: 243195**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.59 | | ug/L | | 92 | 84 - 120 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-244163/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244163**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 0.23 | U | 5.0 | 0.23 | mg/L | | | 09/20/14 12:06 | 1 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: LCS 280-244163/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244163**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 103 | | mg/L | | 103 | 90 - 110 |

**Lab Sample ID: LCSD 280-244163/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244163**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 102 | | mg/L | | 102 | 90 - 110 | 1 | 10 |

**Lab Sample ID: MRL 280-244163/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244163**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 2.50 | 3.51 | J | mg/L | | 140 | 50 - 150 |

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 280-242830/1** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 242830**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 4.7 | U | 10 | 4.7 | mg/L | | | 09/11/14 08:51 | 1 |

**Lab Sample ID: LCS 280-242830/2** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 242830**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 501 | 501 | | mg/L | | 100 | 86 - 110 |

**Lab Sample ID: LCSD 280-242830/3** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 242830**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 501 | 504 | | mg/L | | 101 | 86 - 110 | 1 | 20 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59833-1

## GC/MS Semi VOA

### Prep Batch: 243122

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | 3510C | |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | 3510C | |
| LCS 280-243122/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 280-243122/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |
| MB 280-243122/1-A | Method Blank | Total/NA | Water | 3510C | |

### Analysis Batch: 243757

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | 8270D SIM | 243122 |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | 8270D SIM | 243122 |
| LCS 280-243122/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 243122 |
| LCSD 280-243122/3-A | Lab Control Sample Dup | Total/NA | Water | 8270D SIM | 243122 |
| MB 280-243122/1-A | Method Blank | Total/NA | Water | 8270D SIM | 243122 |

## Metals

### Prep Batch: 242978

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | 3010A | |
| 280-59833-1 MS | MW-1-090914 | Total/NA | Water | 3010A | |
| 280-59833-1 MSD | MW-1-090914 | Total/NA | Water | 3010A | |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | 3010A | |
| LCS 280-242978/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-242978/1-A | Method Blank | Total/NA | Water | 3010A | |

### Prep Batch: 243195

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | 7470A | |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | 7470A | |
| LCS 280-243195/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| MB 280-243195/1-A | Method Blank | Total/NA | Water | 7470A | |

### Analysis Batch: 243607

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | 6010C | 242978 |
| 280-59833-1 MS | MW-1-090914 | Total/NA | Water | 6010C | 242978 |
| 280-59833-1 MSD | MW-1-090914 | Total/NA | Water | 6010C | 242978 |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | 6010C | 242978 |
| LCS 280-242978/2-A | Lab Control Sample | Total/NA | Water | 6010C | 242978 |
| MB 280-242978/1-A | Method Blank | Total/NA | Water | 6010C | 242978 |

### Analysis Batch: 243777

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | 7470A | 243195 |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | 7470A | 243195 |
| LCS 280-243195/2-A | Lab Control Sample | Total/NA | Water | 7470A | 243195 |
| MB 280-243195/1-A | Method Blank | Total/NA | Water | 7470A | 243195 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59833-1

## Metals (Continued)

### Analysis Batch: 243796

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | 6010C | 242978 |
| 280-59833-1 MS | MW-1-090914 | Total/NA | Water | 6010C | 242978 |
| 280-59833-1 MSD | MW-1-090914 | Total/NA | Water | 6010C | 242978 |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | 6010C | 242978 |
| LCS 280-242978/2-A | Lab Control Sample | Total/NA | Water | 6010C | 242978 |
| MB 280-242978/1-A | Method Blank | Total/NA | Water | 6010C | 242978 |

## General Chemistry

### Analysis Batch: 242830

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | SM 2540C | |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | SM 2540C | |
| LCS 280-242830/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| LCSD 280-242830/3 | Lab Control Sample Dup | Total/NA | Water | SM 2540C | |
| MB 280-242830/1 | Method Blank | Total/NA | Water | SM 2540C | |

### Analysis Batch: 244163

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59833-1 | MW-1-090914 | Total/NA | Water | 9056A | |
| 280-59833-2 | MW-2-090914 | Total/NA | Water | 9056A | |
| LCS 280-244163/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-244163/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-244163/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-244163/3 | Lab Control Sample | Total/NA | Water | 9056A | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59833-1

## Client Sample ID: MW-1-090914

**Lab Sample ID: 280-59833-1**

**Date Collected: 09/09/14 13:25**

**Matrix: Water**

**Date Received: 09/10/14 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 981.7 mL | 1 mL | 243122 | 09/12/14 17:37 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 981.7 mL | 1 mL | 243757 | 09/18/14 19:20 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 242978 | 09/15/14 09:15 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243607 | 09/16/14 13:02 | SJS | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 242978 | 09/15/14 09:15 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243796 | 09/17/14 14:31 | LLB | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 20:50 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244163 | 09/20/14 16:26 | MRB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 242830 | 09/11/14 08:51 | SVC | TAL DEN |

## Client Sample ID: MW-2-090914

**Lab Sample ID: 280-59833-2**

**Date Collected: 09/09/14 16:07**

**Matrix: Water**

**Date Received: 09/10/14 09:20**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1010.7 mL | 1 mL | 243122 | 09/12/14 17:37 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1010.7 mL | 1 mL | 243757 | 09/18/14 18:52 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 242978 | 09/15/14 09:15 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243607 | 09/16/14 13:14 | SJS | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 242978 | 09/15/14 09:15 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243796 | 09/17/14 14:44 | LLB | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 20:52 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244163 | 09/20/14 16:43 | MRB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 242830 | 09/11/14 08:51 | SVC | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59833-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Colorado | State Program | 8 | N/A | 09-30-14 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

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**Sample Receipt Documentation ..... 18**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-59833-1

UNC Cogen

Lot #: H4I120420

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

September 23, 2014

# ANALYTICAL METHODS SUMMARY

H4I120420

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H4I120420**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M40T6 | 001 | MW-1-090914 | 09/09/14 | 13:25 |
| M40T7 | 002 | MW-2-090914 | 09/09/14 | 16:07 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H4I120420

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the

# PROJECT NARRATIVE
## H4I120420

concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of ≥2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These criteria include the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- Polychlorinated dibenzofuran purity. No peak can be identified as a polychlorinated dibenzofuran if a polychlorinated diphenyl ether peak maximizes within +/- 2 seconds of the furan candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the

# PROJECT NARRATIVE
## H4I120420

EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

# PROJECT NARRATIVE
## H4I120420

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: MW-1-090914**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I120420 - 001 | **Work Order #....:** | M40T61AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/09/14 | **Date Received....:** | 09/12/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1042 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.6 | 0.044 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.057 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.079 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.081 | pg/L |
| **1,2,3,7,8,9-HxCDD** | **0.28** | **Q B J** | **48** | **0.075** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **0.93** | **Q B J** | **48** | **0.11** | **pg/L** |
| **OCDD** | **7.8** | **B J** | **96** | **0.080** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.6 | 0.050 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.10 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 48 | 0.095 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.096 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.096 | pg/L |
| **2,3,4,6,7,8-HxCDF** | **0.34** | **Q B J** | **48** | **0.092** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.48** | **Q B J** | **48** | **0.11** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.48** | **Q B J** | **48** | **0.040** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.82** | **Q B J** | **48** | **0.056** | **pg/L** |
| **OCDF** | **4.4** | **B J** | **96** | **0.067** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 87 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 104 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 82 | 40 - 135 |
| 13C-OCDD | 77 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 82 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 92 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 92 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 70 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 74 | 40 - 135 |
| 13C-OCDF | 69 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-1-090914**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I120420 - 001 | **Work Order #....:** | M40T61AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/09/14 | **Date Received....:** | 09/12/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1042 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: MW-2-090914

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I120420 - 002 | **Work Order #....:** | M40T71AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/09/14 | **Date Received....:** | 09/12/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1041 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.6 | 0.041 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.051 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.11 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.12 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 48 | 0.11 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.62** | **Q B J** | **48** | **0.14** | **pg/L** |
| **OCDD** | **7.0** | **Q B J** | **96** | **0.11** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.6 | 0.065 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.12 | pg/L |
| **2,3,4,7,8-PeCDF** | **0.21** | **Q B J** | **48** | **0.11** | **pg/L** |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.11 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.11 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 48 | 0.11 | pg/L |
| **1,2,3,7,8,9-HxCDF** | **0.40** | **Q B J** | **48** | **0.14** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.79** | **Q B J** | **48** | **0.061** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.39** | **Q B J** | **48** | **0.075** | **pg/L** |
| **OCDF** | **3.9** | **B J** | **96** | **0.043** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 88 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 102 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 81 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 74 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 88 | 40 - 135 |
| 13C-OCDD | 84 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 82 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 96 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 93 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 73 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 83 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 86 | 40 - 135 |
| 13C-OCDF | 80 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-2-090914**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I120420 - 002 | **Work Order #....:** | M40T71AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/09/14 | **Date Received....:** | 09/12/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1041 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I150000 - 019B | **Work Order #....:** | M41D31AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.053 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 0.043 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.13 | pg/L |
| **1,2,3,6,7,8-HxCDD** | **0.43** | **Q J** | **50** | **0.15** | **pg/L** |
| **1,2,3,7,8,9-HxCDD** | **0.46** | **Q J** | **50** | **0.13** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **1.2** | **Q J** | **50** | **0.24** | **pg/L** |
| **OCDD** | **8.7** | **Q J** | **100** | **0.14** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.078 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.11 | pg/L |
| **2,3,4,7,8-PeCDF** | **0.43** | **J** | **50** | **0.095** | **pg/L** |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.11 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.26** | **Q J** | **50** | **0.12** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.19** | **Q J** | **50** | **0.11** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.17** | **Q J** | **50** | **0.13** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **1.2** | **Q J** | **50** | **0.061** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.36** | **Q J** | **50** | **0.071** | **pg/L** |
| **OCDF** | **7.3** | **J** | **100** | **0.059** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 87 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 97 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 72 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 78 | 40 - 135 |
| 13C-OCDD | 77 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 90 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 93 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 68 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 82 | 40 - 135 |
| 13C-OCDF | 68 | 40 - 135 |

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# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I150000 - 019B | **Work Order #....:** | M41D31AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# LABORATORY CONTROL SAMPLE DATA REPORT

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H4I120420 | **Work Order # ...:** | M41D31AC-LCS | **Matrix .....:** | WATER |
| **LCS Lot-Sample# :** | H4I150000 - 019 | | | | |
| **Prep Date .....:** | 09/15/14 | **Analysis Date ..:** | 09/18/14 | | |
| **Prep Batch # ...:** | 4258019 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1000 mL | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **200** | **195** | **pg/L** | **97** | | **(77 - 127)** |
| **1,2,3,7,8-PeCDD** | **1000** | **1020** | **pg/L** | **102** | | **(78 - 128)** |
| **1,2,3,4,7,8-HxCDD** | **1000** | **930** | **pg/L** | **93** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **1000** | **923** | **pg/L** | **92** | **B** | **(72 - 127)** |
| **1,2,3,7,8,9-HxCDD** | **1000** | **1080** | **pg/L** | **108** | **B** | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDD** | **1000** | **960** | **pg/L** | **96** | **B** | **(73 - 123)** |
| **OCDD** | **2000** | **1770** | **pg/L** | **89** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **200** | **203** | **pg/L** | **101** | | **(74 - 124)** |
| **1,2,3,7,8-PeCDF** | **1000** | **928** | **pg/L** | **93** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **1000** | **947** | **pg/L** | **95** | **B** | **(74 - 124)** |
| **1,2,3,4,7,8-HxCDF** | **1000** | **1010** | **pg/L** | **101** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **1000** | **926** | **pg/L** | **93** | **B** | **(75 - 125)** |
| **2,3,4,6,7,8-HxCDF** | **1000** | **918** | **pg/L** | **92** | **B** | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **1000** | **954** | **pg/L** | **95** | **B** | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDF** | **1000** | **932** | **pg/L** | **93** | **B** | **(71 - 121)** |
| **1,2,3,4,7,8,9-HpCDF** | **1000** | **1000** | **pg/L** | **100** | **B** | **(73 - 123)** |
| **OCDF** | **2000** | **1870** | **pg/L** | **93** | **B** | **(68 - 132)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 87 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 100 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 85 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 76 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 86 | (40 - 135) |
| 13C-OCDD | 89 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 81 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 93 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 95 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 75 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 74 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 85 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 83 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 79 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 85 | (40 - 135) |
| 13C-OCDF | 80 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H4I 12042D

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-264791.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-59833-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 9/26/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2SO3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - ph 4-5 |
| L - EDA | Z - other (specify) |

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-1-090914 (280-59833-1) | 9/9/14 | 13:25 Eastern | | Water | | | X | 2 | |
| MW-2-090914 (280-59833-2) | 9/9/14 | 16:07 Eastern | | Water | | | X | 2 | |

RT CT
REC. @ 0.8°c 0.8°c
CUSTODY SEAL INTACT
1 COOLER RH 9-12-14
FED EX #613992162036

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| Charles Scianno | 9-11-14 1530 | | Ryan Henry | 9/12/14 1030 | |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** HYI120420

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : 5C57<br>Correction factor: 0.0 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: NA

Sample Receiving Associate: Ryan Henry Date: 9/12/14

QA026R28.doc, 042414

# Chain of Custody Record

Sampler ID _____

Temperature on Receipt 1.1, 4.9 IR 0.0 Transferred by MT 9/10/14

Drinking Water? Yes ☐ No ☐

TestAmeri

THE LEADER IN ENVIRONMENTAL

280-59833 Chain of Custody

TAL-4124-280 (0508)

| Client | Project Manager | Date | Chain of Custody Number |
|---|---|---|---|
| Geosyntec Consultants | Beau Hodge | 9/9/14 | 183733 |
| **Address** | **Telephone Number (Area Code)/Fax Number** | **Lab Number** | **Page 1 of 1** |
| 2501 Blue Ridge Rd Suite 430 | 919-412-5118 | | |
| **City / State / Zip Code** | **Site Contact / Lab Contact** | | |
| Raleigh NC 27607 | Rachel Donahue / Patrick McIntee | | |
| **Project Name and Location (State)** | **Carrier/Waybill Number** | | |
| UNC Chapel Hill, NC | | | |
| **Contract/Purchase Order/Quote No.** | | | |

Analysis (Attach list if more space is needed)

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Air | Aqueous | Sed. | Soil | Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | 8270-PAHs | 8260-DCE | 6010C-Metals | 7470A-Hg | 2540C-TDS | 9056A-SO4 | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-1-090914 | 9/9/14 | 1325 | | X | | | 5 | | 1 | | | | X | X | X | X | X | X | |
| MW-2-090914 | 9/9/14 | 1607 | | X | | | 5 | | 1 | | | | X | X | X | X | X | X | |

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☒ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

| | Date | Time | | Date | Time |
|---|---|---|---|---|---|
| 1. Relinquished By | 9/9/14 | 1820 | 1. Received By FEDEX | | |
| 2. Relinquished By | | | 2. Received By | 9/10/14 | 9:20 |
| 3. Relinquished By | | | 3. Received By | | |

Comments: Samples shipped in 2 coolers

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-59833-1

**Login Number: 59833**
**List Number: 1**
**Creator: Dedio, Michael T**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | True | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Field on COC is blank. |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

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# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-59878-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 5:56:18 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| * | LCS or LCSD is outside acceptance limits. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-59878-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-59878-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**
The samples were received on 9/11/2014 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 4 coolers at receipt time were 0.5º C, 0.7º C, 1.8º C and 5.3º C.

Except:

One of four 1L amber bottles for sample MW-99-091014 was received broken. Sufficient volume remains for analysis.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 9/13/2014 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.4º C.

**8270D SIM GCMS**
Samples MW-4-091014 (280-59878-1), MW-3-091014 (280-59878-2), MW-99-091014 (280-59878-3) and MW-5-091014 (280-59878-4) were analyzed for 8270D SIM GCMS in accordance with SW-846 8270D_SIM. The samples were prepared on 09/12/2014 and analyzed on 09/18/2014 and 09/23/2014.

Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene and Indeno[1,2,3-cd]pyrene failed the recovery criteria high for LCS 280-243122/2-A. Several analytes failed the recovery criteria high for LCSD 280-243122/3-A. Refer to the QC report for details. These analytes were biased high and were not detected in the associated samples; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**
Samples MW-4-091014 (280-59878-1), MW-3-091014 (280-59878-2), MW-99-091014 (280-59878-3) and MW-5-091014 (280-59878-4) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/15/2014 and analyzed on 09/16/2014.

The continuing calibration verification (CCVL 280-243610/95) associated with batch 243610 recovered above the upper control limit for As. The samples associated with this CCVL were below the RL for the affected analytes; therefore, the data have been reported. Associated results are qualified ^.

## Job ID: 280-59878-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY**
Samples MW-4-091014 (280-59878-1), MW-3-091014 (280-59878-2), MW-99-091014 (280-59878-3) and MW-5-091014 (280-59878-4) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 09/17/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL DISSOLVED SOLIDS**
Samples MW-4-091014 (280-59878-1), MW-3-091014 (280-59878-2), MW-99-091014 (280-59878-3) and MW-5-091014 (280-59878-4) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 09/12/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS)**
Samples MW-4-091014 (280-59878-1), MW-3-091014 (280-59878-2), MW-99-091014 (280-59878-3) and MW-5-091014 (280-59878-4) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 09/22/2014 and 09/23/2014.

Samples MW-3-091014 (280-59878-2)[5X], MW-99-091014 (280-59878-3)[5X] and MW-5-091014 (280-59878-4)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

## Client Sample ID: MW-4-091014 — Lab Sample ID: 280-59878-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 22 | J | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 14000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 4100 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 3600 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 34 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 15000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 19 | | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 1.7 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 7.7 | J | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 1.8 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 8.8 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 53 | | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 140 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-3-091014 — Lab Sample ID: 280-59878-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 65000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 19000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 8500 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 18 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 99000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Beryllium | 0.51 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 2.8 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 130 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 460 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 7700 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 27 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Silver | 2.4 | J | 10 | 0.93 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 38 | | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Vanadium | 1.1 | J | 10 | 1.1 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 290 | | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Total Dissolved Solids | 650 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-99-091014 — Lab Sample ID: 280-59878-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 63000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 18000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 8300 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 19 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 97000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Beryllium | 0.69 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 2.5 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 120 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 450 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 7600 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 27 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Silver | 1.8 | J | 10 | 0.93 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 37 | | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

## Client Sample ID: MW-99-091014 (Continued) — Lab Sample ID: 280-59878-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Vanadium | 1.4 | J | 10 | 1.1 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 280 | | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Total Dissolved Solids | 640 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-5-091014 — Lab Sample ID: 280-59878-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 42000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 14000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2400 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 18 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 61000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 1.8 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 1.8 | J | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 28 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 5.7 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 170 | | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Total Dissolved Solids | 420 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Water | 09/10/14 11:05 | 09/11/14 09:20 |
| 280-59878-2 | MW-3-091014 | Water | 09/10/14 12:15 | 09/11/14 09:20 |
| 280-59878-3 | MW-99-091014 | Water | 09/10/14 17:00 | 09/11/14 09:20 |
| 280-59878-4 | MW-5-091014 | Water | 09/10/14 15:10 | 09/11/14 09:20 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: MW-4-091014**
**Date Collected: 09/10/14 11:05**
**Date Received: 09/11/14 09:20**

**Lab Sample ID: 280-59878-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 96 | 5.4 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| 2-Methylnaphthalene | 4.9 | U | 96 | 4.9 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Acenaphthene | 10 | U | 96 | 10 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Acenaphthylene | 9.5 | U | 96 | 9.5 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Anthracene | 14 | U | 96 | 14 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Benzo[a]anthracene | 3.1 | U | 96 | 3.1 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Benzo[a]pyrene | 4.9 | U | 96 | 4.9 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Benzo[b]fluoranthene | 3.3 | U * | 96 | 3.3 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 96 | 3.4 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Benzo[k]fluoranthene | 4.8 | U * | 96 | 4.8 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Chrysene | 3.1 | U * | 96 | 3.1 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U * | 96 | 4.6 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Fluoranthene | 4.3 | U * | 96 | 4.3 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Fluorene | 18 | U | 96 | 18 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 96 | 14 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Naphthalene | 5.1 | U | 96 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Phenanthrene | 9.3 | U | 96 | 9.3 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |
| Pyrene | 7.7 | U * | 96 | 7.7 | ng/L | | 09/12/14 17:37 | 09/18/14 19:47 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *93* | | *42 - 120* | *09/12/14 17:37* | *09/18/14 19:47* | *1* |
| *Nitrobenzene-d5* | *73* | | *43 - 120* | *09/12/14 17:37* | *09/18/14 19:47* | *1* |
| *Terphenyl-d14* | *110* | | *47 - 120* | *09/12/14 17:37* | *09/18/14 19:47* | *1* |

**Client Sample ID: MW-3-091014**
**Date Collected: 09/10/14 12:15**
**Date Received: 09/11/14 09:20**

**Lab Sample ID: 280-59878-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 96 | 5.4 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| 2-Methylnaphthalene | 4.9 | U | 96 | 4.9 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Acenaphthene | 10 | U | 96 | 10 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Acenaphthylene | 9.5 | U | 96 | 9.5 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Anthracene | 14 | U | 96 | 14 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Benzo[a]anthracene | 3.1 | U | 96 | 3.1 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Benzo[a]pyrene | 4.9 | U | 96 | 4.9 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Benzo[b]fluoranthene | 3.3 | U * | 96 | 3.3 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 96 | 3.4 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Benzo[k]fluoranthene | 4.8 | U * | 96 | 4.8 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Chrysene | 3.0 | U * | 96 | 3.0 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U * | 96 | 4.6 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Fluoranthene | 4.3 | U * | 96 | 4.3 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Fluorene | 18 | U | 96 | 18 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 96 | 14 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Naphthalene | 5.1 | U | 96 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Phenanthrene | 9.3 | U | 96 | 9.3 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |
| Pyrene | 7.7 | U * | 96 | 7.7 | ng/L | | 09/12/14 17:37 | 09/18/14 20:15 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *42 - 120* | *09/12/14 17:37* | *09/18/14 20:15* | *1* |
| *Nitrobenzene-d5* | *65* | | *43 - 120* | *09/12/14 17:37* | *09/18/14 20:15* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: MW-3-091014**
**Date Collected: 09/10/14 12:15**
**Date Received: 09/11/14 09:20**

**Lab Sample ID: 280-59878-2**
**Matrix: Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *103* | | *47 - 120* | *09/12/14 17:37* | *09/18/14 20:15* | *1* |

**Client Sample ID: MW-99-091014**
**Date Collected: 09/10/14 17:00**
**Date Received: 09/11/14 09:20**

**Lab Sample ID: 280-59878-3**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 95 | 5.4 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| 2-Methylnaphthalene | 4.9 | U | 95 | 4.9 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Acenaphthene | 10 | U | 95 | 10 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Acenaphthylene | 9.5 | U | 95 | 9.5 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Anthracene | 14 | U | 95 | 14 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Benzo[a]anthracene | 3.1 | U | 95 | 3.1 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Benzo[a]pyrene | 4.9 | U | 95 | 4.9 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Benzo[b]fluoranthene | 3.3 | U * | 95 | 3.3 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 95 | 3.4 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Benzo[k]fluoranthene | 4.8 | U * | 95 | 4.8 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Chrysene | 3.0 | U * | 95 | 3.0 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U * | 95 | 4.6 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Fluoranthene | 4.3 | U * | 95 | 4.3 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Fluorene | 18 | U | 95 | 18 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 95 | 14 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Naphthalene | 5.1 | U | 95 | 5.1 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Phenanthrene | 9.3 | U | 95 | 9.3 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |
| Pyrene | 7.7 | U * | 95 | 7.7 | ng/L | | 09/12/14 17:37 | 09/23/14 14:19 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | | *42 - 120* | *09/12/14 17:37* | *09/23/14 14:19* | *1* |
| *Nitrobenzene-d5* | *82* | | *43 - 120* | *09/12/14 17:37* | *09/23/14 14:19* | *1* |
| *Terphenyl-d14* | *89* | | *47 - 120* | *09/12/14 17:37* | *09/23/14 14:19* | *1* |

**Client Sample ID: MW-5-091014**
**Date Collected: 09/10/14 15:10**
**Date Received: 09/11/14 09:20**

**Lab Sample ID: 280-59878-4**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 95 | 5.4 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| 2-Methylnaphthalene | 4.9 | U | 95 | 4.9 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Acenaphthene | 10 | U | 95 | 10 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Acenaphthylene | 9.5 | U | 95 | 9.5 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Anthracene | 13 | U | 95 | 13 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Benzo[a]anthracene | 3.0 | U | 95 | 3.0 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Benzo[a]pyrene | 4.9 | U | 95 | 4.9 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Benzo[b]fluoranthene | 3.3 | U * | 95 | 3.3 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 95 | 3.4 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Benzo[k]fluoranthene | 4.8 | U * | 95 | 4.8 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Chrysene | 3.0 | U * | 95 | 3.0 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U * | 95 | 4.6 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Fluoranthene | 4.3 | U * | 95 | 4.3 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Fluorene | 18 | U | 95 | 18 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 95 | 14 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Naphthalene | 5.1 | U | 95 | 5.1 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: MW-5-091014** — **Lab Sample ID: 280-59878-4**
**Date Collected: 09/10/14 15:10** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 9.3 | U | 95 | 9.3 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |
| Pyrene | 7.7 | U * | 95 | 7.7 | ng/L | | 09/12/14 17:37 | 09/23/14 14:47 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *87* | | *42 - 120* | *09/12/14 17:37* | *09/23/14 14:47* | *1* |
| *Nitrobenzene-d5* | *84* | | *43 - 120* | *09/12/14 17:37* | *09/23/14 14:47* | *1* |
| *Terphenyl-d14* | *92* | | *47 - 120* | *09/12/14 17:37* | *09/23/14 14:47* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: MW-4-091014** — **Lab Sample ID: 280-59878-1**
**Date Collected: 09/10/14 11:05** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **22** | **J** | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Calcium** | **14000** | | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Magnesium** | **4100** | | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Potassium** | **3600** | | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Barium** | **34** | | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Sodium** | **15000** | | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Chromium** | **19** | | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Copper** | **1.7** | **J** | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Manganese** | **7.7** | **J** | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Nickel** | **1.8** | **J** | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| **Zinc** | **8.8** | **J** | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:18 | 1 |

**Client Sample ID: MW-3-091014** — **Lab Sample ID: 280-59878-2**
**Date Collected: 09/10/14 12:15** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Calcium** | **65000** | | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Magnesium** | **19000** | | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Potassium** | **8500** | | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Barium** | **18** | | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Sodium** | **99000** | | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Beryllium** | **0.51** | **J** | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-3-091014** **Lab Sample ID: 280-59878-2**
**Date Collected: 09/10/14 12:15** **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Copper** | **2.8** | **J** | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Cobalt** | **130** | | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Iron** | **460** | | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Manganese** | **7700** | | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Nickel** | **27** | **J** | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Silver** | **2.4** | **J** | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Zinc** | **38** | | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |
| **Vanadium** | **1.1** | **J** | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:20 | 1 |

**Client Sample ID: MW-99-091014** **Lab Sample ID: 280-59878-3**
**Date Collected: 09/10/14 17:00** **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Calcium** | **63000** | | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Magnesium** | **18000** | | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Potassium** | **8300** | | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Barium** | **19** | | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Sodium** | **97000** | | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Beryllium** | **0.69** | **J** | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Copper** | **2.5** | **J** | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Cobalt** | **120** | | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Iron** | **450** | | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Manganese** | **7600** | | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Nickel** | **27** | **J** | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Silver** | **1.8** | **J** | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Zinc** | **37** | | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |
| **Vanadium** | **1.4** | **J** | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:23 | 1 |

**Client Sample ID: MW-5-091014** **Lab Sample ID: 280-59878-4**
**Date Collected: 09/10/14 15:10** **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| **Calcium** | **42000** | | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| **Magnesium** | **14000** | | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-5-091014** — **Lab Sample ID: 280-59878-4**
**Date Collected: 09/10/14 15:10** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Potassium** | **2400** | **J** | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| **Barium** | **18** | | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| **Sodium** | **61000** | | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| **Copper** | **1.8** | **J** | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| **Cobalt** | **1.8** | **J** | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| **Manganese** | **28** | | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| **Nickel** | **5.7** | **J** | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:26 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-4-091014** — **Lab Sample ID: 280-59878-1**
**Date Collected: 09/10/14 11:05** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 20:57 | 1 |

**Client Sample ID: MW-3-091014** — **Lab Sample ID: 280-59878-2**
**Date Collected: 09/10/14 12:15** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 21:04 | 1 |

**Client Sample ID: MW-99-091014** — **Lab Sample ID: 280-59878-3**
**Date Collected: 09/10/14 17:00** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 21:06 | 1 |

**Client Sample ID: MW-5-091014** — **Lab Sample ID: 280-59878-4**
**Date Collected: 09/10/14 15:10** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 21:08 | 1 |

## General Chemistry

**Client Sample ID: MW-4-091014** — **Lab Sample ID: 280-59878-1**
**Date Collected: 09/10/14 11:05** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Sulfate** | **53** | | 5.0 | 0.23 | mg/L | | | 09/22/14 20:25 | 1 |

## General Chemistry (Continued)

**Client Sample ID: MW-4-091014** — **Lab Sample ID: 280-59878-1**
**Date Collected: 09/10/14 11:05** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 140 | | 10 | 4.7 | mg/L | | | 09/12/14 11:26 | 1 |

**Client Sample ID: MW-3-091014** — **Lab Sample ID: 280-59878-2**
**Date Collected: 09/10/14 12:15** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 290 | | 25 | 1.2 | mg/L | | | 09/23/14 19:13 | 5 |
| Total Dissolved Solids | 650 | | 10 | 4.7 | mg/L | | | 09/12/14 11:26 | 1 |

**Client Sample ID: MW-99-091014** — **Lab Sample ID: 280-59878-3**
**Date Collected: 09/10/14 17:00** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 280 | | 25 | 1.2 | mg/L | | | 09/23/14 19:32 | 5 |
| Total Dissolved Solids | 640 | | 10 | 4.7 | mg/L | | | 09/12/14 11:26 | 1 |

**Client Sample ID: MW-5-091014** — **Lab Sample ID: 280-59878-4**
**Date Collected: 09/10/14 15:10** — **Matrix: Water**
**Date Received: 09/11/14 09:20**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 170 | | 25 | 1.2 | mg/L | | | 09/23/14 19:52 | 5 |
| Total Dissolved Solids | 420 | | 10 | 4.7 | mg/L | | | 09/12/14 11:26 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| **Lab Sample ID** | **Client Sample ID** | **(42-120)** | **(43-120)** | **(47-120)** |
| 280-59878-1 | MW-4-091014 | 93 | 73 | 110 |
| 280-59878-2 | MW-3-091014 | 85 | 65 | 103 |
| 280-59878-3 | MW-99-091014 | 81 | 82 | 89 |
| 280-59878-4 | MW-5-091014 | 87 | 84 | 92 |
| LCS 280-243122/2-A | Lab Control Sample | 89 | 74 | 98 |
| LCSD 280-243122/3-A | Lab Control Sample Dup | 96 | 79 | 109 |
| MB 280-243122/1-A | Method Blank | 85 | 85 | 104 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-243122/1-A**
**Matrix: Water**
**Analysis Batch: 243757**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 243122**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 09/12/14 17:37 | 09/18/14 10:05 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *42 - 120* | *09/12/14 17:37* | *09/18/14 10:05* | *1* |
| *Nitrobenzene-d5* | *85* | | *43 - 120* | *09/12/14 17:37* | *09/18/14 10:05* | *1* |
| *Terphenyl-d14* | *104* | | *47 - 120* | *09/12/14 17:37* | *09/18/14 10:05* | *1* |

**Lab Sample ID: LCS 280-243122/2-A**
**Matrix: Water**
**Analysis Batch: 243757**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243122**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 873 | | ng/L | | 97 | 47 - 120 |
| Acenaphthylene | 900 | 853 | | ng/L | | 95 | 39 - 120 |
| Anthracene | 900 | 938 | | ng/L | | 104 | 28 - 120 |
| Benzo[a]anthracene | 900 | 957 | | ng/L | | 106 | 42 - 120 |
| Benzo[a]pyrene | 900 | 1000 | | ng/L | | 111 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 1010 | | ng/L | | 112 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 1140 | * | ng/L | | 127 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 1180 | * | ng/L | | 131 | 43 - 120 |
| Chrysene | 900 | 1130 | * | ng/L | | 125 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 1090 | | ng/L | | 121 | 27 - 126 |
| Fluoranthene | 900 | 980 | | ng/L | | 109 | 46 - 120 |
| Fluorene | 900 | 909 | | ng/L | | 101 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 1110 | * | ng/L | | 124 | 38 - 120 |
| Naphthalene | 900 | 777 | | ng/L | | 86 | 37 - 120 |
| Phenanthrene | 900 | 930 | | ng/L | | 103 | 46 - 120 |
| Pyrene | 900 | 964 | | ng/L | | 107 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-243122/2-A**
**Matrix: Water**
**Analysis Batch: 243757**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243122**

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 89 | | 42 - 120 |
| Nitrobenzene-d5 | 74 | | 43 - 120 |
| Terphenyl-d14 | 98 | | 47 - 120 |

**Lab Sample ID: LCSD 280-243122/3-A**
**Matrix: Water**
**Analysis Batch: 243757**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 243122**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 893 | | ng/L | | 99 | 47 - 120 | 2 | 50 |
| Acenaphthylene | 900 | 887 | | ng/L | | 99 | 39 - 120 | 4 | 50 |
| Anthracene | 900 | 1020 | | ng/L | | 113 | 28 - 120 | 8 | 50 |
| Benzo[a]anthracene | 900 | 1040 | | ng/L | | 116 | 42 - 120 | 9 | 40 |
| Benzo[a]pyrene | 900 | 1070 | | ng/L | | 119 | 38 - 120 | 7 | 21 |
| Benzo[b]fluoranthene | 900 | 1100 | * | ng/L | | 122 | 44 - 120 | 8 | 28 |
| Benzo[g,h,i]perylene | 900 | 1190 | * | ng/L | | 132 | 39 - 120 | 4 | 23 |
| Benzo[k]fluoranthene | 900 | 1250 | * | ng/L | | 139 | 43 - 120 | 5 | 28 |
| Chrysene | 900 | 1220 | * | ng/L | | 135 | 35 - 120 | 8 | 41 |
| Dibenz(a,h)anthracene | 900 | 1140 | * | ng/L | | 127 | 27 - 126 | 5 | 25 |
| Fluoranthene | 900 | 1090 | * | ng/L | | 121 | 46 - 120 | 11 | 24 |
| Fluorene | 900 | 953 | | ng/L | | 106 | 49 - 120 | 5 | 50 |
| Indeno[1,2,3-cd]pyrene | 900 | 1180 | * | ng/L | | 131 | 38 - 120 | 6 | 25 |
| Naphthalene | 900 | 742 | | ng/L | | 82 | 37 - 120 | 5 | 50 |
| Phenanthrene | 900 | 1000 | | ng/L | | 112 | 46 - 120 | 8 | 42 |
| Pyrene | 900 | 1090 | * | ng/L | | 121 | 49 - 120 | 12 | 22 |

| Surrogate | LCSD %Recovery | LCSD Qualifier | Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 96 | | 42 - 120 |
| Nitrobenzene-d5 | 79 | | 43 - 120 |
| Terphenyl-d14 | 109 | | 47 - 120 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-243266/1-A**
**Matrix: Water**
**Analysis Batch: 243610**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 243266**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Sodium | 92 | U | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-243266/1-A**
**Matrix: Water**
**Analysis Batch: 243610**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 243266**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |

**Lab Sample ID: LCS 280-243266/2-A**
**Matrix: Water**
**Analysis Batch: 243610**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243266**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1990 | | ug/L | | 100 | 87 - 111 |
| Calcium | 50000 | 46800 | | ug/L | | 94 | 90 - 111 |
| Antimony | 500 | 489 | | ug/L | | 98 | 88 - 110 |
| Magnesium | 50000 | 47900 | | ug/L | | 96 | 90 - 113 |
| Arsenic | 1000 | 975 | ^ | ug/L | | 98 | 88 - 110 |
| Potassium | 50000 | 49300 | | ug/L | | 99 | 89 - 114 |
| Barium | 2000 | 1910 | | ug/L | | 96 | 90 - 112 |
| Sodium | 50000 | 52800 | | ug/L | | 106 | 90 - 115 |
| Beryllium | 50.0 | 46.9 | | ug/L | | 94 | 89 - 113 |
| Cadmium | 100 | 97.5 | | ug/L | | 98 | 88 - 111 |
| Chromium | 200 | 194 | | ug/L | | 97 | 90 - 113 |
| Copper | 250 | 248 | | ug/L | | 99 | 86 - 112 |
| Cobalt | 500 | 482 | | ug/L | | 96 | 89 - 111 |
| Iron | 1000 | 942 | | ug/L | | 94 | 89 - 115 |
| Lead | 500 | 493 | | ug/L | | 99 | 89 - 110 |
| Manganese | 500 | 471 | | ug/L | | 94 | 90 - 110 |
| Nickel | 500 | 475 | | ug/L | | 95 | 89 - 111 |
| Selenium | 2000 | 1960 | | ug/L | | 98 | 85 - 112 |
| Silver | 50.0 | 54.7 | | ug/L | | 109 | 86 - 115 |
| Thallium | 2000 | 1950 | | ug/L | | 97 | 88 - 110 |
| Zinc | 500 | 476 | | ug/L | | 95 | 85 - 111 |
| Vanadium | 500 | 468 | | ug/L | | 94 | 90 - 111 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-243195/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243777** — **Prep Batch: 243195**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 20:38 | 1 |

**Lab Sample ID: LCS 280-243195/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243777** — **Prep Batch: 243195**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.59 | | ug/L | | 92 | 84 - 120 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-244369/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244369**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 0.23 | U | 5.0 | 0.23 | mg/L | | | 09/22/14 19:06 | 1 |

**Lab Sample ID: LCS 280-244369/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244369**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 93.0 | | mg/L | | 93 | 90 - 110 |

**Lab Sample ID: LCSD 280-244369/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244369**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 92.9 | | mg/L | | 93 | 90 - 110 | 0 | 10 |

**Lab Sample ID: MRL 280-244369/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244369**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 2.50 | 2.39 | J | mg/L | | 96 | 50 - 150 |

**Lab Sample ID: 280-59878-1 MS** — **Client Sample ID: MW-4-091014**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244369**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 53 | | 25.0 | 79.2 | | mg/L | | 105 | 80 - 120 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 280-59878-1 MSD** — **Client Sample ID: MW-4-091014**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244369**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 53 | | 25.0 | 79.0 | | mg/L | | 104 | 80 - 120 | 0 | 20 |

**Lab Sample ID: 280-59878-1 DU** — **Client Sample ID: MW-4-091014**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244369**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 53 | | | 53.1 | | mg/L | | | | 0.2 | 15 |

**Lab Sample ID: MB 280-244490/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244490**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 0.23 | U | 5.0 | 0.23 | mg/L | | | 09/23/14 12:32 | 1 |

**Lab Sample ID: LCS 280-244490/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244490**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | | | 100 | 92.0 | | mg/L | | 92 | 90 - 110 | | |

**Lab Sample ID: LCSD 280-244490/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244490**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | | | 100 | 92.0 | | mg/L | | 92 | 90 - 110 | 0 | 10 |

**Lab Sample ID: MRL 280-244490/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244490**

| Analyte | | | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | | | 2.50 | 2.29 | J | mg/L | | 92 | 50 - 150 | | |

**Lab Sample ID: 280-59878-4 MS** — **Client Sample ID: MW-5-091014**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244490**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 170 | | 125 | 292 | | mg/L | | 99 | 80 - 120 | | |

**Lab Sample ID: 280-59878-4 MSD** — **Client Sample ID: MW-5-091014**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244490**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 170 | | 125 | 291 | | mg/L | | 98 | 80 - 120 | 0 | 20 |

**Lab Sample ID: 280-59878-4 DU** — **Client Sample ID: MW-5-091014**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244490**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 170 | | | 169 | | mg/L | | | | 0.4 | 15 |

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 280-243082/1** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243082**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 4.7 | U | 10 | 4.7 | mg/L | | | 09/12/14 11:26 | 1 |

**Lab Sample ID: LCS 280-243082/2** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243082**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | | | 501 | 498 | | mg/L | | 99 | 86 - 110 | | |

**Lab Sample ID: LCSD 280-243082/3** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243082**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | | | 501 | 500 | | mg/L | | 100 | 86 - 110 | 0 | 20 |

**Lab Sample ID: 280-59878-4 DU** — **Client Sample ID: MW-5-091014**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243082**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 420 | | | 414 | | mg/L | | | | 1 | 10 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

## GC/MS Semi VOA

### Prep Batch: 243122

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Total/NA | Water | 3510C | |
| 280-59878-2 | MW-3-091014 | Total/NA | Water | 3510C | |
| 280-59878-3 | MW-99-091014 | Total/NA | Water | 3510C | |
| 280-59878-4 | MW-5-091014 | Total/NA | Water | 3510C | |
| LCS 280-243122/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 280-243122/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |
| MB 280-243122/1-A | Method Blank | Total/NA | Water | 3510C | |

### Analysis Batch: 243757

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Total/NA | Water | 8270D SIM | 243122 |
| 280-59878-2 | MW-3-091014 | Total/NA | Water | 8270D SIM | 243122 |
| LCS 280-243122/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 243122 |
| LCSD 280-243122/3-A | Lab Control Sample Dup | Total/NA | Water | 8270D SIM | 243122 |
| MB 280-243122/1-A | Method Blank | Total/NA | Water | 8270D SIM | 243122 |

### Analysis Batch: 244517

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-3 | MW-99-091014 | Total/NA | Water | 8270D SIM | 243122 |
| 280-59878-4 | MW-5-091014 | Total/NA | Water | 8270D SIM | 243122 |

## Metals

### Prep Batch: 243195

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Total/NA | Water | 7470A | |
| 280-59878-2 | MW-3-091014 | Total/NA | Water | 7470A | |
| 280-59878-3 | MW-99-091014 | Total/NA | Water | 7470A | |
| 280-59878-4 | MW-5-091014 | Total/NA | Water | 7470A | |
| LCS 280-243195/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| MB 280-243195/1-A | Method Blank | Total/NA | Water | 7470A | |

### Prep Batch: 243266

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Total/NA | Water | 3010A | |
| 280-59878-2 | MW-3-091014 | Total/NA | Water | 3010A | |
| 280-59878-3 | MW-99-091014 | Total/NA | Water | 3010A | |
| 280-59878-4 | MW-5-091014 | Total/NA | Water | 3010A | |
| LCS 280-243266/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-243266/1-A | Method Blank | Total/NA | Water | 3010A | |

### Analysis Batch: 243610

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Total/NA | Water | 6010C | 243266 |
| 280-59878-2 | MW-3-091014 | Total/NA | Water | 6010C | 243266 |
| 280-59878-3 | MW-99-091014 | Total/NA | Water | 6010C | 243266 |
| 280-59878-4 | MW-5-091014 | Total/NA | Water | 6010C | 243266 |
| LCS 280-243266/2-A | Lab Control Sample | Total/NA | Water | 6010C | 243266 |
| MB 280-243266/1-A | Method Blank | Total/NA | Water | 6010C | 243266 |

## Metals (Continued)

### Analysis Batch: 243777

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Total/NA | Water | 7470A | 243195 |
| 280-59878-2 | MW-3-091014 | Total/NA | Water | 7470A | 243195 |
| 280-59878-3 | MW-99-091014 | Total/NA | Water | 7470A | 243195 |
| 280-59878-4 | MW-5-091014 | Total/NA | Water | 7470A | 243195 |
| LCS 280-243195/2-A | Lab Control Sample | Total/NA | Water | 7470A | 243195 |
| MB 280-243195/1-A | Method Blank | Total/NA | Water | 7470A | 243195 |

## General Chemistry

### Analysis Batch: 243082

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Total/NA | Water | SM 2540C | |
| 280-59878-2 | MW-3-091014 | Total/NA | Water | SM 2540C | |
| 280-59878-3 | MW-99-091014 | Total/NA | Water | SM 2540C | |
| 280-59878-4 | MW-5-091014 | Total/NA | Water | SM 2540C | |
| 280-59878-4 DU | MW-5-091014 | Total/NA | Water | SM 2540C | |
| LCS 280-243082/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| LCSD 280-243082/3 | Lab Control Sample Dup | Total/NA | Water | SM 2540C | |
| MB 280-243082/1 | Method Blank | Total/NA | Water | SM 2540C | |

### Analysis Batch: 244369

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-1 | MW-4-091014 | Total/NA | Water | 9056A | |
| 280-59878-1 DU | MW-4-091014 | Total/NA | Water | 9056A | |
| 280-59878-1 MS | MW-4-091014 | Total/NA | Water | 9056A | |
| 280-59878-1 MSD | MW-4-091014 | Total/NA | Water | 9056A | |
| LCS 280-244369/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-244369/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-244369/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-244369/3 | Lab Control Sample | Total/NA | Water | 9056A | |

### Analysis Batch: 244490

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59878-2 | MW-3-091014 | Total/NA | Water | 9056A | |
| 280-59878-3 | MW-99-091014 | Total/NA | Water | 9056A | |
| 280-59878-4 | MW-5-091014 | Total/NA | Water | 9056A | |
| 280-59878-4 DU | MW-5-091014 | Total/NA | Water | 9056A | |
| 280-59878-4 MS | MW-5-091014 | Total/NA | Water | 9056A | |
| 280-59878-4 MSD | MW-5-091014 | Total/NA | Water | 9056A | |
| LCS 280-244490/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-244490/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-244490/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-244490/3 | Lab Control Sample | Total/NA | Water | 9056A | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

## Client Sample ID: MW-4-091014 — Lab Sample ID: 280-59878-1

**Date Collected: 09/10/14 11:05**
**Date Received: 09/11/14 09:20**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1043.2 mL | 1 mL | 243122 | 09/12/14 17:37 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1043.2 mL | 1 mL | 243757 | 09/18/14 19:47 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 243266 | 09/15/14 14:50 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243610 | 09/16/14 20:18 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 20:57 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244369 | 09/22/14 20:25 | MRB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 243082 | 09/12/14 11:26 | SVC | TAL DEN |

## Client Sample ID: MW-3-091014 — Lab Sample ID: 280-59878-2

**Date Collected: 09/10/14 12:15**
**Date Received: 09/11/14 09:20**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1046.9 mL | 1 mL | 243122 | 09/12/14 17:37 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1046.9 mL | 1 mL | 243757 | 09/18/14 20:15 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 243266 | 09/15/14 14:50 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243610 | 09/16/14 20:20 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 21:04 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 244490 | 09/23/14 19:13 | MRB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 243082 | 09/12/14 11:26 | SVC | TAL DEN |

## Client Sample ID: MW-99-091014 — Lab Sample ID: 280-59878-3

**Date Collected: 09/10/14 17:00**
**Date Received: 09/11/14 09:20**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1048.6 mL | 1 mL | 243122 | 09/12/14 17:37 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1048.6 mL | 1 mL | 244517 | 09/23/14 14:19 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 243266 | 09/15/14 14:50 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243610 | 09/16/14 20:23 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 21:06 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 244490 | 09/23/14 19:32 | MRB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 243082 | 09/12/14 11:26 | SVC | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

## Client Sample ID: MW-5-091014

**Date Collected: 09/10/14 15:10**
**Date Received: 09/11/14 09:20**

## Lab Sample ID: 280-59878-4

**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1052.5 mL | 1 mL | 243122 | 09/12/14 17:37 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1052.5 mL | 1 mL | 244517 | 09/23/14 14:47 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 243266 | 09/15/14 14:50 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243610 | 09/16/14 20:26 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 21:08 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 244490 | 09/23/14 19:52 | MRB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 243082 | 09/12/14 11:26 | SVC | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59878-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Colorado | State Program | 8 | N/A | 09-30-14 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

**H4I140406 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 22**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-59878-1

UNC Cogen

Lot #: H4I140406

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

September 23, 2014

# ANALYTICAL METHODS SUMMARY

H4I140406

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

H4I140406

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M405K | 001 | MW-4-091014 | 09/10/14 | 11:05 |
| M405L | 002 | MW-3-091014 | 09/10/14 | 12:15 |
| M405M | 003 | MW-99-091014 | 09/10/14 | 17:00 |
| M405N | 004 | MW-5-091014 | 09/10/14 | 15:10 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H4I140406

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the

# PROJECT NARRATIVE
## H4I140406

concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of ≥2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These criteria include the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- Polychlorinated dibenzofuran purity. No peak can be identified as a polychlorinated dibenzofuran if a polychlorinated diphenyl ether peak maximizes within +/- 2 seconds of the furan candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the

# PROJECT NARRATIVE
## H4I140406

EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

# PROJECT NARRATIVE
## H4I140406

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Indiana | State Program | 5 | C-TN-02 |
| TestAmerica Knoxville | Iowa | State Program | 7 | 375 |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA110001 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Minnesota | NELAC | 5 | 047-999-429 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | 2014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-TX |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00035 |
| TestAmerica Knoxville | Utah | NELAC | 8 | QUAN3 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |

Accreditation may not be offered or required for all methods and analytes reported in this package. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: MW-4-091014**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I140406 - 001 | **Work Order #....:** | M405K1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/10/14 | **Date Received....:** | 09/13/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1041 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.6 | 0.095 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.026 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.11 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.11 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 48 | 0.10 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 48 | 0.13 | pg/L |
| **OCDD** | **5.4** | **B J** | **96** | **0.078** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.6 | 0.041 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.087 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 48 | 0.080 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.11 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.10 | pg/L |
| **2,3,4,6,7,8-HxCDF** | **0.26** | **Q B J** | **48** | **0.10** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.38** | **Q B J** | **48** | **0.12** | **pg/L** |
| 1,2,3,4,6,7,8-HpCDF | ND | | 48 | 0.053 | pg/L |
| **1,2,3,4,7,8,9-HpCDF** | **0.19** | **Q B J** | **48** | **0.069** | **pg/L** |
| **OCDF** | **2.0** | **Q B J** | **96** | **0.056** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 100 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 84 | 40 - 135 |
| 13C-OCDD | 83 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 90 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 92 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 69 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 79 | 40 - 135 |
| 13C-OCDF | 74 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-4-091014**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I140406 - 001 | **Work Order #....:** | M405K1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/10/14 | **Date Received....:** | 09/13/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1041 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: MW-3-091014**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I140406 - 002 | **Work Order #....:** | M405L1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/10/14 | **Date Received....:** | 09/13/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1054 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.5 | 0.059 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 47 | 0.062 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 47 | 0.12 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 47 | 0.13 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 47 | 0.12 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **2.2** | **B J** | **47** | **0.16** | **pg/L** |
| **OCDD** | **13** | **B J** | **95** | **0.10** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.5 | 0.046 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 47 | 0.066 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 47 | 0.059 | pg/L |
| **1,2,3,4,7,8-HxCDF** | **0.35** | **Q J** | **47** | **0.081** | **pg/L** |
| 1,2,3,6,7,8-HxCDF | ND | | 47 | 0.081 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 47 | 0.084 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 47 | 0.093 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.35** | **Q B J** | **47** | **0.059** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 47 | 0.071 | pg/L |
| **OCDF** | **1.4** | **Q B J** | **95** | **0.045** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 91 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 108 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 86 | 40 - 135 |
| 13C-OCDD | 85 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 100 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 101 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 71 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 83 | 40 - 135 |
| 13C-OCDF | 77 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-3-091014**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I140406 - 002 | **Work Order #....:** | M405L1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/10/14 | **Date Received....:** | 09/13/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1054 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: MW-99-091014**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I140406 - 003 | **Work Order #....:** | M405M1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/10/14 | **Date Received....:** | 09/13/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1055 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.5 | 0.027 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 47 | 0.040 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 47 | 0.086 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 47 | 0.087 | pg/L |
| **1,2,3,7,8,9-HxCDD** | **0.33** | **Q B J** | **47** | **0.082** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **0.45** | **Q B J** | **47** | **0.11** | **pg/L** |
| **OCDD** | **2.5** | **Q B J** | **95** | **0.13** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.5 | 0.062 | pg/L |
| **1,2,3,7,8-PeCDF** | **0.28** | **Q J** | **47** | **0.082** | **pg/L** |
| 2,3,4,7,8-PeCDF | ND | | 47 | 0.077 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 47 | 0.086 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 47 | 0.082 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 47 | 0.089 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 47 | 0.10 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.094** | **Q B J** | **47** | **0.038** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 47 | 0.046 | pg/L |
| **OCDF** | **1.5** | **Q B J** | **95** | **0.028** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 86 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 94 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 83 | 40 - 135 |
| 13C-OCDD | 76 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 88 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 94 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 96 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 71 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 75 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 79 | 40 - 135 |
| 13C-OCDF | 69 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-99-091014**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I140406 - 003 | **Work Order #....:** | M405M1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/10/14 | **Date Received....:** | 09/13/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1055 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: MW-5-091014**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I140406 - 004 | **Work Order #....:** | M405N1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/10/14 | **Date Received....:** | 09/13/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1033 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.7 | 0.026 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.022 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.055 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.057 | pg/L |
| **1,2,3,7,8,9-HxCDD** | **0.22** | **B J** | **48** | **0.053** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **0.26** | **Q B J** | **48** | **0.085** | **pg/L** |
| **OCDD** | **2.6** | **B J** | **97** | **0.048** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.7 | 0.028 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.060 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 48 | 0.052 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.050 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.048 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 48 | 0.050 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 48 | 0.059 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.22** | **Q B J** | **48** | **0.033** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.29** | **B J** | **48** | **0.039** | **pg/L** |
| **OCDF** | **1.1** | **Q B J** | **97** | **0.037** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 90 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 106 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 80 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 75 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 85 | 40 - 135 |
| 13C-OCDD | 81 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 89 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 96 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 100 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 72 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 81 | 40 - 135 |
| 13C-OCDF | 73 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-5-091014**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I140406 - 004 | **Work Order #....:** | M405N1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 09/10/14 | **Date Received....:** | 09/13/14 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1033 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

**Lot - Sample #....:** H4I150000 - 019B **Work Order #....:** M41D31AA **Matrix....:** WATER
**Dilution Factor:** 1
**Prep Date....:** 09/15/14 **Analysis Date....:** 09/18/14
**Prep Batch # ....:** 4258019
**Initial Wgt/Vol :** 1000 mL **Instrument ID....:** D2A **Method:** SW846 8290
**Analyst ID....:** Linda K. McWhirter

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.053 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 0.043 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.13 | pg/L |
| **1,2,3,6,7,8-HxCDD** | **0.43** | **Q J** | **50** | **0.15** | **pg/L** |
| **1,2,3,7,8,9-HxCDD** | **0.46** | **Q J** | **50** | **0.13** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **1.2** | **Q J** | **50** | **0.24** | **pg/L** |
| **OCDD** | **8.7** | **Q J** | **100** | **0.14** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.078 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.11 | pg/L |
| **2,3,4,7,8-PeCDF** | **0.43** | **J** | **50** | **0.095** | **pg/L** |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.11 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.26** | **Q J** | **50** | **0.12** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.19** | **Q J** | **50** | **0.11** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.17** | **Q J** | **50** | **0.13** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **1.2** | **Q J** | **50** | **0.061** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.36** | **Q J** | **50** | **0.071** | **pg/L** |
| **OCDF** | **7.3** | **J** | **100** | **0.059** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 87 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 97 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 72 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 78 | 40 - 135 |
| 13C-OCDD | 77 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 90 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 93 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 68 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 82 | 40 - 135 |
| 13C-OCDF | 68 | 40 - 135 |

## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H4I150000 - 019B | **Work Order #....:** | M41D31AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 09/15/14 | **Analysis Date....:** | 09/18/14 | | |
| **Prep Batch # ....:** | 4258019 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H4I140406 | **Work Order # ...:** | M41D31AC-LCS | **Matrix .....:** | WATER |
| **LCS Lot-Sample# :** | H4I150000 - 019 | | | | |
| **Prep Date .....:** | 09/15/14 | **Analysis Date ..:** | 09/18/14 | | |
| **Prep Batch # ...:** | 4258019 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1000 mL | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **200** | **195** | **pg/L** | **97** | | **(77 - 127)** |
| **1,2,3,7,8-PeCDD** | **1000** | **1020** | **pg/L** | **102** | | **(78 - 128)** |
| **1,2,3,4,7,8-HxCDD** | **1000** | **930** | **pg/L** | **93** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **1000** | **923** | **pg/L** | **92** | **B** | **(72 - 127)** |
| **1,2,3,7,8,9-HxCDD** | **1000** | **1080** | **pg/L** | **108** | **B** | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDD** | **1000** | **960** | **pg/L** | **96** | **B** | **(73 - 123)** |
| **OCDD** | **2000** | **1770** | **pg/L** | **89** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **200** | **203** | **pg/L** | **101** | | **(74 - 124)** |
| **1,2,3,7,8-PeCDF** | **1000** | **928** | **pg/L** | **93** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **1000** | **947** | **pg/L** | **95** | **B** | **(74 - 124)** |
| **1,2,3,4,7,8-HxCDF** | **1000** | **1010** | **pg/L** | **101** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **1000** | **926** | **pg/L** | **93** | **B** | **(75 - 125)** |
| **2,3,4,6,7,8-HxCDF** | **1000** | **918** | **pg/L** | **92** | **B** | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **1000** | **954** | **pg/L** | **95** | **B** | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDF** | **1000** | **932** | **pg/L** | **93** | **B** | **(71 - 121)** |
| **1,2,3,4,7,8,9-HpCDF** | **1000** | **1000** | **pg/L** | **100** | **B** | **(73 - 123)** |
| **OCDF** | **2000** | **1870** | **pg/L** | **93** | **B** | **(68 - 132)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 87 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 100 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 85 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 76 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 86 | (40 - 135) |
| 13C-OCDD | 89 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 81 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 93 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 95 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 75 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 74 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 85 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 83 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 79 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 85 | (40 - 135) |
| 13C-OCDF | 80 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

H4I140406

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-264958.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | Analysis Requested | | Job #: 280-59878-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 9/29/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2SO3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - ph 4-5 |
| L - EDA | Z - other (specify) |

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-4-091014 (280-59878-1) | 9/10/14 | 11:05 Eastern | | Water | | | X | 2 | RT: 2.4°C CT: 2.9°C |
| MW-3-091014 (280-59878-2) | 9/10/14 | 12:15 Eastern | | Water | | | X | 2 | Custody seal intact |
| MW-99-091014 (280-59878-3) | 9/10/14 | 17:00 Eastern | | Water | | | X | 2 | Cooler |
| MW-5-091014 (280-59878-4) | 9/10/14 | 15:10 Eastern | | Water | | | X | 2 | KW 9/13/14 |
| | | | | | | | | | JC 57 |
| | | | | | | | | | FedEx PO |
| | | | | | | | | | #K# 6139 9216 2575 |

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: Charles Swanson | Date/Time: 9-12-14 1510 | Company: TA Denver | Received by: Ken Wilson | Date/Time: 9/13/14 1000 | Company: TA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Custody Seal No.: Temperature(s) °C and Other Remarks:

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H4I140404

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : 8C57<br>Correction factor: -0.1 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: _____ | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: [signature] Date: 9-14-14

QA026R28.doc, 042414

[redacted]

# Chain of Custody Record

Sampler ID _____

Temperature on Receipt 0.7, 0.5, 1.8, 5.3 + 0 IR-6 Transfer by 700 9/11/1[redacted]

Drinking Water? Yes ☐ No ☐

TestAmeri

THE LEADER IN ENVIRONMENTAL

280-59878 Chain of Custody

TAL-4124-280 (0508)

| | | | |
|---|---|---|---|
| Client: Geosyntec Consultants | Project Manager: Beau Hodge | Date: 9/10/14 | Chain of Custody Number: 183734 |
| Address: 2501 Blue Ridge Rd Suite 430 | Telephone Number (Area Code)/Fax Number: 919-412-5118 | Lab Number | Page 1 of 1 |
| City: Raleigh; State: NC; Zip Code: 27607 | Site Contact: Rachel Donahue | Lab Contact: Patrick McGinter | |
| Project Name and Location (State): UNC cogen, NC | Carrier/Waybill Number | | |
| Contract/Purchase Order/Quote No. | | | |

Analysis (Attach list if more space is needed)

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Matrix: Air | Aqueous | Sed. | Soil | | Containers & Preservatives: Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | | 8270-PAHs | 8290-O/F | 6010C-metals | 7470A-Hg | 2540C-TDS | 9056-SO4 | | | | | | | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-4-091014 | 9/10/14 | 1105 | | X | | | | 5 | | 1 | | | | | X | X | X | X | X | X | | | | | | | |
| MW-3-091014 | 9/10/14 | 1215 | | X | | | | 5 | | 1 | | | | | X | X | X | X | X | X | | | | | | | |
| MW-99-091014 | 9/10/14 | 1700 | | X | | | | 5 | | 1 | | | | | X | X | X | X | X | X | | | | | | | |
| MW-5-091014 | 9/10/14 | 1510 | | X | | | | 5 | | 1 | | | | | X | X | X | X | X | X | | | | | | | |

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By | Date 1800 | Time 9/10/14 | 1. Received By FEDEX | Date | Time |
| 2. Relinquished By | Date | Time | 2. Received By | Date 9/11/14 | Time 0920 |
| 3. Relinquished By | Date | Time | 3. Received By | Date | Time 9/12/14 |

Comments: Samples Shipped in 4 coolers

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-264958.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-59878-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 9/29/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-4-091014 (280-59878-1) | 9/10/14 | 11:05 Eastern | | Water | | | X | 2 | |
| MW-3-091014 (280-59878-2) | 9/10/14 | 12:15 Eastern | | Water | | | X | 2 | |
| MW-99-091014 (280-59878-3) | 9/10/14 | 17:00 Eastern | | Water | | | X | 2 | |
| MW-5-091014 (280-59878-4) | 9/10/14 | 15:10 Eastern | | Water | | | X | 2 | |

Date: 12Sep14
Wgt: 53.95 LBS
Ref:
Dep: BOTTLE PREP
DV:
Svcs: PRIORITY OVERNIGHT
TRCK: 6139 9216 2573
SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
0.00 TOTAL: 0.00

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: Charles Brianna | Date/Time: 9-12-14 1510 | Company: TA Denver | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-59878-1

**Login Number: 59878**
**List Number: 1**
**Creator: Orfield, Tayler C**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Field on COC is blank. |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | False | Container recd broken. Sufficient sample in remaining containers for analysis. |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-68254-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 5:29:54 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| X | Surrogate is outside control limits |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| B | Compound was found in the blank and sample. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-68254-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-68254-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**

The samples were received on 4/22/2015 10:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 0.5º C, 1.3º C and 4.3º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 Middlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 4/25/2015 10:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1º C.

**8270D SIM GCMS**

Samples MW-5-20150420 (280-68254-1), MW-1-20150421 (280-68254-2), MW-4-20150421 (280-68254-3) and MW-2-20150421 (280-68254-4) were analyzed for 8270D SIM GCMS in accordance with SW-846 8270D. The samples were prepared on 04/27/2015 and analyzed on 05/06/2015.

Terphenyl-d14 failed the surrogate recovery criteria high for MW-1-20150421 (280-68254-2). Refer to the QC report for details. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Terphenyl-d14 failed the surrogate recovery criteria high for LCS 280-274669/2-A. Refer to the QC report for details. The surrogate was biased high in the LCS; however, the associated sample surrogates were either in control or the surrogate was biased high and associated analytes non-detect.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**

Samples MW-5-20150420 (280-68254-1), MW-1-20150421 (280-68254-2), MW-4-20150421 (280-68254-3) and MW-2-20150421 (280-68254-4) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/27/2015 and analyzed on 04/28/2015.

Barium was detected in method blank MB 280-274588/1-A at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

## Job ID: 280-68254-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

The low level continuing calibration verification (CCVL) associated with batch 275022 recovered above the upper control limit for Fe. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY**
Samples MW-5-20150420 (280-68254-1), MW-1-20150421 (280-68254-2), MW-4-20150421 (280-68254-3) and MW-2-20150421 (280-68254-4) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 04/24/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL DISSOLVED SOLIDS**
Samples MW-5-20150420 (280-68254-1), MW-1-20150421 (280-68254-2), MW-4-20150421 (280-68254-3) and MW-2-20150421 (280-68254-4) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 04/24/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS)**
Samples MW-5-20150420 (280-68254-1), MW-1-20150421 (280-68254-2), MW-4-20150421 (280-68254-3) and MW-2-20150421 (280-68254-4) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 05/06/2015.

Sulfate was detected in method blank MB 280-276172/6 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

## Client Sample ID: MW-5-20150420 — Lab Sample ID: 280-68254-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 54 | J | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 37000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 13000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2700 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 23 | B | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 61000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 0.69 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 2.1 | J | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 36 | J | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 38 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 7.6 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 4.6 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 200 | B | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 390 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-1-20150421 — Lab Sample ID: 280-68254-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 460 | | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 13000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 2800 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2700 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 37 | B | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 41000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 1.9 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 430 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 22 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 2.1 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Selenium | 5.3 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 8.2 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 71 | B | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 180 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-4-20150421 — Lab Sample ID: 280-68254-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 46 | J | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 15000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 4500 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 3800 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 32 | B | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 15000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 26 | | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 35 | J | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 4.3 | J | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 2.3 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Selenium | 5.0 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 7.6 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 62 | B | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 140 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

## Client Sample ID: MW-2-20150421 — Lab Sample ID: 280-68254-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 22000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 5600 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 3600 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 57 | B | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 75000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 33 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 190 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 6000 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 5.9 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 93 | | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 120 | B | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 300 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Water | 04/20/15 15:10 | 04/22/15 10:10 |
| 280-68254-2 | MW-1-20150421 | Water | 04/21/15 12:00 | 04/22/15 10:10 |
| 280-68254-3 | MW-4-20150421 | Water | 04/21/15 15:20 | 04/22/15 10:10 |
| 280-68254-4 | MW-2-20150421 | Water | 04/21/15 16:00 | 04/22/15 10:10 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: MW-5-20150420**
**Date Collected: 04/20/15 15:10**
**Date Received: 04/22/15 10:10**

**Lab Sample ID: 280-68254-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 6.0 | U | 110 | 6.0 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| 2-Methylnaphthalene | 5.5 | U | 110 | 5.5 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Acenaphthene | 11 | U | 110 | 11 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Acenaphthylene | 11 | U | 110 | 11 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Anthracene | 15 | U | 110 | 15 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Benzo[a]anthracene | 3.4 | U | 110 | 3.4 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Benzo[a]pyrene | 5.5 | U | 110 | 5.5 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Benzo[b]fluoranthene | 3.7 | U | 110 | 3.7 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Benzo[g,h,i]perylene | 3.8 | U | 110 | 3.8 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Benzo[k]fluoranthene | 5.4 | U | 110 | 5.4 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Chrysene | 3.4 | U | 110 | 3.4 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Dibenz(a,h)anthracene | 5.1 | U | 110 | 5.1 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Fluoranthene | 4.8 | U | 110 | 4.8 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Fluorene | 20 | U | 110 | 20 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Indeno[1,2,3-cd]pyrene | 16 | U | 110 | 16 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Naphthalene | 5.7 | U | 110 | 5.7 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Phenanthrene | 10 | U | 110 | 10 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |
| Pyrene | 8.6 | U | 110 | 8.6 | ng/L | | 04/27/15 09:24 | 05/06/15 14:01 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *74* | | *42 - 120* | *04/27/15 09:24* | *05/06/15 14:01* | *1* |
| *Nitrobenzene-d5* | *78* | | *43 - 120* | *04/27/15 09:24* | *05/06/15 14:01* | *1* |
| *Terphenyl-d14* | *114* | | *47 - 120* | *04/27/15 09:24* | *05/06/15 14:01* | *1* |

**Client Sample ID: MW-1-20150421**
**Date Collected: 04/21/15 12:00**
**Date Received: 04/22/15 10:10**

**Lab Sample ID: 280-68254-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.6 | U | 99 | 5.6 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| 2-Methylnaphthalene | 5.1 | U | 99 | 5.1 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Acenaphthene | 11 | U | 99 | 11 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Acenaphthylene | 9.8 | U | 99 | 9.8 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Anthracene | 14 | U | 99 | 14 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Benzo[a]anthracene | 3.2 | U | 99 | 3.2 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Benzo[a]pyrene | 5.1 | U | 99 | 5.1 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 99 | 3.4 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Benzo[g,h,i]perylene | 3.5 | U | 99 | 3.5 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Benzo[k]fluoranthene | 5.0 | U | 99 | 5.0 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Chrysene | 3.2 | U | 99 | 3.2 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 99 | 4.8 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Fluoranthene | 4.5 | U | 99 | 4.5 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Fluorene | 19 | U | 99 | 19 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 99 | 15 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Naphthalene | 5.3 | U | 99 | 5.3 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Phenanthrene | 9.6 | U | 99 | 9.6 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |
| Pyrene | 8.0 | U | 99 | 8.0 | ng/L | | 04/27/15 09:24 | 05/06/15 14:26 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *79* | | *42 - 120* | *04/27/15 09:24* | *05/06/15 14:26* | *1* |
| *Nitrobenzene-d5* | *79* | | *43 - 120* | *04/27/15 09:24* | *05/06/15 14:26* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: MW-1-20150421**
**Date Collected: 04/21/15 12:00**
**Date Received: 04/22/15 10:10**

**Lab Sample ID: 280-68254-2**
**Matrix: Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *146* | *X* | *47 - 120* | *04/27/15 09:24* | *05/06/15 14:26* | *1* |

**Client Sample ID: MW-4-20150421**
**Date Collected: 04/21/15 15:20**
**Date Received: 04/22/15 10:10**

**Lab Sample ID: 280-68254-3**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.6 | U | 99 | 5.6 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| 2-Methylnaphthalene | 5.1 | U | 99 | 5.1 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Acenaphthene | 11 | U | 99 | 11 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Acenaphthylene | 9.8 | U | 99 | 9.8 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Anthracene | 14 | U | 99 | 14 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Benzo[a]anthracene | 3.2 | U | 99 | 3.2 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Benzo[a]pyrene | 5.1 | U | 99 | 5.1 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 99 | 3.4 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Benzo[g,h,i]perylene | 3.5 | U | 99 | 3.5 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Benzo[k]fluoranthene | 5.0 | U | 99 | 5.0 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Chrysene | 3.1 | U | 99 | 3.1 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 99 | 4.8 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Fluoranthene | 4.5 | U | 99 | 4.5 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Fluorene | 19 | U | 99 | 19 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 99 | 14 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Naphthalene | 5.3 | U | 99 | 5.3 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Phenanthrene | 9.6 | U | 99 | 9.6 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |
| Pyrene | 8.0 | U | 99 | 8.0 | ng/L | | 04/27/15 09:24 | 05/06/15 14:52 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *79* | | *42 - 120* | *04/27/15 09:24* | *05/06/15 14:52* | *1* |
| *Nitrobenzene-d5* | *83* | | *43 - 120* | *04/27/15 09:24* | *05/06/15 14:52* | *1* |
| *Terphenyl-d14* | *90* | | *47 - 120* | *04/27/15 09:24* | *05/06/15 14:52* | *1* |

**Client Sample ID: MW-2-20150421**
**Date Collected: 04/21/15 16:00**
**Date Received: 04/22/15 10:10**

**Lab Sample ID: 280-68254-4**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 95 | 5.4 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| 2-Methylnaphthalene | 4.9 | U | 95 | 4.9 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Acenaphthene | 10 | U | 95 | 10 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Acenaphthylene | 9.5 | U | 95 | 9.5 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Anthracene | 14 | U | 95 | 14 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Benzo[a]anthracene | 3.1 | U | 95 | 3.1 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Benzo[a]pyrene | 4.9 | U | 95 | 4.9 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Benzo[b]fluoranthene | 3.3 | U | 95 | 3.3 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U | 95 | 3.4 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Benzo[k]fluoranthene | 4.8 | U | 95 | 4.8 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Chrysene | 3.0 | U | 95 | 3.0 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U | 95 | 4.6 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Fluoranthene | 4.3 | U | 95 | 4.3 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Fluorene | 18 | U | 95 | 18 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 95 | 14 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Naphthalene | 5.1 | U | 95 | 5.1 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: MW-2-20150421** — **Lab Sample ID: 280-68254-4**
**Date Collected: 04/21/15 16:00** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 9.3 | U | 95 | 9.3 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |
| Pyrene | 7.7 | U | 95 | 7.7 | ng/L | | 04/27/15 09:24 | 05/06/15 15:17 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *76* | | *42 - 120* | *04/27/15 09:24* | *05/06/15 15:17* | *1* |
| *Nitrobenzene-d5* | *76* | | *43 - 120* | *04/27/15 09:24* | *05/06/15 15:17* | *1* |
| *Terphenyl-d14* | *100* | | *47 - 120* | *04/27/15 09:24* | *05/06/15 15:17* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: MW-5-20150420** — **Lab Sample ID: 280-68254-1**
**Date Collected: 04/20/15 15:10** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **54** | **J** | 100 | 18 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Calcium** | **37000** | | 200 | 35 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Magnesium** | **13000** | | 200 | 11 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Potassium** | **2700** | **J** | 3000 | 240 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Barium** | **23** | **B** | 10 | 0.58 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Sodium** | **61000** | | 1000 | 92 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Chromium** | **0.69** | **J** | 10 | 0.66 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Cobalt** | **2.1** | **J** | 10 | 1.2 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Iron** | **36** | **J** | 100 | 22 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Manganese** | **38** | | 10 | 0.25 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Nickel** | **7.6** | **J** | 40 | 1.3 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| **Zinc** | **4.6** | **J** | 20 | 4.5 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 04/27/15 14:30 | 04/28/15 22:53 | 1 |

**Client Sample ID: MW-1-20150421** — **Lab Sample ID: 280-68254-2**
**Date Collected: 04/21/15 12:00** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **460** | | 100 | 18 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Calcium** | **13000** | | 200 | 35 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Magnesium** | **2800** | | 200 | 11 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Potassium** | **2700** | **J** | 3000 | 240 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Barium** | **37** | **B** | 10 | 0.58 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Sodium** | **41000** | | 1000 | 92 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-1-20150421** **Lab Sample ID: 280-68254-2**
**Date Collected: 04/21/15 12:00** **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Chromium** | **1.9** | **J** | 10 | 0.66 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Iron** | **430** | | 100 | 22 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Manganese** | **22** | | 10 | 0.25 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Nickel** | **2.1** | **J** | 40 | 1.3 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Selenium** | **5.3** | **J** | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| **Zinc** | **8.2** | **J** | 20 | 4.5 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 04/27/15 14:30 | 04/28/15 23:06 | 1 |

**Client Sample ID: MW-4-20150421** **Lab Sample ID: 280-68254-3**
**Date Collected: 04/21/15 15:20** **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **46** | **J** | 100 | 18 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Calcium** | **15000** | | 200 | 35 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Magnesium** | **4500** | | 200 | 11 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Potassium** | **3800** | | 3000 | 240 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Barium** | **32** | **B** | 10 | 0.58 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Sodium** | **15000** | | 1000 | 92 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Chromium** | **26** | | 10 | 0.66 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Iron** | **35** | **J** | 100 | 22 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Manganese** | **4.3** | **J** | 10 | 0.25 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Nickel** | **2.3** | **J** | 40 | 1.3 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Selenium** | **5.0** | **J** | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| **Zinc** | **7.6** | **J** | 20 | 4.5 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 04/27/15 14:30 | 04/28/15 23:08 | 1 |

**Client Sample ID: MW-2-20150421** **Lab Sample ID: 280-68254-4**
**Date Collected: 04/21/15 16:00** **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Calcium** | **22000** | | 200 | 35 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Magnesium** | **5600** | | 200 | 11 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-2-20150421** — **Lab Sample ID: 280-68254-4**
**Date Collected: 04/21/15 16:00** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Potassium** | **3600** | | 3000 | 240 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Barium** | **57** | **B** | 10 | 0.58 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Sodium** | **75000** | | 1000 | 92 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Cobalt** | **33** | | 10 | 1.2 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Iron** | **190** | | 100 | 22 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Manganese** | **6000** | | 10 | 0.25 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Nickel** | **5.9** | **J** | 40 | 1.3 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| **Zinc** | **93** | | 20 | 4.5 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 04/27/15 14:30 | 04/28/15 23:11 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-5-20150420** — **Lab Sample ID: 280-68254-1**
**Date Collected: 04/20/15 15:10** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 04/24/15 10:30 | 04/24/15 19:03 | 1 |

**Client Sample ID: MW-1-20150421** — **Lab Sample ID: 280-68254-2**
**Date Collected: 04/21/15 12:00** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 04/24/15 10:30 | 04/24/15 19:05 | 1 |

**Client Sample ID: MW-4-20150421** — **Lab Sample ID: 280-68254-3**
**Date Collected: 04/21/15 15:20** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 04/24/15 10:30 | 04/24/15 19:08 | 1 |

**Client Sample ID: MW-2-20150421** — **Lab Sample ID: 280-68254-4**
**Date Collected: 04/21/15 16:00** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 04/24/15 10:30 | 04/24/15 19:10 | 1 |

## General Chemistry

**Client Sample ID: MW-5-20150420** — **Lab Sample ID: 280-68254-1**
**Date Collected: 04/20/15 15:10** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Sulfate** | **200** | **B** | 5.0 | 0.23 | mg/L | | | 05/06/15 21:09 | 1 |

## General Chemistry (Continued)

**Client Sample ID: MW-5-20150420** — **Lab Sample ID: 280-68254-1**
**Date Collected: 04/20/15 15:10** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 390 | | 10 | 4.7 | mg/L | | | 04/24/15 14:27 | 1 |

**Client Sample ID: MW-1-20150421** — **Lab Sample ID: 280-68254-2**
**Date Collected: 04/21/15 12:00** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 71 | B | 5.0 | 0.23 | mg/L | | | 05/06/15 21:26 | 1 |
| Total Dissolved Solids | 180 | | 10 | 4.7 | mg/L | | | 04/24/15 14:27 | 1 |

**Client Sample ID: MW-4-20150421** — **Lab Sample ID: 280-68254-3**
**Date Collected: 04/21/15 15:20** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 62 | B | 5.0 | 0.23 | mg/L | | | 05/06/15 21:43 | 1 |
| Total Dissolved Solids | 140 | | 10 | 4.7 | mg/L | | | 04/24/15 14:27 | 1 |

**Client Sample ID: MW-2-20150421** — **Lab Sample ID: 280-68254-4**
**Date Collected: 04/21/15 16:00** — **Matrix: Water**
**Date Received: 04/22/15 10:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 120 | B | 5.0 | 0.23 | mg/L | | | 05/06/15 22:00 | 1 |
| Total Dissolved Solids | 300 | | 10 | 4.7 | mg/L | | | 04/24/15 14:27 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| **Lab Sample ID** | **Client Sample ID** | **(42-120)** | **(43-120)** | **(47-120)** |
| 280-68254-1 | MW-5-20150420 | 74 | 78 | 114 |
| 280-68254-2 | MW-1-20150421 | 79 | 79 | 146 X |
| 280-68254-3 | MW-4-20150421 | 79 | 83 | 90 |
| 280-68254-4 | MW-2-20150421 | 76 | 76 | 100 |
| LCS 280-274669/2-A | Lab Control Sample | 91 | 89 | 130 X |
| LCSD 280-274669/3-A | Lab Control Sample Dup | 80 | 86 | 99 |
| MB 280-274669/1-A | Method Blank | 78 | 86 | 95 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-274669/1-A**
**Matrix: Water**
**Analysis Batch: 276178**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 274669**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 04/27/15 09:24 | 05/06/15 10:39 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *78* | | *42 - 120* | *04/27/15 09:24* | *05/06/15 10:39* | *1* |
| *Nitrobenzene-d5* | *86* | | *43 - 120* | *04/27/15 09:24* | *05/06/15 10:39* | *1* |
| *Terphenyl-d14* | *95* | | *47 - 120* | *04/27/15 09:24* | *05/06/15 10:39* | *1* |

**Lab Sample ID: LCS 280-274669/2-A**
**Matrix: Water**
**Analysis Batch: 276178**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 274669**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 733 | | ng/L | | 81 | 47 - 120 |
| Acenaphthylene | 900 | 669 | | ng/L | | 74 | 39 - 120 |
| Anthracene | 900 | 812 | | ng/L | | 90 | 28 - 120 |
| Benzo[a]anthracene | 900 | 831 | | ng/L | | 92 | 42 - 120 |
| Benzo[a]pyrene | 900 | 802 | | ng/L | | 89 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 819 | | ng/L | | 91 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 751 | | ng/L | | 83 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 818 | | ng/L | | 91 | 43 - 120 |
| Chrysene | 900 | 839 | | ng/L | | 93 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 791 | | ng/L | | 88 | 27 - 126 |
| Fluoranthene | 900 | 836 | | ng/L | | 93 | 46 - 120 |
| Fluorene | 900 | 746 | | ng/L | | 83 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 802 | | ng/L | | 89 | 38 - 120 |
| Naphthalene | 900 | 653 | | ng/L | | 73 | 37 - 120 |
| Phenanthrene | 900 | 787 | | ng/L | | 87 | 46 - 120 |
| Pyrene | 900 | 808 | | ng/L | | 90 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-274669/2-A**
**Matrix: Water**
**Analysis Batch: 276178**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 274669**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *91* | | *42 - 120* |
| *Nitrobenzene-d5* | *89* | | *43 - 120* |
| *Terphenyl-d14* | *130* | *X* | *47 - 120* |

**Lab Sample ID: LCSD 280-274669/3-A**
**Matrix: Water**
**Analysis Batch: 276178**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 274669**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 733 | | ng/L | | 81 | 47 - 120 | 0 | 50 |
| Acenaphthylene | 900 | 686 | | ng/L | | 76 | 39 - 120 | 2 | 50 |
| Anthracene | 900 | 831 | | ng/L | | 92 | 28 - 120 | 2 | 50 |
| Benzo[a]anthracene | 900 | 842 | | ng/L | | 94 | 42 - 120 | 1 | 40 |
| Benzo[a]pyrene | 900 | 806 | | ng/L | | 90 | 38 - 120 | 1 | 21 |
| Benzo[b]fluoranthene | 900 | 818 | | ng/L | | 91 | 44 - 120 | 0 | 28 |
| Benzo[g,h,i]perylene | 900 | 771 | | ng/L | | 86 | 39 - 120 | 3 | 23 |
| Benzo[k]fluoranthene | 900 | 840 | | ng/L | | 93 | 43 - 120 | 3 | 28 |
| Chrysene | 900 | 852 | | ng/L | | 95 | 35 - 120 | 2 | 41 |
| Dibenz(a,h)anthracene | 900 | 816 | | ng/L | | 91 | 27 - 126 | 3 | 25 |
| Fluoranthene | 900 | 840 | | ng/L | | 93 | 46 - 120 | 0 | 24 |
| Fluorene | 900 | 773 | | ng/L | | 86 | 49 - 120 | 4 | 50 |
| Indeno[1,2,3-cd]pyrene | 900 | 813 | | ng/L | | 90 | 38 - 120 | 1 | 25 |
| Naphthalene | 900 | 647 | | ng/L | | 72 | 37 - 120 | 1 | 50 |
| Phenanthrene | 900 | 805 | | ng/L | | 89 | 46 - 120 | 2 | 42 |
| Pyrene | 900 | 825 | | ng/L | | 92 | 49 - 120 | 2 | 22 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *80* | | *42 - 120* |
| *Nitrobenzene-d5* | *86* | | *43 - 120* |
| *Terphenyl-d14* | *99* | | *47 - 120* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-274588/1-A**
**Matrix: Water**
**Analysis Batch: 275022**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 274588**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Barium | 0.790 | J | 10 | 0.58 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Sodium | 92 | U | 1000 | 92 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-274588/1-A**
**Matrix: Water**
**Analysis Batch: 275022**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 274588**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Iron | 22 | U ^ | 100 | 22 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 04/27/15 14:30 | 04/28/15 22:39 | 1 |

**Lab Sample ID: LCS 280-274588/2-A**
**Matrix: Water**
**Analysis Batch: 275022**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 274588**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1940 | | ug/L | | 97 | 87 - 111 |
| Calcium | 50000 | 47400 | | ug/L | | 95 | 90 - 111 |
| Antimony | 500 | 512 | | ug/L | | 102 | 88 - 110 |
| Magnesium | 50000 | 49700 | | ug/L | | 99 | 90 - 113 |
| Arsenic | 1000 | 995 | | ug/L | | 99 | 88 - 110 |
| Potassium | 50000 | 49100 | | ug/L | | 98 | 89 - 114 |
| Barium | 2000 | 1940 | | ug/L | | 97 | 90 - 112 |
| Sodium | 50000 | 52500 | | ug/L | | 105 | 90 - 115 |
| Beryllium | 50.0 | 48.9 | | ug/L | | 98 | 89 - 113 |
| Cadmium | 100 | 91.6 | | ug/L | | 92 | 88 - 111 |
| Chromium | 200 | 196 | | ug/L | | 98 | 90 - 113 |
| Copper | 250 | 260 | | ug/L | | 104 | 86 - 112 |
| Cobalt | 500 | 493 | | ug/L | | 99 | 89 - 111 |
| Iron | 1000 | 983 | ^ | ug/L | | 98 | 89 - 115 |
| Lead | 500 | 499 | | ug/L | | 100 | 89 - 110 |
| Manganese | 500 | 515 | | ug/L | | 103 | 90 - 110 |
| Nickel | 500 | 492 | | ug/L | | 98 | 89 - 111 |
| Selenium | 2000 | 2040 | | ug/L | | 102 | 85 - 112 |
| Silver | 50.0 | 47.3 | | ug/L | | 95 | 86 - 115 |
| Thallium | 2000 | 2000 | | ug/L | | 100 | 88 - 110 |
| Zinc | 500 | 509 | | ug/L | | 102 | 85 - 111 |
| Vanadium | 500 | 499 | | ug/L | | 100 | 90 - 111 |

**Lab Sample ID: 280-68254-1 MS**
**Matrix: Water**
**Analysis Batch: 275022**

**Client Sample ID: MW-5-20150420**
**Prep Type: Total/NA**
**Prep Batch: 274588**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 54 | J | 2000 | 2100 | | ug/L | | 103 | 83 - 119 |
| Calcium | 37000 | | 50000 | 88100 | | ug/L | | 102 | 48 - 153 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-68254-1 MS** — **Client Sample ID: MW-5-20150420**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275022** — **Prep Batch: 274588**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 500 | 552 | | ug/L | | 110 | 81 - 124 |
| Magnesium | 13000 | | 50000 | 64700 | | ug/L | | 104 | 62 - 146 |
| Arsenic | 4.4 | U | 1000 | 1070 | | ug/L | | 107 | 84 - 124 |
| Potassium | 2700 | J | 50000 | 54300 | | ug/L | | 103 | 76 - 132 |
| Barium | 23 | B | 2000 | 2050 | | ug/L | | 102 | 85 - 120 |
| Sodium | 61000 | | 50000 | 117000 | | ug/L | | 113 | 70 - 203 |
| Beryllium | 0.47 | U | 50.0 | 51.3 | | ug/L | | 103 | 79 - 121 |
| Cadmium | 0.45 | U | 100 | 97.1 | | ug/L | | 97 | 82 - 119 |
| Chromium | 0.69 | J | 200 | 205 | | ug/L | | 102 | 73 - 135 |
| Copper | 1.4 | U | 250 | 271 | | ug/L | | 108 | 82 - 129 |
| Cobalt | 2.1 | J | 500 | 521 | | ug/L | | 104 | 82 - 119 |
| Iron | 36 | J | 1000 | 1060 | | ug/L | | 103 | 52 - 155 |
| Lead | 2.6 | U | 500 | 520 | | ug/L | | 104 | 89 - 121 |
| Manganese | 38 | | 500 | 571 | | ug/L | | 107 | 79 - 121 |
| Nickel | 7.6 | J | 500 | 521 | | ug/L | | 103 | 84 - 120 |
| Selenium | 4.9 | U | 2000 | 2170 | | ug/L | | 108 | 71 - 140 |
| Silver | 0.93 | U | 50.0 | 49.0 | | ug/L | | 98 | 75 - 141 |
| Thallium | 4.9 | U | 2000 | 2070 | | ug/L | | 104 | 90 - 116 |
| Zinc | 4.6 | J | 500 | 530 | | ug/L | | 105 | 60 - 137 |
| Vanadium | 1.1 | U | 500 | 520 | | ug/L | | 104 | 85 - 120 |

**Lab Sample ID: 280-68254-1 MSD** — **Client Sample ID: MW-5-20150420**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275022** — **Prep Batch: 274588**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 54 | J | 2000 | 2100 | | ug/L | | 102 | 83 - 119 | 0 | 20 |
| Calcium | 37000 | | 50000 | 86000 | | ug/L | | 97 | 48 - 153 | 2 | 20 |
| Antimony | 3.1 | U | 500 | 551 | | ug/L | | 110 | 81 - 124 | 0 | 20 |
| Magnesium | 13000 | | 50000 | 63900 | | ug/L | | 103 | 62 - 146 | 1 | 20 |
| Arsenic | 4.4 | U | 1000 | 1050 | | ug/L | | 105 | 84 - 124 | 2 | 20 |
| Potassium | 2700 | J | 50000 | 53500 | | ug/L | | 102 | 76 - 132 | 1 | 20 |
| Barium | 23 | B | 2000 | 2030 | | ug/L | | 100 | 85 - 120 | 1 | 20 |
| Sodium | 61000 | | 50000 | 116000 | | ug/L | | 109 | 70 - 203 | 2 | 20 |
| Beryllium | 0.47 | U | 50.0 | 50.8 | | ug/L | | 102 | 79 - 121 | 1 | 20 |
| Cadmium | 0.45 | U | 100 | 96.6 | | ug/L | | 97 | 82 - 119 | 0 | 20 |
| Chromium | 0.69 | J | 200 | 204 | | ug/L | | 102 | 73 - 135 | 0 | 20 |
| Copper | 1.4 | U | 250 | 271 | | ug/L | | 108 | 82 - 129 | 0 | 20 |
| Cobalt | 2.1 | J | 500 | 519 | | ug/L | | 103 | 82 - 119 | 1 | 20 |
| Iron | 36 | J | 1000 | 1050 | | ug/L | | 102 | 52 - 155 | 1 | 20 |
| Lead | 2.6 | U | 500 | 519 | | ug/L | | 104 | 89 - 121 | 0 | 20 |
| Manganese | 38 | | 500 | 566 | | ug/L | | 106 | 79 - 121 | 1 | 20 |
| Nickel | 7.6 | J | 500 | 519 | | ug/L | | 102 | 84 - 120 | 0 | 20 |
| Selenium | 4.9 | U | 2000 | 2190 | | ug/L | | 110 | 71 - 140 | 1 | 20 |
| Silver | 0.93 | U | 50.0 | 49.3 | | ug/L | | 99 | 75 - 141 | 1 | 20 |
| Thallium | 4.9 | U | 2000 | 2100 | | ug/L | | 105 | 90 - 116 | 1 | 20 |
| Zinc | 4.6 | J | 500 | 517 | | ug/L | | 103 | 60 - 137 | 2 | 20 |
| Vanadium | 1.1 | U | 500 | 520 | | ug/L | | 104 | 85 - 120 | 0 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-274313/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 274723** — **Prep Batch: 274313**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 04/24/15 10:30 | 04/24/15 18:17 | 1 |

**Lab Sample ID: LCS 280-274313/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 274723** — **Prep Batch: 274313**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.44 | | ug/L | | 109 | 84 - 120 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-276172/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 276172**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 1.46 | J | 5.0 | 0.23 | mg/L | | | 05/06/15 11:47 | 1 |

**Lab Sample ID: LCS 280-276172/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 276172**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 106 | | mg/L | | 106 | 90 - 110 |

**Lab Sample ID: LCSD 280-276172/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 276172**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 106 | | mg/L | | 106 | 90 - 110 | 1 | 10 |

**Lab Sample ID: MRL 280-276172/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 276172**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 2.50 | 2.72 | J | mg/L | | 109 | 50 - 150 |

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 280-274405/1** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 274405**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 4.7 | U | 10 | 4.7 | mg/L | | | 04/24/15 14:27 | 1 |

## Method: SM 2540C - Solids, Total Dissolved (TDS) (Continued)

**Lab Sample ID: LCS 280-274405/2**
**Matrix: Water**
**Analysis Batch: 274405**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | | | 501 | 503 | | mg/L | | 100 | 86 - 110 | | |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

## GC/MS Semi VOA

### Prep Batch: 274669

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Total/NA | Water | 3510C | |
| 280-68254-2 | MW-1-20150421 | Total/NA | Water | 3510C | |
| 280-68254-3 | MW-4-20150421 | Total/NA | Water | 3510C | |
| 280-68254-4 | MW-2-20150421 | Total/NA | Water | 3510C | |
| LCS 280-274669/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 280-274669/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |
| MB 280-274669/1-A | Method Blank | Total/NA | Water | 3510C | |

### Analysis Batch: 276178

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Total/NA | Water | 8270D SIM | 274669 |
| 280-68254-2 | MW-1-20150421 | Total/NA | Water | 8270D SIM | 274669 |
| 280-68254-3 | MW-4-20150421 | Total/NA | Water | 8270D SIM | 274669 |
| 280-68254-4 | MW-2-20150421 | Total/NA | Water | 8270D SIM | 274669 |
| LCS 280-274669/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 274669 |
| LCSD 280-274669/3-A | Lab Control Sample Dup | Total/NA | Water | 8270D SIM | 274669 |
| MB 280-274669/1-A | Method Blank | Total/NA | Water | 8270D SIM | 274669 |

## Metals

### Prep Batch: 274313

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Total/NA | Water | 7470A | |
| 280-68254-2 | MW-1-20150421 | Total/NA | Water | 7470A | |
| 280-68254-3 | MW-4-20150421 | Total/NA | Water | 7470A | |
| 280-68254-4 | MW-2-20150421 | Total/NA | Water | 7470A | |
| LCS 280-274313/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| MB 280-274313/1-A | Method Blank | Total/NA | Water | 7470A | |

### Prep Batch: 274588

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Total/NA | Water | 3010A | |
| 280-68254-1 MS | MW-5-20150420 | Total/NA | Water | 3010A | |
| 280-68254-1 MSD | MW-5-20150420 | Total/NA | Water | 3010A | |
| 280-68254-2 | MW-1-20150421 | Total/NA | Water | 3010A | |
| 280-68254-3 | MW-4-20150421 | Total/NA | Water | 3010A | |
| 280-68254-4 | MW-2-20150421 | Total/NA | Water | 3010A | |
| LCS 280-274588/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-274588/1-A | Method Blank | Total/NA | Water | 3010A | |

### Analysis Batch: 274723

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Total/NA | Water | 7470A | 274313 |
| 280-68254-2 | MW-1-20150421 | Total/NA | Water | 7470A | 274313 |
| 280-68254-3 | MW-4-20150421 | Total/NA | Water | 7470A | 274313 |
| 280-68254-4 | MW-2-20150421 | Total/NA | Water | 7470A | 274313 |
| LCS 280-274313/2-A | Lab Control Sample | Total/NA | Water | 7470A | 274313 |
| MB 280-274313/1-A | Method Blank | Total/NA | Water | 7470A | 274313 |

## Metals (Continued)

### Analysis Batch: 275022

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Total/NA | Water | 6010C | 274588 |
| 280-68254-1 MS | MW-5-20150420 | Total/NA | Water | 6010C | 274588 |
| 280-68254-1 MSD | MW-5-20150420 | Total/NA | Water | 6010C | 274588 |
| 280-68254-2 | MW-1-20150421 | Total/NA | Water | 6010C | 274588 |
| 280-68254-3 | MW-4-20150421 | Total/NA | Water | 6010C | 274588 |
| 280-68254-4 | MW-2-20150421 | Total/NA | Water | 6010C | 274588 |
| LCS 280-274588/2-A | Lab Control Sample | Total/NA | Water | 6010C | 274588 |
| MB 280-274588/1-A | Method Blank | Total/NA | Water | 6010C | 274588 |

## General Chemistry

### Analysis Batch: 274405

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Total/NA | Water | SM 2540C | |
| 280-68254-2 | MW-1-20150421 | Total/NA | Water | SM 2540C | |
| 280-68254-3 | MW-4-20150421 | Total/NA | Water | SM 2540C | |
| 280-68254-4 | MW-2-20150421 | Total/NA | Water | SM 2540C | |
| LCS 280-274405/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| MB 280-274405/1 | Method Blank | Total/NA | Water | SM 2540C | |

### Analysis Batch: 276172

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68254-1 | MW-5-20150420 | Total/NA | Water | 9056A | |
| 280-68254-2 | MW-1-20150421 | Total/NA | Water | 9056A | |
| 280-68254-3 | MW-4-20150421 | Total/NA | Water | 9056A | |
| 280-68254-4 | MW-2-20150421 | Total/NA | Water | 9056A | |
| LCS 280-276172/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-276172/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-276172/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-276172/3 | Lab Control Sample | Total/NA | Water | 9056A | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

## Client Sample ID: MW-5-20150420 — Lab Sample ID: 280-68254-1

**Date Collected: 04/20/15 15:10**
**Date Received: 04/22/15 10:10**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 941.8 mL | 1 mL | 274669 | 04/27/15 09:24 | JKN | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 941.8 mL | 1 mL | 276178 | 05/06/15 14:01 | NRC | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 274588 | 04/27/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 275022 | 04/28/15 22:53 | CRR | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 274313 | 04/24/15 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 274723 | 04/24/15 19:03 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276172 | 05/06/15 21:09 | AJA | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 274405 | 04/24/15 14:27 | SVC | TAL DEN |

## Client Sample ID: MW-1-20150421 — Lab Sample ID: 280-68254-2

**Date Collected: 04/21/15 12:00**
**Date Received: 04/22/15 10:10**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1011.4 mL | 1 mL | 274669 | 04/27/15 09:24 | JKN | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1011.4 mL | 1 mL | 276178 | 05/06/15 14:26 | NRC | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 274588 | 04/27/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 275022 | 04/28/15 23:06 | CRR | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 274313 | 04/24/15 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 274723 | 04/24/15 19:05 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276172 | 05/06/15 21:26 | AJA | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 274405 | 04/24/15 14:27 | SVC | TAL DEN |

## Client Sample ID: MW-4-20150421 — Lab Sample ID: 280-68254-3

**Date Collected: 04/21/15 15:20**
**Date Received: 04/22/15 10:10**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1014.7 mL | 1 mL | 274669 | 04/27/15 09:24 | JKN | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1014.7 mL | 1 mL | 276178 | 05/06/15 14:52 | NRC | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 274588 | 04/27/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 275022 | 04/28/15 23:08 | CRR | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 274313 | 04/24/15 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 274723 | 04/24/15 19:08 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276172 | 05/06/15 21:43 | AJA | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 274405 | 04/24/15 14:27 | SVC | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

## Client Sample ID: MW-2-20150421

**Lab Sample ID: 280-68254-4**

**Date Collected: 04/21/15 16:00**

**Matrix: Water**

**Date Received: 04/22/15 10:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1051.4 mL | 1 mL | 274669 | 04/27/15 09:24 | JKN | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1051.4 mL | 1 mL | 276178 | 05/06/15 15:17 | NRC | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 274588 | 04/27/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 275022 | 04/28/15 23:11 | CRR | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 274313 | 04/24/15 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 274723 | 04/24/15 19:10 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 276172 | 05/06/15 22:00 | AJA | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 274405 | 04/24/15 14:27 | SVC | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68254-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

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**Sample Receipt Documentation ..... 22**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-68254-1

UNC Cogen

Lot #: H5D270404

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

May 5, 2015

# ANALYTICAL METHODS SUMMARY

**H5D270404**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H5D270404**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M6NME | 001 | MW-5-20150420 | 04/20/15 | 15:10 |
| M6NML | 002 | MW-1-20150421 | 04/21/15 | 12:00 |
| M6NMM | 003 | MW-4-20150421 | 04/21/15 | 15:20 |
| M6NMN | 004 | MW-2-20150421 | 04/21/15 | 16:00 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H5D270404

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the

# PROJECT NARRATIVE
## H5D270404

concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of ≥2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

# PROJECT NARRATIVE
## H5D270404

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |

# PROJECT NARRATIVE
## H5D270404

W = amount of sample extracted (grams or liters)
S = percent solids (optional, if results are requested to be reported on dry weight basis)

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA150004 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | TN02014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-14-7 |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00260 |
| TestAmerica Knoxville | Utah | NELAC | 8 | TN000092014-5 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 00165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |
| TestAmerica Knoxville | Wisconsin | State Program | 5 | 998044300 |

Accreditation may not be offered or required for all methods and analytes in this report. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: MW-5-20150420**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D270404 - 001 | **Work Order #....:** | M6NME1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/20/15 | **Date Received....:** | 04/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1003 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.010 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 0.24 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.13 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 50 | 0.14 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.13 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.65** | **Q B J** | **50** | **0.079** | **pg/L** |
| **OCDD** | **5.8** | **Q B J** | **100** | **0.062** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.030 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.062 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.060 | pg/L |
| **1,2,3,4,7,8-HxCDF** | **0.30** | **J** | **50** | **0.065** | **pg/L** |
| 1,2,3,6,7,8-HxCDF | ND | | 50 | 0.063 | pg/L |
| **2,3,4,6,7,8-HxCDF** | **0.41** | **B J** | **50** | **0.065** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.16** | **Q B J** | **50** | **0.081** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.16** | **Q B J** | **50** | **0.16** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 50 | 0.21 | pg/L |
| **OCDF** | **7.0** | **B J** | **100** | **0.10** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 84 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 97 | 40 - 135 |
| 13C-OCDD | 83 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 88 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 80 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 83 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 79 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 84 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 85 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 91 | 40 - 135 |
| 13C-OCDF | 76 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-5-20150420**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D270404 - 001 | **Work Order #....:** | M6NME1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/20/15 | **Date Received....:** | 04/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1003 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

**TestAmerica Denver**

**Sample ID: MW-1-20150421**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D270404 - 002 | **Work Order #....:** | M6NML1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/21/15 | **Date Received....:** | 04/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1015 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.9 | 0.013 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 49 | 0.32 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 49 | 0.13 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 49 | 0.13 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 49 | 0.12 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.78** | **Q B J** | **49** | **0.15** | **pg/L** |
| **OCDD** | **11** | **Q B J** | **99** | **0.085** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.9 | 0.037 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 49 | 0.057 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 49 | 0.054 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 49 | 0.075 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.24** | **Q B J** | **49** | **0.068** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.43** | **Q B J** | **49** | **0.081** | **pg/L** |
| 1,2,3,7,8,9-HxCDF | ND | | 49 | 0.087 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **1.2** | **Q B J** | **49** | **0.21** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.26** | **Q B J** | **49** | **0.26** | **pg/L** |
| **OCDF** | **17** | **B J** | **99** | **0.16** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 92 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 95 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 85 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 100 | 40 - 135 |
| 13C-OCDD | 86 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 95 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 87 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 86 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 82 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 88 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 92 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 97 | 40 - 135 |
| 13C-OCDF | 78 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-1-20150421**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D270404 - 002 | **Work Order #....:** | M6NML1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/21/15 | **Date Received....:** | 04/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1015 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

**TestAmerica Denver**

**Sample ID: MW-4-20150421**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D270404 - 003 | **Work Order #....:** | M6NMM1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/21/15 | **Date Received....:** | 04/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1003 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.035 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 0.28 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.13 | pg/L |
| **1,2,3,6,7,8-HxCDD** | **0.33** | **Q J** | **50** | **0.13** | **pg/L** |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.12 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.56** | **Q B J** | **50** | **0.087** | **pg/L** |
| **OCDD** | **3.6** | **Q B J** | **100** | **0.054** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.028 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.047 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.050 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.070 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 50 | 0.071 | pg/L |
| **2,3,4,6,7,8-HxCDF** | **0.34** | **Q B J** | **50** | **0.073** | **pg/L** |
| 1,2,3,7,8,9-HxCDF | ND | | 50 | 0.088 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **1.0** | **Q B J** | **50** | **0.12** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 50 | 0.16 | pg/L |
| **OCDF** | **7.2** | **Q B J** | **100** | **0.14** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 77 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 75 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 72 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 89 | 40 - 135 |
| 13C-OCDD | 78 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 83 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 79 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 72 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 78 | 40 - 135 |
| 13C-OCDF | 68 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-4-20150421**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D270404 - 003 | **Work Order #....:** | M6NMM1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/21/15 | **Date Received....:** | 04/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1003 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: MW-2-20150421**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D270404 - 004 | **Work Order #....:** | M6NMN1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/21/15 | **Date Received....:** | 04/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1059 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.4 | 0.013 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.45** | **Q B J** | **47** | **0.19** | **pg/L** |
| **1,2,3,4,7,8-HxCDD** | **0.72** | **B J** | **47** | **0.066** | **pg/L** |
| **1,2,3,6,7,8-HxCDD** | **0.39** | **Q J** | **47** | **0.070** | **pg/L** |
| 1,2,3,7,8,9-HxCDD | ND | | 47 | 0.064 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.66** | **Q B J** | **47** | **0.071** | **pg/L** |
| **OCDD** | **3.3** | **B J** | **94** | **0.066** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.4 | 0.027 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 47 | 0.025 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 47 | 0.025 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 47 | 0.050 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.15** | **Q B J** | **47** | **0.052** | **pg/L** |
| 2,3,4,6,7,8-HxCDF | ND | | 47 | 0.054 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 47 | 0.059 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.47** | **Q B J** | **47** | **0.12** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 47 | 0.14 | pg/L |
| **OCDF** | **9.2** | **B J** | **94** | **0.064** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 84 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 86 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 76 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 72 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 87 | 40 - 135 |
| 13C-OCDD | 78 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 90 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 86 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 84 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 68 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 70 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 77 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 69 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 79 | 40 - 135 |
| 13C-OCDF | 72 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-2-20150421**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D270404 - 004 | **Work Order #....:** | M6NMN1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/21/15 | **Date Received....:** | 04/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1059 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280000 - 034B | **Work Order #....:** | M6PJM1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.015 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.99** | **Q J** | **50** | **0.23** | **pg/L** |
| **1,2,3,4,7,8-HxCDD** | **0.43** | **Q J** | **50** | **0.10** | **pg/L** |
| 1,2,3,6,7,8-HxCDD | ND | | 50 | 0.11 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.099 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.94** | **Q J** | **50** | **0.072** | **pg/L** |
| **OCDD** | **7.3** | **J** | **100** | **0.071** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.021 | pg/L |
| **1,2,3,7,8-PeCDF** | **0.21** | **Q J** | **50** | **0.053** | **pg/L** |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.052 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.063 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.43** | **J** | **50** | **0.057** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.47** | **J** | **50** | **0.065** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.34** | **Q J** | **50** | **0.070** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **1.7** | **J** | **50** | **0.12** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **1.2** | **J** | **50** | **0.16** | **pg/L** |
| **OCDF** | **11** | **Q J** | **100** | **0.11** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 79 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 88 | 40 - 135 |
| 13C-OCDD | 77 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 78 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 78 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 74 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 82 | 40 - 135 |
| 13C-OCDF | 69 | 40 - 135 |

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## Method Blank Report

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280000 - 034B | **Work Order #....:** | M6PJM1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Client Lot # ...:** H5D270404 **Work Order # ...:** M6PJM1AC-LCS **Matrix .....:** WATER
**LCS Lot-Sample# :** H5D280000 - 034
**Prep Date .....:** 04/28/15 **Analysis Date ..:** 04/29/15
**Prep Batch # ...:** 5118034
**Dilution Factor :** 1
**Analyst ID.....:** Linda K. McWhirter **Instrument ID..:** D2A **Method.....:** SW846 8290
**Initial Wgt/Vol:** 1000 mL

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **200** | **210** | **pg/L** | **105** | | **(77 - 127)** |
| **1,2,3,7,8-PeCDD** | **1000** | **1040** | **pg/L** | **104** | **B** | **(78 - 128)** |
| **1,2,3,4,7,8-HxCDD** | **1000** | **1060** | **pg/L** | **106** | **B** | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **1000** | **1040** | **pg/L** | **104** | | **(72 - 127)** |
| **1,2,3,7,8,9-HxCDD** | **1000** | **1140** | **pg/L** | **114** | | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDD** | **1000** | **1010** | **pg/L** | **101** | **B** | **(73 - 123)** |
| **OCDD** | **2000** | **1890** | **pg/L** | **95** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **200** | **208** | **pg/L** | **104** | | **(74 - 124)** |
| **1,2,3,7,8-PeCDF** | **1000** | **959** | **pg/L** | **96** | **B** | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **1000** | **1090** | **pg/L** | **109** | | **(74 - 124)** |
| **1,2,3,4,7,8-HxCDF** | **1000** | **1000** | **pg/L** | **100** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **1000** | **1010** | **pg/L** | **101** | **B** | **(75 - 125)** |
| **2,3,4,6,7,8-HxCDF** | **1000** | **1000** | **pg/L** | **100** | **B** | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **1000** | **971** | **pg/L** | **97** | **B** | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDF** | **1000** | **960** | **pg/L** | **96** | **B** | **(71 - 121)** |
| **1,2,3,4,7,8,9-HpCDF** | **1000** | **965** | **pg/L** | **97** | **B** | **(73 - 123)** |
| **OCDF** | **2000** | **1970** | **pg/L** | **98** | **B** | **(68 - 132)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 82 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 81 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 86 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 80 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 100 | (40 - 135) |
| 13C-OCDD | 91 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 82 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 85 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 79 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 87 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 78 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 86 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 87 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 92 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 95 | (40 - 135) |
| 13C-OCDF | 84 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H5D270404

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-297936.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-68254-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 5/8/2015 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-5-20150420 (280-68254-1) | 4/20/15 | 15:10 Eastern | | Water | | | X | 2 | RT: 1.1°C CT: 1.1°C |
| MW-1-20150421 (280-68254-2) | 4/21/15 | 12:00 Eastern | | Water | | | X | 2 | Custody seal intact |
| MW-4-20150421 (280-68254-3) | 4/21/15 | 15:20 Eastern | | Water | | | X | 2 | 1 Cooler, Fedex Po |
| MW-2-20150421 (280-68254-4) | 4/21/15 | 16:00 Eastern | | Water | | | X | 2 | 4614 6291 5142353 |
| | | | | | | | | | JCS7, KL 4/25/15 |
| 2 x 1L Ambers, unpreserved, per sample D.S.b. 4-24-15 | | | | | | | | | |

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 4/24/15 1530 | Company | Received by: | Date/Time: 4/25/15 1045 | Company TA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H5D270404

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : SC57<br>Correction factor: 0 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: _____ | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**Labeling Verified by:** _____ **Date:** _____

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: Ryan Henry Date: 4/27/15

QA026R29.doc, 041115

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

280-68254 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information | Sampler: Rachel Donahue / Robin Warrier | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-41673-16377.2 |
|---|---|---|---|---|
| Client Contact: ~~Lauren Wellborn~~ ~~Mike Schott~~ Rachel Donahue | Phone: 904-705-1346 | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page: 1 of 1 |
| Company: Geosyntec Consultants, Inc. | | | | Job #: |
| Address: ~~8380 Six Forks Road Suite 201~~ 2501 Blue Ridge Rd Suite 430 | Due Date Requested: | | | |
| City: Raleigh | TAT Requested (days): | | | |
| State, Zip: NC, ~~27615~~ 27607 | | | | |
| Phone: 919-870-0576(Tel) | PO #: GN5219 | | | |
| Email: ~~lwellborn~~ rdonahue@geosyntec.com | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: UNC Cogen, Chapel Hill, NC | SSOW#: | | | |

**Analysis Requested**

**Preservation Codes:**
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Dioxins/Furans 8290 (TA-Knoxville) | Total Metals 6010C / 6010C / 7470A (Waters) | Total Metals 6010C / 7471B (soils) | PAHs 8270D_SIM | Sulfate 9056A | TDS 2540C | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | | |
| MW-5-20150420 | 4/20/15 | 1510 | G | W | N | N | X | X | | X | X | X | 6 | |
| MW-1-20150421 | 4/21/15 | 1200 | G | W | N | N | X | X | | X | X | X | 6 | |
| MW-4-20150421 | 4/21/15 | 1520 | G | W | N | N | X | X | | X | X | X | 6 | |
| MW-2-20150421 | 4/21/15 | 1600 | G | W | N | N | X | X | | X | X | X | 6 | |

**Possible Hazard Identification**
[X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown [ ] Radiological

**Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)**
[ ] Return To Client [X] Disposal By Lab [ ] Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) Esdat EDD

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: FedEx

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 4/21/15 1900 | Geosyntec | [signature] | 4/10 22Apr15 | TAD |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.1, 0.3, 1.1 IR Std. 2 @ 23Apr15

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

280-68254 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information | Sampler: Rachel Donahue / Robert Warrier | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-41673-16377.2 |
|---|---|---|---|---|
| Client Contact: ~~Lauren Wellborn~~ ~~Mike Schott~~ Rachel Donahue | Phone: 904-705-1346 | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page: 1 of 1 |
| Company: Geosyntec Consultants, Inc. | | | | Job #: |
| Address: ~~8380 Six Forks Road Suite 201~~ 2501 Blue Ridge Rd Suite 430 | Due Date Requested: | | | |
| City: Raleigh | TAT Requested (days): | | | |
| State, Zip: NC, ~~27615~~ 27607 | | | | |
| Phone: 919-870-0576(Tel) | PO #: GN5219 | | | |
| Email: ~~lwellborn~~ rdonahue@geosyntec.com | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: UNC Cogen, Chapel Hill, NC | SSOW#: | | | |

**Analysis Requested**

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Dioxins/Furans 8290 (TA-Knoxville) | Total Metals 6010C / 6010C / 7470A (Waters) | Total Metals 6010C / 7471B (soils) | PAHs 8270D_SIM | Sulfate 9056A | TDS 2540C | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | | |
| MW-5-20150420 | 4/20/15 | 1510 | G | W | N | N | X | X | | X | X | X | 6 | |
| MW-1-20150421 | 4/21/15 | 1200 | G | W | N | N | X | X | | X | X | X | 6 | |
| MW-4-20150421 | 4/21/15 | 1520 | G | W | N | N | X | X | | X | X | X | 6 | |
| MW-2-20150421 | 4/21/15 | 1600 | G | W | N | N | X | X | | X | X | X | 6 | |

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2SO3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - ph 4-5 |
| L - EDA | Z - other (specify) |

Other:

*Possible Hazard Identification*
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify) ESdat EDD

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: FedEx

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 4/21/15 1900 | GEOSYNTEC | [signature] | 4/10 22 Apr 15 | TAD |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.1, 0.3 | 1.1 | 1.5 | 1.2 @ 23 Apr 15

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-68254-1

**Login Number: 68254**
**List Number: 1**
**Creator: Muniz, Ashley T**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-68403-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/9/2016 5:22:20 AM*

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LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

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*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68403-1

## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-68403-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-68403-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**
The samples were received on 4/25/2015 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 0.6º C and 4.3º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 Middlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 4/28/2015 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1º C.

**8270D SIM GCMS**
Samples MW3-150424 (280-68403-1) and MW93-150424 (280-68403-2) were analyzed for 8270D SIM GCMS in accordance with SW-846 8270D. The samples were prepared on 04/30/2015 and analyzed on 05/06/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**
Samples MW3-150424 (280-68403-1) and MW93-150424 (280-68403-2) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 04/28/2015 and analyzed on 04/29/2015 and 04/30/2015.

Manganese failed the recovery criteria low for the MS of sample MW3-150424MS (280-68403-1) in batch 280-275300. Refer to the QC report for details. The presence of the '4' qualifier indicates analytes where the concentration in the unspiked sample exceeded four times the spiking amount.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY**
Samples MW3-150424 (280-68403-1) and MW93-150424 (280-68403-2) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 04/29/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL DISSOLVED SOLIDS**

## Job ID: 280-68403-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

Samples MW3-150424 (280-68403-1) and MW93-150424 (280-68403-2) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 04/30/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS)**

Samples MW3-150424 (280-68403-1) and MW93-150424 (280-68403-2) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 05/11/2015.

Samples MW3-150424 (280-68403-1)[5X] and MW93-150424 (280-68403-2)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68403-1

## Client Sample ID: MW3-150424 — Lab Sample ID: 280-68403-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 78000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 20000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 8800 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 19 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 110000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Beryllium | 0.61 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | Total/NA |
| Cadmium | 0.50 | J | 5.0 | 0.45 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 130 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 370 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 8500 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 26 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Silver | 2.1 | J | 10 | 0.93 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 38 | | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 330 | | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Total Dissolved Solids | 670 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW93-150424 — Lab Sample ID: 280-68403-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 77000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 20000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 5.3 | J | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 8700 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 19 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 100000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Beryllium | 0.55 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | Total/NA |
| Cadmium | 0.58 | J | 5.0 | 0.45 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 120 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 340 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 8200 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 25 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Silver | 2.7 | J | 10 | 0.93 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 35 | | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 350 | | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Total Dissolved Solids | 670 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68403-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68403-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Water | 04/24/15 11:00 | 04/25/15 09:10 |
| 280-68403-2 | MW93-150424 | Water | 04/24/15 11:00 | 04/25/15 09:10 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: MW3-150424**
**Date Collected: 04/24/15 11:00**
**Date Received: 04/25/15 09:10**

**Lab Sample ID: 280-68403-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.5 | U | 97 | 5.5 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| 2-Methylnaphthalene | 5.0 | U | 97 | 5.0 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Acenaphthene | 10 | U | 97 | 10 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Acenaphthylene | 9.6 | U | 97 | 9.6 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Anthracene | 14 | U | 97 | 14 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Benzo[a]anthracene | 3.1 | U | 97 | 3.1 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Benzo[a]pyrene | 5.0 | U | 97 | 5.0 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Benzo[b]fluoranthene | 3.3 | U | 97 | 3.3 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U | 97 | 3.4 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Benzo[k]fluoranthene | 4.9 | U | 97 | 4.9 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Chrysene | 3.1 | U | 97 | 3.1 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Dibenz(a,h)anthracene | 4.7 | U | 97 | 4.7 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Fluoranthene | 4.4 | U | 97 | 4.4 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Fluorene | 18 | U | 97 | 18 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 97 | 14 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Naphthalene | 5.1 | U | 97 | 5.1 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Phenanthrene | 9.4 | U | 97 | 9.4 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |
| Pyrene | 7.8 | U | 97 | 7.8 | ng/L | | 04/30/15 09:27 | 05/06/15 19:56 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *66* | | *42 - 120* | *04/30/15 09:27* | *05/06/15 19:56* | *1* |
| *Nitrobenzene-d5* | *73* | | *43 - 120* | *04/30/15 09:27* | *05/06/15 19:56* | *1* |
| *Terphenyl-d14* | *68* | | *47 - 120* | *04/30/15 09:27* | *05/06/15 19:56* | *1* |

**Client Sample ID: MW93-150424**
**Date Collected: 04/24/15 11:00**
**Date Received: 04/25/15 09:10**

**Lab Sample ID: 280-68403-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.6 | U | 99 | 5.6 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| 2-Methylnaphthalene | 5.1 | U | 99 | 5.1 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Acenaphthene | 11 | U | 99 | 11 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Acenaphthylene | 9.8 | U | 99 | 9.8 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Anthracene | 14 | U | 99 | 14 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Benzo[a]anthracene | 3.2 | U | 99 | 3.2 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Benzo[a]pyrene | 5.1 | U | 99 | 5.1 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 99 | 3.4 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Benzo[g,h,i]perylene | 3.5 | U | 99 | 3.5 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Benzo[k]fluoranthene | 5.0 | U | 99 | 5.0 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Chrysene | 3.1 | U | 99 | 3.1 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 99 | 4.8 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Fluoranthene | 4.5 | U | 99 | 4.5 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Fluorene | 19 | U | 99 | 19 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U | 99 | 14 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Naphthalene | 5.3 | U | 99 | 5.3 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Phenanthrene | 9.6 | U | 99 | 9.6 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |
| Pyrene | 8.0 | U | 99 | 8.0 | ng/L | | 04/30/15 09:27 | 05/06/15 20:21 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *71* | | *42 - 120* | *04/30/15 09:27* | *05/06/15 20:21* | *1* |
| *Nitrobenzene-d5* | *76* | | *43 - 120* | *04/30/15 09:27* | *05/06/15 20:21* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: MW93-150424**
**Date Collected: 04/24/15 11:00**
**Date Received: 04/25/15 09:10**

**Lab Sample ID: 280-68403-2**
**Matrix: Water**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *75* | | *47 - 120* | *04/30/15 09:27* | *05/06/15 20:21* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: MW3-150424**
**Date Collected: 04/24/15 11:00**
**Date Received: 04/25/15 09:10**

**Lab Sample ID: 280-68403-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Calcium** | **78000** | | 200 | 35 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Magnesium** | **20000** | | 200 | 11 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Potassium** | **8800** | | 3000 | 240 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Barium** | **19** | | 10 | 0.58 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Sodium** | **110000** | | 1000 | 92 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Beryllium** | **0.61** | **J** | 1.0 | 0.47 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Cadmium** | **0.50** | **J** | 5.0 | 0.45 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Cobalt** | **130** | | 10 | 1.2 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Iron** | **370** | | 100 | 22 | ug/L | | 04/28/15 14:30 | 04/30/15 19:49 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Manganese** | **8500** | | 10 | 0.25 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Nickel** | **26** | **J** | 40 | 1.3 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 04/28/15 14:30 | 04/30/15 19:49 | 1 |
| **Silver** | **2.1** | **J** | 10 | 0.93 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| **Zinc** | **38** | | 20 | 4.5 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 04/28/15 14:30 | 04/29/15 19:16 | 1 |

**Client Sample ID: MW93-150424**
**Date Collected: 04/24/15 11:00**
**Date Received: 04/25/15 09:10**

**Lab Sample ID: 280-68403-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Calcium** | **77000** | | 200 | 35 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Magnesium** | **20000** | | 200 | 11 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Arsenic** | **5.3** | **J** | 15 | 4.4 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Potassium** | **8700** | | 3000 | 240 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Barium** | **19** | | 10 | 0.58 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Sodium** | **100000** | | 1000 | 92 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Beryllium** | **0.55** | **J** | 1.0 | 0.47 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Cadmium** | **0.58** | **J** | 5.0 | 0.45 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Cobalt** | **120** | | 10 | 1.2 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Iron** | **340** | | 100 | 22 | ug/L | | 04/28/15 14:30 | 04/30/15 20:02 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW93-150424** — **Lab Sample ID: 280-68403-2**
**Date Collected: 04/24/15 11:00** — **Matrix: Water**
**Date Received: 04/25/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Manganese** | **8200** | | 10 | 0.25 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Nickel** | **25** | **J** | 40 | 1.3 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 04/28/15 14:30 | 04/30/15 20:02 | 1 |
| **Silver** | **2.7** | **J** | 10 | 0.93 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| **Zinc** | **35** | | 20 | 4.5 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 04/28/15 14:30 | 04/29/15 19:29 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW3-150424** — **Lab Sample ID: 280-68403-1**
**Date Collected: 04/24/15 11:00** — **Matrix: Water**
**Date Received: 04/25/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 04/29/15 10:30 | 04/29/15 17:06 | 1 |

**Client Sample ID: MW93-150424** — **Lab Sample ID: 280-68403-2**
**Date Collected: 04/24/15 11:00** — **Matrix: Water**
**Date Received: 04/25/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 04/29/15 10:30 | 04/29/15 17:17 | 1 |

## General Chemistry

**Client Sample ID: MW3-150424** — **Lab Sample ID: 280-68403-1**
**Date Collected: 04/24/15 11:00** — **Matrix: Water**
**Date Received: 04/25/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Sulfate** | **330** | | 25 | 1.2 | mg/L | | | 05/11/15 21:35 | 5 |
| **Total Dissolved Solids** | **670** | | 10 | 4.7 | mg/L | | | 04/30/15 13:30 | 1 |

**Client Sample ID: MW93-150424** — **Lab Sample ID: 280-68403-2**
**Date Collected: 04/24/15 11:00** — **Matrix: Water**
**Date Received: 04/25/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Sulfate** | **350** | | 25 | 1.2 | mg/L | | | 05/11/15 21:52 | 5 |
| **Total Dissolved Solids** | **670** | | 10 | 4.7 | mg/L | | | 04/30/15 13:30 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68403-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (42-120) | (43-120) | (47-120) |
| 280-68403-1 | MW3-150424 | 66 | 73 | 68 |
| 280-68403-2 | MW93-150424 | 71 | 76 | 75 |
| LCS 280-275243/2-A | Lab Control Sample | 74 | 82 | 85 |
| MB 280-275243/1-A | Method Blank | 71 | 81 | 81 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-275243/1-A**
**Matrix: Water**
**Analysis Batch: 276178**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 275243**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 04/30/15 09:27 | 05/06/15 11:54 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *71* | | *42 - 120* | *04/30/15 09:27* | *05/06/15 11:54* | *1* |
| *Nitrobenzene-d5* | *81* | | *43 - 120* | *04/30/15 09:27* | *05/06/15 11:54* | *1* |
| *Terphenyl-d14* | *81* | | *47 - 120* | *04/30/15 09:27* | *05/06/15 11:54* | *1* |

**Lab Sample ID: LCS 280-275243/2-A**
**Matrix: Water**
**Analysis Batch: 276178**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 275243**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 708 | | ng/L | | 79 | 47 - 120 |
| Acenaphthylene | 900 | 649 | | ng/L | | 72 | 39 - 120 |
| Anthracene | 900 | 756 | | ng/L | | 84 | 28 - 120 |
| Benzo[a]anthracene | 900 | 770 | | ng/L | | 86 | 42 - 120 |
| Benzo[a]pyrene | 900 | 725 | | ng/L | | 81 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 760 | | ng/L | | 84 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 669 | | ng/L | | 74 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 744 | | ng/L | | 83 | 43 - 120 |
| Chrysene | 900 | 778 | | ng/L | | 86 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 709 | | ng/L | | 79 | 27 - 126 |
| Fluoranthene | 900 | 787 | | ng/L | | 87 | 46 - 120 |
| Fluorene | 900 | 741 | | ng/L | | 82 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 735 | | ng/L | | 82 | 38 - 120 |
| Naphthalene | 900 | 648 | | ng/L | | 72 | 37 - 120 |
| Phenanthrene | 900 | 742 | | ng/L | | 82 | 46 - 120 |
| Pyrene | 900 | 761 | | ng/L | | 85 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-275243/2-A**
**Matrix: Water**
**Analysis Batch: 276178**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 275243**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *74* | | *42 - 120* |
| *Nitrobenzene-d5* | *82* | | *43 - 120* |
| *Terphenyl-d14* | *85* | | *47 - 120* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-274810/1-A**
**Matrix: Water**
**Analysis Batch: 275300**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 274810**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Sodium | 92 | U | 1000 | 92 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 04/28/15 14:30 | 04/29/15 19:11 | 1 |

**Lab Sample ID: MB 280-274810/1-A**
**Matrix: Water**
**Analysis Batch: 275514**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 274810**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 22 | U | 100 | 22 | ug/L | | 04/28/15 14:30 | 04/30/15 19:44 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 04/28/15 14:30 | 04/30/15 19:44 | 1 |

**Lab Sample ID: LCS 280-274810/2-A**
**Matrix: Water**
**Analysis Batch: 275300**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 274810**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 2130 | | ug/L | | 106 | 87 - 111 |
| Calcium | 50000 | 52300 | | ug/L | | 105 | 90 - 111 |
| Antimony | 500 | 547 | | ug/L | | 109 | 88 - 110 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-274810/2-A**
**Matrix: Water**
**Analysis Batch: 275300**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 274810**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Magnesium | 50000 | 49400 | | ug/L | | 99 | 90 - 113 |
| Arsenic | 1000 | 961 | | ug/L | | 96 | 88 - 110 |
| Potassium | 50000 | 50800 | | ug/L | | 102 | 89 - 114 |
| Barium | 2000 | 2010 | | ug/L | | 100 | 90 - 112 |
| Sodium | 50000 | 56700 | | ug/L | | 113 | 90 - 115 |
| Beryllium | 50.0 | 51.0 | | ug/L | | 102 | 89 - 113 |
| Cadmium | 100 | 99.5 | | ug/L | | 99 | 88 - 111 |
| Chromium | 200 | 223 | | ug/L | | 111 | 90 - 113 |
| Copper | 250 | 238 | | ug/L | | 95 | 86 - 112 |
| Cobalt | 500 | 498 | | ug/L | | 100 | 89 - 111 |
| Lead | 500 | 520 | | ug/L | | 104 | 89 - 110 |
| Manganese | 500 | 512 | | ug/L | | 102 | 90 - 110 |
| Nickel | 500 | 477 | | ug/L | | 95 | 89 - 111 |
| Silver | 50.0 | 55.1 | | ug/L | | 110 | 86 - 115 |
| Thallium | 2000 | 2130 | | ug/L | | 107 | 88 - 110 |
| Zinc | 500 | 503 | | ug/L | | 101 | 85 - 111 |
| Vanadium | 500 | 520 | | ug/L | | 104 | 90 - 111 |

**Lab Sample ID: LCS 280-274810/2-A**
**Matrix: Water**
**Analysis Batch: 275514**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 274810**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Iron | 1000 | 990 | | ug/L | | 99 | 89 - 115 |
| Selenium | 2000 | 2090 | | ug/L | | 105 | 85 - 112 |

**Lab Sample ID: 280-68403-1 MS**
**Matrix: Water**
**Analysis Batch: 275300**

**Client Sample ID: MW3-150424**
**Prep Type: Total/NA**
**Prep Batch: 274810**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 2000 | 2030 | | ug/L | | 102 | 83 - 119 |
| Calcium | 78000 | | 50000 | 129000 | | ug/L | | 102 | 48 - 153 |
| Antimony | 3.1 | U | 500 | 541 | | ug/L | | 108 | 81 - 124 |
| Magnesium | 20000 | | 50000 | 68000 | | ug/L | | 95 | 62 - 146 |
| Arsenic | 4.4 | U | 1000 | 963 | | ug/L | | 96 | 84 - 124 |
| Potassium | 8800 | | 50000 | 59200 | | ug/L | | 101 | 76 - 132 |
| Barium | 19 | | 2000 | 2000 | | ug/L | | 99 | 85 - 120 |
| Sodium | 110000 | | 50000 | 161000 | | ug/L | | 108 | 70 - 203 |
| Beryllium | 0.61 | J | 50.0 | 50.7 | | ug/L | | 100 | 79 - 121 |
| Cadmium | 0.50 | J | 100 | 98.8 | | ug/L | | 98 | 82 - 119 |
| Chromium | 0.66 | U | 200 | 218 | | ug/L | | 109 | 73 - 135 |
| Copper | 1.4 | U | 250 | 237 | | ug/L | | 95 | 82 - 129 |
| Cobalt | 130 | | 500 | 607 | | ug/L | | 96 | 82 - 119 |
| Lead | 2.6 | U | 500 | 500 | | ug/L | | 100 | 89 - 121 |
| Manganese | 8500 | | 500 | 8860 | 4 | ug/L | | 76 | 79 - 121 |
| Nickel | 26 | J | 500 | 490 | | ug/L | | 93 | 84 - 120 |
| Silver | 2.1 | J | 50.0 | 56.7 | | ug/L | | 109 | 75 - 141 |
| Thallium | 4.9 | U | 2000 | 1990 | | ug/L | | 100 | 90 - 116 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-68403-1 MS** — **Client Sample ID: MW3-150424**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275300** — **Prep Batch: 274810**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Zinc | 38 | | 500 | 523 | | ug/L | | 97 | 60 - 137 |
| Vanadium | 1.1 | U | 500 | 514 | | ug/L | | 103 | 85 - 120 |

**Lab Sample ID: 280-68403-1 MS** — **Client Sample ID: MW3-150424**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275514** — **Prep Batch: 274810**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 370 | | 1000 | 1310 | | ug/L | | 94 | 52 - 155 |
| Selenium | 4.9 | U | 2000 | 2060 | | ug/L | | 103 | 71 - 140 |

**Lab Sample ID: 280-68403-1 MSD** — **Client Sample ID: MW3-150424**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275300** — **Prep Batch: 274810**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 2000 | 2060 | | ug/L | | 103 | 83 - 119 | 2 | 20 |
| Calcium | 78000 | | 50000 | 130000 | | ug/L | | 104 | 48 - 153 | 1 | 20 |
| Antimony | 3.1 | U | 500 | 557 | | ug/L | | 111 | 81 - 124 | 3 | 20 |
| Magnesium | 20000 | | 50000 | 68900 | | ug/L | | 97 | 62 - 146 | 1 | 20 |
| Arsenic | 4.4 | U | 1000 | 982 | | ug/L | | 98 | 84 - 124 | 2 | 20 |
| Potassium | 8800 | | 50000 | 59700 | | ug/L | | 102 | 76 - 132 | 1 | 20 |
| Barium | 19 | | 2000 | 2030 | | ug/L | | 100 | 85 - 120 | 1 | 20 |
| Sodium | 110000 | | 50000 | 161000 | | ug/L | | 109 | 70 - 203 | 0 | 20 |
| Beryllium | 0.61 | J | 50.0 | 51.0 | | ug/L | | 101 | 79 - 121 | 1 | 20 |
| Cadmium | 0.50 | J | 100 | 101 | | ug/L | | 101 | 82 - 119 | 2 | 20 |
| Chromium | 0.66 | U | 200 | 223 | | ug/L | | 112 | 73 - 135 | 2 | 20 |
| Copper | 1.4 | U | 250 | 243 | | ug/L | | 97 | 82 - 129 | 2 | 20 |
| Cobalt | 130 | | 500 | 621 | | ug/L | | 99 | 82 - 119 | 2 | 20 |
| Lead | 2.6 | U | 500 | 513 | | ug/L | | 103 | 89 - 121 | 2 | 20 |
| Manganese | 8500 | | 500 | 8940 | 4 | ug/L | | 94 | 79 - 121 | 1 | 20 |
| Nickel | 26 | J | 500 | 500 | | ug/L | | 95 | 84 - 120 | 2 | 20 |
| Silver | 2.1 | J | 50.0 | 57.4 | | ug/L | | 111 | 75 - 141 | 1 | 20 |
| Thallium | 4.9 | U | 2000 | 2040 | | ug/L | | 102 | 90 - 116 | 2 | 20 |
| Zinc | 38 | | 500 | 528 | | ug/L | | 98 | 60 - 137 | 1 | 20 |
| Vanadium | 1.1 | U | 500 | 523 | | ug/L | | 105 | 85 - 120 | 2 | 20 |

**Lab Sample ID: 280-68403-1 MSD** — **Client Sample ID: MW3-150424**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275514** — **Prep Batch: 274810**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 370 | | 1000 | 1350 | | ug/L | | 98 | 52 - 155 | 3 | 20 |
| Selenium | 4.9 | U | 2000 | 2090 | | ug/L | | 104 | 71 - 140 | 1 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-275031/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275304** — **Prep Batch: 275031**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 04/29/15 10:30 | 04/29/15 16:54 | 1 |

**Lab Sample ID: LCS 280-275031/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275304** — **Prep Batch: 275031**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.04 | | ug/L | | 101 | 84 - 120 |

**Lab Sample ID: 280-68403-1 MS** — **Client Sample ID: MW3-150424**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275304** — **Prep Batch: 275031**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 5.00 | 5.17 | | ug/L | | 103 | 75 - 125 |

**Lab Sample ID: 280-68403-1 MSD** — **Client Sample ID: MW3-150424**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275304** — **Prep Batch: 275031**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 5.00 | 5.19 | | ug/L | | 104 | 75 - 125 | 1 | 20 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-276800/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 276800**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 0.23 | U | 5.0 | 0.23 | mg/L | | | 05/11/15 09:20 | 1 |

**Lab Sample ID: LCS 280-276800/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 276800**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 100 | | mg/L | | 100 | 90 - 110 |

**Lab Sample ID: LCSD 280-276800/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 276800**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 100 | | mg/L | | 100 | 90 - 110 | 0 | 10 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MRL 280-276800/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 276800**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 2.50 | 2.39 | J | mg/L | | 95 | 50 - 150 |

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 280-275363/1** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275363**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 4.7 | U | 10 | 4.7 | mg/L | | | 04/30/15 13:30 | 1 |

**Lab Sample ID: LCS 280-275363/2** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 275363**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 501 | 477 | | mg/L | | 95 | 86 - 110 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68403-1

## GC/MS Semi VOA

### Prep Batch: 275243

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | 3510C | |
| 280-68403-2 | MW93-150424 | Total/NA | Water | 3510C | |
| LCS 280-275243/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| MB 280-275243/1-A | Method Blank | Total/NA | Water | 3510C | |

### Analysis Batch: 276178

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | 8270D SIM | 275243 |
| 280-68403-2 | MW93-150424 | Total/NA | Water | 8270D SIM | 275243 |
| LCS 280-275243/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 275243 |
| MB 280-275243/1-A | Method Blank | Total/NA | Water | 8270D SIM | 275243 |

## Metals

### Prep Batch: 274810

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | 3010A | |
| 280-68403-1 MS | MW3-150424 | Total/NA | Water | 3010A | |
| 280-68403-1 MSD | MW3-150424 | Total/NA | Water | 3010A | |
| 280-68403-2 | MW93-150424 | Total/NA | Water | 3010A | |
| LCS 280-274810/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-274810/1-A | Method Blank | Total/NA | Water | 3010A | |

### Prep Batch: 275031

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | 7470A | |
| 280-68403-1 MS | MW3-150424 | Total/NA | Water | 7470A | |
| 280-68403-1 MSD | MW3-150424 | Total/NA | Water | 7470A | |
| 280-68403-2 | MW93-150424 | Total/NA | Water | 7470A | |
| LCS 280-275031/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| MB 280-275031/1-A | Method Blank | Total/NA | Water | 7470A | |

### Analysis Batch: 275300

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | 6010C | 274810 |
| 280-68403-1 MS | MW3-150424 | Total/NA | Water | 6010C | 274810 |
| 280-68403-1 MSD | MW3-150424 | Total/NA | Water | 6010C | 274810 |
| 280-68403-2 | MW93-150424 | Total/NA | Water | 6010C | 274810 |
| LCS 280-274810/2-A | Lab Control Sample | Total/NA | Water | 6010C | 274810 |
| MB 280-274810/1-A | Method Blank | Total/NA | Water | 6010C | 274810 |

### Analysis Batch: 275304

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | 7470A | 275031 |
| 280-68403-1 MS | MW3-150424 | Total/NA | Water | 7470A | 275031 |
| 280-68403-1 MSD | MW3-150424 | Total/NA | Water | 7470A | 275031 |
| 280-68403-2 | MW93-150424 | Total/NA | Water | 7470A | 275031 |
| LCS 280-275031/2-A | Lab Control Sample | Total/NA | Water | 7470A | 275031 |
| MB 280-275031/1-A | Method Blank | Total/NA | Water | 7470A | 275031 |

## Metals (Continued)

### Analysis Batch: 275514

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | 6010C | 274810 |
| 280-68403-1 MS | MW3-150424 | Total/NA | Water | 6010C | 274810 |
| 280-68403-1 MSD | MW3-150424 | Total/NA | Water | 6010C | 274810 |
| 280-68403-2 | MW93-150424 | Total/NA | Water | 6010C | 274810 |
| LCS 280-274810/2-A | Lab Control Sample | Total/NA | Water | 6010C | 274810 |
| MB 280-274810/1-A | Method Blank | Total/NA | Water | 6010C | 274810 |

## General Chemistry

### Analysis Batch: 275363

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | SM 2540C | |
| 280-68403-2 | MW93-150424 | Total/NA | Water | SM 2540C | |
| LCS 280-275363/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| MB 280-275363/1 | Method Blank | Total/NA | Water | SM 2540C | |

### Analysis Batch: 276800

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-68403-1 | MW3-150424 | Total/NA | Water | 9056A | |
| 280-68403-2 | MW93-150424 | Total/NA | Water | 9056A | |
| LCS 280-276800/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-276800/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-276800/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-276800/3 | Lab Control Sample | Total/NA | Water | 9056A | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68403-1

## Client Sample ID: MW3-150424

**Lab Sample ID: 280-68403-1**

**Date Collected: 04/24/15 11:00**

**Matrix: Water**

**Date Received: 04/25/15 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1035.5 mL | 1 mL | 275243 | 04/30/15 09:27 | JKN | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1035.5 mL | 1 mL | 276178 | 05/06/15 19:56 | NRC | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 274810 | 04/28/15 14:30 | MLS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 275300 | 04/29/15 19:16 | LLB | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 274810 | 04/28/15 14:30 | MLS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 275514 | 04/30/15 19:49 | LLB | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 275031 | 04/29/15 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 275304 | 04/29/15 17:06 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 276800 | 05/11/15 21:35 | AFB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 275363 | 04/30/15 13:30 | SVC | TAL DEN |

## Client Sample ID: MW93-150424

**Lab Sample ID: 280-68403-2**

**Date Collected: 04/24/15 11:00**

**Matrix: Water**

**Date Received: 04/25/15 09:10**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1014.2 mL | 1 mL | 275243 | 04/30/15 09:27 | JKN | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1014.2 mL | 1 mL | 276178 | 05/06/15 20:21 | NRC | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 274810 | 04/28/15 14:30 | MLS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 275300 | 04/29/15 19:29 | LLB | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 274810 | 04/28/15 14:30 | MLS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 275514 | 04/30/15 20:02 | LLB | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 275031 | 04/29/15 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 275304 | 04/29/15 17:17 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 276800 | 05/11/15 21:52 | AFB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 275363 | 04/30/15 13:30 | SVC | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-68403-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

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**Sample Receipt Documentation ..... 18**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-68403-1

UNC Cogen

Lot #: H5D280410

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

May 5, 2015

# ANALYTICAL METHODS SUMMARY

**H5D280410**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

H5D280410

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M6PHN | 001 | MW3-150424 | 04/24/15 | 11:00 |
| M6PHP | 002 | MW93-150424 | 04/24/15 | 11:00 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H5D280410

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the

# PROJECT NARRATIVE
## H5D280410

concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of ≥2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

# PROJECT NARRATIVE
## H5D280410

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |

# PROJECT NARRATIVE
## H5D280410

W = amount of sample extracted (grams or liters)
S = percent solids (optional, if results are requested to be reported on dry weight basis)

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA150004 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | TN02014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-14-7 |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00260 |
| TestAmerica Knoxville | Utah | NELAC | 8 | TN000092014-5 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 00165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |
| TestAmerica Knoxville | Wisconsin | State Program | 5 | 998044300 |

Accreditation may not be offered or required for all methods and analytes in this report. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: MW3-150424**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280410 - 001 | **Work Order #....:** | M6PHN1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/24/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 972 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.013 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.63** | **Q B J** | **51** | **0.30** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 51 | 0.11 | pg/L |
| **1,2,3,6,7,8-HxCDD** | **0.72** | **J** | **51** | **0.10** | **pg/L** |
| 1,2,3,7,8,9-HxCDD | ND | | 51 | 0.099 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.75** | **B J** | **51** | **0.091** | **pg/L** |
| **OCDD** | **3.7** | **Q B J** | **100** | **0.079** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.046 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 51 | 0.068 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 51 | 0.063 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 51 | 0.060 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 51 | 0.058 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 51 | 0.066 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 51 | 0.072 | pg/L |
| 1,2,3,4,6,7,8-HpCDF | ND | | 51 | 0.17 | pg/L |
| 1,2,3,4,7,8,9-HpCDF | ND | | 51 | 0.21 | pg/L |
| **OCDF** | **8.1** | **B J** | **100** | **0.093** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 84 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 79 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 73 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 86 | 40 - 135 |
| 13C-OCDD | 75 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 87 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 76 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 77 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 80 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 75 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 80 | 40 - 135 |
| 13C-OCDF | 73 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW3-150424**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280410 - 001 | **Work Order #....:** | M6PHN1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/24/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 972 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: MW93-150424**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280410 - 002 | **Work Order #....:** | M6PHP1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/24/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1012 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.9 | 0.018 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.40** | **Q B J** | **49** | **0.19** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 49 | 0.13 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 49 | 0.15 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 49 | 0.13 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.24** | **Q B J** | **49** | **0.092** | **pg/L** |
| **OCDD** | **7.0** | **B J** | **99** | **0.089** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.9 | 0.039 | pg/L |
| **1,2,3,7,8-PeCDF** | **0.12** | **Q B J** | **49** | **0.065** | **pg/L** |
| 2,3,4,7,8-PeCDF | ND | | 49 | 0.061 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 49 | 0.075 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.39** | **B J** | **49** | **0.074** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.48** | **Q B J** | **49** | **0.075** | **pg/L** |
| 1,2,3,7,8,9-HxCDF | ND | | 49 | 0.089 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.80** | **B J** | **49** | **0.15** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.94** | **Q B J** | **49** | **0.21** | **pg/L** |
| **OCDF** | **6.2** | **Q B J** | **99** | **0.11** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 86 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 85 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 78 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 94 | 40 - 135 |
| 13C-OCDD | 78 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 90 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 83 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 77 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 83 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 81 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 83 | 40 - 135 |
| 13C-OCDF | 70 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW93-150424**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280410 - 002 | **Work Order #....:** | M6PHP1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 04/24/15 | **Date Received....:** | 04/28/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1012 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Melissa A. Davidson | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280000 - 034B | **Work Order #....:** | M6PJM1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.015 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.99** | **Q J** | **50** | **0.23** | **pg/L** |
| **1,2,3,4,7,8-HxCDD** | **0.43** | **Q J** | **50** | **0.10** | **pg/L** |
| 1,2,3,6,7,8-HxCDD | ND | | 50 | 0.11 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.099 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **0.94** | **Q J** | **50** | **0.072** | **pg/L** |
| **OCDD** | **7.3** | **J** | **100** | **0.071** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.021 | pg/L |
| **1,2,3,7,8-PeCDF** | **0.21** | **Q J** | **50** | **0.053** | **pg/L** |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.052 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.063 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.43** | **J** | **50** | **0.057** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.47** | **J** | **50** | **0.065** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.34** | **Q J** | **50** | **0.070** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **1.7** | **J** | **50** | **0.12** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **1.2** | **J** | **50** | **0.16** | **pg/L** |
| **OCDF** | **11** | **Q J** | **100** | **0.11** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 79 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 83 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 88 | 40 - 135 |
| 13C-OCDD | 77 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 85 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 78 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 78 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 74 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 76 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 80 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 82 | 40 - 135 |
| 13C-OCDF | 69 | 40 - 135 |

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# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5D280000 - 034B | **Work Order #....:** | M6PJM1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 04/28/15 | **Analysis Date....:** | 04/30/15 | | |
| **Prep Batch # ....:** | 5118034 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H5D280410 | **Work Order # ...:** | M6PJM1AC-LCS | **Matrix .....:** | WATER |
| **LCS Lot-Sample# :** | H5D280000 - 034 | | | | |
| **Prep Date .....:** | 04/28/15 | **Analysis Date ..:** | 04/29/15 | | |
| **Prep Batch # ...:** | 5118034 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1000 mL | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **200** | **210** | **pg/L** | **105** | | **(77 - 127)** |
| **1,2,3,7,8-PeCDD** | **1000** | **1040** | **pg/L** | **104** | **B** | **(78 - 128)** |
| **1,2,3,4,7,8-HxCDD** | **1000** | **1060** | **pg/L** | **106** | **B** | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **1000** | **1040** | **pg/L** | **104** | | **(72 - 127)** |
| **1,2,3,7,8,9-HxCDD** | **1000** | **1140** | **pg/L** | **114** | | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDD** | **1000** | **1010** | **pg/L** | **101** | **B** | **(73 - 123)** |
| **OCDD** | **2000** | **1890** | **pg/L** | **95** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **200** | **208** | **pg/L** | **104** | | **(74 - 124)** |
| **1,2,3,7,8-PeCDF** | **1000** | **959** | **pg/L** | **96** | **B** | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **1000** | **1090** | **pg/L** | **109** | | **(74 - 124)** |
| **1,2,3,4,7,8-HxCDF** | **1000** | **1000** | **pg/L** | **100** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **1000** | **1010** | **pg/L** | **101** | **B** | **(75 - 125)** |
| **2,3,4,6,7,8-HxCDF** | **1000** | **1000** | **pg/L** | **100** | **B** | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **1000** | **971** | **pg/L** | **97** | **B** | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDF** | **1000** | **960** | **pg/L** | **96** | **B** | **(71 - 121)** |
| **1,2,3,4,7,8,9-HpCDF** | **1000** | **965** | **pg/L** | **97** | **B** | **(73 - 123)** |
| **OCDF** | **2000** | **1970** | **pg/L** | **98** | **B** | **(68 - 132)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 82 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 81 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 86 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 80 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 100 | (40 - 135) |
| 13C-OCDD | 91 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 82 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 85 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 79 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 87 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 78 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 86 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 87 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 92 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 95 | (40 - 135) |
| 13C-OCDF | 84 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

HSD 280410

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| | | | |
|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | |
| Company: TestAmerica Laboratories, Inc. | | | |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 5/13/2015 | | |
| City: Knoxville | TAT Requested (days): | | |
| State, Zip: TN, 37921 | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | |
| Email: | WO #: | | |
| Project Name: UNC Cogen | Project #: 28010940 | | |
| Site: | SSOW#: | | |

COC No: 280-298341.1
Page: Page 1 of 1
Job #: 280-68403-1

**Analysis Requested**

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2SO3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - ph 4-5 |
| L - EDA | Z - other (specify) |

Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW3-150424 (280-68403-1) | 4/24/15 | 11:00 Mountain | | Water | | | X | 2 | |
| MW93-150424 (280-68403-2) | 4/24/15 | 11:00 Mountain | | Water | | | X | 2 | |

2 x 1L unpreserved ambers per Sample. D.B. 4-27-15

RT CT
REC. @ 1.1°c 1.1°c
CUSTODY SEAL INTACT
1 COOLER RH 4-28-15
FED EX# 629115143577

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
| Relinquished by: | Date/Time: 4/27/15 1530 | Company TA | Received by: Ryan Henry | Date/Time: 4/28/15 1030 | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** HSD280416

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : 5C57<br>Correction factor: 0 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: _____ | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**Labeling Verified by:** _____ **Date:** _____

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: Ryan Henry Date: 4/28/15

QA026R29.doc, 041115

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

280-68403 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information | Sampler: Rachel Donahue | Lab PM: McEntee, Patrick J | COC No: 280-41673-16377.5 |
|---|---|---|---|
| Client Contact: ~~Lauren Wellborn~~ Rachel Donahue | Phone: 904-705-1346 | E-Mail: patrick.mcentee@testamericainc.com | Page: Page: 1 of 1 |
| Company: Geosyntec Consultants, Inc. | | | Job #: |
| Address: ~~8380 Six Forks Road Suite 201~~ 2501 Blue Ridge Rd Suite 430 | Due Date Requested: | | |
| City: Raleigh | TAT Requested (days): | | |
| State, Zip: NC, ~~27615~~ 27607 | | | |
| Phone: 919-870-0576(Tel) | PO #: GN5219 | | |
| Email: ~~lwellborn@geosyntec.com~~ rdonahue | WO #: | | |
| Project Name: UNC Cogen | Project #: 28010940 | | |
| Site: | SSOW#: | | |

**Analysis Requested**

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

Special Instructions/Note: Sent in 2 coolers

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Dioxins/Furans 8290 (TA-Knoxville) | Total Metals 6010C / 6010C / 7470A (Waters) | Total Metals 6010C / 7471B (soils) | PAHs 8270D_SIM | Sulfate 9056A | TDS 2540C | Total Number of containers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Preservation Code: | | | | | | | | | | | | | |
| MW3-150424 | 4/24/15 | 1100 | G | W | N | N | X | X | | X | X | X | 6 |
| MW93-150424 | 4/24/15 | 1100 | G | W | N | N | X | X | | X | X | X | 6 |

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☒ Disposal By Lab ☐ Archive For ____ Months

Deliverable Requested: I, II, III, IV, Other (specify) esdat edd

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: fedex

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| [signature] | 4/24/15 1700 | GEOSYNTEC | [signature] | 4/25/15 9:10 | TA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: 4.1, 0.4 IRS +0.2 Tr [illegible] 4/25/15

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-68403-1

**Login Number: 68403**
**List Number: 1**
**Creator: Dedio, Michael T**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-77042-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/8/2016 10:54:25 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| * | RPD of the LCS and LCSD exceeds the control limits |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| X | Surrogate is outside control limits |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-77042-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-77042-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**

The samples were received on 11/19/2015 9:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.1º C and 1.9º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 Middlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 11/21/2015 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.3º C.

**Receipt Exceptions**

Due to current laboratory capacity, the fastest turnaround time TestAmerica Denver iis able to provide for the requested analyses is 20 business days, with results due 12/18/2015. This was accepted by the client on 11/19/2015.

**8270D SIM GCMS**

Samples MW-1-20151118 (280-77042-1), MW-5-20151118 (280-77042-2) and MW-4-20151118 (280-77042-3) were analyzed for 8270D SIM GCMS in accordance with SW-846 8270D. The samples were prepared on 11/25/2015 and analyzed on 11/30/2015.

Terphenyl-d14 failed the surrogate recovery criteria high for MW-1-20151118 (280-77042-1). Terphenyl-d14 failed the surrogate recovery criteria high for MW-4-20151118 (280-77042-3). Terphenyl-d14 failed the surrogate recovery criteria high for MB 280-305566/1-A. Refer to the QC report for details. These samples either did not contain any target analytes associated to this surrogate or did not contain any target analytes associated with this surrogate above one half the RL; MW-1-20151118 (280-77042-1) - Benzo[b]fluoranthene and Benzo[k]fluoranthene.

Several analytes exceeded the RPD limit for LCSD 280-305566/3-A. Refer to the QC report for details. The LCS and LCSD recoveries were within limits; therefore, re-extraction/reanalysis were not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**

Samples MW-1-20151118 (280-77042-1), MW-5-20151118 (280-77042-2) and MW-4-20151118 (280-77042-3) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/30/2015 and analyzed on 12/11/2015.

## Job ID: 280-77042-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

Manganese, Silver and Sodium were detected in method blank MB 280-305839/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The low level continuing calibration verification (CCVL 280-307545/125) associated with batch 280-307545 recovered above the upper control limit for As. The samples and MB associated with this CCVL were below the RL and 1/2 the RL, respectively, for the affected analyte; therefore, the data have been reported.

The low level continuing calibration verification (CCVL 280-307545/113) associated with batch 280-307545 recovered above the upper control limit for Be and Fe. The MB and samples associated with this CCV were below 1/2 the RL and below the RL, respectively, for the affected analytes; therefore, the data have been reported.

The continuing calibration verification (CCV 280-307545/111) associated with batch 280-307545 recovered above the upper control limit for Cr and low line Na. The sample and MB associated with this CCV were below RL and 1/2RL, respectively, for Cr. The MB was below 1/2 RL for Na and the samples were reported from the high line; therefore, the data have been reported.

The continuing calibration verification (CCV 280-307545/132) associated with batch 280-307545 recovered above the upper control limit for low line Na. The samples associated with this CCV were from the high line Na for the affected analytes; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY**

Samples MW-1-20151118 (280-77042-1), MW-5-20151118 (280-77042-2) and MW-4-20151118 (280-77042-3) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 11/30/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL DISSOLVED SOLIDS**

Samples MW-1-20151118 (280-77042-1), MW-5-20151118 (280-77042-2) and MW-4-20151118 (280-77042-3) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 11/20/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS)**

Samples MW-1-20151118 (280-77042-1), MW-5-20151118 (280-77042-2) and MW-4-20151118 (280-77042-3) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 12/08/2015.

Sulfate was detected in method blank MB 280-306950/6 at a level that was above the method detection limit but below the reporting limit. The value should be considered an estimate, and has been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Sulfate failed the recovery criteria high for the MS of sample MW-5-20151118MS (280-77042-2) in batch 280-306950. Sulfate failed the recovery criteria high for the MSD of sample MW-5-20151118MSD (280-77042-2) in batch 280-306950. Refer to the QC report for details.

Sample MW-5-20151118 (280-77042-2)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

## Client Sample ID: MW-1-20151118 — Lab Sample ID: 280-77042-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[b]fluoranthene | 40 | J * | 96 | 3.3 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 13 | J * | 96 | 4.8 | ng/L | 1 | | 8270D SIM | Total/NA |
| Chrysene | 49 | J | 96 | 3.1 | ng/L | 1 | | 8270D SIM | Total/NA |
| Fluoranthene | 66 | J * | 96 | 4.3 | ng/L | 1 | | 8270D SIM | Total/NA |
| Phenanthrene | 24 | J | 96 | 9.3 | ng/L | 1 | | 8270D SIM | Total/NA |
| Pyrene | 41 | J * | 96 | 7.7 | ng/L | 1 | | 8270D SIM | Total/NA |
| Aluminum | 750 | | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 10000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 2300 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2800 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 38 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 40000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 5.5 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 540 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 17 | B | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Selenium | 13 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Thallium | 5.2 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 11 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Vanadium | 2.3 | J | 10 | 1.1 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 71 | B | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 180 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-5-20151118 — Lab Sample ID: 280-77042-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[a]anthracene | 43 | J | 96 | 3.1 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 36 | J * | 96 | 4.9 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 49 | J * | 96 | 3.3 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 67 | J * | 96 | 3.4 | ng/L | 1 | | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 49 | J * | 96 | 4.8 | ng/L | 1 | | 8270D SIM | Total/NA |
| Chrysene | 48 | J | 96 | 3.1 | ng/L | 1 | | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 70 | J * | 96 | 4.6 | ng/L | 1 | | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 61 | J * | 96 | 14 | ng/L | 1 | | 8270D SIM | Total/NA |
| Pyrene | 27 | J * | 96 | 7.8 | ng/L | 1 | | 8270D SIM | Total/NA |
| Aluminum | 120 | | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 40000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 13000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 5.1 | J ^ | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2800 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 21 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 63000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 4.4 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 1.5 | J | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 67 | J | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 22 | B | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 3.5 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Selenium | 11 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Thallium | 7.7 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 200 | F1 B | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Total Dissolved Solids | 410 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

## Client Sample ID: MW-4-20151118 — Lab Sample ID: 280-77042-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 46 | J | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 20000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 5500 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 7.1 | J ^ | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 3800 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 41 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 14000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 29 | | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 70 | J | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 4.0 | J B | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Thallium | 6.7 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 7.5 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 73 | B | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 170 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Water | 11/18/15 11:45 | 11/19/15 09:35 |
| 280-77042-2 | MW-5-20151118 | Water | 11/18/15 14:00 | 11/19/15 09:35 |
| 280-77042-3 | MW-4-20151118 | Water | 11/18/15 15:40 | 11/19/15 09:35 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: MW-1-20151118**
**Date Collected: 11/18/15 11:45**
**Date Received: 11/19/15 09:35**

**Lab Sample ID: 280-77042-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 96 | 5.4 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| 2-Methylnaphthalene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Acenaphthene | 10 | U | 96 | 10 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Acenaphthylene | 9.5 | U | 96 | 9.5 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Anthracene | 14 | U | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Benzo[a]anthracene | 3.1 | U | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Benzo[a]pyrene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| **Benzo[b]fluoranthene** | **40** | **J *** | 96 | 3.3 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 96 | 3.4 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| **Benzo[k]fluoranthene** | **13** | **J *** | 96 | 4.8 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| **Chrysene** | **49** | **J** | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U * | 96 | 4.6 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| **Fluoranthene** | **66** | **J *** | 96 | 4.3 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Fluorene | 18 | U | 96 | 18 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| Naphthalene | 5.1 | U | 96 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| **Phenanthrene** | **24** | **J** | 96 | 9.3 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |
| **Pyrene** | **41** | **J *** | 96 | 7.7 | ng/L | | 11/25/15 09:50 | 11/30/15 18:28 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *93* | | *42 - 120* | *11/25/15 09:50* | *11/30/15 18:28* | *1* |
| *Nitrobenzene-d5* | *100* | | *43 - 120* | *11/25/15 09:50* | *11/30/15 18:28* | *1* |
| *Terphenyl-d14* | *152* | *X* | *47 - 120* | *11/25/15 09:50* | *11/30/15 18:28* | *1* |

**Client Sample ID: MW-5-20151118**
**Date Collected: 11/18/15 14:00**
**Date Received: 11/19/15 09:35**

**Lab Sample ID: 280-77042-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 96 | 5.4 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| 2-Methylnaphthalene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| Acenaphthene | 10 | U | 96 | 10 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| Acenaphthylene | 9.6 | U | 96 | 9.6 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| Anthracene | 14 | U | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Benzo[a]anthracene** | **43** | **J** | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Benzo[a]pyrene** | **36** | **J *** | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Benzo[b]fluoranthene** | **49** | **J *** | 96 | 3.3 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Benzo[g,h,i]perylene** | **67** | **J *** | 96 | 3.4 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Benzo[k]fluoranthene** | **49** | **J *** | 96 | 4.8 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Chrysene** | **48** | **J** | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Dibenz(a,h)anthracene** | **70** | **J *** | 96 | 4.6 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| Fluoranthene | 4.3 | U * | 96 | 4.3 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| Fluorene | 18 | U | 96 | 18 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Indeno[1,2,3-cd]pyrene** | **61** | **J *** | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| Naphthalene | 5.1 | U | 96 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| Phenanthrene | 9.4 | U | 96 | 9.4 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |
| **Pyrene** | **27** | **J *** | 96 | 7.8 | ng/L | | 11/25/15 09:50 | 11/30/15 18:54 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *68* | | *42 - 120* | *11/25/15 09:50* | *11/30/15 18:54* | *1* |
| *Nitrobenzene-d5* | *78* | | *43 - 120* | *11/25/15 09:50* | *11/30/15 18:54* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: MW-5-20151118** — **Lab Sample ID: 280-77042-2**
**Date Collected: 11/18/15 14:00** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *93* | | *47 - 120* | *11/25/15 09:50* | *11/30/15 18:54* | *1* |

**Client Sample ID: MW-4-20151118** — **Lab Sample ID: 280-77042-3**
**Date Collected: 11/18/15 15:40** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 96 | 5.4 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| 2-Methylnaphthalene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Acenaphthene | 10 | U | 96 | 10 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Acenaphthylene | 9.6 | U | 96 | 9.6 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Anthracene | 14 | U | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Benzo[a]anthracene | 3.1 | U | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Benzo[a]pyrene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Benzo[b]fluoranthene | 3.3 | U * | 96 | 3.3 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 96 | 3.4 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Benzo[k]fluoranthene | 4.8 | U * | 96 | 4.8 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Chrysene | 3.1 | U | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U * | 96 | 4.6 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Fluoranthene | 4.3 | U * | 96 | 4.3 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Fluorene | 18 | U | 96 | 18 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Naphthalene | 5.1 | U | 96 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Phenanthrene | 9.4 | U | 96 | 9.4 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |
| Pyrene | 7.8 | U * | 96 | 7.8 | ng/L | | 11/25/15 09:50 | 11/30/15 19:20 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *93* | | *42 - 120* | *11/25/15 09:50* | *11/30/15 19:20* | *1* |
| *Nitrobenzene-d5* | *104* | | *43 - 120* | *11/25/15 09:50* | *11/30/15 19:20* | *1* |
| *Terphenyl-d14* | *188* | *X* | *47 - 120* | *11/25/15 09:50* | *11/30/15 19:20* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: MW-1-20151118** — **Lab Sample ID: 280-77042-1**
**Date Collected: 11/18/15 11:45** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **750** | | 100 | 18 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| **Calcium** | **10000** | | 200 | 35 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| **Magnesium** | **2300** | | 200 | 11 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| **Potassium** | **2800** | **J** | 3000 | 240 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| **Barium** | **38** | | 10 | 0.58 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| **Sodium** | **40000** | **B** | 1000 | 92 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| **Chromium** | **5.5** | **J** | 10 | 0.66 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| **Iron** | **540** | | 100 | 22 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-1-20151118** — **Lab Sample ID: 280-77042-1**
**Date Collected: 11/18/15 11:45** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| **Manganese** | **17** | **B** | 10 | 0.25 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| **Selenium** | **13** | **J** | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 22:19 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| **Thallium** | **5.2** | **J** | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| **Zinc** | **11** | **J** | 20 | 4.5 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |
| **Vanadium** | **2.3** | **J** | 10 | 1.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:41 | 1 |

**Client Sample ID: MW-5-20151118** — **Lab Sample ID: 280-77042-2**
**Date Collected: 11/18/15 14:00** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **120** | | 100 | 18 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| **Calcium** | **40000** | | 200 | 35 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Magnesium** | **13000** | | 200 | 11 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Arsenic** | **5.1** | **J ^** | 15 | 4.4 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| **Potassium** | **2800** | **J** | 3000 | 240 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| **Barium** | **21** | | 10 | 0.58 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| **Sodium** | **63000** | **B** | 1000 | 92 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Chromium** | **4.4** | **J** | 10 | 0.66 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Cobalt** | **1.5** | **J** | 10 | 1.2 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Iron** | **67** | **J** | 100 | 22 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Manganese** | **22** | **B** | 10 | 0.25 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Nickel** | **3.5** | **J** | 40 | 1.3 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Selenium** | **11** | **J** | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 22:22 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| **Thallium** | **7.7** | **J** | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:44 | 1 |

**Client Sample ID: MW-4-20151118** — **Lab Sample ID: 280-77042-3**
**Date Collected: 11/18/15 15:40** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **46** | **J** | 100 | 18 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| **Calcium** | **20000** | | 200 | 35 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| **Magnesium** | **5500** | | 200 | 11 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| **Arsenic** | **7.1** | **J ^** | 15 | 4.4 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| **Potassium** | **3800** | | 3000 | 240 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| **Barium** | **41** | | 10 | 0.58 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| **Sodium** | **14000** | **B** | 1000 | 92 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-4-20151118** — **Lab Sample ID: 280-77042-3**
**Date Collected: 11/18/15 15:40** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Chromium** | **29** | | 10 | 0.66 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| **Iron** | **70** | **J** | 100 | 22 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| **Manganese** | **4.0** | **J B** | 10 | 0.25 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 22:24 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| **Thallium** | **6.7** | **J** | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| **Zinc** | **7.5** | **J** | 20 | 4.5 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:46 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-1-20151118** — **Lab Sample ID: 280-77042-1**
**Date Collected: 11/18/15 11:45** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 11/30/15 10:35 | 11/30/15 17:26 | 1 |

**Client Sample ID: MW-5-20151118** — **Lab Sample ID: 280-77042-2**
**Date Collected: 11/18/15 14:00** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 11/30/15 10:35 | 11/30/15 17:28 | 1 |

**Client Sample ID: MW-4-20151118** — **Lab Sample ID: 280-77042-3**
**Date Collected: 11/18/15 15:40** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 11/30/15 10:35 | 11/30/15 17:30 | 1 |

## General Chemistry

**Client Sample ID: MW-1-20151118** — **Lab Sample ID: 280-77042-1**
**Date Collected: 11/18/15 11:45** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Sulfate** | **71** | **B** | 5.0 | 0.23 | mg/L | | | 12/08/15 13:21 | 1 |
| **Total Dissolved Solids** | **180** | | 10 | 4.7 | mg/L | | | 11/20/15 15:52 | 1 |

**Client Sample ID: MW-5-20151118** — **Lab Sample ID: 280-77042-2**
**Date Collected: 11/18/15 14:00** — **Matrix: Water**
**Date Received: 11/19/15 09:35**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Sulfate** | **200** | **F1 B** | 25 | 1.2 | mg/L | | | 12/08/15 23:58 | 5 |
| **Total Dissolved Solids** | **410** | | 10 | 4.7 | mg/L | | | 11/20/15 15:52 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

## General Chemistry

**Client Sample ID: MW-4-20151118**
**Date Collected: 11/18/15 15:40**
**Date Received: 11/19/15 09:35**

**Lab Sample ID: 280-77042-3**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 73 | B | 5.0 | 0.23 | mg/L | | | 12/08/15 14:49 | 1 |
| Total Dissolved Solids | 170 | | 10 | 4.7 | mg/L | | | 11/20/15 15:52 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| **Lab Sample ID** | **Client Sample ID** | **(42-120)** | **(43-120)** | **(47-120)** |
| 280-77042-1 | MW-1-20151118 | 93 | 100 | 152 X |
| 280-77042-2 | MW-5-20151118 | 68 | 78 | 93 |
| 280-77042-3 | MW-4-20151118 | 93 | 104 | 188 X |
| LCS 280-305566/2-A | Lab Control Sample | 58 | 66 | 66 |
| LCSD 280-305566/3-A | Lab Control Sample Dup | 83 | 95 | 118 |
| MB 280-305566/1-A | Method Blank | 80 | 93 | 121 X |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-305566/1-A**
**Matrix: Water**
**Analysis Batch: 305967**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 305566**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *80* | | *42 - 120* | *11/25/15 09:50* | *11/30/15 11:45* | *1* |
| *Nitrobenzene-d5* | *93* | | *43 - 120* | *11/25/15 09:50* | *11/30/15 11:45* | *1* |
| *Terphenyl-d14* | *121* | *X* | *47 - 120* | *11/25/15 09:50* | *11/30/15 11:45* | *1* |

**Lab Sample ID: LCS 280-305566/2-A**
**Matrix: Water**
**Analysis Batch: 305967**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 305566**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 443 | | ng/L | | 49 | 47 - 120 |
| Acenaphthylene | 900 | 440 | | ng/L | | 49 | 39 - 120 |
| Anthracene | 900 | 460 | | ng/L | | 51 | 28 - 120 |
| Benzo[a]anthracene | 900 | 496 | | ng/L | | 55 | 42 - 120 |
| Benzo[a]pyrene | 900 | 532 | | ng/L | | 59 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 526 | | ng/L | | 58 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 537 | | ng/L | | 60 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 507 | | ng/L | | 56 | 43 - 120 |
| Chrysene | 900 | 496 | | ng/L | | 55 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 629 | | ng/L | | 70 | 27 - 126 |
| Fluoranthene | 900 | 452 | | ng/L | | 50 | 46 - 120 |
| Fluorene | 900 | 444 | | ng/L | | 49 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 543 | | ng/L | | 60 | 38 - 120 |
| Naphthalene | 900 | 483 | | ng/L | | 54 | 37 - 120 |
| Phenanthrene | 900 | 471 | | ng/L | | 52 | 46 - 120 |
| Pyrene | 900 | 458 | | ng/L | | 51 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-305566/2-A**
**Matrix: Water**
**Analysis Batch: 305967**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 305566**

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 58 | | 42 - 120 |
| Nitrobenzene-d5 | 66 | | 43 - 120 |
| Terphenyl-d14 | 66 | | 47 - 120 |

**Lab Sample ID: LCSD 280-305566/3-A**
**Matrix: Water**
**Analysis Batch: 305967**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 305566**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 624 | | ng/L | | 69 | 47 - 120 | 34 | 50 |
| Acenaphthylene | 900 | 628 | | ng/L | | 70 | 39 - 120 | 35 | 50 |
| Anthracene | 900 | 623 | | ng/L | | 69 | 28 - 120 | 30 | 50 |
| Benzo[a]anthracene | 900 | 673 | | ng/L | | 75 | 42 - 120 | 30 | 40 |
| Benzo[a]pyrene | 900 | 720 | * | ng/L | | 80 | 38 - 120 | 30 | 21 |
| Benzo[b]fluoranthene | 900 | 716 | * | ng/L | | 80 | 44 - 120 | 31 | 28 |
| Benzo[g,h,i]perylene | 900 | 772 | * | ng/L | | 86 | 39 - 120 | 36 | 23 |
| Benzo[k]fluoranthene | 900 | 683 | * | ng/L | | 76 | 43 - 120 | 30 | 28 |
| Chrysene | 900 | 679 | | ng/L | | 75 | 35 - 120 | 31 | 41 |
| Dibenz(a,h)anthracene | 900 | 852 | * | ng/L | | 95 | 27 - 126 | 30 | 25 |
| Fluoranthene | 900 | 592 | * | ng/L | | 66 | 46 - 120 | 27 | 24 |
| Fluorene | 900 | 607 | | ng/L | | 67 | 49 - 120 | 31 | 50 |
| Indeno[1,2,3-cd]pyrene | 900 | 759 | * | ng/L | | 84 | 38 - 120 | 33 | 25 |
| Naphthalene | 900 | 718 | | ng/L | | 80 | 37 - 120 | 39 | 50 |
| Phenanthrene | 900 | 652 | | ng/L | | 72 | 46 - 120 | 32 | 42 |
| Pyrene | 900 | 594 | * | ng/L | | 66 | 49 - 120 | 26 | 22 |

| Surrogate | LCSD %Recovery | LCSD Qualifier | Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 83 | | 42 - 120 |
| Nitrobenzene-d5 | 95 | | 43 - 120 |
| Terphenyl-d14 | 118 | | 47 - 120 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-305839/1-A**
**Matrix: Water**
**Analysis Batch: 307426**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 305839**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Manganese | 0.570 | J | 10 | 0.25 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Silver | 1.08 | J | 10 | 0.93 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-305839/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |

**Lab Sample ID: MB 280-305839/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Sodium | 175 | J ^ | 1000 | 92 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Beryllium | 0.47 | U ^ | 1.0 | 0.47 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Chromium | 0.66 | U ^ | 10 | 0.66 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Iron | 22 | U ^ | 100 | 22 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |

**Lab Sample ID: LCS 280-305839/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 500 | 471 | | ug/L | | 94 | 88 - 110 |
| Magnesium | 50000 | 49100 | | ug/L | | 98 | 90 - 113 |
| Cadmium | 100 | 97.6 | | ug/L | | 98 | 88 - 111 |
| Copper | 250 | 247 | | ug/L | | 99 | 86 - 112 |
| Cobalt | 500 | 496 | | ug/L | | 99 | 89 - 111 |
| Lead | 500 | 492 | | ug/L | | 98 | 89 - 110 |
| Manganese | 500 | 467 | | ug/L | | 93 | 90 - 110 |
| Nickel | 500 | 495 | | ug/L | | 99 | 89 - 111 |
| Silver | 50.0 | 48.8 | | ug/L | | 98 | 86 - 115 |
| Thallium | 2000 | 2050 | | ug/L | | 103 | 88 - 110 |
| Zinc | 500 | 463 | | ug/L | | 93 | 85 - 111 |
| Vanadium | 500 | 499 | | ug/L | | 100 | 90 - 111 |

**Lab Sample ID: LCS 280-305839/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1980 | | ug/L | | 99 | 87 - 111 |
| Calcium | 50000 | 47100 | | ug/L | | 94 | 90 - 111 |
| Arsenic | 1000 | 1020 | ^ | ug/L | | 102 | 88 - 110 |
| Potassium | 50000 | 50700 | | ug/L | | 101 | 89 - 114 |
| Barium | 2000 | 1930 | | ug/L | | 97 | 90 - 112 |
| Sodium | 50000 | 51900 | ^ | ug/L | | 104 | 90 - 115 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-305839/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Beryllium | 50.0 | 48.0 | ^ | ug/L | | 96 | 89 - 113 |
| Chromium | 200 | 209 | ^ | ug/L | | 104 | 90 - 113 |
| Iron | 1000 | 946 | ^ | ug/L | | 95 | 89 - 115 |
| Selenium | 2000 | 2090 | | ug/L | | 104 | 85 - 112 |

**Lab Sample ID: LCSD 280-305839/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 500 | 478 | | ug/L | | 96 | 88 - 110 | 1 | 20 |
| Magnesium | 50000 | 50200 | | ug/L | | 100 | 90 - 113 | 2 | 20 |
| Cadmium | 100 | 99.1 | | ug/L | | 99 | 88 - 111 | 2 | 20 |
| Copper | 250 | 253 | | ug/L | | 101 | 86 - 112 | 2 | 20 |
| Cobalt | 500 | 506 | | ug/L | | 101 | 89 - 111 | 2 | 20 |
| Lead | 500 | 503 | | ug/L | | 101 | 89 - 110 | 2 | 20 |
| Manganese | 500 | 478 | | ug/L | | 96 | 90 - 110 | 2 | 20 |
| Nickel | 500 | 504 | | ug/L | | 101 | 89 - 111 | 2 | 20 |
| Silver | 50.0 | 49.3 | | ug/L | | 99 | 86 - 115 | 1 | 20 |
| Thallium | 2000 | 2050 | | ug/L | | 103 | 88 - 110 | 0 | 20 |
| Zinc | 500 | 471 | | ug/L | | 94 | 85 - 111 | 2 | 20 |
| Vanadium | 500 | 509 | | ug/L | | 102 | 90 - 111 | 2 | 20 |

**Lab Sample ID: LCSD 280-305839/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 2010 | | ug/L | | 100 | 87 - 111 | 1 | 20 |
| Calcium | 50000 | 51200 | | ug/L | | 102 | 90 - 111 | 8 | 20 |
| Arsenic | 1000 | 1030 | ^ | ug/L | | 103 | 88 - 110 | 1 | 20 |
| Potassium | 50000 | 55100 | | ug/L | | 110 | 89 - 114 | 8 | 20 |
| Barium | 2000 | 2100 | | ug/L | | 105 | 90 - 112 | 8 | 20 |
| Sodium | 50000 | 55500 | ^ | ug/L | | 111 | 90 - 115 | 7 | 20 |
| Beryllium | 50.0 | 51.9 | ^ | ug/L | | 104 | 89 - 113 | 8 | 20 |
| Chromium | 200 | 211 | ^ | ug/L | | 106 | 90 - 113 | 1 | 20 |
| Iron | 1000 | 1040 | ^ | ug/L | | 104 | 89 - 115 | 9 | 20 |
| Selenium | 2000 | 2100 | | ug/L | | 105 | 85 - 112 | 1 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-305316/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306126** — **Prep Batch: 305316**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 11/30/15 10:35 | 11/30/15 17:17 | 1 |

## Method: 7470A - Mercury (CVAA) (Continued)

**Lab Sample ID: LCS 280-305316/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306126** — **Prep Batch: 305316**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.32 | | ug/L | | 106 | 84 - 120 |

**Lab Sample ID: LCSD 280-305316/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306126** — **Prep Batch: 305316**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.19 | | ug/L | | 104 | 84 - 120 | 2 | 15 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-306950/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306950**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 0.850 | J | 5.0 | 0.23 | mg/L | | | 12/08/15 11:59 | 1 |

**Lab Sample ID: LCS 280-306950/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306950**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 99.8 | | mg/L | | 100 | 90 - 110 |

**Lab Sample ID: LCSD 280-306950/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306950**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 100 | 99.9 | | mg/L | | 100 | 90 - 110 | 0 | 10 |

**Lab Sample ID: MRL 280-306950/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306950**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Sulfate | 2.50 | 2.68 | J | mg/L | | 107 | 50 - 150 |

**Lab Sample ID: 280-77042-2 MS** — **Client Sample ID: MW-5-20151118**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306950**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 200 | F1 B | 125 | 455 | F1 | mg/L | | 200 | 80 - 120 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: 280-77042-2 MSD** — **Client Sample ID: MW-5-20151118**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306950**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 200 | F1 B | 125 | 456 | F1 | mg/L | | 201 | 80 - 120 | 0 | 20 |

**Lab Sample ID: 280-77042-2 DU** — **Client Sample ID: MW-5-20151118**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306950**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 200 | F1 B | | 205 | | mg/L | | | | 0.2 | 15 |

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 280-305111/1** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 305111**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 4.7 | U | 10 | 4.7 | mg/L | | | 11/20/15 15:52 | 1 |

**Lab Sample ID: LCS 280-305111/2** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 305111**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | | | 501 | 495 | | mg/L | | 99 | 86 - 110 | | |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

## GC/MS Semi VOA

### Prep Batch: 305566

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | 3510C | |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | 3510C | |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | 3510C | |
| LCS 280-305566/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 280-305566/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |
| MB 280-305566/1-A | Method Blank | Total/NA | Water | 3510C | |

### Analysis Batch: 305967

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-305566/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 305566 |
| LCSD 280-305566/3-A | Lab Control Sample Dup | Total/NA | Water | 8270D SIM | 305566 |
| MB 280-305566/1-A | Method Blank | Total/NA | Water | 8270D SIM | 305566 |

### Analysis Batch: 306003

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | 8270D SIM | 305566 |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | 8270D SIM | 305566 |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | 8270D SIM | 305566 |

## Metals

### Prep Batch: 305316

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | 7470A | |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | 7470A | |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | 7470A | |
| LCS 280-305316/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| LCSD 280-305316/3-A | Lab Control Sample Dup | Total/NA | Water | 7470A | |
| MB 280-305316/1-A | Method Blank | Total/NA | Water | 7470A | |

### Prep Batch: 305839

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | 3010A | |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | 3010A | |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | 3010A | |
| LCS 280-305839/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| LCSD 280-305839/3-A | Lab Control Sample Dup | Total/NA | Water | 3010A | |
| MB 280-305839/1-A | Method Blank | Total/NA | Water | 3010A | |

### Analysis Batch: 306126

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | 7470A | 305316 |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | 7470A | 305316 |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | 7470A | 305316 |
| LCS 280-305316/2-A | Lab Control Sample | Total/NA | Water | 7470A | 305316 |
| LCSD 280-305316/3-A | Lab Control Sample Dup | Total/NA | Water | 7470A | 305316 |
| MB 280-305316/1-A | Method Blank | Total/NA | Water | 7470A | 305316 |

## Metals (Continued)

### Analysis Batch: 307426

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | 6010C | 305839 |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | 6010C | 305839 |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | 6010C | 305839 |
| LCS 280-305839/2-A | Lab Control Sample | Total/NA | Water | 6010C | 305839 |
| LCSD 280-305839/3-A | Lab Control Sample Dup | Total/NA | Water | 6010C | 305839 |
| MB 280-305839/1-A | Method Blank | Total/NA | Water | 6010C | 305839 |

### Analysis Batch: 307545

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | 6010C | 305839 |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | 6010C | 305839 |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | 6010C | 305839 |
| LCS 280-305839/2-A | Lab Control Sample | Total/NA | Water | 6010C | 305839 |
| LCSD 280-305839/3-A | Lab Control Sample Dup | Total/NA | Water | 6010C | 305839 |
| MB 280-305839/1-A | Method Blank | Total/NA | Water | 6010C | 305839 |

## General Chemistry

### Analysis Batch: 305111

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | SM 2540C | |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | SM 2540C | |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | SM 2540C | |
| LCS 280-305111/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| MB 280-305111/1 | Method Blank | Total/NA | Water | SM 2540C | |

### Analysis Batch: 306950

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77042-1 | MW-1-20151118 | Total/NA | Water | 9056A | |
| 280-77042-2 | MW-5-20151118 | Total/NA | Water | 9056A | |
| 280-77042-2 DU | MW-5-20151118 | Total/NA | Water | 9056A | |
| 280-77042-2 MS | MW-5-20151118 | Total/NA | Water | 9056A | |
| 280-77042-2 MSD | MW-5-20151118 | Total/NA | Water | 9056A | |
| 280-77042-3 | MW-4-20151118 | Total/NA | Water | 9056A | |
| LCS 280-306950/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-306950/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-306950/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-306950/3 | Lab Control Sample | Total/NA | Water | 9056A | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

## Client Sample ID: MW-1-20151118
**Date Collected: 11/18/15 11:45**
**Date Received: 11/19/15 09:35**

**Lab Sample ID: 280-77042-1**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1044.7 mL | 1 mL | 305566 | 11/25/15 09:50 | ELV | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1044.7 mL | 1 mL | 306003 | 11/30/15 18:28 | ELJ | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307426 | 12/11/15 02:41 | CRR | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307545 | 12/11/15 22:19 | CMK | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 50 mL | 305316 | 11/30/15 10:35 | CDH | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 50 mL | 306126 | 11/30/15 17:26 | CDH | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 306950 | 12/08/15 13:21 | AFB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 305111 | 11/20/15 15:52 | RSM | TAL DEN |

## Client Sample ID: MW-5-20151118
**Date Collected: 11/18/15 14:00**
**Date Received: 11/19/15 09:35**

**Lab Sample ID: 280-77042-2**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1041.5 mL | 1 mL | 305566 | 11/25/15 09:50 | ELV | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1041.5 mL | 1 mL | 306003 | 11/30/15 18:54 | ELJ | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307426 | 12/11/15 02:44 | CRR | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307545 | 12/11/15 22:22 | CMK | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 50 mL | 305316 | 11/30/15 10:35 | CDH | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 50 mL | 306126 | 11/30/15 17:28 | CDH | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 306950 | 12/08/15 23:58 | AFB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 305111 | 11/20/15 15:52 | RSM | TAL DEN |

## Client Sample ID: MW-4-20151118
**Date Collected: 11/18/15 15:40**
**Date Received: 11/19/15 09:35**

**Lab Sample ID: 280-77042-3**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1042.1 mL | 1 mL | 305566 | 11/25/15 09:50 | ELV | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1042.1 mL | 1 mL | 306003 | 11/30/15 19:20 | ELJ | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307426 | 12/11/15 02:46 | CRR | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307545 | 12/11/15 22:24 | CMK | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 50 mL | 305316 | 11/30/15 10:35 | CDH | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 50 mL | 306126 | 11/30/15 17:30 | CDH | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 306950 | 12/08/15 14:49 | AFB | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 305111 | 11/20/15 15:52 | RSM | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77042-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

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**Sample Receipt Documentation ..... 20**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-77042-1

UNC Cogen

Lot #: H5K230403

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

December 3, 2015

# ANALYTICAL METHODS SUMMARY

**H5K230403**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H5K230403**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M7XLT | 001 | MW-1-20151118 | 11/18/15 | 11:45 |
| M7XLV | 002 | MW-5-20151118 | 11/18/15 | 14:00 |
| M7XLW | 003 | MW-4-20151118 | 11/18/15 | 15:40 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H5K230403

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The 12-hour shift closing standard 151130s1 did not meet the 13C-12378-PeCDD response factor (RF) acceptance criterion of +/-35 percent difference from the ICAL (%D). The observed value was +37%D. The change in the response was due to sample matrix interferences. This was confirmed by running two system rinses and re-injecting a daily CCV. The second CCV met the 13C-12378-PeCDD RF acceptance criteria. The % recoveries for 13C-12378-PeCDD were calculated using the average of the opening and closing standard RFs instead of the ICAL mean RF. The results for the native analogue were not similarly affected.

The percent differences (%D from the ICAL) for 13C-12378-PeCDF and 13C-23478-PeCDF on closing standard 151130s1 were +34%D and +33%D, respectively. When the %D falls between 30 and 35%, the method requires the use of the average (of the bracketing) response factors for all samples on the shift. This adjustment was performed as specified by the method.

The following flags are used to qualify results for chlorinated dioxin and furan results:

> **J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:
>
> **Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.
>
> Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample

# PROJECT NARRATIVE
## H5K230403

extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

# PROJECT NARRATIVE
## H5K230403

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated

# PROJECT NARRATIVE
## H5K230403

estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

In sample data, peaks must have an intensity of $\geq$2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA150004 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | TN02014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-14-7 |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00260 |
| TestAmerica Knoxville | Utah | NELAC | 8 | TN000092014-5 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 00165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |
| TestAmerica Knoxville | Wisconsin | State Program | 5 | 998044300 |

Accreditation may not be offered or required for all methods and analytes in this report. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: MW-1-20151118**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K230403 - 001 | **Work Order #....:** | M7XLT1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/18/15 | **Date Received....:** | 11/21/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/25/15 | **Analysis Date....:** | 11/30/15 | | |
| **Prep Batch # ....:** | 5329015 | | | | |
| **Initial Wgt/Vol :** | 1051 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.5 | 0.089 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.31** | **B J** | **48** | **0.072** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.11 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.12 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 48 | 0.11 | pg/L |
| **1,2,3,4,6,7,8-HpCDD** | **1.5** | **Q B J** | **48** | **0.14** | **pg/L** |
| **OCDD** | **14** | **B J** | **95** | **0.098** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.5 | 0.099 | pg/L |
| **1,2,3,7,8-PeCDF** | **0.37** | **Q B J** | **48** | **0.083** | **pg/L** |
| **2,3,4,7,8-PeCDF** | **0.30** | **Q J** | **48** | **0.082** | **pg/L** |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.079 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.077 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 48 | 0.086 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 48 | 0.10 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.50** | **B J** | **48** | **0.059** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.41** | **Q B J** | **48** | **0.077** | **pg/L** |
| **OCDF** | **1.6** | **Q B J** | **95** | **0.059** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 64 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 65 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 67 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 66 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 77 | 40 - 135 |
| 13C-OCDD | 71 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 58 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 61 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 61 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 60 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 63 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 68 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 66 | 40 - 135 |
| 13C-OCDF | 58 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-1-20151118**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K230403 - 001 | **Work Order #....:** | M7XLT1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/18/15 | **Date Received....:** | 11/21/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/25/15 | **Analysis Date....:** | 11/30/15 | | |
| **Prep Batch # ....:** | 5329015 | | | | |
| **Initial Wgt/Vol :** | 1051 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

TestAmerica Denver

Sample ID: MW-5-20151118

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K230403 - 002 | **Work Order #....:** | M7XLV1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/18/15 | **Date Received....:** | 11/21/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/25/15 | **Analysis Date....:** | 11/30/15 | | |
| **Prep Batch # ....:** | 5329015 | | | | |
| **Initial Wgt/Vol :** | 1053 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.5 | 0.14 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 47 | 0.084 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 47 | 0.12 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 47 | 0.13 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 47 | 0.12 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 47 | 0.13 | pg/L |
| **OCDD** | **2.0** | **B J** | **95** | **0.14** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.5 | 0.11 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 47 | 0.093 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 47 | 0.089 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 47 | 0.081 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 47 | 0.078 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 47 | 0.082 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 47 | 0.10 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.22** | **Q B J** | **47** | **0.047** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 47 | 0.066 | pg/L |
| **OCDF** | **0.85** | **Q B J** | **95** | **0.067** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 75 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 72 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 82 | 40 - 135 |
| 13C-OCDD | 70 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 68 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 69 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 71 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 73 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 68 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 70 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 69 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 72 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 69 | 40 - 135 |
| 13C-OCDF | 57 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-5-20151118**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K230403 - 002 | **Work Order #....:** | M7XLV1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/18/15 | **Date Received....:** | 11/21/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/25/15 | **Analysis Date....:** | 11/30/15 | | |
| **Prep Batch # ....:** | 5329015 | | | | |
| **Initial Wgt/Vol :** | 1053 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

TestAmerica Denver

Sample ID: MW-4-20151118

Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K230403 - 003 | **Work Order #....:** | M7XLW1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/18/15 | **Date Received....:** | 11/21/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/25/15 | **Analysis Date....:** | 11/30/15 | | |
| **Prep Batch # ....:** | 5329015 | | | | |
| **Initial Wgt/Vol :** | 1060 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.4 | 0.12 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 47 | 0.10 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 47 | 0.11 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 47 | 0.11 | pg/L |
| **1,2,3,7,8,9-HxCDD** | **0.41** | **Q B J** | **47** | **0.11** | **pg/L** |
| 1,2,3,4,6,7,8-HpCDD | ND | | 47 | 0.17 | pg/L |
| **OCDD** | **2.1** | **B J** | **94** | **0.15** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.4 | 0.095 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 47 | 0.086 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 47 | 0.080 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 47 | 0.11 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 47 | 0.10 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 47 | 0.11 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 47 | 0.13 | pg/L |
| 1,2,3,4,6,7,8-HpCDF | ND | | 47 | 0.050 | pg/L |
| 1,2,3,4,7,8,9-HpCDF | ND | | 47 | 0.069 | pg/L |
| **OCDF** | **0.36** | **Q B J** | **94** | **0.078** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 76 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 77 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 76 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 83 | 40 - 135 |
| 13C-OCDD | 72 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 70 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 72 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 75 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 69 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 72 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 74 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 72 | 40 - 135 |
| 13C-OCDF | 63 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-4-20151118**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K230403 - 003 | **Work Order #....:** | M7XLW1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/18/15 | **Date Received....:** | 11/21/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/25/15 | **Analysis Date....:** | 11/30/15 | | |
| **Prep Batch # ....:** | 5329015 | | | | |
| **Initial Wgt/Vol :** | 1060 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K250000 - 015B | **Work Order #....:** | M7X2Q1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/25/15 | **Analysis Date....:** | 11/30/15 | | |
| **Prep Batch # ....:** | 5329015 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.14 | pg/L |
| **1,2,3,7,8-PeCDD** | **0.39** | **Q J** | **50** | **0.10** | **pg/L** |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.15 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 50 | 0.14 | pg/L |
| **1,2,3,7,8,9-HxCDD** | **0.82** | **J** | **50** | **0.14** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDD** | **0.93** | **Q J** | **50** | **0.14** | **pg/L** |
| **OCDD** | **3.3** | **J** | **100** | **0.11** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.092 | pg/L |
| **1,2,3,7,8-PeCDF** | **0.40** | **J** | **50** | **0.092** | **pg/L** |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.089 | pg/L |
| **1,2,3,4,7,8-HxCDF** | **0.39** | **Q J** | **50** | **0.096** | **pg/L** |
| **1,2,3,6,7,8-HxCDF** | **0.40** | **Q J** | **50** | **0.093** | **pg/L** |
| **2,3,4,6,7,8-HxCDF** | **0.55** | **Q J** | **50** | **0.097** | **pg/L** |
| **1,2,3,7,8,9-HxCDF** | **0.74** | **Q J** | **50** | **0.12** | **pg/L** |
| **1,2,3,4,6,7,8-HpCDF** | **0.71** | **J** | **50** | **0.055** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.96** | **Q J** | **50** | **0.076** | **pg/L** |
| **OCDF** | **2.2** | **J** | **100** | **0.077** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 76 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 79 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 76 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 86 | 40 - 135 |
| 13C-OCDD | 76 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 70 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 70 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 70 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 70 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 72 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 72 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 76 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 75 | 40 - 135 |
| 13C-OCDF | 63 | 40 - 135 |

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K250000 - 015B | **Work Order #....:** | M7X2Q1AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/25/15 | **Analysis Date....:** | 11/30/15 | | |
| **Prep Batch # ....:** | 5329015 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D2A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Client Lot # ...:** | H5K230403 | **Work Order # ...:** | M7X2Q1AC-LCS | **Matrix .....:** | WATER |
| **LCS Lot-Sample# :** | H5K250000 - 015 | | | | |
| **Prep Date .....:** | 11/25/15 | **Analysis Date ..:** | 11/29/15 | | |
| **Prep Batch # ...:** | 5329015 | | | | |
| **Dilution Factor :** | 1 | | | | |
| **Analyst ID.....:** | Linda K. McWhirter | **Instrument ID..:** | D2A | **Method.....:** | SW846 8290 |
| **Initial Wgt/Vol:** | 1000 mL | | | | |

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **200** | **186** | **pg/L** | **93** | | **(77 - 127)** |
| **1,2,3,7,8-PeCDD** | **1000** | **956** | **pg/L** | **96** | **B** | **(78 - 128)** |
| **1,2,3,4,7,8-HxCDD** | **1000** | **909** | **pg/L** | **91** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **1000** | **865** | **pg/L** | **86** | | **(72 - 127)** |
| **1,2,3,7,8,9-HxCDD** | **1000** | **1030** | **pg/L** | **103** | **B** | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDD** | **1000** | **888** | **pg/L** | **89** | **B** | **(73 - 123)** |
| **OCDD** | **2000** | **1730** | **pg/L** | **86** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **200** | **194** | **pg/L** | **97** | | **(74 - 124)** |
| **1,2,3,7,8-PeCDF** | **1000** | **847** | **pg/L** | **85** | **B** | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **1000** | **902** | **pg/L** | **90** | | **(74 - 124)** |
| **1,2,3,4,7,8-HxCDF** | **1000** | **909** | **pg/L** | **91** | **B** | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **1000** | **895** | **pg/L** | **89** | **B** | **(75 - 125)** |
| **2,3,4,6,7,8-HxCDF** | **1000** | **916** | **pg/L** | **92** | **B** | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **1000** | **902** | **pg/L** | **90** | **B** | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDF** | **1000** | **897** | **pg/L** | **90** | **B** | **(71 - 121)** |
| **1,2,3,4,7,8,9-HpCDF** | **1000** | **935** | **pg/L** | **94** | **B** | **(73 - 123)** |
| **OCDF** | **2000** | **1790** | **pg/L** | **90** | **B** | **(68 - 132)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 69 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 66 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 72 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 71 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 84 | (40 - 135) |
| 13C-OCDD | 79 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 65 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 64 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 64 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 67 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 64 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 65 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 67 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 72 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 72 | (40 - 135) |
| 13C-OCDF | 65 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H5K230403

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| | | | | |
|---|---|---|---|---|
| **Client Information (Sub Contract Lab)** | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-330728.1 |
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-77042-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 12/8/2015 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-1-20151118 (280-77042-1) | 11/18/15 | 11:45 Eastern | | Water | | | X | 2 | |
| MW-5-20151118 (280-77042-2) | 11/18/15 | 14:00 Eastern | | Water | | | X | 2 | |
| MW-4-20151118 (280-77042-3) | 11/18/15 | 15:40 Eastern | | Water | | | X | 2 | |

2 x 1L unpreserved ambers per sample D.B. 11-20-15

RT: 2.3°C
CT: 2.3°C
Cooler, Fedex PO
tr KH 6554 1459 8235
Custody seal intact
KU 11/20/15

| | | | |
|---|---|---|---|
| *Possible Hazard Identification* Unconfirmed | | *Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)* ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months* | |
| Deliverable Requested: I, II, III, IV, Other (specify) | | Special Instructions/QC Requirements: | |
| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| | 11/20/15 @1510 | TAD | | 11/21/15 0920 | TA |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

| Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks: |
|---|---|---|

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** HSK230403

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : SC63<br>Correction factor: 0.0 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: _____ | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**Labeling Verified by:** **Date:**

**pH test strip lot number:**

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: [signature] Date: 11-23-15

QA026R29.doc, 041115

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

280-77042 Chain of Custody

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| | | | |
|---|---|---|---|
| **Client Information** | Sampler: Matt Jenny (NJ) | Lab PM: McEntee, Patrick J | COC No: 280-47859-17892.1 |
| Client Contact: Michael Schott | Phone: 919 424 1826 | E-Mail: patrick.mcentee@testamericainc.com | Page: Page: 1 of 1 |
| Company: Geosyntec Consultants, Inc. | | | Job #: |
| Address: 2501 Blue Ridge Road, Suite 430 | Due Date Requested: | | |
| City: Raleigh | TAT Requested (days): Normal | | |
| State, Zip: NC, 27607 | | | |
| Phone: 919-424-1824(Tel) | PO #: GN5219 | | |
| Email: lwellborn@geosyntec.com | WO #: | | |
| Project Name: UNC Cogen | Project #: 28010940 | | |
| Site: Chapel Hill, NC | SSOW#: | | |

**Analysis Requested**

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Dioxins/Furans 8290 (TA-Knoxville) No preservative | PAHs 8270_SIM No preservative | Total Metals 6010C/7470A (bothe sets of 6010C Total Metals) | TDS 2540C / Sulfate 9056A No preservative | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | |
| MW-1-20151118 | 11/18/2015 | 1145 | G | W | | | 2 | 2 | 1 | 1 | 6 | SHIPPED IN COOLERS. |
| MW-5-20151118 | 11/18/2015 | 1400 | G | W | | | 2 | 2 | 1 | 1 | 6 | |
| MW-4-20151118 | 11/18/2015 | 1540 | G | W | | | 2 | 2 | 1 | 1 | 6 | |

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2SO3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - ph 4-5 |
| L - EDA | Z - other (specify) |

Other:

**Possible Hazard Identification**
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

**Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)**
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| | | | | | |
|---|---|---|---|---|---|
| Empty Kit Relinquished by: | Date: | | Time: | Method of Shipment: | |
| Relinquished by: [signature] | Date/Time: 11/18/15 18:00 | Company: Geosyntec | Received by: [signature] | Date/Time: 11/19/15 935 | Company: TAD |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: 1.8, 1.0 +0.1 DR#5 DW 11/19/15

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-77042-1

**Login Number: 77042**
**List Number: 1**
**Creator: White, Denise E**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

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# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-77166-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*4/11/2016 8:19:09 AM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| * | RPD of the LCS and LCSD exceeds the control limits |
| X | Surrogate is outside control limits |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| B | Compound was found in the blank and sample. |
| U | Indicates the analyte was analyzed for but not detected. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-77166-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-77166-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**
The samples were received on 11/21/2015 8:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the coolers at receipt time were 0.2º C and 1.1º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 Middlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 11/25/2015 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.5º C.

**SEMIVOLATILE ORGANICS 8270D SIM GCMS**
Samples MW-2-2015-1120 (280-77166-1), MW-3-2015-1120 (280-77166-2) and MW-3-2015-1120-DUP (280-77166-3) were analyzed for 8270D SIM GCMS in accordance with SW-846 8270D. The samples were prepared on 11/25/2015 and analyzed on 11/30/2015.

Terphenyl-d14 failed the surrogate recovery criteria high for MB 280-305566/1-A. Refer to the QC report for details. This surrogate was in control in the associated samples; therefore, re-extraction/reanalysis were not performed.

Several analytes exceeded the RPD limit for LCSD 280-305566/3-A. Refer to the QC report for details. The LCS and LCSD recoveries were within limits; therefore, re-extraction/reanalysis were not performed.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**
Samples MW-2-2015-1120 (280-77166-1), MW-3-2015-1120 (280-77166-2) and MW-3-2015-1120-DUP (280-77166-3) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 11/30/2015 and analyzed on 12/11/2015 and 12/13/2015.

Manganese, Silver and Sodium were detected in method blank MB 280-305839/1-A at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

The low level continuing calibration verification (CCVL 280-307545/125) associated with batch 280-307545 recovered above the upper control limit for As. The samples and MB associated with this CCVL were below the RL and 1/2 the RL respectively, for the affected

## Job ID: 280-77166-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

analyte; therefore, the data have been reported.

The low level continuing calibration verification (CCVL 280-307545/113) associated with batch 280-307545 recovered above the upper control limit for Be and Fe. The MB and samples associated with this CCV were below 1/2 the RL and below the RL ,respectively for the affected analytes; therefore, the data have been reported.

The continuing calibration verification (CCV 280-307545/111) associated with batch 280-307545 recovered above the upper control limit for Cr and low line Na. The sample and MB associated with this CCV were below RL and below 1/2 RL, respectively for Cr. The MB was below 1/2 RL for Na and the samples were reported from the high line; therefore, the data have been reported.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY**
Samples MW-2-2015-1120 (280-77166-1), MW-3-2015-1120 (280-77166-2) and MW-3-2015-1120-DUP (280-77166-3) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 12/01/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL DISSOLVED SOLIDS**
Samples MW-2-2015-1120 (280-77166-1), MW-3-2015-1120 (280-77166-2) and MW-3-2015-1120-DUP (280-77166-3) were analyzed for total dissolved solids in accordance with SM20 2540C. The samples were analyzed on 11/25/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS)**
Samples MW-2-2015-1120 (280-77166-1), MW-3-2015-1120 (280-77166-2) and MW-3-2015-1120-DUP (280-77166-3) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 12/09/2015.

Chloride and Sulfate were detected in method blank MB 280-307106/6 at levels that were above the method detection limit but below the reporting limit. The values should be considered estimates, and have been flagged. If the associated sample reported a result above the MDL and/or RL, the result has been flagged. Refer to the QC report for details.

Samples MW-3-2015-1120 (280-77166-2)[5X] and MW-3-2015-1120-DUP (280-77166-3)[5X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## Client Sample ID: MW-2-2015-1120 — Lab Sample ID: 280-77166-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 15000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 3700 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 5.0 | J ^ | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2700 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 39 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 62000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 2.7 | J ^ | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 23 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 140 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 3800 | B | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 2.9 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Thallium | 7.2 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 5.0 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Vanadium | 1.7 | J | 10 | 1.1 | ug/L | 1 | | 6010C | Total/NA |
| Chloride | 11 | B | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 90 | B | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |
| Total Dissolved Solids | 250 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-3-2015-1120 — Lab Sample ID: 280-77166-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 73000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 20000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 12 | J ^ | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 9500 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 19 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 97000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Beryllium | 0.52 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 2.0 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 120 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 360 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 7800 | B | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 25 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Selenium | 16 | | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Thallium | 18 | | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 88 | | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Chloride | 54 | B | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 340 | B | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Total Dissolved Solids | 680 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

## Client Sample ID: MW-3-2015-1120-DUP — Lab Sample ID: 280-77166-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 74000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 20000 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 12 | J ^ | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 10000 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 19 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 97000 | B | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Beryllium | 0.48 | J | 1.0 | 0.47 | ug/L | 1 | | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## Client Sample ID: MW-3-2015-1120-DUP (Continued) — Lab Sample ID: 280-77166-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Chromium | 1.8 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Cobalt | 120 | | 10 | 1.2 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 330 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 7900 | B | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Nickel | 25 | J | 40 | 1.3 | ug/L | 1 | | 6010C | Total/NA |
| Selenium | 14 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Thallium | 21 | | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 220 | | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Vanadium | 1.4 | J | 10 | 1.1 | ug/L | 1 | | 6010C | Total/NA |
| Chloride | 53 | B | 3.0 | 0.25 | mg/L | 1 | | 9056A | Total/NA |
| Sulfate | 340 | B | 25 | 1.2 | mg/L | 5 | | 9056A | Total/NA |
| Total Dissolved Solids | 680 | | 10 | 4.7 | mg/L | 1 | | SM 2540C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| SM 2540C | Solids, Total Dissolved (TDS) | SM | TAL DEN |

**Protocol References:**

SM = "Standard Methods For The Examination Of Water And Wastewater",

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Water | 11/20/15 08:55 | 11/21/15 08:50 |
| 280-77166-2 | MW-3-2015-1120 | Water | 11/20/15 10:56 | 11/21/15 08:50 |
| 280-77166-3 | MW-3-2015-1120-DUP | Water | 11/20/15 10:56 | 11/21/15 08:50 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: MW-2-2015-1120**
**Date Collected: 11/20/15 08:55**
**Date Received: 11/21/15 08:50**

**Lab Sample ID: 280-77166-1**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 96 | 5.4 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| 2-Methylnaphthalene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Acenaphthene | 10 | U | 96 | 10 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Acenaphthylene | 9.6 | U | 96 | 9.6 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Anthracene | 14 | U | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Benzo[a]anthracene | 3.1 | U | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Benzo[a]pyrene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Benzo[b]fluoranthene | 3.3 | U * | 96 | 3.3 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 96 | 3.4 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Benzo[k]fluoranthene | 4.8 | U * | 96 | 4.8 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Chrysene | 3.1 | U | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U * | 96 | 4.6 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Fluoranthene | 4.3 | U * | 96 | 4.3 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Fluorene | 18 | U | 96 | 18 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Naphthalene | 5.1 | U | 96 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Phenanthrene | 9.4 | U | 96 | 9.4 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |
| Pyrene | 7.8 | U * | 96 | 7.8 | ng/L | | 11/25/15 09:50 | 11/30/15 19:46 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *70* | | *42 - 120* | *11/25/15 09:50* | *11/30/15 19:46* | *1* |
| *Nitrobenzene-d5* | *87* | | *43 - 120* | *11/25/15 09:50* | *11/30/15 19:46* | *1* |
| *Terphenyl-d14* | *81* | | *47 - 120* | *11/25/15 09:50* | *11/30/15 19:46* | *1* |

**Client Sample ID: MW-3-2015-1120**
**Date Collected: 11/20/15 10:56**
**Date Received: 11/21/15 08:50**

**Lab Sample ID: 280-77166-2**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.5 | U | 97 | 5.5 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| 2-Methylnaphthalene | 5.0 | U * | 97 | 5.0 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Acenaphthene | 10 | U | 97 | 10 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Acenaphthylene | 9.6 | U | 97 | 9.6 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Anthracene | 14 | U | 97 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Benzo[a]anthracene | 3.1 | U | 97 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Benzo[a]pyrene | 5.0 | U * | 97 | 5.0 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Benzo[b]fluoranthene | 3.3 | U * | 97 | 3.3 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 97 | 3.4 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Benzo[k]fluoranthene | 4.9 | U * | 97 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Chrysene | 3.1 | U | 97 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Dibenz(a,h)anthracene | 4.7 | U * | 97 | 4.7 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Fluoranthene | 4.4 | U * | 97 | 4.4 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Fluorene | 18 | U | 97 | 18 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 97 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Naphthalene | 5.2 | U | 97 | 5.2 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Phenanthrene | 9.4 | U | 97 | 9.4 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |
| Pyrene | 7.8 | U * | 97 | 7.8 | ng/L | | 11/25/15 09:50 | 11/30/15 20:12 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *72* | | *42 - 120* | *11/25/15 09:50* | *11/30/15 20:12* | *1* |
| *Nitrobenzene-d5* | *77* | | *43 - 120* | *11/25/15 09:50* | *11/30/15 20:12* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: MW-3-2015-1120** — **Lab Sample ID: 280-77166-2**
**Date Collected: 11/20/15 10:56** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *103* | | *47 - 120* | *11/25/15 09:50* | *11/30/15 20:12* | *1* |

**Client Sample ID: MW-3-2015-1120-DUP** — **Lab Sample ID: 280-77166-3**
**Date Collected: 11/20/15 10:56** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.4 | U | 96 | 5.4 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| 2-Methylnaphthalene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Acenaphthene | 10 | U | 96 | 10 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Acenaphthylene | 9.6 | U | 96 | 9.6 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Anthracene | 14 | U | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Benzo[a]anthracene | 3.1 | U | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Benzo[a]pyrene | 4.9 | U * | 96 | 4.9 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Benzo[b]fluoranthene | 3.3 | U * | 96 | 3.3 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Benzo[g,h,i]perylene | 3.4 | U * | 96 | 3.4 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Benzo[k]fluoranthene | 4.8 | U * | 96 | 4.8 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Chrysene | 3.1 | U | 96 | 3.1 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Dibenz(a,h)anthracene | 4.6 | U * | 96 | 4.6 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Fluoranthene | 4.3 | U * | 96 | 4.3 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Fluorene | 18 | U | 96 | 18 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Indeno[1,2,3-cd]pyrene | 14 | U * | 96 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Naphthalene | 5.1 | U | 96 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Phenanthrene | 9.4 | U | 96 | 9.4 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |
| Pyrene | 7.8 | U * | 96 | 7.8 | ng/L | | 11/25/15 09:50 | 11/30/15 20:38 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *69* | | *42 - 120* | *11/25/15 09:50* | *11/30/15 20:38* | *1* |
| *Nitrobenzene-d5* | *75* | | *43 - 120* | *11/25/15 09:50* | *11/30/15 20:38* | *1* |
| *Terphenyl-d14* | *115* | | *47 - 120* | *11/25/15 09:50* | *11/30/15 20:38* | *1* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: MW-2-2015-1120** — **Lab Sample ID: 280-77166-1**
**Date Collected: 11/20/15 08:55** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| **Calcium** | **15000** | | 200 | 35 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Magnesium** | **3700** | | 200 | 11 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Arsenic** | **5.0** | **J ^** | 15 | 4.4 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| **Potassium** | **2700** | **J** | 3000 | 240 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| **Barium** | **39** | | 10 | 0.58 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| **Sodium** | **62000** | **B** | 1000 | 92 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| Beryllium | 0.47 | U ^ | 1.0 | 0.47 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Chromium** | **2.7** | **J ^** | 10 | 0.66 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Cobalt** | **23** | | 10 | 1.2 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Iron** | **140** | | 100 | 22 | ug/L | | 11/30/15 14:30 | 12/13/15 12:48 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-2-2015-1120** — **Lab Sample ID: 280-77166-1**
**Date Collected: 11/20/15 08:55** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Manganese** | **3800** | **B** | 10 | 0.25 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Nickel** | **2.9** | **J** | 40 | 1.3 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 21:51 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Thallium** | **7.2** | **J** | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Zinc** | **5.0** | **J** | 20 | 4.5 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |
| **Vanadium** | **1.7** | **J** | 10 | 1.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:13 | 1 |

**Client Sample ID: MW-3-2015-1120** — **Lab Sample ID: 280-77166-2**
**Date Collected: 11/20/15 10:56** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| **Calcium** | **73000** | | 200 | 35 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Magnesium** | **20000** | | 200 | 11 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Arsenic** | **12** | **J ^** | 15 | 4.4 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| **Potassium** | **9500** | | 3000 | 240 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| **Barium** | **19** | | 10 | 0.58 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| **Sodium** | **97000** | **B** | 1000 | 92 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| **Beryllium** | **0.52** | **J** | 1.0 | 0.47 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Chromium** | **2.0** | **J** | 10 | 0.66 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Cobalt** | **120** | | 10 | 1.2 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Iron** | **360** | | 100 | 22 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Manganese** | **7800** | **B** | 10 | 0.25 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Nickel** | **25** | **J** | 40 | 1.3 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Selenium** | **16** | | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 22:14 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Thallium** | **18** | | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| **Zinc** | **88** | | 20 | 4.5 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:36 | 1 |

**Client Sample ID: MW-3-2015-1120-DUP** — **Lab Sample ID: 280-77166-3**
**Date Collected: 11/20/15 10:56** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| **Calcium** | **74000** | | 200 | 35 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| **Magnesium** | **20000** | | 200 | 11 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| **Arsenic** | **12** | **J ^** | 15 | 4.4 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| **Potassium** | **10000** | | 3000 | 240 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| **Barium** | **19** | | 10 | 0.58 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| **Sodium** | **97000** | **B** | 1000 | 92 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| **Beryllium** | **0.48** | **J** | 1.0 | 0.47 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: MW-3-2015-1120-DUP** — **Lab Sample ID: 280-77166-3**
**Date Collected: 11/20/15 10:56** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chromium | 1.8 | J | 10 | 0.66 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| Cobalt | 120 | | 10 | 1.2 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| Iron | 330 | | 100 | 22 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| Manganese | 7900 | B | 10 | 0.25 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| Nickel | 25 | J | 40 | 1.3 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| Selenium | 14 | J | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 22:16 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| Thallium | 21 | | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| Zinc | 220 | | 20 | 4.5 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |
| Vanadium | 1.4 | J | 10 | 1.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:38 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: MW-2-2015-1120** — **Lab Sample ID: 280-77166-1**
**Date Collected: 11/20/15 08:55** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 12/01/15 11:00 | 12/01/15 15:28 | 1 |

**Client Sample ID: MW-3-2015-1120** — **Lab Sample ID: 280-77166-2**
**Date Collected: 11/20/15 10:56** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 12/01/15 11:00 | 12/01/15 15:35 | 1 |

**Client Sample ID: MW-3-2015-1120-DUP** — **Lab Sample ID: 280-77166-3**
**Date Collected: 11/20/15 10:56** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 12/01/15 11:00 | 12/01/15 15:37 | 1 |

## General Chemistry

**Client Sample ID: MW-2-2015-1120** — **Lab Sample ID: 280-77166-1**
**Date Collected: 11/20/15 08:55** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 11 | B | 3.0 | 0.25 | mg/L | | | 12/09/15 17:27 | 1 |
| Sulfate | 90 | B | 5.0 | 0.23 | mg/L | | | 12/09/15 17:27 | 1 |
| Total Dissolved Solids | 250 | | 10 | 4.7 | mg/L | | | 11/25/15 17:59 | 1 |

**Client Sample ID: MW-3-2015-1120** — **Lab Sample ID: 280-77166-2**
**Date Collected: 11/20/15 10:56** — **Matrix: Water**
**Date Received: 11/21/15 08:50**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 54 | B | 3.0 | 0.25 | mg/L | | | 12/09/15 17:42 | 1 |
| Sulfate | 340 | B | 25 | 1.2 | mg/L | | | 12/09/15 22:05 | 5 |
| Total Dissolved Solids | 680 | | 10 | 4.7 | mg/L | | | 11/25/15 17:59 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## General Chemistry

**Client Sample ID: MW-3-2015-1120-DUP**
**Date Collected: 11/20/15 10:56**
**Date Received: 11/21/15 08:50**

**Lab Sample ID: 280-77166-3**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 53 | B | 3.0 | 0.25 | mg/L | | | 12/09/15 17:58 | 1 |
| Sulfate | 340 | B | 25 | 1.2 | mg/L | | | 12/09/15 22:21 | 5 |
| Total Dissolved Solids | 680 | | 10 | 4.7 | mg/L | | | 11/25/15 17:59 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| **Lab Sample ID** | **Client Sample ID** | **(42-120)** | **(43-120)** | **(47-120)** |
| 280-77166-1 | MW-2-2015-1120 | 70 | 87 | 81 |
| 280-77166-2 | MW-3-2015-1120 | 72 | 77 | 103 |
| 280-77166-3 | MW-3-2015-1120-DUP | 69 | 75 | 115 |
| LCS 280-305566/2-A | Lab Control Sample | 58 | 66 | 66 |
| LCSD 280-305566/3-A | Lab Control Sample Dup | 83 | 95 | 118 |
| MB 280-305566/1-A | Method Blank | 80 | 93 | 121 X |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-305566/1-A**
**Matrix: Water**
**Analysis Batch: 305967**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 305566**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 11/25/15 09:50 | 11/30/15 11:45 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *80* | | *42 - 120* | *11/25/15 09:50* | *11/30/15 11:45* | *1* |
| *Nitrobenzene-d5* | *93* | | *43 - 120* | *11/25/15 09:50* | *11/30/15 11:45* | *1* |
| *Terphenyl-d14* | *121* | *X* | *47 - 120* | *11/25/15 09:50* | *11/30/15 11:45* | *1* |

**Lab Sample ID: LCS 280-305566/2-A**
**Matrix: Water**
**Analysis Batch: 305967**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 305566**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 443 | | ng/L | | 49 | 47 - 120 |
| Acenaphthylene | 900 | 440 | | ng/L | | 49 | 39 - 120 |
| Anthracene | 900 | 460 | | ng/L | | 51 | 28 - 120 |
| Benzo[a]anthracene | 900 | 496 | | ng/L | | 55 | 42 - 120 |
| Benzo[a]pyrene | 900 | 532 | | ng/L | | 59 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 526 | | ng/L | | 58 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 537 | | ng/L | | 60 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 507 | | ng/L | | 56 | 43 - 120 |
| Chrysene | 900 | 496 | | ng/L | | 55 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 629 | | ng/L | | 70 | 27 - 126 |
| Fluoranthene | 900 | 452 | | ng/L | | 50 | 46 - 120 |
| Fluorene | 900 | 444 | | ng/L | | 49 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 543 | | ng/L | | 60 | 38 - 120 |
| Naphthalene | 900 | 483 | | ng/L | | 54 | 37 - 120 |
| Phenanthrene | 900 | 471 | | ng/L | | 52 | 46 - 120 |
| Pyrene | 900 | 458 | | ng/L | | 51 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-305566/2-A**
**Matrix: Water**
**Analysis Batch: 305967**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 305566**

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 58 | | 42 - 120 |
| Nitrobenzene-d5 | 66 | | 43 - 120 |
| Terphenyl-d14 | 66 | | 47 - 120 |

**Lab Sample ID: LCSD 280-305566/3-A**
**Matrix: Water**
**Analysis Batch: 305967**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 305566**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 624 | | ng/L | | 69 | 47 - 120 | 34 | 50 |
| Acenaphthylene | 900 | 628 | | ng/L | | 70 | 39 - 120 | 35 | 50 |
| Anthracene | 900 | 623 | | ng/L | | 69 | 28 - 120 | 30 | 50 |
| Benzo[a]anthracene | 900 | 673 | | ng/L | | 75 | 42 - 120 | 30 | 40 |
| Benzo[a]pyrene | 900 | 720 | * | ng/L | | 80 | 38 - 120 | 30 | 21 |
| Benzo[b]fluoranthene | 900 | 716 | * | ng/L | | 80 | 44 - 120 | 31 | 28 |
| Benzo[g,h,i]perylene | 900 | 772 | * | ng/L | | 86 | 39 - 120 | 36 | 23 |
| Benzo[k]fluoranthene | 900 | 683 | * | ng/L | | 76 | 43 - 120 | 30 | 28 |
| Chrysene | 900 | 679 | | ng/L | | 75 | 35 - 120 | 31 | 41 |
| Dibenz(a,h)anthracene | 900 | 852 | * | ng/L | | 95 | 27 - 126 | 30 | 25 |
| Fluoranthene | 900 | 592 | * | ng/L | | 66 | 46 - 120 | 27 | 24 |
| Fluorene | 900 | 607 | | ng/L | | 67 | 49 - 120 | 31 | 50 |
| Indeno[1,2,3-cd]pyrene | 900 | 759 | * | ng/L | | 84 | 38 - 120 | 33 | 25 |
| Naphthalene | 900 | 718 | | ng/L | | 80 | 37 - 120 | 39 | 50 |
| Phenanthrene | 900 | 652 | | ng/L | | 72 | 46 - 120 | 32 | 42 |
| Pyrene | 900 | 594 | * | ng/L | | 66 | 49 - 120 | 26 | 22 |

| Surrogate | LCSD %Recovery | LCSD Qualifier | Limits |
|---|---|---|---|
| 2-Fluorobiphenyl | 83 | | 42 - 120 |
| Nitrobenzene-d5 | 95 | | 43 - 120 |
| Terphenyl-d14 | 118 | | 47 - 120 |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-305839/1-A**
**Matrix: Water**
**Analysis Batch: 307426**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 305839**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Manganese | 0.570 | J | 10 | 0.25 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Silver | 1.08 | J | 10 | 0.93 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-305839/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 11/30/15 14:30 | 12/11/15 02:06 | 1 |

**Lab Sample ID: MB 280-305839/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Sodium | 175 | J ^ | 1000 | 92 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Beryllium | 0.47 | U ^ | 1.0 | 0.47 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Chromium | 0.66 | U ^ | 10 | 0.66 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Iron | 22 | U ^ | 100 | 22 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 11/30/15 14:30 | 12/11/15 21:43 | 1 |

**Lab Sample ID: LCS 280-305839/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 500 | 471 | | ug/L | | 94 | 88 - 110 |
| Magnesium | 50000 | 49100 | | ug/L | | 98 | 90 - 113 |
| Cadmium | 100 | 97.6 | | ug/L | | 98 | 88 - 111 |
| Copper | 250 | 247 | | ug/L | | 99 | 86 - 112 |
| Cobalt | 500 | 496 | | ug/L | | 99 | 89 - 111 |
| Lead | 500 | 492 | | ug/L | | 98 | 89 - 110 |
| Manganese | 500 | 467 | | ug/L | | 93 | 90 - 110 |
| Nickel | 500 | 495 | | ug/L | | 99 | 89 - 111 |
| Silver | 50.0 | 48.8 | | ug/L | | 98 | 86 - 115 |
| Thallium | 2000 | 2050 | | ug/L | | 103 | 88 - 110 |
| Zinc | 500 | 463 | | ug/L | | 93 | 85 - 111 |
| Vanadium | 500 | 499 | | ug/L | | 100 | 90 - 111 |

**Lab Sample ID: LCS 280-305839/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1980 | | ug/L | | 99 | 87 - 111 |
| Calcium | 50000 | 47100 | | ug/L | | 94 | 90 - 111 |
| Arsenic | 1000 | 1020 | ^ | ug/L | | 102 | 88 - 110 |
| Potassium | 50000 | 50700 | | ug/L | | 101 | 89 - 114 |
| Barium | 2000 | 1930 | | ug/L | | 97 | 90 - 112 |
| Sodium | 50000 | 51900 | | ug/L | | 104 | 90 - 115 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-305839/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Beryllium | 50.0 | 48.0 | ^ | ug/L | | 96 | 89 - 113 |
| Chromium | 200 | 209 | ^ | ug/L | | 104 | 90 - 113 |
| Iron | 1000 | 946 | ^ | ug/L | | 95 | 89 - 115 |
| Selenium | 2000 | 2090 | | ug/L | | 104 | 85 - 112 |

**Lab Sample ID: LCSD 280-305839/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 500 | 478 | | ug/L | | 96 | 88 - 110 | 1 | 20 |
| Magnesium | 50000 | 50200 | | ug/L | | 100 | 90 - 113 | 2 | 20 |
| Cadmium | 100 | 99.1 | | ug/L | | 99 | 88 - 111 | 2 | 20 |
| Copper | 250 | 253 | | ug/L | | 101 | 86 - 112 | 2 | 20 |
| Cobalt | 500 | 506 | | ug/L | | 101 | 89 - 111 | 2 | 20 |
| Lead | 500 | 503 | | ug/L | | 101 | 89 - 110 | 2 | 20 |
| Manganese | 500 | 478 | | ug/L | | 96 | 90 - 110 | 2 | 20 |
| Nickel | 500 | 504 | | ug/L | | 101 | 89 - 111 | 2 | 20 |
| Silver | 50.0 | 49.3 | | ug/L | | 99 | 86 - 115 | 1 | 20 |
| Thallium | 2000 | 2050 | | ug/L | | 103 | 88 - 110 | 0 | 20 |
| Zinc | 500 | 471 | | ug/L | | 94 | 85 - 111 | 2 | 20 |
| Vanadium | 500 | 509 | | ug/L | | 102 | 90 - 111 | 2 | 20 |

**Lab Sample ID: LCSD 280-305839/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 2010 | | ug/L | | 100 | 87 - 111 | 1 | 20 |
| Calcium | 50000 | 51200 | | ug/L | | 102 | 90 - 111 | 8 | 20 |
| Arsenic | 1000 | 1030 | ^ | ug/L | | 103 | 88 - 110 | 1 | 20 |
| Potassium | 50000 | 55100 | | ug/L | | 110 | 89 - 114 | 8 | 20 |
| Barium | 2000 | 2100 | | ug/L | | 105 | 90 - 112 | 8 | 20 |
| Sodium | 50000 | 55500 | | ug/L | | 111 | 90 - 115 | 7 | 20 |
| Beryllium | 50.0 | 51.9 | ^ | ug/L | | 104 | 89 - 113 | 8 | 20 |
| Chromium | 200 | 211 | ^ | ug/L | | 106 | 90 - 113 | 1 | 20 |
| Iron | 1000 | 1040 | ^ | ug/L | | 104 | 89 - 115 | 9 | 20 |
| Selenium | 2000 | 2100 | | ug/L | | 105 | 85 - 112 | 1 | 20 |

**Lab Sample ID: 280-77166-1 MS** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 500 | 464 | | ug/L | | 93 | 81 - 124 |
| Magnesium | 3700 | | 50000 | 52600 | | ug/L | | 98 | 62 - 146 |
| Cadmium | 0.45 | U | 100 | 96.6 | | ug/L | | 97 | 82 - 119 |
| Copper | 1.4 | U | 250 | 247 | | ug/L | | 99 | 82 - 129 |
| Cobalt | 23 | | 500 | 513 | | ug/L | | 98 | 82 - 119 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-77166-1 MS** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Lead | 2.6 | U | 500 | 485 | | ug/L | | 97 | 89 - 121 |
| Manganese | 3800 | B | 500 | 4310 | 4 | ug/L | | 100 | 79 - 121 |
| Nickel | 2.9 | J | 500 | 493 | | ug/L | | 98 | 84 - 120 |
| Silver | 0.93 | U | 50.0 | 48.2 | | ug/L | | 96 | 75 - 141 |
| Thallium | 7.2 | J | 2000 | 1970 | | ug/L | | 98 | 90 - 116 |
| Zinc | 5.0 | J | 500 | 467 | | ug/L | | 92 | 60 - 137 |
| Vanadium | 1.7 | J | 500 | 500 | | ug/L | | 100 | 85 - 120 |

**Lab Sample ID: 280-77166-1 MS** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 2000 | 1930 | | ug/L | | 97 | 83 - 119 |
| Calcium | 15000 | | 50000 | 64400 | | ug/L | | 99 | 48 - 153 |
| Calcium | 15000 | | 50000 | 64400 | | ug/L | | 99 | 48 - 153 |
| Arsenic | 5.0 | J ^ | 1000 | 1030 | ^ | ug/L | | 102 | 84 - 124 |
| Potassium | 2700 | J | 50000 | 55100 | | ug/L | | 105 | 76 - 132 |
| Potassium | 2700 | J | 50000 | 55100 | | ug/L | | 105 | 76 - 132 |
| Barium | 39 | | 2000 | 2030 | | ug/L | | 100 | 85 - 120 |
| Sodium | 62000 | B | 50000 | 112000 | | ug/L | | 100 | 70 - 203 |
| Sodium | 62000 | B | 50000 | 112000 | | ug/L | | 100 | 70 - 203 |
| Beryllium | 0.47 | U ^ | 50.0 | 49.4 | ^ | ug/L | | 99 | 79 - 121 |
| Chromium | 2.7 | J ^ | 200 | 208 | ^ | ug/L | | 103 | 73 - 135 |
| Selenium | 4.9 | U | 2000 | 2050 | | ug/L | | 102 | 71 - 140 |

**Lab Sample ID: 280-77166-1 MS** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307602** — **Prep Batch: 305839**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Iron | 140 | | 1000 | 1120 | | ug/L | | 98 | 52 - 155 |

**Lab Sample ID: 280-77166-1 MSD** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 500 | 464 | | ug/L | | 93 | 81 - 124 | 0 | 20 |
| Magnesium | 3700 | | 50000 | 52900 | | ug/L | | 99 | 62 - 146 | 1 | 20 |
| Cadmium | 0.45 | U | 100 | 97.1 | | ug/L | | 97 | 82 - 119 | 1 | 20 |
| Copper | 1.4 | U | 250 | 247 | | ug/L | | 99 | 82 - 129 | 0 | 20 |
| Cobalt | 23 | | 500 | 515 | | ug/L | | 98 | 82 - 119 | 0 | 20 |
| Lead | 2.6 | U | 500 | 489 | | ug/L | | 98 | 89 - 121 | 1 | 20 |
| Manganese | 3800 | B | 500 | 4280 | 4 | ug/L | | 95 | 79 - 121 | 1 | 20 |
| Nickel | 2.9 | J | 500 | 494 | | ug/L | | 98 | 84 - 120 | 0 | 20 |
| Silver | 0.93 | U | 50.0 | 47.9 | | ug/L | | 96 | 75 - 141 | 1 | 20 |
| Thallium | 7.2 | J | 2000 | 1980 | | ug/L | | 99 | 90 - 116 | 0 | 20 |
| Zinc | 5.0 | J | 500 | 468 | | ug/L | | 93 | 60 - 137 | 0 | 20 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-77166-1 MSD** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307426** — **Prep Batch: 305839**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Vanadium | 1.7 | J | 500 | 504 | | ug/L | | 100 | 85 - 120 | 1 | 20 |

**Lab Sample ID: 280-77166-1 MSD** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307545** — **Prep Batch: 305839**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 2000 | 1960 | | ug/L | | 98 | 83 - 119 | 1 | 20 |
| Calcium | 15000 | | 50000 | 62800 | | ug/L | | 95 | 48 - 153 | 3 | 20 |
| Calcium | 15000 | | 50000 | 62800 | | ug/L | | 95 | 48 - 153 | 3 | 20 |
| Arsenic | 5.0 | J ^ | 1000 | 1040 | ^ | ug/L | | 103 | 84 - 124 | 1 | 20 |
| Potassium | 2700 | J | 50000 | 53900 | | ug/L | | 102 | 76 - 132 | 2 | 20 |
| Potassium | 2700 | J | 50000 | 53900 | | ug/L | | 102 | 76 - 132 | 2 | 20 |
| Barium | 39 | | 2000 | 2000 | | ug/L | | 98 | 85 - 120 | 2 | 20 |
| Sodium | 62000 | B | 50000 | 109000 | | ug/L | | 96 | 70 - 203 | 2 | 20 |
| Sodium | 62000 | B | 50000 | 109000 | | ug/L | | 96 | 70 - 203 | 2 | 20 |
| Beryllium | 0.47 | U ^ | 50.0 | 48.3 | ^ | ug/L | | 97 | 79 - 121 | 2 | 20 |
| Chromium | 2.7 | J ^ | 200 | 210 | ^ | ug/L | | 104 | 73 - 135 | 1 | 20 |
| Selenium | 4.9 | U | 2000 | 2050 | | ug/L | | 102 | 71 - 140 | 0 | 20 |

**Lab Sample ID: 280-77166-1 MSD** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307602** — **Prep Batch: 305839**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Iron | 140 | | 1000 | 1130 | | ug/L | | 99 | 52 - 155 | 0 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-305729/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306193** — **Prep Batch: 305729**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 12/01/15 11:00 | 12/01/15 15:14 | 1 |

**Lab Sample ID: LCS 280-305729/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306193** — **Prep Batch: 305729**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.00 | | ug/L | | 100 | 84 - 120 |

**Lab Sample ID: LCSD 280-305729/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306193** — **Prep Batch: 305729**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 5.10 | | ug/L | | 102 | 84 - 120 | 2 | 15 |

## Method: 7470A - Mercury (CVAA) (Continued)

**Lab Sample ID: 280-77166-1 MS** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306193** — **Prep Batch: 305729**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 5.00 | 5.00 | | ug/L | | 100 | 75 - 125 |

**Lab Sample ID: 280-77166-1 MSD** — **Client Sample ID: MW-2-2015-1120**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 306193** — **Prep Batch: 305729**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 5.00 | 5.14 | | ug/L | | 103 | 75 - 125 | 3 | 20 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-307106/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307106**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 0.376 | J | 3.0 | 0.25 | mg/L | | | 12/09/15 11:48 | 1 |
| Sulfate | 0.447 | J | 5.0 | 0.23 | mg/L | | | 12/09/15 11:48 | 1 |

**Lab Sample ID: LCS 280-307106/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307106**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 100 | 96.6 | | mg/L | | 97 | 90 - 110 |
| Sulfate | 100 | 96.2 | | mg/L | | 96 | 90 - 110 |

**Lab Sample ID: LCSD 280-307106/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307106**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 100 | 96.9 | | mg/L | | 97 | 90 - 110 | 0 | 10 |
| Sulfate | 100 | 96.3 | | mg/L | | 96 | 90 - 110 | 0 | 10 |

**Lab Sample ID: MRL 280-307106/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 307106**

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 2.50 | 2.28 | J | mg/L | | 91 | 50 - 150 |
| Sulfate | 2.50 | 2.28 | J | mg/L | | 91 | 50 - 150 |

# QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## Method: SM 2540C - Solids, Total Dissolved (TDS)

**Lab Sample ID: MB 280-305703/1**
**Matrix: Water**
**Analysis Batch: 305703**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 4.7 | U | 10 | 4.7 | mg/L | | | 11/25/15 17:59 | 1 |

**Lab Sample ID: LCS 280-305703/2**
**Matrix: Water**
**Analysis Batch: 305703**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | | | 501 | 491 | | mg/L | | 98 | 86 - 110 | | |

**Lab Sample ID: 280-77166-3 DU**
**Matrix: Water**
**Analysis Batch: 305703**

**Client Sample ID: MW-3-2015-1120-DUP**
**Prep Type: Total/NA**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Total Dissolved Solids | 680 | | | 680 | | mg/L | | | | 0.1 | 10 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## GC/MS Semi VOA

### Prep Batch: 305566

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 3510C | |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 3510C | |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 3510C | |
| LCS 280-305566/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 280-305566/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |
| MB 280-305566/1-A | Method Blank | Total/NA | Water | 3510C | |

### Analysis Batch: 305967

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-305566/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 305566 |
| LCSD 280-305566/3-A | Lab Control Sample Dup | Total/NA | Water | 8270D SIM | 305566 |
| MB 280-305566/1-A | Method Blank | Total/NA | Water | 8270D SIM | 305566 |

### Analysis Batch: 306003

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 8270D SIM | 305566 |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 8270D SIM | 305566 |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 8270D SIM | 305566 |

## Metals

### Prep Batch: 305729

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 7470A | |
| 280-77166-1 MS | MW-2-2015-1120 | Total/NA | Water | 7470A | |
| 280-77166-1 MSD | MW-2-2015-1120 | Total/NA | Water | 7470A | |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 7470A | |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 7470A | |
| LCS 280-305729/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| LCSD 280-305729/3-A | Lab Control Sample Dup | Total/NA | Water | 7470A | |
| MB 280-305729/1-A | Method Blank | Total/NA | Water | 7470A | |

### Prep Batch: 305839

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 3010A | |
| 280-77166-1 MS | MW-2-2015-1120 | Total/NA | Water | 3010A | |
| 280-77166-1 MSD | MW-2-2015-1120 | Total/NA | Water | 3010A | |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 3010A | |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 3010A | |
| LCS 280-305839/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| LCSD 280-305839/3-A | Lab Control Sample Dup | Total/NA | Water | 3010A | |
| MB 280-305839/1-A | Method Blank | Total/NA | Water | 3010A | |

### Analysis Batch: 306193

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 7470A | 305729 |
| 280-77166-1 MS | MW-2-2015-1120 | Total/NA | Water | 7470A | 305729 |
| 280-77166-1 MSD | MW-2-2015-1120 | Total/NA | Water | 7470A | 305729 |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 7470A | 305729 |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 7470A | 305729 |

## Metals (Continued)

### Analysis Batch: 306193 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-305729/2-A | Lab Control Sample | Total/NA | Water | 7470A | 305729 |
| LCSD 280-305729/3-A | Lab Control Sample Dup | Total/NA | Water | 7470A | 305729 |
| MB 280-305729/1-A | Method Blank | Total/NA | Water | 7470A | 305729 |

### Analysis Batch: 307426

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-1 MS | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-1 MSD | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 6010C | 305839 |
| LCS 280-305839/2-A | Lab Control Sample | Total/NA | Water | 6010C | 305839 |
| LCSD 280-305839/3-A | Lab Control Sample Dup | Total/NA | Water | 6010C | 305839 |
| MB 280-305839/1-A | Method Blank | Total/NA | Water | 6010C | 305839 |

### Analysis Batch: 307545

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-1 MS | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-1 MSD | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 6010C | 305839 |
| LCS 280-305839/2-A | Lab Control Sample | Total/NA | Water | 6010C | 305839 |
| LCSD 280-305839/3-A | Lab Control Sample Dup | Total/NA | Water | 6010C | 305839 |
| MB 280-305839/1-A | Method Blank | Total/NA | Water | 6010C | 305839 |

### Analysis Batch: 307602

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-1 MS | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |
| 280-77166-1 MSD | MW-2-2015-1120 | Total/NA | Water | 6010C | 305839 |

## General Chemistry

### Analysis Batch: 305703

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | SM 2540C | |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | SM 2540C | |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | SM 2540C | |
| 280-77166-3 DU | MW-3-2015-1120-DUP | Total/NA | Water | SM 2540C | |
| LCS 280-305703/2 | Lab Control Sample | Total/NA | Water | SM 2540C | |
| MB 280-305703/1 | Method Blank | Total/NA | Water | SM 2540C | |

### Analysis Batch: 307106

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-77166-1 | MW-2-2015-1120 | Total/NA | Water | 9056A | |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 9056A | |
| 280-77166-2 | MW-3-2015-1120 | Total/NA | Water | 9056A | |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 9056A | |
| 280-77166-3 | MW-3-2015-1120-DUP | Total/NA | Water | 9056A | |

## General Chemistry (Continued)

### Analysis Batch: 307106 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-307106/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-307106/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-307106/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-307106/3 | Lab Control Sample | Total/NA | Water | 9056A | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## Client Sample ID: MW-2-2015-1120

**Lab Sample ID: 280-77166-1**
**Date Collected: 11/20/15 08:55**
**Matrix: Water**
**Date Received: 11/21/15 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1042.3 mL | 1 mL | 305566 | 11/25/15 09:50 | ELV | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1042.3 mL | 1 mL | 306003 | 11/30/15 19:46 | ELJ | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307426 | 12/11/15 02:13 | CRR | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307545 | 12/11/15 21:51 | CMK | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307602 | 12/13/15 12:48 | CMK | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 50 mL | 305729 | 12/01/15 11:00 | CDH | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 50 mL | 306193 | 12/01/15 15:28 | CDH | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 307106 | 12/09/15 17:27 | CML | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 305703 | 11/25/15 17:59 | RSM | TAL DEN |

## Client Sample ID: MW-3-2015-1120

**Lab Sample ID: 280-77166-2**
**Date Collected: 11/20/15 10:56**
**Matrix: Water**
**Date Received: 11/21/15 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1034.5 mL | 1 mL | 305566 | 11/25/15 09:50 | ELV | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1034.5 mL | 1 mL | 306003 | 11/30/15 20:12 | ELJ | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307426 | 12/11/15 02:36 | CRR | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307545 | 12/11/15 22:14 | CMK | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 50 mL | 305729 | 12/01/15 11:00 | CDH | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 50 mL | 306193 | 12/01/15 15:35 | CDH | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 307106 | 12/09/15 17:42 | CML | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 307106 | 12/09/15 22:05 | CML | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 305703 | 11/25/15 17:59 | RSM | TAL DEN |

## Client Sample ID: MW-3-2015-1120-DUP

**Lab Sample ID: 280-77166-3**
**Date Collected: 11/20/15 10:56**
**Matrix: Water**
**Date Received: 11/21/15 08:50**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1041.5 mL | 1 mL | 305566 | 11/25/15 09:50 | ELV | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 1041.5 mL | 1 mL | 306003 | 11/30/15 20:38 | ELJ | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307426 | 12/11/15 02:38 | CRR | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 305839 | 11/30/15 14:30 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 307545 | 12/11/15 22:16 | CMK | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 50 mL | 305729 | 12/01/15 11:00 | CDH | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 50 mL | 306193 | 12/01/15 15:37 | CDH | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 307106 | 12/09/15 17:58 | CML | TAL DEN |
| Total/NA | Analysis | 9056A | | 5 | 5 mL | 5 mL | 307106 | 12/09/15 22:21 | CML | TAL DEN |
| Total/NA | Analysis | SM 2540C | | 1 | 100 mL | 100 mL | 305703 | 11/25/15 17:59 | RSM | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-77166-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-17 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-17 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-17 |
| Arizona | State Program | 9 | AZ0713 | 12-19-16 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-17 |
| Illinois | NELAP | 5 | 200017 | 04-30-17 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-16 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 06-30-16 |
| New York | NELAP | 2 | 11964 | 04-01-17 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-16 |
| North Dakota | State Program | 8 | R-034 | 01-09-17 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-17 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 * |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-16 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-17 |

* Certification renewal pending - certification considered valid.

**H5K250406 Analytical Report ..... 1**

**Sample Receipt Documentation ..... 20**

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

TestAmerica Laboratories, Inc.

# ANALYTICAL REPORT

PROJECT NO. 280-77166-1

UNC Cogen

Lot #: H5K250406

Patrick McEntee

TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002

TESTAMERICA LABORATORIES, INC.

Ryan Henry

Ryan Henry
Project Manager

December 7, 2015

# ANALYTICAL METHODS SUMMARY

**H5K250406**

| PARAMETER | ANALYTICAL METHOD |
|---|---|
| Dibenzodioxins and Dibenzofurans, HRGC/HRMS | SW846 8290 |

**References:**

SW846 "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 and its updates.

# SAMPLE SUMMARY

**H5K250406**

| WO # | SAMPLE# | CLIENT SAMPLE ID | SAMPLED DATE | SAMP TIME |
|---|---|---|---|---|
| M7X2T | 001 | MW-2-2015-1120 | 11/20/15 | 08:55 |
| M7X2V | 002 | MW-3-2015-1120 | 11/20/15 | 10:56 |
| M7X2W | 003 | MW-3-2015-1120-DUP | 11/20/15 | 10:56 |

**NOTE(S):**

- The analytical results of the samples listed above are presented on the following pages.
- All calculations are performed before rounding to avoid round-off errors in calculated results.
- Results noted as "ND" were not detected at or above the stated limit.
- This report must not be reproduced, except in full, without the written approval of the laboratory.
- Results for the following parameters are never reported on a dry weight basis: color, corrosivity, density, flashpoint, ignitability, layers, odor, paint filter test, pH, porosity pressure, reactivity, redox potential, specific gravity, spot tests, solids, solubility, temperature, viscosity, and weight.

# PROJECT NARRATIVE
## H5K250406

The results reported herein are applicable to the samples submitted for analysis only. If you have any questions about this report, please call (865) 291-3000 to speak with the TestAmerica project manager listed on the cover page.

This report shall not be reproduced except in full, without the written approval of the laboratory.

**The original chain of custody documentation is included with this report.**

**Sample Receipt**

There were no problems with the condition of the samples received.

**Quality Control and Data Interpretation**

Unless otherwise noted, all holding times and QC criteria were met and the test results shown in this report meet all applicable NELAC requirements.

The following flags are used to qualify results for chlorinated dioxin and furan results:

**J** – The reported result is an estimate. The amount reported is below the Minimum Level (ML). The qualitative definition of the ML is "the lowest level at which the analytical system must give a reliable signal and an acceptable calibration point". The ML was introduced in EPA Methods 1624 and 1625 in 1980 and was promulgated in these methods in 1984 at 40 CFR Part 136, Appendix A. For the purposes of this report, the ML is qualitatively defined as described above, and quantitatively defined as follows:

**Minimum Level**: The concentration or mass of analyte in the sample that corresponds to the lowest calibration level in the initial calibration. It represents a concentration (in the sample extract) equivalent to that of the lowest calibration standard, after corrections for method-specified sample weights, volumes and cleanup procedures has been employed.

Example: The lowest calibration level for TCDD in the initial calibration is 0.5 pg/uL. A mass of 10 pg of 2,3,7,8-TCDD in the sample would result in a concentration of 0.5 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the lowest calibration standard, the 10 pg mass in the sample components is the ML. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The ML for 2,3,7,8-TCDD becomes 100 pg rather than the default of 10 pg.

**E** – The reported result is an estimate. The amount reported is above the Upper Calibration Level (UCL) described below. The quantitative definition of the UCL is listed below:

**Upper Calibration Level:** The concentration or mass of analyte in the sample that corresponds to the highest calibration level in the initial calibration. It is equivalent to the

# PROJECT NARRATIVE
## H5K250406

concentration of the highest calibration standard, assuming that all method-specified sample weights, volumes, and cleanup procedures have been employed.

Example: The maximum calibration level for TCDD in the initial calibration is 200 pg/uL. A mass of 4000 pg of 2,3,7,8-TCDD in the sampling components would result in a concentration of 200 pg/uL in the sample extract (at a final volume of 20 uL). Since the concentration in the sample extract corresponds to the concentration in the highest calibration standard, the 4000 pg mass in the sample components is the UCL. If the sample extract is further diluted, the ML will increase by the dilution factor.

Example: A 1/10 dilution is performed on the sample extract described above. The UCL for 2,3,7,8-TCDD becomes 40,000 pg rather than the default of 4000 pg. In this example, all positive 2,3,7,8-TCDD results above 40,000 pg are flagged with an E.

**B** – The analyte is present in the associated method blank at a detectable level. For this analysis, there is no method specified reporting level other than the qualitative criterion that peaks must exhibit a signal-to-noise ratio of $\geq$2.5 to 1. Therefore, the presence of any reportable amount of the analyte in the blank will result in a B qualifier on all associated samples.

**Q** – Estimated maximum possible concentration. This qualifier is used when the result is generated from chromatographic data that does not meet all the qualitative criteria for a positive identification given in the method. These may include one or more of the following:

- Ion abundance ratios must be within specified limits (+/-15% of theoretical ion abundance ratio).
- Retention time criteria (relative to the method-specified isotope labeled retention time standard).
- Co-maximization criterion. The two quantitation ion peaks must reach their maxima within 2 seconds of each other.
- 2,3,7,8-TCDF result is reported from the non-isomer specific Rtx-5 column.
- Polychlorinated dibenzofuran purity. An interference may be present on the indicated polychlorinated dibenzofuran when a polychlorinated diphenyl ether peak is present and maximizes within +/- 3 seconds of the dibenzofuran candidate.

**S** – Ion suppression evident. The trace indicating the signal from the lock mass of the calibration compound shows a deflection at the retention time of the analyte. This may indicate a temporary suppression of the instrument sensitivity due to a matrix-borne interference.

**C** – Coeluting Isomer. The isomer is known to coelute with another member of its homologue group, or the peak shape is shouldered, indicating the likelihood of a coeluting isomer.

**X** – Other. See explanation in narrative.

# PROJECT NARRATIVE
## H5K250406

Laboratory studies supporting risk assessment and Total Maximum Daily Load (TMDL) evaluations, frequently use qualified data reported as low as the Method Detection Limit (MDL), or the Estimated Detection Limit (EDL). Several of EPA's isotope dilution methods employ the EDL.[1,2,3] The EDL is based on a direct measurement of the signal-to-noise (S/N) ratio acquired during sample analysis. This S/N measurement is used to calculate the concentration in the sample corresponding to the minimum intensity of the smallest quantifiable peak. The EDL reflects the amount of the particular analyte which would be required to cause a positive result for the particular analysis. Because the S/N obtained covaries with recovery, instrument sensitivity and sample-specific cleanup efficacy, the EDL is a more valid measure of the sensitivity of the entire analytical process for the specific sample than is an MDL run periodically on a reference matrix.

The EDL is typically calculated according to the following equation:

$$\text{Estimated Detection Limit} = \frac{N \times 2.5 \times Qis}{His \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| N | = | peak to peak noise of quantitation ion signal in the region of the ion chromatogram where the compound of interest is expected to elute |
| His | = | peak height of quantitation ion for appropriate internal standard |
| Qis | = | ng of internal standard added to sample |
| RRF | = | mean relative response factor of compound obtained during initial calibration |
| W | = | amount of sample extracted (grams or liters) |
| S | = | percent solids (optional, if results are requested to be reported on dry weight basis) |

(The area of the internal standard is sometimes used instead of height, along with an area-to-height conversion factor.)

This method of estimating the detection limit differs from the MDL in that it does not carry the requirement that the sample be statistically distinguished as being from a contaminated population. As results approach the EDL, the risk of false positives and the analytical uncertainty increase significantly. However, a low false positive well below the ML or MDL is often closer to the true value than an assumption that the target analyte is present at the detection or reporting limits. For relatively clean samples, MDL studies may give an elevated estimate of the detection limit. Additionally, on contaminated samples, the MDL may give a falsely low estimate of the detection limit.

$$\text{Analyte Concentration} = \frac{As \times Qis}{Ais \times RRF \times W \times S}$$

Where:

| | | |
|---|---|---|
| As | = | Sum of areas of the target peaks |
| Qis | = | ng of internal standard added to sample |
| Ais | = | Sum of areas of the internal standard peaks |
| RRF | = | mean relative response factor of compound obtained during initial calibration |

# PROJECT NARRATIVE
## H5K250406

W = amount of sample extracted (grams or liters)
S = percent solids (optional, if results are requested to be reported on dry weight basis)

In sample data, peaks must have an intensity of ≥2.5 times the height of the background noise in order to be considered. Careful examination of the two equations above reveals that for the concentration of the smallest peak detectable (per the EDL equation) to exactly equal the smallest peaks that are calculated, requires that the average height to area ratio obtained during the calibration must equal the area to height ratio for every peak obtained near 2.5 times the noise. When the area to height ratio on a peak in a sample is less than the average obtained during calibration, the calculated result will correspond to a peak that would have been less than 2.5 times the noise on the calibration. This is the result of normal variability. Because the source methods for the EDL (SW-846 8290 and 8280A) do not provide for censoring of results by any other magnitude standard than being 2.5 times the noise, the laboratory does not censor at the calculated EDL. Hence, detections may be reported below the estimated detection limits.

Footnotes:

1. Code of Federal Regulations, Part 136, Chapter 1, Appendix 1, October 1994: Method 1613 Tetra- Through Octa-Chlorinated Dioxins and Furans by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry.
2. U.S. EPA. Test Methods for Evaluating Solid Waste, Volume II, SW-846, Update III, December 1996. Method 8280A: The Analysis of Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/Low Resolution Mass Spectrometry.
3. U.S. EPA. Test Methods for Evaluating Solid Waste, SW-846. Third Edition. March 1995 Method 8290: Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by High Resolution Gas Chromatography/High Resolution Mass Spectrometry.

# CERTIFICATION SUMMARY

| Laboratory | Authority | Program | EPA Region | Certification ID |
|---|---|---|---|---|
| TestAmerica Knoxville | L-A-B | DoD ELAP | | L2311 |
| TestAmerica Knoxville | Arkansas DEQ | State Program | 6 | 88-0688 |
| TestAmerica Knoxville | California | State Program | 9 | 2423 |
| TestAmerica Knoxville | Colorado | State Program | 8 | N/A |
| TestAmerica Knoxville | Connecticut | State Program | 1 | PH-0223 |
| TestAmerica Knoxville | Florida | NELAC | 4 | E87177 |
| TestAmerica Knoxville | Georgia | State Program | 4 | 906 |
| TestAmerica Knoxville | Hawaii | State Program | 9 | N/A |
| TestAmerica Knoxville | Kansas | NELAC | 7 | E-10349 |
| TestAmerica Knoxville | Kentucky | State Program | 4 | 90101 |
| TestAmerica Knoxville | Louisiana DOHH | State Program | 6 | LA150004 |
| TestAmerica Knoxville | Louisiana DEQ | NELAC | 6 | 83979 |
| TestAmerica Knoxville | Maryland | State Program | 3 | 277 |
| TestAmerica Knoxville | Michigan | State Program | 5 | 9933 |
| TestAmerica Knoxville | Nevada | State Program | 9 | TN00009 |
| TestAmerica Knoxville | New Jersey | NELAC | 2 | TN001 |
| TestAmerica Knoxville | New York | NELAC | 2 | 10781 |
| TestAmerica Knoxville | North Carolina DENR | State Program | 4 | 64 |
| TestAmerica Knoxville | North Carolina DHHS | State Program | 4 | 21705 |
| TestAmerica Knoxville | Ohio | OVAP | 5 | CL0059 |
| TestAmerica Knoxville | Oklahoma | State Program | 6 | 9415 |
| TestAmerica Knoxville | Pennsylvania | NELAC | 3 | 68-00576 |
| TestAmerica Knoxville | South Carolina | State Program | 4 | 84001 |
| TestAmerica Knoxville | Tennessee | State Program | 4 | TN02014 |
| TestAmerica Knoxville | Texas | NELAC | 6 | T104704380-14-7 |
| TestAmerica Knoxville | Federal | USDA | | P330-11-00260 |
| TestAmerica Knoxville | Utah | NELAC | 8 | TN000092014-5 |
| TestAmerica Knoxville | Virginia | NELAC | 3 | 460176 |
| TestAmerica Knoxville | Virginia | State Program | 3 | 00165 |
| TestAmerica Knoxville | Washington | State Program | 10 | C593 |
| TestAmerica Knoxville | West Virginia DEP | State Program | 3 | 345 |
| TestAmerica Knoxville | West Virginia DHHR | State Program | 3 | 9955C |
| TestAmerica Knoxville | Wisconsin | State Program | 5 | 998044300 |

Accreditation may not be offered or required for all methods and analytes in this report. Please contact your project manager for the laboratory's current list of certified methods and analytes.

# Sample Data Summary

**TestAmerica Denver**

**Sample ID: MW-2-2015-1120**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K250406 - 001 | **Work Order #....:** | M7X2T1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/20/15 | **Date Received....:** | 11/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/30/15 | **Analysis Date....:** | 12/01/15 | | |
| **Prep Batch # ....:** | 5334014 | | | | |
| **Initial Wgt/Vol :** | 1017 mL | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Kenneya L. Reynolds | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.8 | 0.19 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 49 | 0.086 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 49 | 0.36 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 49 | 0.36 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 49 | 0.34 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 49 | 0.54 | pg/L |
| **OCDD** | **2.4** | **Q B J** | **98** | **0.38** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.8 | 0.10 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 49 | 0.18 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 49 | 0.16 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 49 | 0.26 | pg/L |
| **1,2,3,6,7,8-HxCDF** | **0.57** | **Q J** | **49** | **0.25** | **pg/L** |
| 2,3,4,6,7,8-HxCDF | ND | | 49 | 0.27 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 49 | 0.31 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.58** | **B J** | **49** | **0.077** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 49 | 0.14 | pg/L |
| **OCDF** | **1.6** | **Q B J** | **98** | **0.15** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 67 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 52 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 72 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 80 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 78 | 40 - 135 |
| 13C-OCDD | 68 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 74 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 58 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 57 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 75 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 74 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 74 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 87 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 87 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 77 | 40 - 135 |
| 13C-OCDF | 66 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-2-2015-1120**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K250406 - 001 | **Work Order #....:** | M7X2T1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/20/15 | **Date Received....:** | 11/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/30/15 | **Analysis Date....:** | 12/01/15 | | |
| **Prep Batch # ....:** | 5334014 | | | | |
| **Initial Wgt/Vol :** | 1017 mL | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Kenneya L. Reynolds | | | | |

**QUALIFIERS**

| | |
|---|---|
| B | Method blank contamination. The associated method blank contains the target analyte at a reportable level. |
| J | Estimated Result. |
| Q | Estimated maximum possible concentration (EMPC). |

**TestAmerica Denver**

**Sample ID: MW-3-2015-1120**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K250406 - 002 | **Work Order #....:** | M7X2V1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/20/15 | **Date Received....:** | 11/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/30/15 | **Analysis Date....:** | 12/02/15 | | |
| **Prep Batch # ....:** | 5334014 | | | | |
| **Initial Wgt/Vol :** | 1046 mL | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.6 | 0.11 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.13 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.24 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.28 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 48 | 0.24 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 48 | 0.69 | pg/L |
| **OCDD** | **1.5** | **B J** | **96** | **0.47** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.6 | 0.17 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.21 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 48 | 0.18 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.30 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.29 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 48 | 0.30 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 48 | 0.35 | pg/L |
| 1,2,3,4,6,7,8-HpCDF | ND | | 48 | 0.088 | pg/L |
| **1,2,3,4,7,8,9-HpCDF** | **0.41** | **Q B J** | **48** | **0.13** | **pg/L** |
| OCDF | ND | | 96 | 0.16 | pg/L |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 80 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 77 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 84 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 90 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 81 | 40 - 135 |
| 13C-OCDD | 65 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 92 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 75 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 75 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 86 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 88 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 89 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 98 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 82 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 85 | 40 - 135 |
| 13C-OCDF | 66 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-3-2015-1120**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K250406 - 002 | **Work Order #....:** | M7X2V1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/20/15 | **Date Received....:** | 11/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/30/15 | **Analysis Date....:** | 12/02/15 | | |
| **Prep Batch # ....:** | 5334014 | | | | |
| **Initial Wgt/Vol :** | 1046 mL | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

**TestAmerica Denver**

**Sample ID: MW-3-2015-1120-DUP**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K250406 - 003 | **Work Order #....:** | M7X2W1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/20/15 | **Date Received....:** | 11/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/30/15 | **Analysis Date....:** | 12/03/15 | | |
| **Prep Batch # ....:** | 5334014 | | | | |
| **Initial Wgt/Vol :** | 1049 mL | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 9.5 | 0.072 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 48 | 0.082 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 48 | 0.13 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 48 | 0.12 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 48 | 0.12 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 48 | 0.29 | pg/L |
| **OCDD** | **3.1** | **Q B J** | **95** | **0.21** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 9.5 | 0.060 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 48 | 0.093 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 48 | 0.094 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 48 | 0.18 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 48 | 0.18 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 48 | 0.20 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 48 | 0.21 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.38** | **Q B J** | **48** | **0.080** | **pg/L** |
| 1,2,3,4,7,8,9-HpCDF | ND | | 48 | 0.12 | pg/L |
| **OCDF** | **0.93** | **B J** | **95** | **0.055** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 68 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 73 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 72 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 79 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 82 | 40 - 135 |
| 13C-OCDD | 72 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 67 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 75 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 64 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 66 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 64 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 66 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 78 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 71 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 73 | 40 - 135 |
| 13C-OCDF | 70 | 40 - 135 |

**TestAmerica Denver**

**Sample ID: MW-3-2015-1120-DUP**

**Trace Level Organic Compounds**

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K250406 - 003 | **Work Order #....:** | M7X2W1AA | **Matrix....:** | WATER |
| **Date Sampled....:** | 11/20/15 | **Date Received....:** | 11/25/15 | **Dilution Factor:** | 1 |
| **Prep Date....:** | 11/30/15 | **Analysis Date....:** | 12/03/15 | | |
| **Prep Batch # ....:** | 5334014 | | | | |
| **Initial Wgt/Vol :** | 1049 mL | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

# Method Blank Report

## Trace Level Organic Compounds

**Lot - Sample #....:** H5K300000 - 014B **Work Order #....:** M7X721AA **Matrix....:** WATER
**Dilution Factor:** 1
**Prep Date....:** 11/30/15 **Analysis Date....:** 12/01/15
**Prep Batch # ....:** 5334014
**Initial Wgt/Vol :** 1000 mL **Instrument ID....:** D11A **Method:** SW846 8290
**Analyst ID....:** Linda K. McWhirter

| PARAMETER | RESULT | | MINIMUM LEVEL | ESTIMATED DETECTION LIMIT | UNITS |
|---|---|---|---|---|---|
| 2,3,7,8-TCDD | ND | | 10 | 0.21 | pg/L |
| 1,2,3,7,8-PeCDD | ND | | 50 | 0.13 | pg/L |
| 1,2,3,4,7,8-HxCDD | ND | | 50 | 0.26 | pg/L |
| 1,2,3,6,7,8-HxCDD | ND | | 50 | 0.27 | pg/L |
| 1,2,3,7,8,9-HxCDD | ND | | 50 | 0.25 | pg/L |
| 1,2,3,4,6,7,8-HpCDD | ND | | 50 | 0.45 | pg/L |
| **OCDD** | **1.9** | **J** | **100** | **0.32** | **pg/L** |
| 2,3,7,8-TCDF | ND | | 10 | 0.14 | pg/L |
| 1,2,3,7,8-PeCDF | ND | | 50 | 0.19 | pg/L |
| 2,3,4,7,8-PeCDF | ND | | 50 | 0.17 | pg/L |
| 1,2,3,4,7,8-HxCDF | ND | | 50 | 0.30 | pg/L |
| 1,2,3,6,7,8-HxCDF | ND | | 50 | 0.31 | pg/L |
| 2,3,4,6,7,8-HxCDF | ND | | 50 | 0.32 | pg/L |
| 1,2,3,7,8,9-HxCDF | ND | | 50 | 0.33 | pg/L |
| **1,2,3,4,6,7,8-HpCDF** | **0.21** | **Q J** | **50** | **0.092** | **pg/L** |
| **1,2,3,4,7,8,9-HpCDF** | **0.62** | **J** | **50** | **0.15** | **pg/L** |
| **OCDF** | **1.2** | **J** | **100** | **0.089** | **pg/L** |

| INTERNAL STANDARDS | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 59 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDD | 56 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDD | 60 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDD | 69 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDD | 76 | 40 - 135 |
| 13C-OCDD | 68 | 40 - 135 |
| 13C-2,3,7,8-TCDF | 68 | 40 - 135 |
| 13C-1,2,3,7,8-PeCDF | 57 | 40 - 135 |
| 13C-2,3,4,7,8-PeCDF | 57 | 40 - 135 |
| 13C-1,2,3,4,7,8-HxCDF | 64 | 40 - 135 |
| 13C-1,2,3,6,7,8-HxCDF | 69 | 40 - 135 |
| 13C-2,3,4,6,7,8-HxCDF | 65 | 40 - 135 |
| 13C-1,2,3,7,8,9-HxCDF | 81 | 40 - 135 |
| 13C-1,2,3,4,6,7,8-HpCDF | 78 | 40 - 135 |
| 13C-1,2,3,4,7,8,9-HpCDF | 75 | 40 - 135 |
| 13C-OCDF | 64 | 40 - 135 |

# Method Blank Report

## Trace Level Organic Compounds

| | | | | | |
|---|---|---|---|---|---|
| **Lot - Sample #....:** | H5K300000 - 014B | **Work Order #....:** | M7X721AA | **Matrix....:** | WATER |
| **Dilution Factor:** | 1 | | | | |
| **Prep Date....:** | 11/30/15 | **Analysis Date....:** | 12/01/15 | | |
| **Prep Batch # ....:** | 5334014 | | | | |
| **Initial Wgt/Vol :** | 1000 mL | **Instrument ID....:** | D11A | **Method:** | SW846 8290 |
| **Analyst ID....:** | Linda K. McWhirter | | | | |

**QUALIFIERS**

J Estimated Result.

Q Estimated maximum possible concentration (EMPC).

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Client Lot # ...:** H5K250406 **Work Order # ...:** M7X721AC-LCS **Matrix .....:** WATER
**LCS Lot-Sample# :** H5K300000 - 014
**Prep Date .....:** 11/30/15 **Analysis Date ..:** 12/01/15
**Prep Batch # ...:** 5334014
**Dilution Factor :** 1
**Analyst ID.....:** Kenneya L. Reynolds **Instrument ID..:** D11A **Method.....:** SW846 8290
**Initial Wgt/Vol:** 1000 mL

| PARAMETER | SPIKE AMOUNT | MEASURED AMOUNT | UNITS | PERCENT RECOVERY | | RECOVERY LIMITS |
|---|---|---|---|---|---|---|
| **2,3,7,8-TCDD** | **200** | **213** | **pg/L** | **106** | | **(77 - 127)** |
| **1,2,3,7,8-PeCDD** | **1000** | **1040** | **pg/L** | **104** | | **(78 - 128)** |
| **1,2,3,4,7,8-HxCDD** | **1000** | **1050** | **pg/L** | **105** | | **(73 - 123)** |
| **1,2,3,6,7,8-HxCDD** | **1000** | **1030** | **pg/L** | **103** | | **(72 - 127)** |
| **1,2,3,7,8,9-HxCDD** | **1000** | **1150** | **pg/L** | **115** | | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDD** | **1000** | **967** | **pg/L** | **97** | | **(73 - 123)** |
| **OCDD** | **2000** | **1960** | **pg/L** | **98** | **B** | **(75 - 125)** |
| **2,3,7,8-TCDF** | **200** | **213** | **pg/L** | **106** | | **(74 - 124)** |
| **1,2,3,7,8-PeCDF** | **1000** | **959** | **pg/L** | **96** | | **(74 - 124)** |
| **2,3,4,7,8-PeCDF** | **1000** | **1050** | **pg/L** | **105** | | **(74 - 124)** |
| **1,2,3,4,7,8-HxCDF** | **1000** | **1060** | **pg/L** | **106** | | **(75 - 125)** |
| **1,2,3,6,7,8-HxCDF** | **1000** | **1000** | **pg/L** | **100** | | **(75 - 125)** |
| **2,3,4,6,7,8-HxCDF** | **1000** | **1070** | **pg/L** | **107** | | **(76 - 126)** |
| **1,2,3,7,8,9-HxCDF** | **1000** | **1030** | **pg/L** | **103** | | **(76 - 126)** |
| **1,2,3,4,6,7,8-HpCDF** | **1000** | **1010** | **pg/L** | **101** | **B** | **(71 - 121)** |
| **1,2,3,4,7,8,9-HpCDF** | **1000** | **1030** | **pg/L** | **103** | **B** | **(73 - 123)** |
| **OCDF** | **2000** | **1780** | **pg/L** | **89** | **B** | **(68 - 132)** |

| INTERNAL STANDARD | PERCENT RECOVERY | RECOVERY LIMITS |
|---|---|---|
| 13C-2,3,7,8-TCDD | 66 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDD | 68 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDD | 65 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDD | 77 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDD | 93 | (40 - 135) |
| 13C-OCDD | 99 | (40 - 135) |
| 13C-2,3,7,8-TCDF | 73 | (40 - 135) |
| 13C-1,2,3,7,8-PeCDF | 71 | (40 - 135) |
| 13C-2,3,4,7,8-PeCDF | 64 | (40 - 135) |
| 13C-1,2,3,4,7,8-HxCDF | 75 | (40 - 135) |
| 13C-1,2,3,6,7,8-HxCDF | 80 | (40 - 135) |
| 13C-2,3,4,6,7,8-HxCDF | 70 | (40 - 135) |
| 13C-1,2,3,7,8,9-HxCDF | 86 | (40 - 135) |
| 13C-1,2,3,4,6,7,8-HpCDF | 89 | (40 - 135) |
| 13C-1,2,3,4,7,8,9-HpCDF | 92 | (40 - 135) |
| 13C-OCDF | 96 | (40 - 135) |

## LABORATORY CONTROL SAMPLE DATA REPORT

### Trace Level Organic Compounds

**Notes:**

Calculations are performed before rounding to avoid round-off errors in calculated results.

Bold print denotes control parameters

B Method blank contamination. The associated method blank contains the target analyte at a reportable level.

# Sample Receipt Documentation

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

H5K250406

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-331117.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-77166-1 |
| Address: 5815 Middlebrook Pike, , | Due Date Requested: 12/16/2015 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA
M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | |
| MW-2-2015-1120 (280-77166-1) | 11/20/15 | 08:55 Eastern | | Water | | | X | 2 | |
| MW-3-2015-1120 (280-77166-2) | 11/20/15 | 10:56 Eastern | | Water | | | X | 2 | |
| MW-3-2015-1120-DUP (280-77166-3) | 11/20/15 | 10:56 Eastern | | Water | | | X | 2 | |

2 X 1L unpreserved ambers per sample D.B. 11-23-15

RT CT
REC. @ 0.5°c 0.5°c
CUSTODY SEAL INTACT
COOLER RH 11-25-15
FED Ex #655914600169

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: | Date/Time: 11/24/15 @1445 | Company TAD | Received by: Ryan Henry | Date/Time: 11/25/15 1030 | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks:

# TESTAMERICA KNOXVILLE SAMPLE RECEIPT/CONDITION UPON RECEIPT ANOMALY CHECKLIST

**Lot Number:** H5K250406

| Review Items | Yes | No | NA | If No, what was the problem? |
|---|---|---|---|---|
| 1. Do sample container labels match COC? (IDs, Dates, Times) | ✓ | | | ☐ **1a** Do not match COC<br>☐ **1b** Incomplete information<br>☐ **1c** Marking smeared<br>☐ **1d** Label torn<br>☐ **1e** No label<br>☐ **1f** COC not received<br>☐ **1g** Other: |
| 2. Is the cooler temperature within limits? (> freezing temp. of water to 6 °C, VOST: 10°C)<br>Thermometer ID : SC63<br>Correction factor: 0 | ✓ | | | ☐ **2a** Temp Blank = _____<br>☐ **2b** Cooler Temp = _____<br>☐ **2c** Cooling initiated for recently collected samples, ice present. |
| 3. Were samples received with correct chemical preservative (excluding Encore)? | | | ✓ | ☐ **3a** See box 3A for pH Preservation<br>☐ **3b** Other: |
| 4. Were custody seals present/intact on cooler and/or containers? | ✓ | | | ☐ **4a** Not present<br>☐ **4b** Not intact<br>☐ **4c** Other: |
| 5. Were all of the samples listed on the COC received? | ✓ | | | ☐ **5a** Samples received-not on COC<br>☐ **5b** Samples not received-on COC |
| 6. Were all of the sample containers received intact? | ✓ | | | ☐ **6a** Leaking<br>☐ **6b** Broken |
| 7. Were VOA samples received without headspace? | | | ✓ | ☐ **7a** Headspace (VOA only) |
| 8. Were samples received in appropriate containers? | ✓ | | | ☐ **8a** Improper container |
| 9. Did you check for residual chlorine, if necessary? (e.g. 1613B, 1668)<br>Chlorine test strip lot number: _____ | | | ✓ | ☐ **9a** Could not be determined due to matrix interference |
| 10. Were samples received within holding time? | ✓ | | | ☐ **10a** Holding time expired |
| 11. For rad samples, was sample activity info. provided? | | | ✓ | ☐ Incomplete information |
| 12. For 1613B water samples is pH<9? | | | ✓ | If no, was pH adjusted to pH 7 - 9 with sulfuric acid? _____ |
| 13. Are the shipping containers intact? | ✓ | | | ☐ **13a** Leaking<br>☐ **13b** Other: |
| 14. Was COC relinquished? (Signed/Dated/Timed) | ✓ | | | ☐ **14a** Not relinquished |
| 15. Are tests/parameters listed for each sample? | ✓ | | | ☐ **15a** Incomplete information |
| 16. Is the matrix of the samples noted? | ✓ | | | ☐ **15a** Incomplete information |
| 17. Is the date/time of sample collection noted? | ✓ | | | ☐ **15a** Incomplete information |
| 18. Is the client and project name/# identified? | ✓ | | | ☐ **15a** Incomplete information |
| 19. Was the sampler identified on the COC? | | ✓ | | ☐ **19a** Other |

**Comments/Actions Taken**

**Labeling Verified by:** _____ **Date:** _____

**pH test strip lot number:** _____

| | Box 3A: pH Preservation | Box 9A: Residual Chlorine |
|---|---|---|
| **Preservative:** | | |
| **Lot Number:** | | |
| **Exp Date:** | | |
| **Analyst:** | | |
| **Date:** | | |
| **Time:** | | |

Quote #: 91585 PM Instructions: _____

Sample Receiving Associate: Ryan Henry Date: 11/25/15

QA026R29.doc, 041115

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information | Sampler: Amber Greune | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): 775029057072 | COC No: 280-47859-17892.2 |
|---|---|---|---|---|
| Client Contact: Michael Schott | Phone: (919) 424-1832 | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page: |
| Company: Geosyntec Consultants, Inc. | | | | Job #: |
| Address: 2501 Blue Ridge Road, Suite 430 | Due Date Requested: | | | |
| City: Raleigh | TAT Requested (days): | | | |
| State, Zip: NC, 27607 | | | | |
| Phone: 919-424-1824(Tel) | PO #: GN5219 | | | |
| Email: mschott@geosyntec.com | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: CH | SSOW#: | | | |

Analysis Requested

280-77166 Chain of Custody

Preservation Codes:
HCL - M - Hexane
NaOH - N - None
Zn Acetate - O - AsNaO2
Nitric Acid - P - Na2O4S
NaHSO4 - Q - Na2SO3
MeOH - R - Na2S2SO3
Amchlor - S - H2SO4
Ascorbic Acid - T - TSP Dodecahydrate
I - Ice - U - Acetone
J - DI Water - V - MCAA
K - EDTA - W - ph 4-5
L - EDA - Z - other (specify)
Other:

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Dioxins/Furans 8290 (TA-Knoxville) | PAHs 8270_SIM | Total Metals 6010C/7470A (both sets r | TDS 2540C / Sulfate 9056A | Total Number of Containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | |
| MW-2-2015-1120 | 11/20/15 | 0855 | G | W | N | N | 2 | 2 | 1 | 1 | | |
| MW-3-2015-1120 | 11/20/15 | 1056 | G | W | N | N | 2 | 2 | 1 | 1 | | |
| MW-3-2015-1120-DUP | 11/20/15 | 1056 | G | W | N | N | 2 | 2 | 1 | 1 | | |

NFE TP

Possible Hazard Identification
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: |
|---|---|---|---|

| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
|---|---|---|---|---|---|
| Eric Nesbit | 11/20/2015 3 pm | Geosyntec | Tayra Soto | 11/21/15 850 | |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No
Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks: Transferred to 0.2 IR7 ~~+0.1~~ +0.0
1.1 IR7 ~~+0.1~~ +0.0

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-77166-1

**Login Number: 77166**
**List Number: 1**
**Creator: Soto, Mayra A**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | True | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | N/A | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | True | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# APPENDIX N

# Sediment / Surface Water Screening Report

## Michael Schott

**From:** Eric Nesbit
**Sent:** Monday, November 30, 2015 10:52 AM
**To:** Michael Schott
**Subject:** FW: UNC Sediment/Surface Water Screening report Site ID No. NCR000010272

I

---

**From:** Macdonald, Janet K [mailto:janet.macdonald@ncdenr.gov]
**Sent:** Friday, November 20, 2015 3:16 PM
**To:** Eric Nesbit
**Subject:** RE: UNC Sediment/Surface Water Screening report Site ID No. NCR000010272

Hi Eric,

I heard back from the toxicologist, but she could not address the leaching concerns. Your best argument for the PAHs is that they have not been detected in groundwater. What are the PAH concentrations in the soil source area, and what is the age of the release? If source soil concentrations are higher than what is in sediment and the release was more than 15 years ago, then the leachability is addressed. The leachability of contaminated soil and/or sediment cannot be compared with MCLs unless you are pursuing a risk-based cleanup. Just be sure that this is addressed in your final RI report.

For the ecological risk assessment, our toxicologist, Hanna Assefa, provided the following:

"Janet, I have reviewed and concur with the conclusions. The contaminant concentrations in sediment and water are not likely to pose risk and hazard to humans above allowable limits. This is because of the concentrations being lower than screening concentrations, and MCLs and also due to the nature of the surface water body being a narrow shallow ditch where exposure will be unlikely to limited. For ecological risk the benchmarks used for comparison are appropriate."

*Janet*

Janet Macdonald
Phone: (919) 707-8349

*Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.*

**From:** Eric Nesbit [mailto:ENesbit@Geosyntec.com]
**Sent:** Friday, October 09, 2015 3:41 PM
**To:** Macdonald, Janet K <janet.macdonald@ncdenr.gov>
**Subject:** UNC Sediment/Surface Water Screening report Site ID No. NCR000010272

Janet,

Attached please find the Sediment and Surface Water Screening report for the UNC Chapel Hill site no. NCR000010272.

In addition to sampling the sediment and surface water against applicable screening criteria this report contains an ecological risk evaluation and recommendation for selection and applicability of appropriate screening criteria for review.

Thanks,

**Eric Nesbit, PE**
**Principal**

---

**Geosyntec Consultants of NC, PC**
2501 Blue Ridge Road
Suite 430
Raleigh, NC 27607
Phone: (919) 424-1823
Mobile: (919) 796-4137
www.Geosyntec.com

Geosyntec consultants

engineers | scientists | innovators

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UNC
ENVIRONMENT, HEALTH & SAFETY

The University of North Carolina at Chapel Hill
Department of Environment, Health & Safety
1120 Estes Drive Ext., CB# 1650
Chapel Hill, North Carolina 27599-1650

October 5, 2015

Ms. Janet K. Macdonald
NC DEQ Division of Waste Management
Inactive Hazardous Sites Branch
217 West Jones Street
Raleigh, North Carolina 27603

**Subject: Sediment / Surface Water Screening Report**
**The University of North Carolina at Chapel Hill Cogeneration Facility**
**Chapel Hill, Orange County, NC**
**Site ID No. NCR000010272**

Dear Ms. Macdonald:

Attached for your review and comment is a sediment and surface water screening report consistent with section A.4 of the REC Program Implementation Guidance dated November 2014. Geosyntec Consultants of NC, PC, the project REC, collected, analyzed and evaluated the Phase 1 samples.

Please contact me at (919) 843-5913 if you have any questions. Thank you.

Sincerely,

Mary Beth Koza

Mary Beth Koza
Director, Environment, Health and Safety

Attachment

Cc: Larry Daw, UNC-CH
Daniel Elliott, Geosyntec
Eric Nesbit, Geosyntec

{00087060.DOCX}

REC PROGRAM DOCUMENT CERTIFICATION FORM - PAGE 1 OF 2
IHSB SITE NAME UNC Cogeneration Facility, Site ID No. NCR000010272
DATE & NAME OF DOCUMENT October 2015 Sediment / Surface Water Screening Report
TYPE OF SUBMITTAL (circle all that apply): Report, Work plan, Work Phase Comp. Statement, Schedule Change

## REMEDIATING PARTY DOCUMENT CERTIFICATION STATEMENT (.0306(B)(2))

"I certify under penalty of law that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this certification, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Mary Beth Koza
Name of Remediating Party

Mary Beth Koza
Signature of Remediating Party

10-7-15
Date

**NOTARIZATION**

_North Carolina__ (Enter State)

__Wake_____ **COUNTY**

I, _Holly Van Norman_____, a Notary Public of said County and State, do hereby certify that ___Mary Beth Koza_____did personally appear and sign before me this day, produced proper identification in the form of ___NCDL_____, was duly sworn or affirmed, and declared that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certification is true and accurate, and he or she then signed this Certification in my presence.

WITNESS my hand and official seal this 7 day of October, 2015.

Notary Public (signature)

My commission expires: Nov 15, 2017.

HOLLY VAN NORMAN
OFFICIAL SEAL
Notary Public
Wake County
NORTH CAROLINA

REC PROGRAM DOCUMENT CERTIFICATION FORM - PAGE 2 OF 2
IHSB SITE NAME UNC Cogeneration Facility, Site ID No. NCR000010272
DATE & NAME OF DOCUMENT October 2015 Sediment / Surface Water Screening Report
TYPE OF SUBMITTAL (circle all that apply): Report, Work plan, Work Phase Comp. Statement, Schedule Change

## REGISTERED SITE MANAGER CERTIFICATION OF SIGNATURES

As the Registered Environmental Consultant for the Site for which this filing is made, I certify that the signatures included herewith are genuine and authentic original handwritten signatures and/or true, accurate, and complete copies of the genuine and authentic original handwritten signatures of the persons who purport to sign for this filing. I further certify that I have collected through reliable means the originals and/or copies of said signatures from the persons authorized to sign for this filing who, in fact, signed the originals thereof. Those persons and I understand and agree that any copies of signatures have the same legally binding effect as original handwritten signatures, and I certify that any person for whom I am submitting a copy of their signature has provided me with their express consent to submit said copy. Additionally, I certify that I am authorized to attest to the genuineness and authenticity of the signatures, both originals and any copies, being submitted herewith and that by signing below, I do in fact attest to the genuineness and authenticity of all the signatures, both originals and copies, being submitted for this filing.

Eric Nesbit
Name of Registered Site Manager

Signature of Registered Site Manager

10/9/2015
Date

## REGISTERED SITE MANAGER DOCUMENT CERTIFICATION STATEMENT (.0306(b)(1))

"I certify under penalty of law that I am personally familiar with the information contained in this submittal, including any and all supporting documents accompanying this certification, and that the material and information contained herein is, to the best of my knowledge and belief, true, accurate and complete and complies with the Inactive Hazardous Sites Response Act N.C.G.S. 130A-310, et seq, and the remedial action program Rules 15A NCAC 13C .0300. I am aware that there are significant penalties for willfully submitting false, inaccurate or incomplete information."

Eric Nesbit
Name of Registered Site Manager

Signature of Registered Site Manager

10/9/2015
Date

**NOTARIZATION**

North Carolina (Enter State)

Wake **COUNTY**

I, Keith Arnold Bell, a Notary Public of said County and State, do hereby certify that Eric Charles Nesbit did personally appear and sign before me this day, produced proper identification in the form of NCDL, was duly sworn or affirmed, and declared that, he or she is the duly authorized environmental consultant of the remediating party of the property referenced above and that, to the best of his or her knowledge and belief, after thorough investigation, the information contained in the above certifications is true and accurate, and he or she then signed these Certifications in my presence.

WITNESS my hand and official seal this 9 day of Oct, 2015

(OFFICIAL SEAL)

Notary Public (signature)

My commission expires: 12/18/16

KEITH ARNOLD BELL
NOTARY PUBLIC
Moore County
North Carolina
My Commission Expires Dec. 18, 2016

*Document Certification Form No. DC - II*
*(Revised 8/11)*

*Prepared for*

**The University of North Carolina at Chapel Hill**
Department of Environment, Health and Safety
1120 Estes Drive Extension, CB#1650
Chapel Hill, NC 27599-1650

# SEDIMENT / SURFACE WATER SCREENING REPORT

## UNC-CH COGENERATION FACILITY
## CHAPEL HILL, NORTH CAROLINA
## SITE ID # NCR000010272

*Prepared by*

Geosyntec Consultants of NC, PC
2501 Blue Ridge Rd, Suite 430
Raleigh, North Carolina 27607

Project Number GN5219

October 2015

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# 1. INTRODUCTION

## 1.1 Background

The University of North Carolina at Chapel Hill (UNC-CH) contracted Geosyntec Consultants of NC, PC (Geosyntec) to conduct a remedial investigation (RI) of the UNC-CH Cogeneration Facility located at 575 West Cameron Avenue, Chapel Hill, North Carolina (Site). The Site location is shown in **Figure 1**. This report presents analytical results and data evaluation for sediment and surface water collected from the drainage feature that runs approximately northeast-southwest along the facility boundary, as shown in **Figure 2**.

The investigation and data evaluation presented herein were conducted in accordance with North Carolina's Registered Environmental Consultant (REC) guidance, dated November 2014. The data evaluation was conducted to address any potential for human health or ecological risk related to the drainage feature.

# 2. SITE CHARACTERIZATION

## 2.1 Site Description and Topography

The Site is located at 575 West Cameron Avenue, Chapel Hill, North Carolina. The Site is within Orange County; the parcel ID is 9788145406. The Site and surrounding area are shown on the U.S. Geological Survey topographic quadrangle (Chapel Hill, North Carolina) excerpt in **Figure 1**. The Site is zoned as Chapel Hill Zoning District IND (industrial use). Most of the adjacent and nearby land is zoned primarily as residential use or, less commonly, as business use. The Site topography generally slopes to the southwest.

## 2.2 Drainage Feature and Surface Water Hydrology

The drainage feature runs approximately northeast-southwest along the facility boundary as shown in **Figure 2**. The drainage feature is approximately 2-feet wide and 6-inches deep, and is mainly fed by urban runoff from the town of Chapel Hill. The drainage feature upstream of McCauley Street is either deeply incised or fully enclosed in a culvert. Since April 2001, the UNC-CH Cogeneration Facility does not discharge process water into the drainage feature but instead treats and discharges storm water to the Orange Water and Sewer Authority sanitary sewer.

## 2.3 Downstream Wetlands

The drainage feature flows into Morgan Creek, part of the New Hope Creek arm of the Jordan Lake watershed, approximately 3,500 feet south of the Site. Morgan Creek drains into Jordan Lake, approximately five miles downstream of the Site. As shown on **Figure 3**, the U.S. Fish and Wildlife Service's National Wetlands Inventory categorize the Morgan Creek entrance into Jordan Lake as "Freshwater Forested /Shrub Wetland."

# 3. SEDIMENT AND SURFACE WATER INVESTIGATION

## 3.1. Sampling

Between September 2014 and January 2015, Geosyntec collected co-located surface water and sediment samples from three locations within the drainage feature. Sampling locations are indicated in **Figure 2**. Geosyntec collected the upstream sample (SED-1/SW-1) and midstream sample (SED-2/SW-2) from a location on the Site; Geosyntec collected the downstream sample (SED-3/SW-3) from a location on UNC-CH owned property located south of the Site and south of McCauley Street. Geosyntec collected a field duplicate sediment sample at the downstream location in September 2014. In January 2015, Geosyntec collected confirmatory sediment and surface water samples (SED-3R/SW-3R from this location for analysis of a subset of parameters (see **Table 1**).

Geosyntec placed the samples into laboratory-supplied sample containers, which were properly preserved, labeled, logged onto a chain-of-custody form, and placed into an iced cooler prior to shipment. Geosyntec took precautions to minimize agitation and aeration of the surface water samples during collection.

Sediment and surface water samples were analyzed for:

- Total metals by U. S. Environmental Protection Agency (EPA) Method 6010C;
- Total mercury by EPA Method 7470A;
- Polynuclear aromatic hydrocarbons (PAHs) by EPA Method 8270D SIM;
- Dioxins/furans by EPA Method 8290;
- Anions by EPA Method 9056A; and

- Total dissolved solids (TDS; surface water only) by Standard Method 2540C.

Surface water and sediment sampling was performed in accordance with EPA Standard Operating Procedures (SOPs) for surface water and sediment sampling (EPA, 2007; EPA, 2010). Geosyntec collected the surface water samples prior to the sediment samples to minimize the introduction of suspended solids into the surface water samples. Geosyntec collected surface water samples sing a peristaltic pump with dedicated tubing. Geosyntec collected sediment samples using a 10-inch coring device at an interval of 0 to 6 inches below grade. Geosyntec homogenized the samples in a stainless steel bowl with a stainless steel spoon prior to collection into sample containers. Geosyntec decontaminated the sediment sampling equipment in accordance with the Quality Assurance Project Plan (QAPP).

Upon receipt of the analytical results, a Stage 2A data validation was performed on the data set.

### 3.2. Results

A summary of analytical results for sediment and surface water samples is presented in **Table 1** and is summarized below by target analyte class. Laboratory reports are provided as **Appendix A**.

- The data validation concluded the data as qualified are usable for meeting project objectives. The data validation report is provided in **Appendix B**.

- Dioxin/furan congeners were detected in each of the three sediment samples, with dioxin detections occurring more frequently than furan detections. Dioxin/furan detections in surface water were only reported in the downstream location (SW-3 and SW-3R). Dioxin/furan congeners were normalized to a 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) toxic equivalent (TEQ) using toxic equivalency factors (TEFs) for birds, mammals, and fish. These calculations are included in **Appendix C – Table 1 (sediment) and Table 2 (surface water)**.

- PAHs were detected in each sediment sample, with the highest concentrations occurring in the upstream sample (SED-1). PAH detections in surface water were only reported in the downstream sample (SW-3) and were limited to two low molecular weight PAHs, both of which were J-flagged as estimated.

Carcinogenic PAHs were normalized to a benzo(a)pyrene [B(a)P] TEQ using standard TEFs (for human health) and summed to Total PAHs (for ecological endpoints). TEQ calculations are included in **Appendix C – Table 3**.

- Metals were detected in each sediment and surface water sample; however, detections occurred more frequently in sediment samples. Upstream-to-downstream concentration gradients were not readily apparent based on initial inspection of the data.

## 4. DATA EVALUATION

The North Carolina REC guidance (NCDENR, 2014) distinguishes between intermittent and perennial streams. For intermittent streams, preliminary sediment remediation goals (PSRGs) consider human health exposure scenarios only. PSRGs for perennial streams consider ecological exposure scenarios as well as human health. Although the drainage feature appears to be too shallow to support populations of aquatic (fish) receptors, water is regularly present and the potential presence of benthic receptors cannot be excluded. As such, it is conservatively assumed that PSRGs for perennial streams (as described in Section D.2.2.1 of the REC guidance) are applicable for evaluating potential risks to human health and the environment from constituents in the drainage feature.

Note that the evaluation that follows is primarily risk-based. However, because constituents of interest at the Site are commonly associated with natural and anthropogenic background conditions, concentrations in the drainage feature may not be entirely attributable to Site operations or releases. For metals, this uncertainty is addressed through comparisons to regional stream sediment data and site-specific background soil data (**Table 1**). Similar background data is not available for dioxins or PAHs; however, both classes of constituents are present in urban environments.

### 4.1 Direct Contact Human Health Evaluation

***Sediment***

North Carolina recognizes a generally acceptable cumulative cancer risk of one in ten thousand (1E-4) and a cumulative hazard index (HI) of 1 for non-carcinogens affecting the same target organ or system. As a point-of-departure for identifying potentially unacceptable risks and hazards, default PSRGs (NCDENR, 2015) for soil are adjusted

to correspond to an individual cancer risk of one in a million (1E-6) or an individual hazard quotient (HQ) of 0.2. (Note that NCDENR PSRGs were updated in March 2015 to reflect EPA's January 2015 update to the Regional Screening Level [RSL] tables); however, in June 2015, EPA released revised RSLs; PSRGs in this evaluation reflect EPA's June 2015 RSL tables.

Risk estimates were calculated directly from sediment data and PSRGs to provide a quantitative estimate of cumulative risks and hazards. The evaluation was conducted using a ratio-based approach modeled after a screening-level risk estimate process recognized by EPA Region 4, where:

$$\sum CR = (EPC/PSRG_{ca}) \times 10^{-6}$$

$$\sum HQ = (EPC/PSRG_{nc}) \times 0.2$$

- CR = Excess lifetime cancer risk (unitless)
- HQ = Non-cancer hazard quotient (unitless)
- EPC = Exposure point concentration in sediment (mg/kg)
- $PSRG_{ca}$ = PSRG based on a residential target cancer risk of 1E-06 (mg/kg)
- $PSRG_{nc}$ = PSRG based on a residential target hazard quotient of 0.2 (mg/kg)

Results of the direct contact human health risk evaluation are included in **Table 2**. There are no unacceptable cumulative cancer risks or noncancer hazards for human receptors exposed to drainage feature sediments. Concentrations of arsenic, cobalt, manganese, and B(a)P TEQ in drainage feature sediments exceeded their default PSRGs in one or more samples; however, the ratio-based approach demonstrated that these screening-level exceedances do not pose an unacceptable human health risk. It should be noted that this evaluation provides a conservative estimate of potential direct contact risks and hazards because exposure to sediment is likely to be less frequent than residential exposure to soil and several exposure assumptions used in the development of PSRGs are not likely relevant to this exposure scenario. For example, residential PSRGs assume a receptor is exposed to soil 350 days per year over a period of 26 years; more realistic receptors for Site sediment are maintenance-type workers and trespassers

who would be expected to have a lower exposure frequency and duration. In addition, concentrations of arsenic, cobalt, and manganese in stream sediment are less than or within the range of background concentrations reported by NCDENR for North Carolina stream sediment (Reid, 1993) and less than Site-specific soil background concentrations.

### *Surface Water*

The North Carolina Administrative Code (NCAC; 2007) 2B standards and NCDENR (2013) criteria for "human health" were used primarily to evaluate potential risk to humans from exposure to surface water in the drainage feature. For constituents of concern without a codified 2B standard, those constituents were screened against the following criteria (in order of preference in which they are listed).

- EPA National Recommended Water Quality Criteria for Human Health for the Consumption of Aquatic Organisms (NRWQC);
- Federal Maximum Contaminant Levels (MCLs) for drinking water; and
- EPA (2015) RSLs for drinking water based on a target cancer risk of 1E-6 or an HQ of 0.2.

Importantly, the drainage feature does not support aquatic organisms (i.e., fish); as such, the NRWQC are considered conservative benchmarks for evaluation of the drainage feature, but may have relevance to downstream surface water bodies.

Selected surface water benchmarks and the results of the human health surface water evaluation are presented in **Table 3**, and summarized below by constituent class.

- TCDD TEQ concentrations in surface water exceed the NCAC 2B Standard in the downstream location (SW-3 and SW-3R). The 2B Standard is based on the NRWQC for the consumption of organisms (i.e., fish) and water. For the reasons stated above, this is a conservative benchmark for predicting potential surface water risks.
- Metals concentrations in surface water are less than human health benchmarks.

- PAHs were not detected in surface water samples, with the exception of fluoranthene and pyrene in the downstream sample (SW-3). Concentrations of these PAHs are less than human health benchmarks.

No detected metals or PAH concentrations exceeded human health benchmarks. Downstream TCDD TEQ concentrations exceeded the surface water benchmark when assuming consumption of fish and drinking water from the drainage feature. However, it should be noted that TCDD tends to be present in aquatic environments as particulates bound to sediment and concentrations in drainage channel sediment are orders of magnitude less than risk-based benchmarks for human (and ecological) health.

## 4.2 Migration to Groundwater Evaluation

Geosyntec conducted a preliminary evaluation of the potential for constituents in drainage feature media to migrate to groundwater by comparing sediment concentrations to North Carolina's leachability-based PSRGs (**Table 4**). These PSRGs (NCDENR, 2015) are derived from target groundwater concentrations that consider: (i) systemic/non-cancer health endpoints (based on an HQ of 1); (ii) cancer health endpoints (based on a cancer risk of 1E-6); (iii) Federal MCLs; (iv) national secondary drinking water standards; and (v) threshold limit values based on odor or taste (NCDWQ, 2011). Leachability PSRGs are back-calculated from the selected target groundwater concentration using linear equations and conservative assumptions with regard to physical properties (e.g., porosity) that may not be reflective of actual Site conditions. As with direct contact PSRGs, leachability PSRGs represent a point-of-departure for determining whether further risk-based evaluation is warranted.

Benz(a)anthracene, B(a)P, chromium, cobalt, iron, manganese, and vanadium are present at concentrations greater than their respective soil /sediment to groundwater-based PSRGs in at least one sample. To supplement these comparisons, Geosyntec considered several additional lines of evidence; these are summarized below.

- Benz(a)anthracene and/or B(a)P exceeded default leachability PSRGs at each of the sediment sampling locations. Leachability PSRGs for these PAHs were back-calculated from target groundwater concentrations of 0.05 and 0.005 µg/L, respectively, which each correspond to 1E-6 cancer risk. Notably, the MCL for B(a)P in groundwater is 0.2 µg/L (i.e., more than two orders of magnitude higher than the risk-based value). PAH concentrations in sediment would not

exceed an MCL-based leachability PSRG. These PAHs were not detected in surface water. Furthermore, these PAHs have not been detected in any groundwater sample collected as part of the overall site Remedial Investigation. Three rounds of groundwater sampling have occurred to date including two monitoring wells just down gradient of the source area. The surface water and groundwater data to data suggest limited solubility of benz(a)anthracene and B(a)P under actual site conditions.

- Total chromium concentrations in two sediment samples (SED-2 and SED-3) exceeded the default leachability PSRG. This leachability PSRG was back-calculated from a target groundwater concentration of 10 µg/L which corresponds to a non-cancer HQ of 1 for hexavalent chromium. This represents a conservative target groundwater concentration as there are no known sources of hexavalent chromium in the vicinity of the stream. Coal combustion byproducts are not a source of hexavalent chromium. Notably, the MCL for total chromium is 100 µg/L (i.e., an order of magnitude higher than the risk-based value). Thus, chromium concentrations in sediment would not exceed an MCL-based leachability PSRG. Further, total chromium concentrations are less than the site-specific soil background concentration.

- Concentrations of cobalt, iron, manganese, and vanadium in stream sediment are less than or within the range of background concentrations reported by NCDENR for North Carolina stream sediment (Reid, 1993). Concentrations of these metals are also less than Site-specific soil background concentrations.

Based on PSRG comparisons and the additional lines of evidence provided above, there is a limited potential for indirect human health risks as a result of constituent migration (via leaching) from drainage feature sediment to groundwater.

### 4.3 Ecological Evaluation

The drainage feature is approximately 2-feet wide and 6-inches deep. Although water is regularly present, the drainage feature does not appear to serve as habitat for fish or other aquatic-dependent receptors (e.g., semi-aquatic birds, mammals). Given its physical configuration, oxygen levels, TDS, and other physiochemical parameters are likely to vary with precipitation and other seasonal effects. Further, the drainage feature receives urban storm water runoff from the Town of Chapel Hill, which is likely a

source of chemical and biological stressors. However, because the drainage feature discharges to downstream water bodies that are likely to support ecological communities, Geosyntec compared sediment and surface water from the drainage feature to media-specific benchmarks for the protection of ecological receptors.

### *Sediment*

To provide a bounded estimate of potential ecological risks, Geosyntec compared sediment data to "No Effect" and "Low Effect" benchmarks. No Effect and Low Effect benchmarks are described below and detailed in **Appendix D – Table 1.**

"No Effect" benchmarks represent concentrations in sediment below which adverse effects are not expected to occur; a receptor could be exposed at a level that exceeds the No Effect benchmark and still not experience an adverse effect. Thus, these comparisons are conservative and have the potential to overestimate risks. Sources of No Effect benchmarks are listed below, in order of priority.

- EPA (2006) Region 3 freshwater benchmarks. The REC guidance identifies the Region 3 benchmarks as the default PSRGs for sediment.

- MacDonald et al. (2000) Threshold Effects Concentrations (TECs). Note that for the majority of target analytes, TECs are cited by Region 3 as preferred benchmarks.

- Los Alamos National Laboratory (LANL; 2014) No Observable Adverse Effect Levels (NOAELs). The LANL developed sediment NOAELs for multiple endpoints (invertebrates, mammals, birds); for this screening-level evaluation, the minimum of available NOAELs was selected.

"Low Effect" benchmarks represent concentrations in sediment above which adverse effects are more likely to occur than not. While typically less conservative than No Effect benchmarks, Low Effect benchmarks are generally more representative of natural toxicological response with meaningful ecological ramifications. Sources of Low Effect benchmarks are listed below, in order of priority.

- MacDonald et al. (2000) Probable Effects Concentrations (PECs).

- LANL (2012) Lowest Observable Adverse Effect Levels (LOAELs) for sediment. The minimum available LOAEL was selected for this screening-level evaluation.

Results of the ecological sediment evaluation are presented in **Table 5** and summarized below by constituent class.

- TCDD TEQ concentrations in sediment are less than both No Effect and Low Effect benchmarks.

- Metals concentrations in sediment are less than the No Effect and Low Effect benchmarks, with the exception of manganese in sample SED-3. Manganese in this sample exceeds its No Effect benchmark by a factor of 1.3; however, the concentration is below the Low Effect benchmark. Based on comparison to its Site-specific soil background concentration (**Table 1**), manganese concentrations do not appear to be Site-related.

- Individual and/or Total PAH concentrations at each sampling location exceed the No Effect benchmark[1]. Location-specific Total PAH hazard quotient (HQs) based on the No Effect benchmark range from 0.15 to 2.0. Individual and Total PAH concentrations are less than Low Effect benchmarks, generally by an order of magnitude.

Based on comparisons to No Effect benchmarks, and in consideration of background, adverse effects to ecological receptors exposed to dioxins/furans and metals in sediment are unlikely. PAHs exceed No Effect benchmarks; however, by definition, exceedance of a No Effect benchmark (e.g., TEC/NOAEL) does not indicate an adverse ecological effect is occurring or will occur. In fact, EPA (2002) and others (e.g., Ingersoll et al., 2001) have used the PEC, rather than the TEC, as the primary tool for predicting ecologically significant ecological risks. Together, the No Effect and Low Effect benchmark comparisons support that PAH concentrations in sediment are unlikely to result in adverse ecological effects to receptors potential present in the drainage feature.

[1] Based on the highest result for the downstream results (SED-3, SED-3 duplicate, and SED-3R).

### *Surface Water*

The North Carolina Administrative Code (NCAC; 2007) 2B standards and NCDENR (2013) criteria for "freshwater aquatic life" were used primarily to evaluate potential risk to aquatic organisms from exposure to surface water in the drainage feature. For constituents of concern without a codified 2B standard, those constituents were screened against the following criteria (in order of preference in which they are listed).

- EPA National Recommended Water Quality Criteria for Aquatic Life (AWQC);
- EPA (2001) Region 4 freshwater benchmarks;
- EPA (1996) OSWER Ambient Water Quality Criteria or Tier II values;
- EPA Region 3 (2006) Biological Technical Assistance Group benchmarks; and
- EPA Region 5 (2003) Ecological Screening Levels (ESLs).

Benchmarks from the above sources are detailed in **Appendix D – Table 2**. Selected surface water benchmarks and the results of the ecological surface water evaluation are presented in **Table 6,** and summarized below by constituent class.

- TCDD TEQ concentrations in surface water are less than the ecological benchmark.
- Metals concentrations in surface water are less than ecological benchmarks, with the exception of aluminum and barium.
    - Aluminum concentrations in SW-3 and SW-3R are 140 and 90 µg/L, respectively, and exceed the state criterion of 87 µg/L. This criterion corresponds to the EPA's AWQC, which is derived from a toxicity test with striped bass – an endpoint that is not relevant to the drainage feature. EPA has also acknowledged within the AWQC narrative that many water bodies naturally exhibit higher aluminum concentrations. Further, the aluminum concentration is below the acute AWQC (750 µg/L; see **Appendix D- Table 2**).

- Barium exceeds the OSWER Tier II value in each of the four samples. Tier II values are developed when there is insufficient data to develop an AWQC and, thus, should be interpreted carefully. Barium concentrations are less than the EPA (2003) Region 5 ESL (220 µg/L).

- Aluminum and barium (and most other metals) tend to be present in aquatic environments as particulates bound to sediment rather than in bioavailable forms in the water column. Given that concentrations in sediment are consistent with other North Carolina streams, it seems unlikely that these metals would be present in the water column at concentrations sufficient to elicit an adverse aquatic effect.

- PAHs were not detected in surface water samples, with the exception of fluoranthene and pyrene in the downstream sample (SW-3). Fluoranthene does not exceed its ESV; however, pyrene exceeds the Region 3 benchmark by a factor by 3.8. Pyrene is, however, less than the EPA Region 5 ESL (0.3 µg/L).

No detected constituent concentrations exceed NCAC 2B standards, and the magnitude of criteria/screening level exceedances is small. Given the conservative assumptions inherent to most screening-level benchmarks, these exceedances are unlikely to be indicative of meaningful ecological effects.

## 5. SUMMARY AND CONCLUSIONS

UNC-CH contracted with Geosyntec, an approved REC consultant, to conduct an RI at the UNC-CH Cogeneration Facility located in Chapel Hill, North Carolina (**Figure 1**). As part of the RI, Geosyntec collected sediment and surface water samples from an incised, urbanized and partially culvertized drainage feature (**Figure 2**) and analyzed the samples for dioxins, metals, and PAHs. This report presented a risk-based evaluation of sediment and surface water results to provide a conservative evaluation of potential human and ecological risks.

The results of this evaluation are summarized below.

- Concentrations of arsenic, cobalt, manganese, and B(a)P TEQ in sediment exceed default North Carolina PSRG for the protection of human health; however, the ratio-based risk evaluation demonstrated there are no unacceptable

cumulative risks or hazards, even when assuming a hypothetical residential-type exposure scenario.

- Concentrations of TCDD TEQ in surface water exceeded the NCAC 2B Standard for the protection of human health. However, the TCDD TEQ assumes consumption of fish. The drainage feature does not support populations of fish. Also, the TCDD TEQ assumes persons are using the drainage feature water as a source of (potable) water. The water in the drainage feature is not being used as a source for (potable) drinking water. Given the hypothetical nature of this comparison and in consideration of the lack of human health risk predicted for TCDD TEQ in sediment, surface water exposure within the drainage channel is unlikely to pose an unacceptable risk.

- Concentrations of benz(a)anthracene, B(a)P, chromium, cobalt, iron, manganese, and vanadium in sediment are present at concentrations greater than their respective leachability-based screening levels in at least one sample. Neither of the PAHs have been detected in any groundwater sample collected as part of the site Remedial Investigation. Three rounds of groundwater sampling have occurred to date including two monitoring wells just down gradient of the source area. The lack of benz(a)anthracene and B(a)P in surface water and groundwater data suggest limited solubility under actual site conditions. Concentrations of the five metals are less than site-specific soil background concentrations and concentrations of cobalt, iron, manganese, and vanadium are within the range of background concentrations reported by NCDENR for North Carolina stream sediment (Reid, 1993). Based on these additional data comparisons and in consideration of the conservative assumptions that underlie the leachability screening levels, there is a limited potential for indirect human health risks as a result of constituent migration (via leaching) from drainage feature sediment to groundwater.

- Concentrations of dioxins and metals in sediment are less than ecological No Effect benchmarks (e.g., TECs/NOAELs) or, in the case of manganese, consistent with background and less than Low Effect benchmarks (e.g., PECs/LOAELs). Individual and Total PAH concentrations exceed No Effect, but are less than Low Effect benchmarks. These comparisons support that PAH concentrations in drainage feature sediment are unlikely to result in adverse ecological effects to receptors potentially present in the drainage feature. The

concentrations of PAHs in the upstream samples are greater than the midstream or downstream samples. As the drainage feature approaches water bodies capable of supporting aquatic populations, constituent concentrations are likely to attenuate, further reducing the potential for ecological effects.

- Concentrations of aluminum, barium, and pyrene exceed ecological surface water benchmarks. This is considered a conservative evaluation as many of the benchmarks are derived from toxicity tests with endpoints that are not relevant to the drainage feature (i.e., fish). Even based on these conservative comparisons, the margin of exceedance is small. Further, adverse ecological effects for these constituents are not predicted in paired sediment samples.

In summary, Geosyntec identified no unacceptable human or ecological risks for dioxins in sediment. Surface water dioxin concentrations are less than ecological benchmarks, but exceed the NCAC 2B Standard for the protection of human health in the downstream location. Concentrations of some metals and PAHs exceed PSRGs, but predicted risks based on these comparisons are largely attributable to the inherent conservatism of the PSRGs. Further, metals concentrations are generally consistent with background. Background concentrations of PAHs have not been quantified; however, the drainage feature is primarily fed by urban runoff, which is suggested as an important pathway of PAHs into sediments (e.g., Hoffman et al., 1984). Further, the upstream samples have greater concentrations of PAHs than the midstream or downstream samples indicating that the source of these impacts originates from runoff from the urban area upstream of the Site and are not a result of the former coal combustion byproducts management practices.

Based on the results of this evaluation, no further assessment of the drainage feature is recommended.

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# TABLES

Table 1
Summary of Analytical Results
Drainage Feature Sediment and Surface Water
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Analyte | CAS | Sediment Analytical Data [1] | | | | | | | | Surface Water Analytical Data [1] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Units | Background | | Site Drainage Feature | | | | | Units | Site Drainage Feature | | | |
| | | | | N. Carolina Streams [2] | Site-Specific Soils [3] | SED-1 Upstream 9/11/2014 | SED-2 Middle 9/11/2014 | SED-3 Downstream 9/11/2014 | SED-3 DUP Downstream 9/11/2014 | SED-3R Downstream 1/29/2015 | | SW-1 Upstream 9/11/2014 | SW-2 Middle 9/11/2014 | SW-3 Downstream 9/11/2014 | SW-3R Downstream 1/29/2015 |
| Dioxins/ Furans [4] | 1,2,3,4,6,7,8,9-Octachlorooxanthrene | 3268-87-9 | ng/kg | -- | -- | 29 | **75 B** | **35 J** | **69 J** | -- | µg/L | 9.8E-06 U | 2.6E-05 U | **5.5E-04** | 9.5E-05 U |
| | 1,2,3,4,6,7,8-Heptachlorooxanthrene | 35822-46-9 | ng/kg | -- | -- | 2.5 U | **6.6 B** | 3.3 U | **5.7 J** | -- | µg/L | 5.2E-07 U | 6.9E-07 U | 4.9E-05 U | 4.7E-05 U |
| | 1,2,3,4,7,8-Hexachlorooxanthrene | 39227-28-6 | ng/kg | -- | -- | 0.077 U | **0.19 J** | **0.097 J** | **0.13 J** | -- | µg/L | 7.4E-08 U | 1.6E-07 U | 2.7E-07 U | 6.0E-08 U |
| | 1,2,3,6,7,8-Hexachlorooxanthrene | 57653-85-7 | ng/kg | -- | -- | 0.081 U | **0.27 J** | **0.082 J** | **0.27 J** | -- | µg/L | 7.6E-08 U | 1.7E-07 U | **1.5E-06 J** | 6.0E-08 U |
| | 1,2,3,7,8,9-Hexachlorooxanthrene | 19408-74-3 | ng/kg | -- | -- | **0.26 J** | **0.28 J** | **0.22 J** | **0.16 J** | -- | µg/L | 7.1E-08 U | 1.6E-07 U | 4.4E-06 U | 5.7E-08 U |
| | 1,2,3,7,8-Pentachlorooxanthrene | 40321-76-4 | ng/kg | -- | -- | 0.21 U | 0.04 U | 0.012 U | 0.19 U | -- | µg/L | 7.2E-08 U | 6.0E-08 U | 1.3E-07 U | 2.7E-08 U |
| | 2,3,7,8-Tetrachlorooxanthrene | 1746-01-6 | ng/kg | -- | -- | 0.088 U | 0.072 U | 0.059 U | 0.045 U | -- | µg/L | 3.7E-08 U | 2.7E-08 U | 4.6E-08 U | 2.1E-08 U |
| | 1,2,3,4,6,7,8,9-Octachlorodibenzofuran | 39001-02-0 | ng/kg | -- | -- | 2.4 U | 5 U | 1.7 U | 3.6 U | -- | µg/L | 9.8E-07 U | 1.7E-06 U | 1.8E-05 U | 9.5E-05 U |
| | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | ng/kg | -- | -- | 0.55 U | 1.9 U | 0.48 U | 0.94 U | -- | µg/L | 2.7E-07 U | 3.2E-07 U | 5.3E-06 U | 4.7E-05 U |
| | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | ng/kg | -- | -- | 0.084 U | 0.12 U | 0.33 U | 0.3 U | -- | µg/L | 1.7E-07 U | 4.1E-07 U | 7.2E-07 U | **2.5E-07 J** |
| | 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | ng/kg | -- | -- | 0.068 U | 0.2 U | 0.12 U | 0.15 U | -- | µg/L | 9.5E-08 U | 9.7E-08 U | 1.2E-07 U | 4.7E-05 U |
| | 1,2,3,6,7,8-Hexachlorodibenzofuran | 57117-44-9 | ng/kg | -- | -- | 0.068 U | 0.74 U | 0.11 U | 0.23 U | -- | µg/L | 8.4E-08 U | 4.4E-07 U | 2.1E-06 U | **1.7E-07 J** |
| | 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | ng/kg | -- | -- | 0.086 U | 0.039 U | 0.021 UJ | **0.12 J** | -- | µg/L | 1.0E-07 U | 1.2E-07 U | 1.4E-07 U | **4.4E-07 J** |
| | 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | ng/kg | -- | -- | 0.047 U | 0.039 U | 0.023 U | 0.019 U | -- | µg/L | 8.1E-08 U | 1.2E-07 U | 1.6E-07 U | 4.7E-08 U |
| | 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | ng/kg | -- | -- | 0.07 U | 0.26 U | 0.092 U | 0.14 U | -- | µg/L | 8.9E-08 U | 9.8E-08 U | **6.8E-07 J** | 1.0E-07 U |
| | 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | ng/kg | -- | -- | 0.1 U | 0.042 U | 0.02 U | 0.017 U | -- | µg/L | 8.0E-08 U | 1.1E-07 U | 1.4E-07 U | **3.0E-07 J** |
| | 2,3,7,8-Tetrachlorodibenzofuran | 51207-31-9 | ng/kg | -- | -- | 0.024 U | **0.076 J** | 0.0094 U | 0.019 U | -- | µg/L | 2.9E-08 U | 7.5E-08 U | 1.1E-07 U | 3.5E-08 U |
| Metals | Aluminium | 7429-90-5 | mg/kg | 32,000 | 42,996 | **3,800** | **3,500 J** | **2,400** | **3,000** | -- | µg/L | **20 J** | **37 J** | **140** | **90 J** |
| | Antimony | 7440-36-0 | mg/kg | -- | -- | 0.44 U | 0.57 U | 0.46 UJ | **0.73 J+** | -- | µg/L | 3.1 U | 3.1 U | 3.1 U | 3.1 U |
| | Arsenic | 7440-38-2 | mg/kg | 4 - 8 | 3.17 | **1.4 J** | **1.3 J** | **1.4 J** | 0.8 UJ | -- | µg/L | 4.4 U | 4.4 U | **4.8 J+** | 4.4 U |
| | Barium | 7440-39-3 | mg/kg | 25 - 50 | 58.38 | **13 B** | **39 B** | **100 J** | **15 J** | -- | µg/L | **61** | **63** | **59 J** | **68** |
| | Beryllium | 7440-41-7 | mg/kg | 1 - 2 | 1.35 | 0.038 U | **0.11 J** | **0.15 J** | 0.04 UJ | -- | µg/L | 0.47 U | 0.47 U | 0.47 U | 0.47 U |
| | Cadmium | 7440-43-9 | mg/kg | -- | -- | 0.048 U | **0.085 J** | **0.052 J** | **0.072 J** | -- | µg/L | 0.45 U | 0.45 U | 0.45 U | 0.45 U |
| | Calcium | 7440-70-2 | -- | -- | -- | -- | -- | -- | -- | -- | µg/L | **18,000** | **17,000** | **18,000** | -- |
| | Chromium (III+VI) | 16065-83-1 | mg/kg | 2.5 - 5 | 52.2 | **3.5** | **6.6** | **8 J** | **3.1 J** | -- | µg/L | 0.66 U | 0.66 U | **0.88 J** | **0.71 J** |
| | Cobalt | 7440-48-4 | mg/kg | 5 - 10 | 30.85 | **2.9** | **3.1** | **7 J** | **2.4 J** | -- | µg/L | 1.2 U | 1.2 U | 1.2 U | 1.2 U |
| | Copper | 7440-50-8 | mg/kg | 4 - 16 | 67.3 | **5** | **8.9** | **6** | **4.3** | -- | µg/L | **1.9 J** | **1.9 J** | **2.6 J** | 1.4 U |
| | Iron | 7439-89-6 | mg/kg | 20,000 - 40,000 | 59,291 | **6,700 B** | **6,300 B** | **4,400 B** | **5,300 B** | -- | µg/L | **390** | **270** | **210** | **130** |
| | Lead | 7439-92-1 | mg/kg | 5 - 15 | 35 | **9.1** | **14** | **14 J** | **7 J** | -- | µg/L | 2.6 U | 2.6 U | 2.6 U | 2.6 U |
| | Magnesium | 7439-95-4 | -- | -- | -- | -- | -- | -- | -- | -- | µg/L | **5,600** | **5,500** | **5,300** | -- |
| | Manganese | 7439-96-5 | mg/kg | 500 - 2,000 | 1,542 | **200 B** | **210 J** | **590 J** | **140 J** | -- | µg/L | **56** | **53** | **13 J** | **6.4 J** |
| | Mercury | 7439-97-6 | mg/kg | -- | -- | 0.0063 U | **0.0097 J** | 0.0062 U | 0.0067 U | -- | µg/L | 0.027 U | 0.027 U | 0.027 U | 0.027 U |
| | Nickel | 7440-02-0 | mg/kg | 5 | 7.6 | **2.9 J** | **3.7 J** | **2.6 J** | **2.5 J** | -- | µg/L | 1.3 U | 1.3 U | 1.3 U | 1.3 U |
| | Potassium | 7440-09-7 | -- | -- | -- | -- | -- | -- | -- | -- | µg/L | **3,600** | **2,900 J** | **2,900 J** | -- |
| | Selenium | 7782-49-2 | mg/kg | 0.5 | 1.936 | 1 U | 1.3 U | **1.3 J** | 1 UJ | -- | µg/L | 4.9 U | **5 J** | 4.9 U | 4.9 U |
| | Silver | 7440-22-4 | mg/kg | 0.125 - 0.25 | -- | 0.19 U | 0.24 U | 0.19 UJ | **0.2 J** | -- | µg/L | 0.93 U | 0.93 U | 0.93 U | 0.93 U |
| | Sodium | 7440-23-5 | -- | -- | -- | -- | -- | -- | -- | -- | µg/L | **15,000** | **16,000** | **20,000** | -- |
| | Sulphate | 18785-72-3 | -- | -- | -- | -- | -- | -- | -- | -- | µg/L | **28,000** | **38,000** | **49,000** | -- |
| | Thallium | 7440-28-0 | mg/kg | -- | -- | 0.76 U | 0.97 U | 0.78 U | 0.79 U | -- | µg/L | 4.9 U | 4.9 U | 4.9 U | 4.9 U |
| | Vanadium | 7440-62-2 | mg/kg | 45 - >180 | 96.2 | **12** | **10** | **8.5** | **6.5** | -- | µg/L | 1.1 U | 1.1 U | **1.5 J** | 1.1 U |
| | Zinc | 7440-66-6 | mg/kg | 25 | 257 | **27** | **45** | **23** | **23** | -- | µg/L | **7.5 J** | **9 J** | **10 J** | **6.9 J** |
| PAHs [5] | 1-Methylnaphthalene | 90-12-0 | µg/kg | -- | -- | **54 J** | **17** | **4.3 J** | **4 J** | **24** | µg/L | 0.13 U | 0.054 U | 0.065 U | -- |
| | 2-Methylnaphthalene | 91-57-6 | µg/kg | -- | -- | **34 J** | **18 J** | **4.1 J** | **3.7 J** | **21** | µg/L | 0.12 U | 0.049 U | 0.059 U | -- |
| | Acenaphthene | 83-32-9 | µg/kg | -- | -- | **33 J** | **18** | 0.2 UJ | **2.1 J** | **7.6** | µg/L | 0.25 U | 0.1 U | 0.12 U | -- |
| | Acenaphthylene | 208-96-8 | µg/kg | -- | -- | **62** | **21 J** | **4.2 J** | **8 J** | **97** | µg/L | 0.23 U | 0.095 U | 0.11 U | -- |
| | Anthracene | 120-12-7 | µg/kg | -- | -- | **68** | **53 J** | **4.3 J** | **6.9 J** | **77** | µg/L | 0.33 U | 0.14 U | 0.16 U | -- |
| | Benz(a)anthracene * | 56-55-3 | µg/kg | -- | -- | **220** | **190 J** | **17 J** | **27 J** | **160** | µg/L | 0.074 U | 0.031 U | 0.037 U | -- |
| | Benzo(a)pyrene * | 50-32-8 | µg/kg | -- | -- | **210** | **220** | **17 J** | **28 J** | **150** | µg/L | 0.12 U | 0.049 U | 0.059 U | -- |
| | Benzo(b)fluoranthene * | 205-99-2 | µg/kg | -- | -- | **230** | **260** | **21 J** | **33 J** | **160** | µg/L | 0.079 U | 0.033 U | 0.04 U | -- |
| | Benzo(g,h,i)perylene | 191-24-2 | µg/kg | -- | -- | **140** | **140 J** | **10 J** | **18 J** | **74** | µg/L | 0.082 U | 0.034 U | 0.041 U | -- |
| | Benzo(k)fluoranthene * | 207-08-9 | µg/kg | -- | -- | **64** | **92 J** | **7.6 J** | **12 J** | **50** | µg/L | 0.12 U | 0.048 U | 0.058 U | -- |
| | Chrysene * | 218-01-9 | µg/kg | -- | -- | **280** | **220** | **22 J** | **34 J** | **190** | µg/L | 0.073 U | 0.03 U | 0.037 U | -- |
| | Dibenz(a,h)anthracene * | 53-70-3 | µg/kg | -- | -- | **33 J** | **41 J** | **2.5 J** | **4.7 J** | **21** | µg/L | 0.11 U | 0.046 U | 0.055 U | -- |
| | Fluoranthene | 206-44-0 | µg/kg | -- | -- | **430** | **330** | **39 J** | **59 J** | **300** | µg/L | 0.1 U | 0.043 U | **0.084 J** | -- |
| | Fluorene | 86-73-7 | µg/kg | -- | -- | **62** | **22** | 6.2 U | 5.8 U | **31** | µg/L | 0.43 U | 0.18 U | 0.22 U | -- |
| | Indeno(1,2,3-c,d)pyrene * | 193-39-5 | µg/kg | -- | -- | **130** | **170 J** | **11 J** | **19 J** | **84** | µg/L | 0.34 U | 0.14 U | 0.17 U | -- |
| | Naphthalene | 91-20-3 | µg/kg | -- | -- | 58 U | **17** | 6.2 U | 5.8 U | **16** | µg/L | 0.12 U | 0.051 U | 0.061 U | -- |
| | Phenanthrene | 85-01-8 | µg/kg | -- | -- | **580** | **220** | **36** | **46** | **270** | µg/L | 0.22 U | 0.093 U | 1.1 U | -- |
| | Pyrene | 129-00-0 | µg/kg | -- | -- | **540** | **290** | **38 J** | **60 J** | **360** | µg/L | 0.19 U | 0.077 U | **0.096 J** | -- |

**Table 1 Notes**

1. Sediment samples were collected from 0 to 0.5 feet below ground surface. Results are shown as follows:
   U indicates a non-detect result; the method detection limit is presented.
   J indicates an estimated result; "+" indicates the estimate is biased high
   B indicates method blank contamination
   Bold text indicates a detected result
2. Interpreted from *A Geochemical Atlas of North Carolina* , http://portal.ncdenr.org/web/lr/geochem2
3. Upper Threshold Limit (95% confidence limit on 95th percentile) as established using ProUCL 5.0 (EPA, 2013).
4. Dioxin/furan congeners were normalized to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) using toxic equivalency factors (TEFs) for evaluation of direct contact human health and ecological risks. See Appendix C.
5. Carcinogenic polynuclear aromatic hydrocarbons (PAHs; indicated with an asterix [*]) were normalized to benzo(a)pyrene using current TEFs for evaluation of direct contact human health risks. Ecological risks are evaluated based on individual and Total PAHs. See Appendix C.

**Definitions**

ng/kg = nanogram per kilogram
mg/kg = microgram per kilogram
µg/L = microgram per liter
"--" = value not available

Table 2
Evaluation of Potential Direct Contact Human Health Risks
Drainage Feature Sediment
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Analyte | CAS | Units | $PSRG_{ca}$ [1] | $PSRG_{nc}$ [1] | Analytical Data [3] | | | | | Excess Lifetime Cancer Risk [3] | | | | | Noncancer Hazard Quotient [4] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | SED-1 Upstream 9/11/2014 | SED-2 Middle 9/11/2014 | SED-3 Downstream 9/11/2014 | SED-3 DUP Downstream 9/11/2014 | SED-3R Downstream 1/29/2015 | SED-1 | SED-2 | SED-3 | SED-3 DUP | SED-3R | SED-1 | SED-2 | SED-3 | SED-3 DUP | SED-3 DUP |
| Dioxins/Furans | TCDD Equivalent [5] | TCDD Eq | ng/kg | 4.8 | 10.2 | **0.0347** | **0.170** | **0.0504** | **0.146** | -- | 7.2E-09 | 3.5E-08 | 1.1E-08 | 3.0E-08 | -- | 6.8E-04 | 3.3E-03 | 9.9E-04 | 2.9E-03 | -- |
| Metals | Aluminium | 7429-90-5 | mg/kg | -- | 15,400 | **3,800** | **3,500 J** | **2,400** | **3,000** | -- | -- | -- | -- | -- | -- | 4.9E-02 | 4.5E-02 | 3.1E-02 | 3.9E-02 | -- |
| | Antimony | 7440-36-0 | mg/kg | -- | 6.2 | 0.44 U | 0.57 U | 0.46 UJ | **0.73 J+** | -- | -- | -- | -- | -- | -- | ND | ND | ND | 2.4E-02 | -- |
| | Arsenic | 7440-38-2 | mg/kg | 0.68 | 7 | **1.4 J** | **1.3 J** | **1.4 J** | 0.8 UJ | -- | 2.1E-06 | 1.9E-06 | 2.1E-06 | ND | -- | 4.0E-02 | 3.7E-02 | 4.0E-02 | ND | -- |
| | Barium | 7440-39-3 | mg/kg | -- | 3,000 | **13 B** | **39 B** | **100 J** | **15 J** | -- | -- | -- | -- | -- | -- | 8.7E-04 | 2.6E-03 | 6.7E-03 | 1.0E-03 | -- |
| | Beryllium | 7440-41-7 | mg/kg | 1,600 | 32 | 0.038 U | **0.11 J** | **0.15 J** | 0.04 UJ | -- | ND | 6.9E-11 | 9.4E-11 | ND | -- | ND | 6.9E-04 | 9.4E-04 | ND | -- |
| | Cadmium | 7440-43-9 | mg/kg | 2,100 | 14.2 | 0.048 U | **0.085 J** | **0.052 J** | **0.072 J** | -- | ND | 4.0E-11 | 2.5E-11 | 3.4E-11 | -- | ND | 1.2E-03 | 7.3E-04 | 1.0E-03 | -- |
| | Chromium (III+VI) | 16065-83-1 | mg/kg | -- | 24,000 | **3.5** | **6.6** | **8 J** | **3.1 J** | -- | -- | -- | -- | -- | -- | 2.9E-05 | 5.5E-05 | 6.7E-05 | 2.6E-05 | -- |
| | Cobalt | 7440-48-4 | mg/kg | 420 | 4.6 | **2.9** | **3.1** | **7 J** | **2.4 J** | -- | 6.9E-09 | 7.4E-09 | 1.7E-08 | 5.7E-09 | -- | 1.3E-01 | 1.3E-01 | 3.0E-01 | 1.0E-01 | -- |
| | Copper | 7440-50-8 | mg/kg | -- | 620 | **5** | **8.9** | **6** | **4.3** | -- | -- | -- | -- | -- | -- | 1.6E-03 | 2.9E-03 | 1.9E-03 | 1.4E-03 | -- |
| | Iron | 7439-89-6 | mg/kg | -- | 11,000 | **6,700 B** | **6,300 B** | **4,400 B** | **5,300 B** | -- | -- | -- | -- | -- | -- | 1.2E-01 | 1.1E-01 | 8.0E-02 | 9.6E-02 | -- |
| | Lead [6] | 7439-92-1 | mg/kg | -- | 400 | **9.1** | **14** | **14 J** | **7 J** | -- | -- | -- | -- | -- | -- | 4.6E-03 | 7.0E-03 | 7.0E-03 | 3.5E-03 | -- |
| | Manganese | 7439-96-5 | mg/kg | -- | 360 | **200 B** | **210 J** | **590 J** | **140 J** | -- | -- | -- | -- | -- | -- | 1.1E-01 | 1.2E-01 | 3.3E-01 | 7.8E-02 | -- |
| | Mercury | 7439-97-6 | mg/kg | -- | 1.88 | 0.0063 U | **0.0097 J** | 0.0062 U | 0.0067 U | -- | -- | -- | -- | -- | -- | ND | 1.0E-03 | ND | ND | -- |
| | Nickel | 7440-02-0 | mg/kg | 15,000 | 300 | **2.9 J** | **3.7 J** | **2.6 J** | **2.5 J** | -- | 1.9E-10 | 2.5E-10 | 1.7E-10 | 1.7E-10 | -- | 1.9E-03 | 2.5E-03 | 1.7E-03 | 1.7E-03 | -- |
| | Selenium | 7782-49-2 | mg/kg | -- | 78 | 1 U | 1.3 U | **1.3 J** | 1 UJ | -- | -- | -- | -- | -- | -- | ND | ND | 3.3E-03 | ND | -- |
| | Silver | 7440-22-4 | mg/kg | -- | 78 | 0.19 U | 0.24 U | 0.19 UJ | **0.2 J** | -- | -- | -- | -- | -- | -- | ND | ND | ND | 5.1E-04 | -- |
| | Thallium | 7440-28-0 | mg/kg | -- | 0.156 | *0.76 U* | *0.97 U* | *0.78 U* | *0.79 U* | -- | -- | -- | -- | -- | -- | ND | ND | ND | ND | -- |
| | Vanadium | 7440-62-2 | mg/kg | -- | 78 | **12** | **10** | **8.5** | **6.5** | -- | -- | -- | -- | -- | -- | 3.1E-02 | 2.6E-02 | 2.2E-02 | 1.7E-02 | -- |
| | Zinc | 7440-66-6 | mg/kg | -- | 4,600 | **27** | **45** | **23** | **23** | -- | -- | -- | -- | -- | -- | 1.2E-03 | 2.0E-03 | 1.0E-03 | 1.0E-03 | -- |
| PAHs | B(a)P Equivalent [7] | BaP TEQ | µg/kg | 16 | -- | **302** | **324** | **24.5** | **40.8** | **212** | 1.9E-05 | 2.0E-05 | 1.5E-06 | 2.5E-06 | 1.3E-05 | -- | -- | -- | -- | -- |
| | 1-Methylnaphthalene | 90-12-0 | µg/kg | 18,000 | 840,000 | **54 J** | **17** | **4.3 J** | **4 J** | **24** | 3.0E-09 | 9.4E-10 | 2.4E-10 | 2.2E-10 | 1.3E-09 | 1.3E-05 | 4.0E-06 | 1.0E-06 | 9.5E-07 | 5.7E-06 |
| | 2-Methylnaphthalene | 91-57-6 | µg/kg | -- | 48,000 | **34 J** | **18 J** | **4.1 J** | **3.7 J** | **21** | -- | -- | -- | -- | -- | 1.4E-04 | 7.5E-05 | 1.7E-05 | 1.5E-05 | 8.8E-05 |
| | Acenaphthene | 83-32-9 | µg/kg | -- | 720,000 | **33 J** | **18** | 0.2 UJ | **2.1 J** | **7.6** | -- | -- | -- | -- | -- | 9.2E-06 | 5.0E-06 | ND | 5.8E-07 | 2.1E-06 |
| | Acenaphthylene [8] | 208-96-8 | µg/kg | -- | -- | **62** | **21 J** | **4.2 J** | **8 J** | **97** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Anthracene | 120-12-7 | µg/kg | -- | 3,600,000 | **68** | **53 J** | **4.3 J** | **6.9 J** | **77** | -- | -- | -- | -- | -- | 3.8E-06 | 2.9E-06 | 2.4E-07 | 3.8E-07 | 4.3E-06 |
| | Benzo(g,h,i)perylene [8] | 191-24-2 | µg/kg | -- | -- | **140** | **140 J** | **10 J** | **18 J** | **74** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Fluoranthene | 206-44-0 | µg/kg | -- | 480,000 | **430** | **330** | **39 J** | **59 J** | **300** | -- | -- | -- | -- | -- | 1.8E-04 | 1.4E-04 | 1.6E-05 | 2.5E-05 | 1.3E-04 |
| | Fluorene | 86-73-7 | µg/kg | -- | 480,000 | **62** | **22** | 6.2 U | 5.8 U | **31** | -- | -- | -- | -- | -- | 2.6E-05 | 9.2E-06 | ND | ND | 1.3E-05 |
| | Naphthalene | 91-20-3 | µg/kg | 3,800 | 26,000 | 58 U | **17** | 6.2 U | 5.8 U | **16** | ND | 4.5E-09 | ND | ND | 4.2E-09 | ND | 1.3E-04 | ND | ND | 1.2E-04 |
| | Phenanthrene [8] | 85-01-8 | µg/kg | -- | -- | **580** | **220** | **36** | **46** | **270** | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| | Pyrene | 129-00-0 | µg/kg | -- | 360,000 | **540** | **290** | **38 J** | **60 J** | **360** | -- | -- | -- | -- | -- | 3.0E-04 | 1.6E-04 | 2.1E-05 | 3.3E-05 | 2.0E-04 |
| | | | | | | | | | | **Cumulative Risk/Hazard** | 2.1E-05 | 2.2E-05 | 3.6E-06 | 2.6E-06 | 1.3E-05 | 4.9E-01 | 5.0E-01 | 8.3E-01 | 3.7E-01 | 5.6E-04 |

**Table 2 Notes**

1. Sediment results were compared to NCDENR (March 2015) PSRGs, but updated to reflect the most recent EPA RSLs (June 2015). PSRGs are based on a residential exposure scenario, and either a cancer risk of 1E-6 ($PSRG_{ca}$) or a non-cancer hazard quotient (HQ) of 0.2 ($PSRG_{nc}$).
2. Sediment samples were collected from 0 to 0.5 feet below ground surface. Results are shown as follows:
   - U indicates a non-detect result; the method detection limit is presented.
   - J indicates an estimated result; "+" indicates the estimate is biased high
   - B indicates method blank contamination
   - Bold text indicates a detected result
   - Italicized text indicates a non-detect result for which one-half the detection limit exceeds the default North Carolina PSRG
   - Yellow highlighting indicates a detected constituent exceeds the default North Carolina PSRG
3. Cancer Risk = (Chemical concentration / $PSRG_{ca}$) x 1E-6.
4. Hazard Quotient = (Chemical concentration / $PSRG_{nc}$) x 0.2.
5. Dioxin/furan congeners were normalized to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) using toxic equivalency factors (TEFs) for mammals. See Appendix C.
6. The evaluation of lead differs from other noncarcinogens; consistent with current risk assessment practice, a hazard quotient is not calculated.
7. Carcinogenic PAHs were normalized to benzo(a)pyrene using current TEFs. See Appendix C.
8. Acenaphthylene, benzo(g,h,i)perylene, and phenanthrene use pyrene as a surrogate.

**Definitions**

ng/kg = nanogram per kilogram
µg/kg = microgram per kilogram
mg/kg = microgram per kilogram
NCDENR = North Carolina Department of Environment and Natural Resouces
ND = non-detect
PAH = polynuclear aromatic hydrocarbon
PSRG = preliminary sediment/soil remediation goal
RSL = regional screening level
"--" = value not available/not calculated

Table 3
Evaluation of Potential Human Health Risks
Drainage Feature Surface Water
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Analyte | CAS | UNITS | Human Health Surface Water Benchmark [1] | | Analytical Data [2] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | SW-1 Upstream | SW-2 Middle | SW-3 Downstream | SW-3R Downstream |
| | | | | Value | Source | 9/11/2014 | 9/11/2014 | 9/11/2014 | 1/29/2015 |
| Dioxin | TCDD Equivalent [3] | TCDD Eq | µg/L | 5.0E-09 | NCAC | ND | ND | **3.8E-07** | **1.5E-07** |
| Metals | Aluminium | 7429-90-5 | µg/L | 8000 | NCDENR | **20 J** | **37 J** | **140** | **90 J** |
| | Antimony | 7440-36-0 | µg/L | 640 | NCDENR | 3.1 U | 3.1 U | 3.1 U | 3.1 U |
| | Arsenic | 7440-38-2 | µg/L | 10 | NCAC | 4.4 U | 4.4 U | **4.8 J+** | 4.4 U |
| | Barium | 7440-39-3 | µg/L | 200000 | NCDENR | **61** | **63** | **59 J** | **68** |
| | Beryllium | 7440-41-7 | µg/L | 4 | MCL | 0.47 U | 0.47 U | 0.47 U | 0.47 U |
| | Cadmium | 7440-43-9 | µg/L | 5 | MCL | 0.45 U | 0.45 U | 0.45 U | 0.45 U |
| | Chromium (III+VI) | 16065-83-1 | µg/L | 100 | MCL | 0.66 U | 0.66 U | **0.88 J** | **0.71 J** |
| | Cobalt | 7440-48-4 | µg/L | 4 | NCDENR | 1.2 U | 1.2 U | 1.2 U | 1.2 U |
| | Copper | 7440-50-8 | µg/L | 1300 | MCL | **1.9 J** | **1.9 J** | **2.6 J** | 1.4 U |
| | Iron | 7439-89-6 | µg/L | 14000 | MCL | **390** | **270** | **210** | **130** |
| | Lead | 7439-92-1 | µg/L | 15 | MCL | 2.6 U | 2.6 U | 2.6 U | 2.6 U |
| | Manganese | 7439-96-5 | µg/L | 100 | NRWCQ | **56** | **53** | **13 J** | **6.4 J** |
| | Mercury | 7439-97-6 | µg/L | 2 | MCL | 0.027 U | 0.027 U | 0.027 U | 0.027 U |
| | Nickel | 7440-02-0 | µg/L | 4600 | NRWCQ | 1.3 U | 1.3 U | 1.3 U | 1.3 U |
| | Selenium | 7782-49-2 | µg/L | 4200 | NRWCQ | 4.9 U | **5 J** | 4.9 U | 4.9 U |
| | Silver | 7440-22-4 | µg/L | 18.8 | RSLnc | 0.93 U | 0.93 U | 0.93 U | 0.93 U |
| | Thallium | 7440-28-0 | µg/L | 0.47 | NCDENR | 4.9 U | 4.9 U | 4.9 U | 4.9 U |
| | Vanadium | 7440-62-2 | µg/L | 17.2 | RSLnc | 1.1 U | 1.1 U | **1.5 J** | 1.1 U |
| | Zinc | 7440-66-6 | µg/L | 1200 | RSLnc | **7.5 J** | **9 J** | **10 J** | **6.9 J** |
| Other | Calcium | 7440-70-2 | µg/L | -- | -- | **18000** | **17000** | **18000** | -- |
| | Magnesium | 7439-95-4 | µg/L | -- | -- | **5600** | **5500** | **5300** | -- |
| | Potassium | 7440-09-7 | µg/L | -- | -- | **3600** | **2900 J** | **2900 J** | -- |
| | Sodium | 7440-23-5 | µg/L | -- | -- | **15000** | **16000** | **20000** | -- |
| | Sulphate | 18785-72-3 | µg/L | -- | -- | **28000** | **38000** | **49000** | -- |
| PAH | 1-Methylnaphthalene | 90-12-0 | µg/L | 2.6 | NCDENR | 0.13 U | 0.054 U | 0.065 U | -- |
| | 2-Methylnaphthalene | 91-57-6 | µg/L | 80 | NCDENR | 0.12 U | 0.049 U | 0.059 U | -- |
| | Acenaphthene | 83-32-9 | µg/L | 90 | NRWCQ | 0.25 U | 0.1 U | 0.12 U | -- |
| | Acenaphthylene | 208-96-8 | µg/L | -- | -- | 0.23 U | 0.095 U | 0.11 U | -- |
| | Anthracene | 120-12-7 | µg/L | 40000 | NCDENR | 0.33 U | 0.14 U | 0.16 U | -- |
| | Benz(a)anthracene | 56-55-3 | µg/L | 0.0311 | NCAC | *0.074 U* | 0.031 U | 0.037 U | -- |
| | Benzo(a)pyrene | 50-32-8 | µg/L | 0.0311 | NCAC | *0.12 U* | 0.049 U | 0.059 U | -- |
| | Benzo(b)fluoranthene | 205-99-2 | µg/L | 0.0311 | NCAC | *0.079 U* | 0.033 U | 0.04 U | -- |
| | Benzo(g,h,i)perylene | 191-24-2 | µg/L | -- | -- | 0.082 U | 0.034 U | 0.041 U | -- |
| | Benzo(k)fluoranthene | 207-08-9 | µg/L | 0.0311 | NCAC | *0.12 U* | 0.048 U | 0.058 U | -- |
| | Chrysene | 218-01-9 | µg/L | 0.0311 | NCAC | *0.073 U* | 0.03 U | 0.037 U | -- |
| | Dibenz(a,h)anthracene | 53-70-3 | µg/L | 0.0311 | NCAC | *0.11 U* | 0.046 U | 0.055 U | -- |
| | Fluoranthene | 206-44-0 | µg/L | 20 | NRWCQ | 0.1 U | 0.043 U | **0.084 J** | -- |
| | Fluorene | 86-73-7 | µg/L | 5300 | NCDENR | 0.43 U | 0.18 U | 0.22 U | -- |
| | Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/L | 0.0311 | NCAC | *0.34 U* | *0.14 U* | *0.17 U* | -- |
| | Naphthalene | 91-20-3 | µg/L | 0.17 | RSLca | 0.12 U | 0.051 U | 0.061 U | -- |
| | Phenanthrene | 85-01-8 | µg/L | -- | -- | 0.22 U | 0.093 U | 1.1 U | -- |
| | Pyrene | 129-00-0 | µg/L | 4000 | NCDENR | 0.19 U | 0.077 U | **0.096 J** | -- |

**Table 5 Notes**

1. Surface water data from the channel were compared to benchmarks for the protection of human health from the following sources, in the order in which they are listed:
   a. NCAC - State 2B Standards from the North Carolina Administrative Code (NCAC, 2007).
   b. NCDENR - State Criterion from the Department of Environment and Natural Resources (NCDENR, 2013).
   c. NRWQC - EPA National Recommended Human Health Criteria for the Consumption of Organisms (EPA, 2015b).
   d. MCL - Federal Maximum Contaminant Leve for drinking water.
   e. RSL - EPA Regional Screning Levels (RSLs, Updated June 2015) based on a tapwater exposure scenario, and either a cancer risk of 1E-6 (RSLca) or a non-cancer hazard quotient (HQ) of 0.2 (RSLnc).
2. Analytical results are shown as follows:
   U indicates a non-detect result; the method detection limit is presented.
   J indicates an estimated result; "+" indicates the estimate is biased high
   Italicized text indicates a non-detect result for which one-half the detection limit exceeds the NCAC Standard
   Bold text indicates a detected result
   Yellow highlighting indicates a detected constituent exceeds the surface water benchmark
3. Dioxin/furan congeners were normalized to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) using toxic equivalency factors (TEFs) for mammals/humans. See Appendix C.

**Definitions**

µg/L = microgram per liter
PAH = polynuclear aromatic hydrocarbon
ND = non-detect
EPA = United States Environmental Protection Agency
"--" = value not available

Table 4
Evaluation of Potential Migration to Groundwater Pathway
Drainage Feature Sediment
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Target Analyte | CAS | Units | PSRG Leachability [1] | Analytical Data [2] | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | SED-1 Upstream 9/11/2014 | SED-2 Middle 9/11/2014 | SED-3 Downstream 9/11/2014 | SED-3 DUP Downstream 9/11/2014 | SED-3R Downstream 1/29/2015 |
| Dioxins/Furans | TCDD Equivalent [4] | TCDD Eq | ng/kg | 1.1 | **0.0347** | **0.170** | **0.0504** | **0.146** | -- |
| Metals | Aluminium | 7429-90-5 | mg/kg | -- | **3,800** | **3,500 J** | **2,400** | **3,000** | -- |
| | Antimony | 7440-36-0 | mg/kg | 0.9 | 0.44 U | 0.57 U | 0.46 UJ | **0.73 J+** | -- |
| | Arsenic | 7440-38-2 | mg/kg | 5.8 | **1.4 J** | **1.3 J** | **1.4 J** | 0.8 UJ | -- |
| | Barium | 7440-39-3 | mg/kg | 580 | **13 B** | **39 B** | **100 J** | **15 J** | -- |
| | Beryllium | 7440-41-7 | mg/kg | 63 | 0.038 U | **0.11 J** | **0.15 J** | 0.04 UJ | -- |
| | Cadmium | 7440-43-9 | mg/kg | 3 | 0.048 U | **0.085 J** | **0.052 J** | **0.072 J** | -- |
| | Chromium (III+VI) | 16065-83-1 | mg/kg | 3.8 | **3.5** | **6.6** | **8 J** | **3.1 J** | -- |
| | Cobalt | 7440-48-4 | mg/kg | 0.90 | **2.9** | **3.1** | **7 J** | **2.4 J** | -- |
| | Copper | 7440-50-8 | mg/kg | 700 | **5** | **8.9** | **6** | **4.3** | -- |
| | Iron | 7439-89-6 | mg/kg | 150 | **6,700 B** | **6,300 B** | **4,400 B** | **5,300 B** | -- |
| | Lead | 7439-92-1 | mg/kg | 270 | **9.1** | **14** | **14 J** | **7 J** | -- |
| | Manganese | 7439-96-5 | mg/kg | 65 | **200 B** | **210 J** | **590 J** | **140 J** | -- |
| | Mercury | 7439-97-6 | mg/kg | 1 | 0.0063 U | **0.0097 J** | 0.0062 U | 0.0067 U | -- |
| | Nickel | 7440-02-0 | mg/kg | 130 | **2.9 J** | **3.7 J** | **2.6 J** | **2.5 J** | -- |
| | Selenium | 7782-49-2 | mg/kg | 2.1 | 1 U | 1.3 U | **1.3 J** | 1 UJ | -- |
| | Silver | 7440-22-4 | mg/kg | 3.4 | 0.19 U | 0.24 U | 0.19 UJ | **0.2 J** | -- |
| | Thallium | 7440-28-0 | mg/kg | 0.28 | *0.76 U* | *0.97 U* | *0.78 U* | *0.79 U* | -- |
| | Vanadium | 7440-62-2 | mg/kg | 6 | **12** | **10** | **8.5** | **6.5** | -- |
| | Zinc | 7440-66-6 | mg/kg | 1,200 | **27** | **45** | **23** | **23** | -- |
| PAHs | 1-Methylnaphthalene | 90-12-0 | µg/kg | 55 | **54 J** | **17** | **4.3 J** | **4 J** | **24** |
| | 2-Methylnaphthalene | 91-57-6 | µg/kg | 1,600 | **34 J** | **18 J** | **4.1 J** | **3.7 J** | **21** |
| | Acenaphthene | 83-32-9 | µg/kg | 8,400 | **33 J** | **18** | 0.2 UJ | **2.1 J** | **7.6** |
| | Acenaphthylene * | 208-96-8 | µg/kg | 21,000 | **62** | **21 J** | **4.2 J** | **8 J** | **97** |
| | Anthracene | 120-12-7 | µg/kg | 660,000 | **68** | **53 J** | **4.3 J** | **6.9 J** | **77** |
| | Benz(a)anthracene | 56-55-3 | µg/kg | 180 | **220** | **190 J** | **17 J** | **27 J** | **160** |
| | Benzo(a)pyrene | 50-32-8 | µg/kg | 59 | **210** | **220** | **17 J** | **28 J** | **150** |
| | Benzo(b)fluoranthene | 205-99-2 | µg/kg | 600 | **230** | **260** | **21 J** | **33 J** | **160** |
| | Benzo(g,h,i)perylene * | 191-24-2 | µg/kg | 7,800,000 | **140** | **140 J** | **10 J** | **18 J** | **74** |
| | Benzo(k)fluoranthene | 207-08-9 | µg/kg | 5,900 | **64** | **92 J** | **7.6 J** | **12 J** | **50** |
| | Chrysene | 218-01-9 | µg/kg | 18,000 | **280** | **220** | **22 J** | **34 J** | **190** |
| | Dibenz(a,h)anthracene | 53-70-3 | µg/kg | 190 | **33 J** | **41 J** | **2.5 J** | **4.7 J** | **21** |
| | Fluoranthene | 206-44-0 | µg/kg | 330,000 | **430** | **330** | **39 J** | **59 J** | **300** |
| | Fluorene | 86-73-7 | µg/kg | 56,000 | **62** | **22** | 6.2 U | 5.8 U | **31** |
| | Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/kg | 3,500 | **130** | **170 J** | **11 J** | **19 J** | **84** |
| | Naphthalene | 91-20-3 | µg/kg | 210 | 58 U | **17** | 6.2 U | 5.8 U | **16** |
| | Phenanthrene * | 85-01-8 | µg/kg | 68,000 | **580** | **220** | **36** | **46** | **270** |
| | Pyrene | 129-00-0 | µg/kg | 220,000 | **540** | **290** | **38 J** | **60 J** | **360** |

**Table 3 Notes**

1. Sediment results were compared to NCDENR (2015) PSRGs for the protection of groundwater.
2. Sediment samples were collected from 0 to 0.5 feet below ground surface. Results are shown as follows:
   - U indicates a non-detect result; the method detection limit is presented.
   - J indicates an estimated result; "+" indicates the estimate is biased high
   - B indicates method blank contamination
   - Bold text indicates a detected result
   - Italicized text indicates a non-detect result for which one-half the detection limit exceeds the default NCDENR (2015) PSRG for leachability

Yellow highlighting indicates a detected constituent exceeds the default NCDENR (2015) PSRG for leachability

**Definitions**

ng/kg = nanogram per kilogram
µg/kg = microgram per kilogram
mg/kg = microgram per kilogram
NCDENR = North Carolina Department of Environment and Natural Resouces
ND = non-detect
PAH = polynuclear aromatic hydrocarbon
PSRG = preliminary sediment/soil remediation goal
"--" = value not available

Table 5
Evaluation of Potential Ecological Risks
Drainage Feature Sediment
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Target Analytes | CAS | Units | Sediment Benchmark [1] | | Analytical Results [4] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | "No Effect" Banchmark [2] | "Low Effect" Benchmark [3] | SED-1 Upstream 9/11/2014 | SED-2 Middle 9/11/2014 | SED-3 Downstream 9/11/2014 | SED-3 DUP Downstream 9/11/2014 | SED-3R Downstream 1/29/2015 |
| Dioxins | TCDD Equivalent [5] | TCDD Eq | ng/kg | 0.85 (a) | 2.4 (b) | **0.0347** | **0.170** | **0.0504** | **0.146** | -- |
| Metals | Aluminium | 7429-90-5 | mg/kg | 25000 (c) | 58000 (b) | **3,800** | **3,500 J** | **2,400** | **3000** | -- |
| | Antimony | 7440-36-0 | mg/kg | 2 (a) | 3.6 (b) | 0.44 U | 0.57 U | 0.46 UJ | **0.73 J+** | -- |
| | Arsenic | 7440-38-2 | mg/kg | 9.8 (a) | 33 (a,b) | **1.4 J** | **1.3 J** | **1.4 J** | 0.8 UJ | -- |
| | Barium | 7440-39-3 | mg/kg | 150 (c) | 300 (b) | **13 B** | **39 B** | **100 J** | **15 J** | -- |
| | Beryllium | 7440-41-7 | mg/kg | 73 (c) | 730 (b) | 0.038 U | **0.11 J** | **0.15 J** | 0.04 UJ | -- |
| | Cadmium | 7440-43-9 | mg/kg | 0.99 (a,b) | 4.98 (a) | 0.048 U | **0.085 J** | **0.052 J** | **0.072 J** | -- |
| | Chromium (III+VI) | 16065-83-1 | mg/kg | 43.4 (a,b) | 111 (a) | **3.5** | **6.6** | **8 J** | **3.1 J** | -- |
| | Cobalt | 7440-48-4 | mg/kg | 50 (a) | 2300 (b) | **2.9** | **3.1** | **7 J** | **2.4 J** | -- |
| | Copper | 7440-50-8 | mg/kg | 31.6 (a,b) | 149 (a) | **5** | **8.9** | **6** | **4.3** | -- |
| | Iron | 7439-89-6 | mg/kg | 20000 (a) | 40000 (b) | **6700 B** | **6,300 B** | **4,400 B** | **5,300 B** | -- |
| | Lead | 7439-92-1 | mg/kg | 35.8 (a,b) | 128 (a) | **9.1** | **14** | **14 J** | **7 J** | -- |
| | Manganese | 7439-96-5 | mg/kg | 460 (a) | 1100 (b) | **200 B** | **210 J** | **590 J** | **140 J** | -- |
| | Mercury | 7439-97-6 | mg/kg | 0.18 (a,b) | 1.06 (a) | 0.0063 U | **0.0097 J** | 0.0062 U | 0.0067 U | -- |
| | Nickel | 7440-02-0 | mg/kg | 22.7 (a,b) | 48.6 (a) | **2.9 J** | **3.7 J** | **2.6 J** | **2.5 J** | -- |
| | Selenium | 7782-49-2 | mg/kg | 2 (a) | 2.9 (b) | 1 U | 1.3 U | **1.3 J** | 1 UJ | -- |
| | Silver | 7440-22-4 | mg/kg | 1 (a) | 5 (b) | 0.19 U | 0.24 U | 0.19 UJ | **0.2 J** | -- |
| | Thallium | 7440-28-0 | mg/kg | 0.044 (c) | 0.44 (b) | *0.76 U* | *0.97 U* | *0.78 U* | *0.79 U* | -- |
| | Vanadium | 7440-62-2 | mg/kg | 30 (c) | 61 (b) | **12** | **10** | **8.5** | **6.5** | -- |
| | Zinc | 7440-66-6 | mg/kg | 121 (a,b) | 459 (a) | **27** | **45** | **23** | **23** | -- |
| PAHs | Total PAH | PAH SUM | µg/kg | 1610 (a,b) | 22800 (a) | **3199** | **2339** | **244** | **371** | **2093** |
| | 1-Methylnaphthalene | 90-12-0 | µg/kg | 76 (c) | 760 (b) | **54 J** | **17** | **4.3 J** | **4 J** | **24** |
| | 2-Methylnaphthalene | 91-57-6 | µg/kg | 20.2 (a) | 760 (b) | **34 J** | **18 J** | **4.1 J** | **3.7 J** | **21** |
| | Acenaphthene | 83-32-9 | µg/kg | 6.7 (a) | 760 (b) | **33 J** | **18** | 0.2 UJ | **2.1 J** | **7.6** |
| | Acenaphthylene | 208-96-8 | µg/kg | 5.9 (a) | 760 (b) | **62** | **21 J** | **4.2 J** | **8 J** | **97** |
| | Anthracene | 120-12-7 | µg/kg | 57.2 (a,b) | 845 (a) | **68** | **53 J** | **4.3 J** | **6.9 J** | **77** |
| | Benz(a)anthracene | 56-55-3 | µg/kg | 108 (a,b) | 1050 (a) | **220** | **190 J** | **17 J** | **27 J** | **160** |
| | Benzo(a)pyrene | 50-32-8 | µg/kg | 150 (a,b) | 1450 (a) | **210** | **220** | **17 J** | **28 J** | **150** |
| | Benzo(b)fluoranthene [6] | 205-99-2 | µg/kg | 27.2 (a) | 1900 (b) | **230** | **260** | **21 J** | **33 J** | **160** |
| | Benzo(g,h,i)perylene | 191-24-2 | µg/kg | 170 (a) | 1700 (b) | **140** | **140 J** | **10 J** | **18 J** | **74** |
| | Benzo(k)fluoranthene | 207-08-9 | µg/kg | 240 (a) | 2400 (b) | **64** | **92 J** | **7.6 J** | **12 J** | **50** |
| | Chrysene | 218-01-9 | µg/kg | 166 (a,b) | 1200 (b) | **280** | **220** | **22 J** | **34 J** | **190** |
| | Dibenz(a,h)anthracene | 53-70-3 | µg/kg | 33 (a,b) | 1290 (a) | **33 J** | **41 J** | **2.5 J** | **4.7 J** | **21** |
| | Fluoranthene | 206-44-0 | µg/kg | 423 (a,b) | 2230 (a) | **430** | **330** | **39 J** | **59 J** | **300** |
| | Fluorene | 86-73-7 | µg/kg | 77.4 (a,b) | 536 (a) | **62** | **22** | 6.2 U | 5.8 U | **31** |
| | Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/kg | 17 (a) | 2000 (b) | **130** | **170 J** | **11 J** | **19 J** | **84** |
| | Naphthalene | 91-20-3 | µg/kg | 176 (a,b) | 561 (a) | 58 U | **17** | 6.2 U | 5.8 U | **16** |
| | Phenanthrene | 85-01-8 | µg/kg | 204 (a,b) | 1170 (a) | **580** | **220** | **36** | **46** | **270** |
| | Pyrene | 129-00-0 | µg/kg | 195 (a,b) | 1520 (a) | **540** | **290** | **38 J** | **60 J** | **360** |

**Table 4 Notes**

1. The drainage feature does not support populations of aquatic-dependent receptors. However, as a point-of-departure for evaluating the need for further investigation/evaluation, sediment data from the channel were compared to risk-based benchmarks for the protection of benthic receptors.
2. Region 3 sediment benchmark [(a); EPA, 2006], threshold effects concentration [(b); MacDonald et al., 2000], or no observable adverse effect level [(c); LANL, 2012]. See Appendix D.
3. Probable effects concentration [(a); MacDonald et al., 2000] or lowest observable adverse effect level [(b); LANL, 2012]. See Appendix D.
4. Sediment samples were collected from 0 to 0.5 feet below ground surface. Results are shown as follows:
   U indicates a non-detect result; the method detection limit is presented.
   J indicates an estimated result; "+" indicates the estimate is biased high
   B indicates method blank contamination
   Bold text indicates a detected result
   Italicized text indicates a non-detect result for which one-half the detection limit exceeds the No Effect benchmark
   Yellow highlighting indicates a detected constituent concentration exceeds the No Effect benchmark
5. Dioxin/furan congeners were normalized to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) using toxic equivalency factors (TEFs). Sediment results represent the highest calculated TCDD Equivalent (mammals). See Appendix C.
6. The selected benchmark for benzo(b)fluoranthene is the "benzo(b+k)fluoranthene" available from EPA (2006) Region 3.

**Definitions**

ng/kg = nanogram per kilogram
µg/kg = microgram per kilogram
mg/kg = microgram per kilogram
PAH = polynuclear aromatic hydrocarbon
"--" = value not available
EPA = United States Environmental Protection Agency

Table 6
Evaluation of Potential Ecological Risks
Drainage Feature Surface Water
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Analyte | CAS | UNITS | Surface Water Benchmark [1] | | Analytical Data [2] | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Value | Source | SW-1 Upstream 9/11/2014 | SW-2 Middle 9/11/2014 | SW-3 Downstream 9/11/2014 | SW-3R Downstream 1/29/2015 |
| Dioxin | TCDD Equivalent [3] | TCDD Eq | µg/L | 1.00E-05 | Region 4 | ND | ND | **1.4E-07** | **2.1E-07** |
| Metals | Aluminium | 7429-90-5 | µg/L | 87 | NCDENR | **20 J** | **37 J** | **140** | **90 J** |
| | Antimony | 7440-36-0 | µg/L | 160 | Region 4 | 3.1 U | 3.1 U | 3.1 U | 3.1 U |
| | Arsenic | 7440-38-2 | µg/L | 50 | NCAC | 4.4 U | 4.4 U | **4.8 J+** | 4.4 U |
| | Barium | 7440-39-3 | µg/L | 3.9 | OSWER | **61** | **63** | **59 J** | **68** |
| | Beryllium | 7440-41-7 | µg/L | 6.5 | NCAC | 0.47 U | 0.47 U | 0.47 U | 0.47 U |
| | Cadmium | 7440-43-9 | µg/L | 2 | NCAC | 0.45 U | 0.45 U | 0.45 U | 0.45 U |
| | Chromium (III+VI) | 16065-83-1 | µg/L | 50 | NCAC | 0.66 U | 0.66 U | **0.88 J** | **0.71 J** |
| | Cobalt | 7440-48-4 | µg/L | 3 | OSWER | 1.2 U | 1.2 U | 1.2 U | 1.2 U |
| | Copper | 7440-50-8 | µg/L | 7 | NCAC | **1.9 J** | **1.9 J** | **2.6 J** | 1.4 U |
| | Iron | 7439-89-6 | µg/L | 1000 | NCAC | **390** | **270** | **210** | **130** |
| | Lead | 7439-92-1 | µg/L | 25 | NCAC | 2.6 U | 2.6 U | 2.6 U | 2.6 U |
| | Manganese | 7439-96-5 | µg/L | 80 | OSWER | **56** | **53** | **13 J** | **6.4 J** |
| | Mercury | 7439-97-6 | µg/L | 0.012 | NCAC | *0.027 U* | *0.027 U* | *0.027 U* | *0.027 U* |
| | Nickel | 7440-02-0 | µg/L | 88 | NCAC | 1.3 U | 1.3 U | 1.3 U | 1.3 U |
| | Selenium | 7782-49-2 | µg/L | 5 | NCAC | 4.9 U | **5 J** | 4.9 U | 4.9 U |
| | Silver | 7440-22-4 | µg/L | 0.06 | NCAC | *0.93 U* | *0.93 U* | *0.93 U* | *0.93 U* |
| | Thallium | 7440-28-0 | µg/L | 4 | Region 4 | 4.9 U | 4.9 U | 4.9 U | 4.9 U |
| | Vanadium | 7440-62-2 | µg/L | 19 | OSWER | 1.1 U | 1.1 U | **1.5 J** | 1.1 U |
| | Zinc | 7440-66-6 | µg/L | 50 | NCAC | **7.5 J** | **9 J** | **10 J** | **6.9 J** |
| Other | Calcium | 7440-70-2 | µg/L | 116000 | Region 3 | **18000** | **17000** | **18000** | -- |
| | Magnesium | 7439-95-4 | µg/L | 82000 | Region 3 | **5600** | **5500** | **5300** | -- |
| | Potassium | 7440-09-7 | µg/L | 53000 | Region 3 | **3600** | **2900 J** | **2900 J** | -- |
| | Sodium | 7440-23-5 | µg/L | 680000 | Region 3 | **15000** | **16000** | **20000** | -- |
| | Sulphate | 18785-72-3 | µg/L | -- | | **28000** | **38000** | **49000** | -- |
| PAH | 1-Methylnaphthalene | 90-12-0 | µg/L | 2.1 | Region 3 | 0.13 U | 0.054 U | 0.065 U | -- |
| | 2-Methylnaphthalene | 91-57-6 | µg/L | 4.7 | Region 3 | 0.12 U | 0.049 U | 0.059 U | -- |
| | Acenaphthene | 83-32-9 | µg/L | 60 | NCDENR | 0.25 U | 0.1 U | 0.12 U | -- |
| | Acenaphthylene | 208-96-8 | µg/L | 4840 | Region 5 | 0.23 U | 0.095 U | 0.11 U | -- |
| | Anthracene | 120-12-7 | µg/L | 0.05 | NCDENR | 0.33 U | 0.14 U | 0.16 U | -- |
| | Benz(a)anthracene | 56-55-3 | µg/L | 0.018 | Region 3 | 0.074 U | 0.031 U | 0.037 U | -- |
| | Benzo(a)pyrene | 50-32-8 | µg/L | 0.014 | OSWER | 0.12 U | 0.049 U | 0.059 U | -- |
| | Benzo(b)fluoranthene | 205-99-2 | µg/L | 9.07 | Region 5 | 0.079 U | 0.033 U | 0.04 U | -- |
| | Benzo(g,h,i)perylene | 191-24-2 | µg/L | 7.64 | Region 5 | 0.082 U | 0.034 U | 0.041 U | -- |
| | Benzo(k)fluoranthene | 207-08-9 | µg/L | -- | | 0.12 U | 0.048 U | 0.058 U | -- |
| | Chrysene | 218-01-9 | µg/L | -- | | 0.073 U | 0.03 U | 0.037 U | -- |
| | Dibenz(a,h)anthracene | 53-70-3 | µg/L | -- | | 0.11 U | 0.046 U | 0.055 U | -- |
| | Fluoranthene | 206-44-0 | µg/L | 0.11 | NCDENR | 0.1 U | 0.043 U | **0.084 J** | -- |
| | Fluorene | 86-73-7 | µg/L | 30 | NCDENR | 0.43 U | 0.18 U | 0.22 U | -- |
| | Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/L | 4.31 | Region 5 | 0.34 U | 0.14 U | 0.17 U | -- |
| | Naphthalene | 91-20-3 | µg/L | 12 | NCDENR | 0.12 U | 0.051 U | 0.061 U | -- |
| | Phenanthrene | 85-01-8 | µg/L | 0.7 | NCDENR | 0.22 U | 0.093 U | 1.1 U | -- |
| | Pyrene | 129-00-0 | µg/L | 0.025 | Region 3 | 0.19 U | 0.077 U | **0.096 J** | -- |

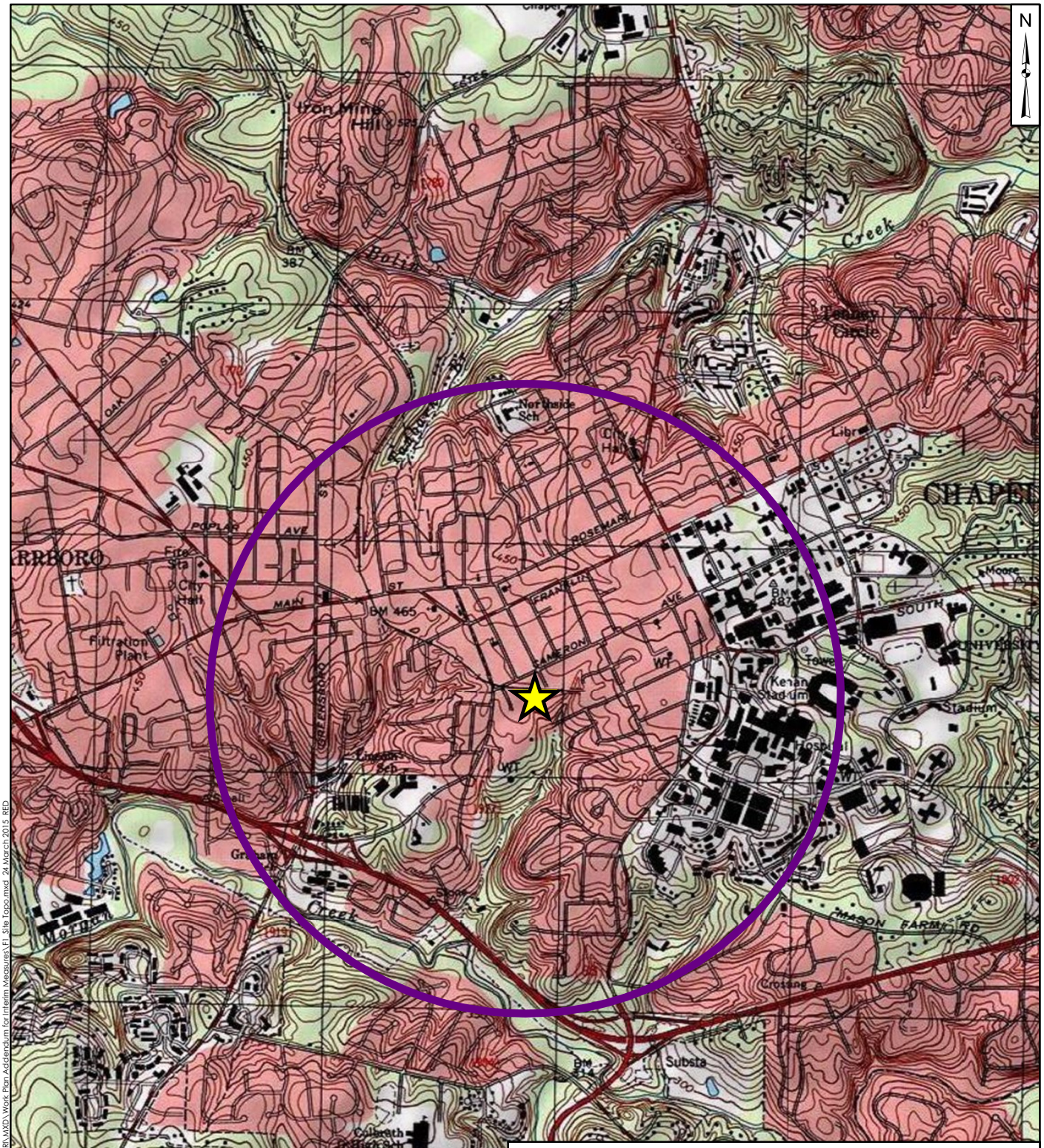
**Table 5 Notes**

1. The drainage channel does not support populations of aquatic-dependent receptors. However, as a point-of-departure for evaluating the need for further investigation/evaluation, surface water data from the channel were compared to risk-based benchmarks for the protection of aquatic receptors. Benchmarks were selected from the following sources, in the order in which they are listed (see Appendix C, Table 2):
   a. North Carolina - Standards (S) from the North Carolina Administrative Code (NCAC, 2007) or Criteria (C) from the Department of Environment and Natural Resources (NCDENR, 2013).
   b. AWQC - EPA Aquatic Life Water Quality Criteria, lower of chronic and acute values (EPA, 2015).
   c. Region 4 - EPA Region 4 freshwater sediment benchmarks, lower of chronic and acute values (EPA, 2001).
   d. OSWER - EPA Office of Solid Waste and Emergency Response, Ecotox Thresholds for Freshwater: (i) Ambient Water Quality Criterion or (ii) Tier II value (EPA, 1996)
   e. Region 3 - EPA Region 3 Biological Technical Assistance Group freshwater benchmarks (EPA, 2006).
   f. Region 5 - EPA Region 5 Ecological Screening Levels for surface water (EPA, 2003).
2. Analytical results are shown as follows:
   U indicates a non-detect result; the method detection limit is presented.
   J indicates an estimated result; "+" indicates the estimate is biased high
   Italicized text indicates a non-detect result for which one-half the detection limit exceeds the NCAC Standard
   Bold text indicates a detected result
   Yellow highlighting indicates a detected constituent exceeds the surface water benchmark
3. Dioxin/furan congeners were normalized to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) using toxic equivalency factors (TEFs) for fish. See Appendix C.

**Definitions**

µg/L = microgram per liter
PAH = polynuclear aromatic hydrocarbon
ND = non-detect
EPA = United States Environmental Protection Agency
"--" = value not available

# FIGURES




2,400 1,200 0 2,400 Feet

**Legend**

Site Location

1-Mile Radius

Source: 2013 National Geographic Society, i-cubed

**Site Location**

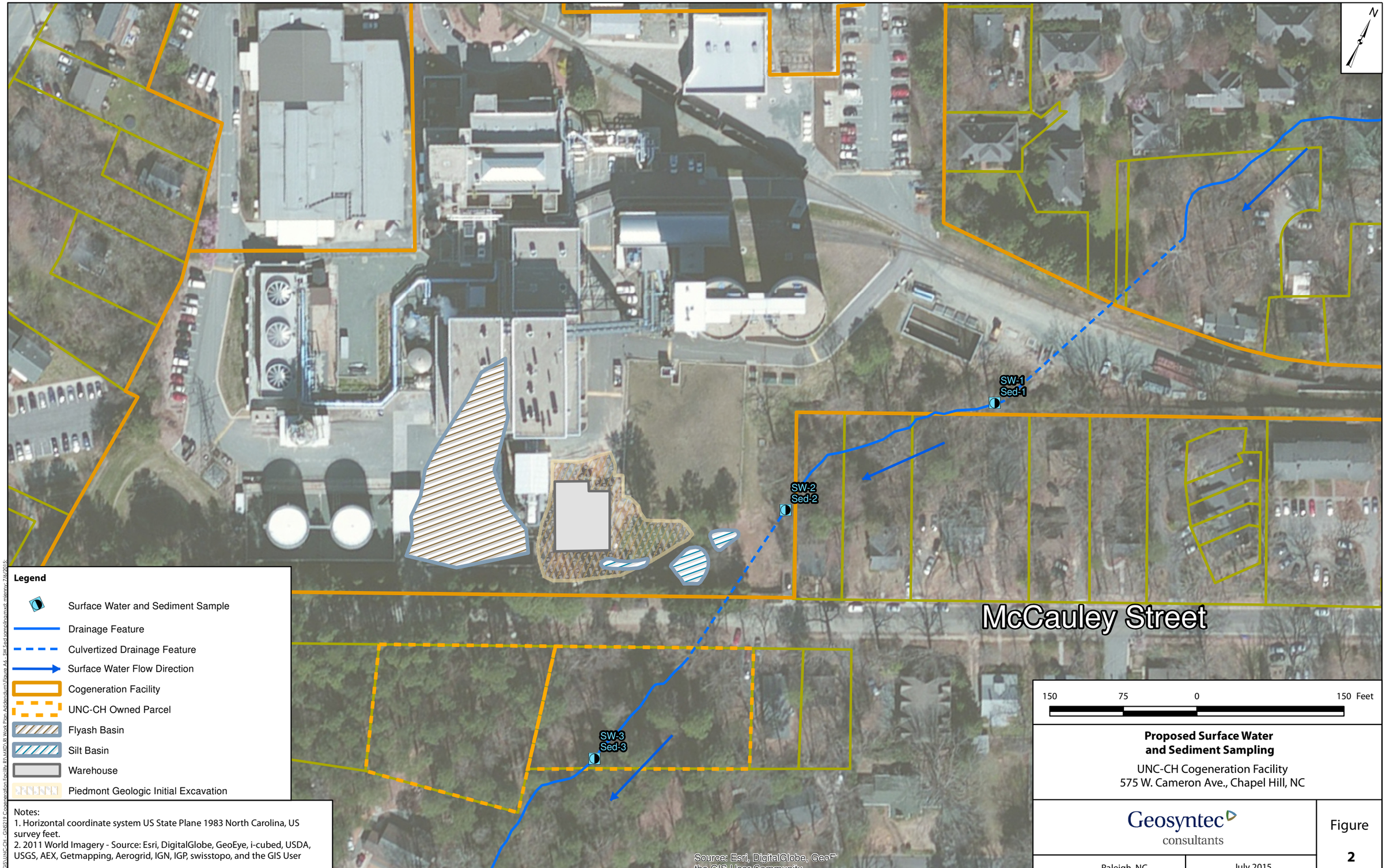
UNC-CH COGENERATION FACILITY
575 W. CAMERON AVE., CHAPEL HILL, NORTH CAROLINA

Geosyntec
Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | March 2015

Figure 1

Path: \\Raleigh-01\Data1 M:\GIS\UNC-CH - GN5219 Cogeneration Facility RI\MXD\ Work Plan Addendum for Interim Measures\ FI_Site Topo.mxd 24 March 2015 RED




Notes:
1. Horizontal coordinate system US State Plane 1983 North Carolina, US survey feet.
2. 2011 World Imagery - Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User

P:\GIS\UNC-CH_-GIS\219 Cogeneration Facility_RI\MXD\RI Work Plan Addendum\Figure A6 - SW-Sed sampling.mxd; mienrv; 7/6/2015;

**Proposed Surface Water and Sediment Sampling**

UNC-CH Cogeneration Facility
575 W. Cameron Ave., Chapel Hill, NC

Geosyntec consultants

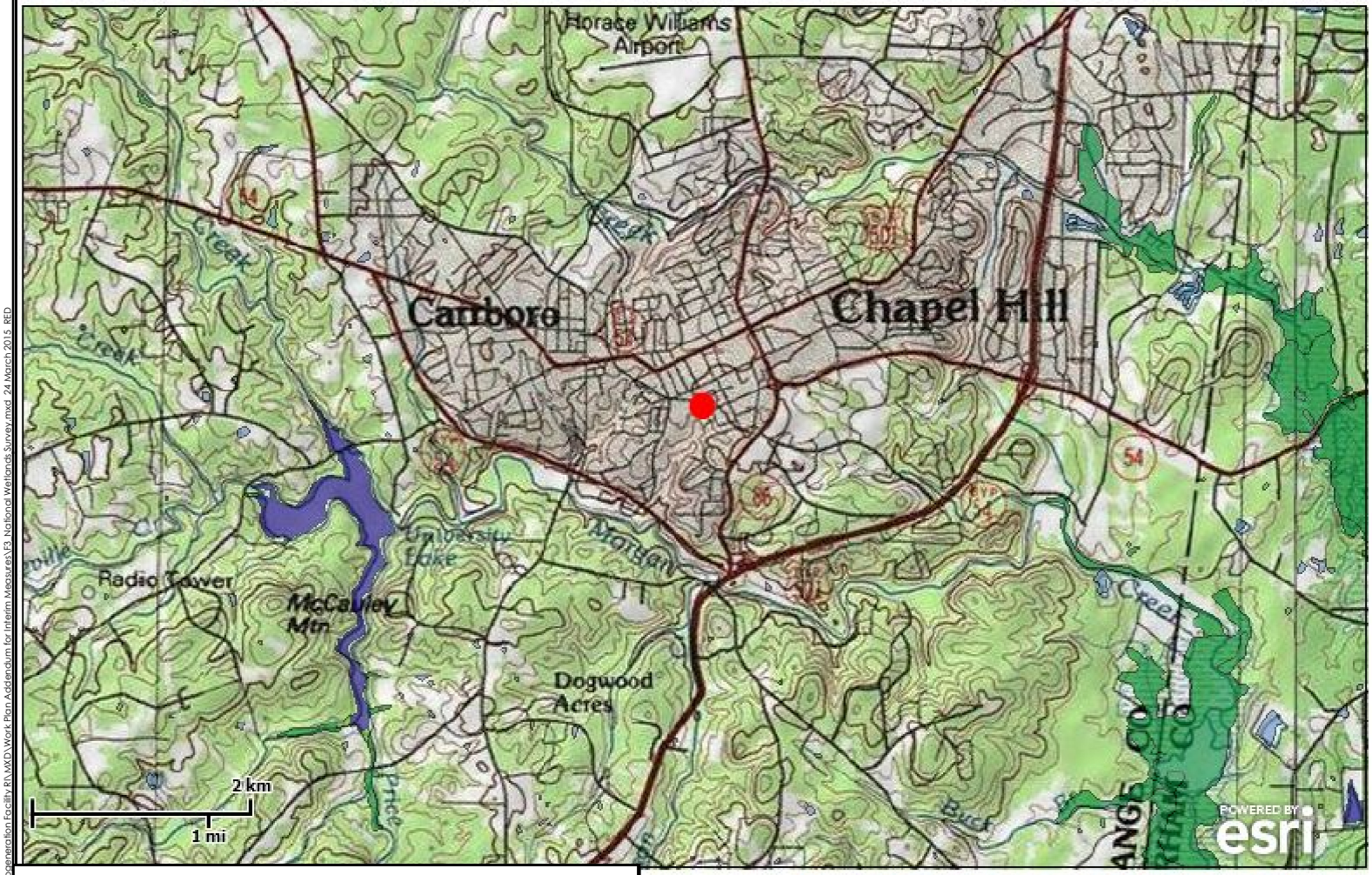
Raleigh, NC | July 2015

Figure 2

# U.S. Fish and Wildlife Service

# National Wetlands Inventory

Jan 30, 2015




## Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

**Site Location**

UNC-CH COGENERATION FACILITY
575 W. CAMERON AVE., CHAPEL HILL, NORTH CAROLINA

Geosyntec Consultants of NC, PC
NC License No.: C-3500

Raleigh, NC | March 2015

Figure 3

Path: //Raleigh01/Data1/M:\GIS\UNC-CH - GN9219 Cogeneration Facility RI\MXD\Work Plan Addendum for Interim Measures\F3 National Wetlands Survey.mxd 24 March 2015 RED

# APPENDIX A

# Laboratory Reports

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-59923-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*10/9/2015 12:59:36 PM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| E | Result exceeded calibration range. |
| F2 | MS/MSD RPD exceeds control limits |
| D | Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples. |
| * | LCS or LCSD is outside acceptance limits. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| U | Indicates the analyte was analyzed for but not detected. |
| B | Compound was found in the blank and sample. |
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| 4 | MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable. |
| F2 | MS/MSD RPD exceeds control limits |
| F1 | MS and/or MSD Recovery is outside acceptance limits. |
| ^ | ICV,CCV,ICB,CCB, ISA, ISB, CRI, CRA, DLCK or MRL standard: Instrument related QC is outside acceptance limits. |

### General Chemistry

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-59923-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-59923-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**RECEIPT**
The samples were received on 9/12/2014 9:55 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 5 coolers at receipt time were 0.3º C, 0.4º C, 1.2º C, 1.4º C and 1.9º C.

Except:

SED-2-091114 MS/MSD is requesting Moisture and pH analysis. As MS/MSD is not performed for these tests, pH and Moisture were only logged for the parent sample.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The samples were received at TA Knoxville on 9/16/2014 10:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.0º C and 0.2º C .

**8270D SIM GCMS - Solid**
Samples SED-3-091114 (280-59923-1), SED-2-091114 (280-59923-2), SED-1-091114 (280-59923-3) and SED-99-091114 (280-59923-4) were analyzed for 8270D SIM GCMS in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 09/19/2014 and analyzed on 09/30/2014 and 10/02/2014.

Several analytes failed the recovery criteria low for the MS of sample SED-2-091114MS (280-59923-2) in batch 280-245546. Several analytes failed the recovery criteria low for the MSD of sample SED-2-091114MSD (280-59923-2) in batch 280-245546. Benzo[b]fluoranthene, Benzo[k]fluoranthene and Fluoranthene exceeded the RPD limit. Refer to the QC report for details.

Due to target analyte concentration, sample SED-2-091114 (280-59923-2)[2X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

Due to extract viscosity and color, sample SED-2-091114 (280-59923-2)[2X] and SED-1-091114 (280-59923-3)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly. The latter sample was not run at a lesser dilution in order to protect the sensitivity of the instrumentation.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Job ID: 280-59923-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

**8270D SIM GCMS - Aqueous**

Samples SW-3-091114 (280-59923-5), SW-2-091114 (280-59923-6), SW-1-091114 (280-59923-7) and ER-091114 (280-59923-8) were analyzed for 8270D SIM GCMS in accordance with SW-846 8270D_SIM. The samples were prepared on 09/15/2014 and analyzed on 09/30/2014 and 10/02/2014.

Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenz(a,h)anthracene and Indeno[1,2,3-cd]pyrene failed the recovery criteria high for LCSD 280-243333/3-A. Refer to the QC report for details. These analytes were biased high in the LCSD and were not detected in the associated samples; therefore, the data have been reported.

Due to matrix interference, samples SW-3-091114 (280-59923-5)[10X], SW-2-091114 (280-59923-6)[10X], SW-1-091114 (280-59923-7) [20X] and ER-091114 (280-59923-8)[10X] required dilution prior to analysis. The reporting limits have been adjusted accordingly. The internal standards failed when analyzed less diluted.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP) - Solid**

Samples SED-3-091114 (280-59923-1), SED-2-091114 (280-59923-2), SED-1-091114 (280-59923-3) and SED-99-091114 (280-59923-4) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/16/2014 and analyzed on 09/19/2014, 09/22/2014 and 09/24/2014.

Barium and Manganese were detected in method blank MB 280-243230/1-A at levels that were above the method detection limit but below one half the reporting limit. The values should be considered estimates, and have been flagged. Refer to the QC report for details.

Method Blank MB 280-243230/1-A contained Iron above half the reporting limit (RL). Associated sample(s) were not re-extracted and/or re-analyzed because results were greater than 10X the value found in the Method Blank.

Iron and Aluminum failed the recovery criteria high for the MS of sample SED-2-091114MS (280-59923-2) in batch 280-244438. Iron, Manganese and Aluminum failed the recovery criteria high for the MSD of sample SED-2-091114MSD (280-59923-2) in batch 280-244438. Iron, Lead, Manganese and Aluminum exceeded the RPD limit. Refer to the QC report for details.

The continuing calibration verification (CCVL 280-244802/21) associated with batch 244802 recovered above the upper control limit for Sb. The samples associated with this CCVL were below one half the RL for the affected analytes; therefore, the data have been reported. Associated results are qualified ^.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP) - Aqueous**

Samples SW-3-091114 (280-59923-5), SW-2-091114 (280-59923-6), SW-1-091114 (280-59923-7) and ER-091114 (280-59923-8) were analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 09/15/2014 and analyzed on 09/16/2014.

The continuing calibration verification (CCVL 280-243610/95) associated with batch 243610 recovered above the upper control limit for As. The samples associated with this CCVL were below one half the RL for the affected analytes; therefore, the data have been reported. Associated results are qualified ^.

The Serial Dilution associated with batch 243266 was performed on sample SW-3-091114 (280-59923-5) and was outside control limits for Barium and Manganese. The Post Digestion Spike was in control.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL MERCURY - Aqueous**

Samples SW-3-091114 (280-59923-5), SW-2-091114 (280-59923-6), SW-1-091114 (280-59923-7) and ER-091114 (280-59923-8) were analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 09/17/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Job ID: 280-59923-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

**TOTAL MERCURY (CVAA) - Solid**
Samples SED-3-091114 (280-59923-1), SED-2-091114 (280-59923-2), SED-1-091114 (280-59923-3) and SED-99-091114 (280-59923-4) were analyzed for total mercury (CVAA) in accordance with EPA SW-846 Method 7471B. The samples were prepared and analyzed on 09/17/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**PH (CORROSIVITY)**
Samples SED-3-091114 (280-59923-1), SED-2-091114 (280-59923-2), SED-1-091114 (280-59923-3) and SED-99-091114 (280-59923-4) were analyzed for pH (corrosivity) in accordance with EPA SW-846 Method 9045D. The samples were leached on 09/15/2014 and analyzed on 09/15/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS) - Solid**
Samples SED-3-091114 (280-59923-1), SED-2-091114 (280-59923-2), SED-1-091114 (280-59923-3) and SED-99-091114 (280-59923-4) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were leached on 09/24/2014 and analyzed on 09/24/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**ANIONS (28 DAYS) - Aqueous**
Samples SW-3-091114 (280-59923-5), SW-2-091114 (280-59923-6) and SW-1-091114 (280-59923-7) were analyzed for anions (28 days) in accordance with EPA SW-846 Method 9056A. The samples were analyzed on 09/23/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**PERCENT SOLIDS**
Samples SED-3-091114 (280-59923-1), SED-2-091114 (280-59923-2), SED-1-091114 (280-59923-3) and SED-99-091114 (280-59923-4) were analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 09/13/2014.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Client Sample ID: SED-3-091114 — Lab Sample ID: 280-59923-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 4300 | J | 6200 | 320 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 4100 | J | 6200 | 380 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 4200 | J | 6200 | 210 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 4300 | J | 6200 | 890 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 17000 | | 6200 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 17000 | | 6200 | 910 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 21000 | | 6200 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 10000 | | 6200 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 7600 | | 6200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 22000 | | 6200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 2500 | J | 6200 | 1600 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 39000 | | 6200 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 3600 | J | 6200 | 580 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 11000 | | 6200 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 4200 | J | 6200 | 400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 36000 | | 6200 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 38000 | | 6200 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 2400 | | 12 | 1.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.4 | J | 2.4 | 0.79 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 100 | B | 1.2 | 0.091 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.15 | J | 0.60 | 0.040 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.052 | J | 0.60 | 0.049 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 8.0 | | 1.8 | 0.070 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 7.0 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 6.0 | | 2.4 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 4400 | B | 18 | 4.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 14 | | 0.96 | 0.32 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 590 | B | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.6 | J | 4.8 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Selenium | 1.3 | J | 1.6 | 1.0 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 8.5 | | 2.4 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 23 | | 3.6 | 0.48 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| pH adj. to 25 deg C | 7.11 | | 0.100 | 0.100 | SU | 1 | | 9045D | Soluble |
| Temperature | 23.2 | | 1.00 | 1.00 | Degrees C | 1 | | 9045D | Soluble |
| Chloride | 6.7 | J | 36 | 2.4 | mg/Kg | 1 | ☼ | 9056A | Soluble |
| Sulfate | 13 | J | 60 | 2.1 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SED-2-091114 — Lab Sample ID: 280-59923-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 17000 | | 7100 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 18000 | | 7100 | 440 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 18000 | | 7100 | 230 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 21000 | | 7100 | 240 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 53000 | | 7100 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 190000 | | 7100 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 220000 | | 7100 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 140000 | | 7100 | 1600 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 92000 | | 7100 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 220000 | | 7100 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

## Client Sample ID: SED-2-091114 (Continued) — Lab Sample ID: 280-59923-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Dibenz(a,h)anthracene | 41000 | | 7100 | 1900 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 22000 | | 7100 | 670 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 170000 | | 7100 | 1600 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 17000 | | 7100 | 460 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 220000 | | 7100 | 1600 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene - DL | 260000 | | 14000 | 3400 | ng/Kg | 2 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene - DL | 330000 | | 14000 | 2900 | ng/Kg | 2 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 290000 | | 14000 | 3100 | ng/Kg | 2 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 3500 | | 15 | 2.3 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Arsenic | 1.3 | J | 3.0 | 0.99 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 39 | B | 1.5 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Beryllium | 0.11 | J | 0.75 | 0.049 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.085 | J | 0.75 | 0.061 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 6.6 | | 2.2 | 0.087 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 3.1 | | 1.5 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 8.9 | | 3.0 | 0.32 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 6300 | B | 22 | 5.7 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 14 | | 1.2 | 0.40 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 210 | B | 1.5 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 3.7 | J | 6.0 | 0.18 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 10 | | 3.0 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 45 | | 4.5 | 0.59 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Mercury | 9.7 | J | 23 | 7.5 | ug/Kg | 1 | ☼ | 7471B | Total/NA |
| pH adj. to 25 deg C | 6.97 | | 0.100 | 0.100 | SU | 1 | | 9045D | Soluble |
| Temperature | 23.1 | | 1.00 | 1.00 | Degrees C | 1 | | 9045D | Soluble |
| Chloride | 12 | J | 44 | 2.9 | mg/Kg | 1 | ☼ | 9056A | Soluble |
| Sulfate | 9.7 | J | 73 | 2.5 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SED-1-091114 — Lab Sample ID: 280-59923-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 54000 | J | 58000 | 3000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 34000 | J | 58000 | 3600 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 33000 | J | 58000 | 1900 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 62000 | | 58000 | 2000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 68000 | | 58000 | 8400 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 220000 | | 58000 | 10000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 210000 | | 58000 | 8600 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 230000 | | 58000 | 14000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 140000 | | 58000 | 13000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 64000 | | 58000 | 12000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 280000 | | 58000 | 12000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 33000 | J | 58000 | 15000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 430000 | | 58000 | 12000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 62000 | | 58000 | 5500 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 130000 | | 58000 | 13000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 21000 | J | 58000 | 3800 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 580000 | | 58000 | 13000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 540000 | | 58000 | 13000 | ng/Kg | 10 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 3800 | | 12 | 1.8 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Client Sample ID: SED-1-091114 (Continued) — Lab Sample ID: 280-59923-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.4 | J | 2.3 | 0.77 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 13 | B | 1.2 | 0.088 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 3.5 | | 1.7 | 0.067 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 2.9 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 5.0 | | 2.3 | 0.25 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 6700 | B | 17 | 4.4 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 9.1 | | 0.93 | 0.31 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 200 | B | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.9 | J | 4.7 | 0.14 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 12 | | 2.3 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Zinc | 27 | | 3.5 | 0.46 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| pH adj. to 25 deg C | 6.87 | | 0.100 | 0.100 | SU | 1 | | 9045D | Soluble |
| Temperature | 23.3 | | 1.00 | 1.00 | Degrees C | 1 | | 9045D | Soluble |
| Chloride | 6.2 | J | 36 | 2.4 | mg/Kg | 1 | ☼ | 9056A | Soluble |
| Sulfate | 11 | J | 59 | 2.0 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SED-99-091114 — Lab Sample ID: 280-59923-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 4000 | J | 5800 | 300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 3700 | J | 5800 | 360 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 2100 | J | 5800 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 8000 | | 5800 | 200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 6900 | | 5800 | 830 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 27000 | | 5800 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 28000 | | 5800 | 850 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 33000 | | 5800 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 18000 | | 5800 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 12000 | | 5800 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 34000 | | 5800 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 4700 | J | 5800 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene | 59000 | | 5800 | 1200 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 4200 | J | 5800 | 540 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 19000 | | 5800 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 3100 | J | 5800 | 380 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene | 46000 | | 5800 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Pyrene | 60000 | | 5800 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Aluminum | 3000 | | 12 | 1.9 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Antimony | 0.73 | J ^ | 1.8 | 0.46 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Barium | 15 | B | 1.2 | 0.092 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cadmium | 0.072 | J | 0.61 | 0.050 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Chromium | 3.1 | | 1.8 | 0.071 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Cobalt | 2.4 | | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Copper | 4.3 | | 2.4 | 0.26 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Iron | 5300 | B | 18 | 4.6 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Lead | 7.0 | | 0.97 | 0.33 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Manganese | 140 | B | 1.2 | 0.12 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Nickel | 2.5 | J | 4.9 | 0.15 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Silver | 0.20 | J | 1.2 | 0.19 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| Vanadium | 6.5 | | 2.4 | 0.11 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Client Sample ID: SED-99-091114 (Continued) — Lab Sample ID: 280-59923-4

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Zinc | 23 | | 3.7 | 0.48 | mg/Kg | 1 | ☼ | 6010C | Total/NA |
| pH adj. to 25 deg C | 7.22 | | 0.100 | 0.100 | SU | 1 | | 9045D | Soluble |
| Temperature | 23.4 | | 1.00 | 1.00 | Degrees C | 1 | | 9045D | Soluble |
| Chloride | 6.6 | J | 35 | 2.3 | mg/Kg | 1 | ☼ | 9056A | Soluble |
| Sulfate | 14 | J | 58 | 2.0 | mg/Kg | 1 | ☼ | 9056A | Soluble |

## Client Sample ID: SW-3-091114 — Lab Sample ID: 280-59923-5

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | 84 | J | 1100 | 52 | ng/L | 10 | | 8270D SIM | Total/NA |
| Phenanthrene | 120 | J | 1100 | 110 | ng/L | 10 | | 8270D SIM | Total/NA |
| Pyrene | 96 | J | 1100 | 93 | ng/L | 10 | | 8270D SIM | Total/NA |
| Aluminum | 140 | | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 18000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 5300 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Arsenic | 4.8 | J ^ | 15 | 4.4 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2900 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 59 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 20000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 0.88 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 2.6 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 210 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 13 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 10 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Vanadium | 1.5 | J | 10 | 1.1 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 49 | | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |

## Client Sample ID: SW-2-091114 — Lab Sample ID: 280-59923-6

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 37 | J | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 17000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 5500 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 2900 | J | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 63 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 16000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 1.9 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 270 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 53 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Selenium | 5.0 | J | 15 | 4.9 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 9.0 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 38 | | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |

## Client Sample ID: SW-1-091114 — Lab Sample ID: 280-59923-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 20 | J | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Calcium | 18000 | | 200 | 35 | ug/L | 1 | | 6010C | Total/NA |
| Magnesium | 5600 | | 200 | 11 | ug/L | 1 | | 6010C | Total/NA |
| Potassium | 3600 | | 3000 | 240 | ug/L | 1 | | 6010C | Total/NA |

This Detection Summary does not include radiochemical test results.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Client Sample ID: SW-1-091114 (Continued) — Lab Sample ID: 280-59923-7

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Barium | 61 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Sodium | 15000 | | 1000 | 92 | ug/L | 1 | | 6010C | Total/NA |
| Copper | 1.9 | J | 15 | 1.4 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 390 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 56 | | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 7.5 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |
| Sulfate | 28 | | 5.0 | 0.23 | mg/L | 1 | | 9056A | Total/NA |

## Client Sample ID: ER-091114 — Lab Sample ID: 280-59923-8

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Fluorene | 290 | J | 950 | 180 | ng/L | 10 | | 8270D SIM | Total/NA |
| Naphthalene | 230 | J | 950 | 51 | ng/L | 10 | | 8270D SIM | Total/NA |
| Phenanthrene | 150 | J | 950 | 93 | ng/L | 10 | | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| 7471B | Mercury (CVAA) | SW846 | TAL DEN |
| 9045D | pH | SW846 | TAL DEN |
| 9056A | Anions, Ion Chromatography | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Solid | 09/11/14 10:30 | 09/12/14 09:55 |
| 280-59923-2 | SED-2-091114 | Solid | 09/11/14 12:00 | 09/12/14 09:55 |
| 280-59923-3 | SED-1-091114 | Solid | 09/11/14 12:20 | 09/12/14 09:55 |
| 280-59923-4 | SED-99-091114 | Solid | 09/11/14 17:00 | 09/12/14 09:55 |
| 280-59923-5 | SW-3-091114 | Water | 09/11/14 09:45 | 09/12/14 09:55 |
| 280-59923-6 | SW-2-091114 | Water | 09/11/14 11:30 | 09/12/14 09:55 |
| 280-59923-7 | SW-1-091114 | Water | 09/11/14 12:15 | 09/12/14 09:55 |
| 280-59923-8 | ER-091114 | Water | 09/11/14 14:15 | 09/12/14 09:55 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SED-3-091114**
**Date Collected: 09/11/14 10:30**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-1**
**Matrix: Solid**
**Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 4300 | J | 6200 | 320 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| 2-Methylnaphthalene | 4100 | J | 6200 | 380 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Acenaphthene | 200 | U | 6200 | 200 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Acenaphthylene | 4200 | J | 6200 | 210 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Anthracene | 4300 | J | 6200 | 890 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Benzo[a]anthracene | 17000 | | 6200 | 1100 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Benzo[a]pyrene | 17000 | | 6200 | 910 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Benzo[b]fluoranthene | 21000 | | 6200 | 1500 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Benzo[g,h,i]perylene | 10000 | | 6200 | 1400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Benzo[k]fluoranthene | 7600 | | 6200 | 1200 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Chrysene | 22000 | | 6200 | 1200 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Dibenz(a,h)anthracene | 2500 | J | 6200 | 1600 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Fluoranthene | 39000 | | 6200 | 1200 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Fluorene | 3600 | J | 6200 | 580 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Indeno[1,2,3-cd]pyrene | 11000 | | 6200 | 1400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Naphthalene | 4200 | J | 6200 | 400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Phenanthrene | 36000 | | 6200 | 1400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |
| Pyrene | 38000 | | 6200 | 1400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:22 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *78* | | *39 - 120* | *09/19/14 12:30* | *09/30/14 19:22* | *1* |
| *Nitrobenzene-d5* | *81* | | *42 - 120* | *09/19/14 12:30* | *09/30/14 19:22* | *1* |
| *Terphenyl-d14* | *75* | | *35 - 124* | *09/19/14 12:30* | *09/30/14 19:22* | *1* |

**Client Sample ID: SED-2-091114**
**Date Collected: 09/11/14 12:00**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-2**
**Matrix: Solid**
**Percent Solids: 67.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 17000 | | 7100 | 370 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| 2-Methylnaphthalene | 18000 | | 7100 | 440 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Acenaphthene | 18000 | | 7100 | 230 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Acenaphthylene | 21000 | | 7100 | 240 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Anthracene | 53000 | | 7100 | 1000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Benzo[a]anthracene | 190000 | | 7100 | 1300 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Benzo[a]pyrene | 220000 | | 7100 | 1100 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Benzo[g,h,i]perylene | 140000 | | 7100 | 1600 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Benzo[k]fluoranthene | 92000 | | 7100 | 1400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Chrysene | 220000 | | 7100 | 1400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Dibenz(a,h)anthracene | 41000 | | 7100 | 1900 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Fluorene | 22000 | | 7100 | 670 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Indeno[1,2,3-cd]pyrene | 170000 | | 7100 | 1600 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Naphthalene | 17000 | | 7100 | 460 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |
| Phenanthrene | 220000 | | 7100 | 1600 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 19:50 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *60* | | *39 - 120* | *09/19/14 12:30* | *09/30/14 19:50* | *1* |
| *Nitrobenzene-d5* | *89* | | *42 - 120* | *09/19/14 12:30* | *09/30/14 19:50* | *1* |
| *Terphenyl-d14* | *48* | | *35 - 124* | *09/19/14 12:30* | *09/30/14 19:50* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SED-1-091114** — **Lab Sample ID: 280-59923-3**
**Date Collected: 09/11/14 12:20** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 81.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 54000 | J | 58000 | 3000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| 2-Methylnaphthalene | 34000 | J | 58000 | 3600 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Acenaphthene | 33000 | J | 58000 | 1900 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Acenaphthylene | 62000 | | 58000 | 2000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Anthracene | 68000 | | 58000 | 8400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Benzo[a]anthracene | 220000 | | 58000 | 10000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Benzo[a]pyrene | 210000 | | 58000 | 8600 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Benzo[b]fluoranthene | 230000 | | 58000 | 14000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Benzo[g,h,i]perylene | 140000 | | 58000 | 13000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Benzo[k]fluoranthene | 64000 | | 58000 | 12000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Chrysene | 280000 | | 58000 | 12000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Dibenz(a,h)anthracene | 33000 | J | 58000 | 15000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Fluoranthene | 430000 | | 58000 | 12000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Fluorene | 62000 | | 58000 | 5500 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Indeno[1,2,3-cd]pyrene | 130000 | | 58000 | 13000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Naphthalene | 21000 | J | 58000 | 3800 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Phenanthrene | 580000 | | 58000 | 13000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |
| Pyrene | 540000 | | 58000 | 13000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:13 | 10 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *74* | *D* | *39 - 120* | *09/19/14 12:30* | *09/30/14 21:13* | *10* |
| *Nitrobenzene-d5* | *82* | *D* | *42 - 120* | *09/19/14 12:30* | *09/30/14 21:13* | *10* |
| *Terphenyl-d14* | *84* | *D* | *35 - 124* | *09/19/14 12:30* | *09/30/14 21:13* | *10* |

**Client Sample ID: SED-99-091114** — **Lab Sample ID: 280-59923-4**
**Date Collected: 09/11/14 17:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 4000 | J | 5800 | 300 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| 2-Methylnaphthalene | 3700 | J | 5800 | 360 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Acenaphthene | 2100 | J | 5800 | 180 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Acenaphthylene | 8000 | | 5800 | 200 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Anthracene | 6900 | | 5800 | 830 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Benzo[a]anthracene | 27000 | | 5800 | 1000 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Benzo[a]pyrene | 28000 | | 5800 | 850 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Benzo[b]fluoranthene | 33000 | | 5800 | 1400 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Benzo[g,h,i]perylene | 18000 | | 5800 | 1300 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Benzo[k]fluoranthene | 12000 | | 5800 | 1200 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Chrysene | 34000 | | 5800 | 1200 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Dibenz(a,h)anthracene | 4700 | J | 5800 | 1500 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Fluoranthene | 59000 | | 5800 | 1200 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Fluorene | 4200 | J | 5800 | 540 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Indeno[1,2,3-cd]pyrene | 19000 | | 5800 | 1300 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Naphthalene | 3100 | J | 5800 | 380 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Phenanthrene | 46000 | | 5800 | 1300 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |
| Pyrene | 60000 | | 5800 | 1300 | ng/Kg | ☼ | 09/19/14 12:30 | 09/30/14 21:41 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | | *39 - 120* | *09/19/14 12:30* | *09/30/14 21:41* | *1* |
| *Nitrobenzene-d5* | *89* | | *42 - 120* | *09/19/14 12:30* | *09/30/14 21:41* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SED-99-091114**
**Date Collected: 09/11/14 17:00**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-4**
**Matrix: Solid**
**Percent Solids: 82.2**

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *Terphenyl-d14* | *81* | | *35 - 124* | *09/19/14 12:30* | *09/30/14 21:41* | *1* |

**Client Sample ID: SW-3-091114**
**Date Collected: 09/11/14 09:45**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-5**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 65 | U | 1100 | 65 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| 2-Methylnaphthalene | 59 | U | 1100 | 59 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Acenaphthene | 120 | U | 1100 | 120 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Acenaphthylene | 110 | U | 1100 | 110 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Anthracene | 160 | U | 1100 | 160 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Benzo[a]anthracene | 37 | U | 1100 | 37 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Benzo[a]pyrene | 59 | U | 1100 | 59 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Benzo[b]fluoranthene | 40 | U | 1100 | 40 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Benzo[g,h,i]perylene | 41 | U * | 1100 | 41 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Benzo[k]fluoranthene | 58 | U * | 1100 | 58 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Chrysene | 37 | U * | 1100 | 37 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Dibenz(a,h)anthracene | 55 | U * | 1100 | 55 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| **Fluoranthene** | **84** | **J** | 1100 | 52 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Fluorene | 220 | U | 1100 | 220 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Indeno[1,2,3-cd]pyrene | 170 | U * | 1100 | 170 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| Naphthalene | 61 | U | 1100 | 61 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| **Phenanthrene** | **120** | **J** | 1100 | 110 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |
| **Pyrene** | **96** | **J** | 1100 | 93 | ng/L | | 09/15/14 17:16 | 09/30/14 15:19 | 10 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *67* | *D* | *42 - 120* | *09/15/14 17:16* | *09/30/14 15:19* | *10* |
| *Nitrobenzene-d5* | *60* | *D* | *43 - 120* | *09/15/14 17:16* | *09/30/14 15:19* | *10* |
| *Terphenyl-d14* | *61* | *D* | *47 - 120* | *09/15/14 17:16* | *09/30/14 15:19* | *10* |

**Client Sample ID: SW-2-091114**
**Date Collected: 09/11/14 11:30**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-6**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 54 | U | 960 | 54 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| 2-Methylnaphthalene | 49 | U | 960 | 49 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Acenaphthene | 100 | U | 960 | 100 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Acenaphthylene | 95 | U | 960 | 95 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Anthracene | 140 | U | 960 | 140 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Benzo[a]anthracene | 31 | U | 960 | 31 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Benzo[a]pyrene | 49 | U | 960 | 49 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Benzo[b]fluoranthene | 33 | U | 960 | 33 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Benzo[g,h,i]perylene | 34 | U * | 960 | 34 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Benzo[k]fluoranthene | 48 | U * | 960 | 48 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Chrysene | 30 | U * | 960 | 30 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Dibenz(a,h)anthracene | 46 | U * | 960 | 46 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Fluoranthene | 43 | U | 960 | 43 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Fluorene | 180 | U | 960 | 180 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Indeno[1,2,3-cd]pyrene | 140 | U * | 960 | 140 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Naphthalene | 51 | U | 960 | 51 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: SW-2-091114** — **Lab Sample ID: 280-59923-6**
**Date Collected: 09/11/14 11:30** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Phenanthrene | 93 | U | 960 | 93 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |
| Pyrene | 77 | U | 960 | 77 | ng/L | | 09/15/14 17:16 | 09/30/14 15:47 | 10 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *70* | *D* | *42 - 120* | *09/15/14 17:16* | *09/30/14 15:47* | *10* |
| *Nitrobenzene-d5* | *58* | *D* | *43 - 120* | *09/15/14 17:16* | *09/30/14 15:47* | *10* |
| *Terphenyl-d14* | *58* | *D* | *47 - 120* | *09/15/14 17:16* | *09/30/14 15:47* | *10* |

**Client Sample ID: SW-1-091114** — **Lab Sample ID: 280-59923-7**
**Date Collected: 09/11/14 12:15** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 130 | U | 2300 | 130 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| 2-Methylnaphthalene | 120 | U | 2300 | 120 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Acenaphthene | 250 | U | 2300 | 250 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Acenaphthylene | 230 | U | 2300 | 230 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Anthracene | 330 | U | 2300 | 330 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Benzo[a]anthracene | 74 | U | 2300 | 74 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Benzo[a]pyrene | 120 | U | 2300 | 120 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Benzo[b]fluoranthene | 79 | U | 2300 | 79 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Benzo[g,h,i]perylene | 82 | U * | 2300 | 82 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Benzo[k]fluoranthene | 120 | U * | 2300 | 120 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Chrysene | 73 | U * | 2300 | 73 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Dibenz(a,h)anthracene | 110 | U * | 2300 | 110 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Fluoranthene | 100 | U | 2300 | 100 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Fluorene | 430 | U | 2300 | 430 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Indeno[1,2,3-cd]pyrene | 340 | U * | 2300 | 340 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Naphthalene | 120 | U | 2300 | 120 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Phenanthrene | 220 | U | 2300 | 220 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |
| Pyrene | 190 | U | 2300 | 190 | ng/L | | 09/15/14 17:16 | 10/02/14 12:41 | 20 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *81* | *D* | *42 - 120* | *09/15/14 17:16* | *10/02/14 12:41* | *20* |
| *Nitrobenzene-d5* | *80* | *D* | *43 - 120* | *09/15/14 17:16* | *10/02/14 12:41* | *20* |
| *Terphenyl-d14* | *82* | *D* | *47 - 120* | *09/15/14 17:16* | *10/02/14 12:41* | *20* |

**Client Sample ID: ER-091114** — **Lab Sample ID: 280-59923-8**
**Date Collected: 09/11/14 14:15** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 54 | U | 950 | 54 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| 2-Methylnaphthalene | 49 | U | 950 | 49 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Acenaphthene | 100 | U | 950 | 100 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Acenaphthylene | 95 | U | 950 | 95 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Anthracene | 130 | U | 950 | 130 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Benzo[a]anthracene | 30 | U | 950 | 30 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Benzo[a]pyrene | 49 | U | 950 | 49 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Benzo[b]fluoranthene | 33 | U | 950 | 33 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Benzo[g,h,i]perylene | 34 | U * | 950 | 34 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Benzo[k]fluoranthene | 48 | U * | 950 | 48 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Client Sample ID: ER-091114** — **Lab Sample ID: 280-59923-8**
**Date Collected: 09/11/14 14:15** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chrysene | 30 | U * | 950 | 30 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Dibenz(a,h)anthracene | 46 | U * | 950 | 46 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Fluoranthene | 43 | U | 950 | 43 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| **Fluorene** | **290** | **J** | 950 | 180 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Indeno[1,2,3-cd]pyrene | 140 | U * | 950 | 140 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| **Naphthalene** | **230** | **J** | 950 | 51 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| **Phenanthrene** | **150** | **J** | 950 | 93 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |
| Pyrene | 77 | U | 950 | 77 | ng/L | | 09/15/14 17:16 | 09/30/14 16:42 | 10 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *74* | *D* | *42 - 120* | *09/15/14 17:16* | *09/30/14 16:42* | *10* |
| *Nitrobenzene-d5* | *70* | *D* | *43 - 120* | *09/15/14 17:16* | *09/30/14 16:42* | *10* |
| *Terphenyl-d14* | *56* | *D* | *47 - 120* | *09/15/14 17:16* | *09/30/14 16:42* | *10* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

**Client Sample ID: SED-2-091114** — **Lab Sample ID: 280-59923-2**
**Date Collected: 09/11/14 12:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 67.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Benzo[b]fluoranthene** | **260000** | | 14000 | 3400 | ng/Kg | ☼ | 09/19/14 12:30 | 10/02/14 13:09 | 2 |
| **Fluoranthene** | **330000** | | 14000 | 2900 | ng/Kg | ☼ | 09/19/14 12:30 | 10/02/14 13:09 | 2 |
| **Pyrene** | **290000** | | 14000 | 3100 | ng/Kg | ☼ | 09/19/14 12:30 | 10/02/14 13:09 | 2 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *58* | | *39 - 120* | *09/19/14 12:30* | *10/02/14 13:09* | *2* |
| *Nitrobenzene-d5* | *87* | | *42 - 120* | *09/19/14 12:30* | *10/02/14 13:09* | *2* |
| *Terphenyl-d14* | *40* | | *35 - 124* | *09/19/14 12:30* | *10/02/14 13:09* | *2* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: SED-3-091114** — **Lab Sample ID: 280-59923-1**
**Date Collected: 09/11/14 10:30** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **2400** | | 12 | 1.9 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:54 | 1 |
| Antimony | 0.46 | U | 1.8 | 0.46 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:54 | 1 |
| **Arsenic** | **1.4** | **J** | 2.4 | 0.79 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:54 | 1 |
| **Barium** | **100** | **B** | 1.2 | 0.091 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Beryllium** | **0.15** | **J** | 0.60 | 0.040 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Cadmium** | **0.052** | **J** | 0.60 | 0.049 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Chromium** | **8.0** | | 1.8 | 0.070 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Cobalt** | **7.0** | | 1.2 | 0.12 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Copper** | **6.0** | | 2.4 | 0.26 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:54 | 1 |
| **Iron** | **4400** | **B** | 18 | 4.6 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Lead** | **14** | | 0.96 | 0.32 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Manganese** | **590** | **B** | 1.2 | 0.12 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Nickel** | **2.6** | **J** | 4.8 | 0.15 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Selenium** | **1.3** | **J** | 1.6 | 1.0 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| Silver | 0.19 | U | 1.2 | 0.19 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SED-3-091114** — **Lab Sample ID: 280-59923-1**
**Date Collected: 09/11/14 10:30** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Thallium | 0.78 | U | 1.4 | 0.78 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |
| **Vanadium** | **8.5** | | 2.4 | 0.11 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:54 | 1 |
| **Zinc** | **23** | | 3.6 | 0.48 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:40 | 1 |

**Client Sample ID: SED-2-091114** — **Lab Sample ID: 280-59923-2**
**Date Collected: 09/11/14 12:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 67.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **3500** | | 15 | 2.3 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:57 | 1 |
| Antimony | 0.57 | U | 2.2 | 0.57 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:57 | 1 |
| **Arsenic** | **1.3** | **J** | 3.0 | 0.99 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:57 | 1 |
| **Barium** | **39** | **B** | 1.5 | 0.11 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Beryllium** | **0.11** | **J** | 0.75 | 0.049 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Cadmium** | **0.085** | **J** | 0.75 | 0.061 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Chromium** | **6.6** | | 2.2 | 0.087 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Cobalt** | **3.1** | | 1.5 | 0.15 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Copper** | **8.9** | | 3.0 | 0.32 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:57 | 1 |
| **Iron** | **6300** | **B** | 22 | 5.7 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Lead** | **14** | | 1.2 | 0.40 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Manganese** | **210** | **B** | 1.5 | 0.15 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Nickel** | **3.7** | **J** | 6.0 | 0.18 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| Selenium | 1.3 | U | 1.9 | 1.3 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| Silver | 0.24 | U | 1.5 | 0.24 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| Thallium | 0.97 | U | 1.8 | 0.97 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |
| **Vanadium** | **10** | | 3.0 | 0.14 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 14:57 | 1 |
| **Zinc** | **45** | | 4.5 | 0.59 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:42 | 1 |

**Client Sample ID: SED-1-091114** — **Lab Sample ID: 280-59923-3**
**Date Collected: 09/11/14 12:20** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 81.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **3800** | | 12 | 1.8 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 15:09 | 1 |
| Antimony | 0.44 | U | 1.7 | 0.44 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 15:09 | 1 |
| **Arsenic** | **1.4** | **J** | 2.3 | 0.77 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 15:09 | 1 |
| **Barium** | **13** | **B** | 1.2 | 0.088 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| Beryllium | 0.038 | U | 0.58 | 0.038 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| Cadmium | 0.048 | U | 0.58 | 0.048 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| **Chromium** | **3.5** | | 1.7 | 0.067 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| **Cobalt** | **2.9** | | 1.2 | 0.12 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| **Copper** | **5.0** | | 2.3 | 0.25 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 15:09 | 1 |
| **Iron** | **6700** | **B** | 17 | 4.4 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| **Lead** | **9.1** | | 0.93 | 0.31 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| **Manganese** | **200** | **B** | 1.2 | 0.12 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| **Nickel** | **2.9** | **J** | 4.7 | 0.14 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| Selenium | 1.0 | U | 1.5 | 1.0 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| Silver | 0.19 | U | 1.2 | 0.19 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| Thallium | 0.76 | U | 1.4 | 0.76 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |
| **Vanadium** | **12** | | 2.3 | 0.11 | mg/Kg | ☼ | 09/16/14 14:30 | 09/22/14 15:09 | 1 |
| **Zinc** | **27** | | 3.5 | 0.46 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:55 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Method: 6010C - Metals (ICP)

**Client Sample ID: SED-99-091114**
**Date Collected: 09/11/14 17:00**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-4**
**Matrix: Solid**
**Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 3000 | | 12 | 1.9 | mg/Kg | ☼ | 09/16/14 14:30 | 09/24/14 13:40 | 1 |
| Antimony | 0.73 | J ^ | 1.8 | 0.46 | mg/Kg | ☼ | 09/16/14 14:30 | 09/24/14 13:40 | 1 |
| Arsenic | 0.80 | U | 2.4 | 0.80 | mg/Kg | ☼ | 09/16/14 14:30 | 09/24/14 13:40 | 1 |
| Barium | 15 | B | 1.2 | 0.092 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Beryllium | 0.040 | U | 0.61 | 0.040 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Cadmium | 0.072 | J | 0.61 | 0.050 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Chromium | 3.1 | | 1.8 | 0.071 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Cobalt | 2.4 | | 1.2 | 0.12 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Copper | 4.3 | | 2.4 | 0.26 | mg/Kg | ☼ | 09/16/14 14:30 | 09/24/14 13:40 | 1 |
| Iron | 5300 | B | 18 | 4.6 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Lead | 7.0 | | 0.97 | 0.33 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Manganese | 140 | B | 1.2 | 0.12 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Nickel | 2.5 | J | 4.9 | 0.15 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Selenium | 1.0 | U | 1.6 | 1.0 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Silver | 0.20 | J | 1.2 | 0.19 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Thallium | 0.79 | U | 1.5 | 0.79 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |
| Vanadium | 6.5 | | 2.4 | 0.11 | mg/Kg | ☼ | 09/16/14 14:30 | 09/24/14 13:40 | 1 |
| Zinc | 23 | | 3.7 | 0.48 | mg/Kg | ☼ | 09/16/14 14:30 | 09/19/14 15:57 | 1 |

**Client Sample ID: SW-3-091114**
**Date Collected: 09/11/14 09:45**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-5**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 140 | | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Calcium | 18000 | | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Magnesium | 5300 | | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Arsenic | 4.8 | J ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Potassium | 2900 | J | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Barium | 59 | | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Sodium | 20000 | | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Chromium | 0.88 | J | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Copper | 2.6 | J | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Iron | 210 | | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Manganese | 13 | | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Zinc | 10 | J | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |
| Vanadium | 1.5 | J | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 19:46 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Method: 6010C - Metals (ICP)

**Client Sample ID: SW-2-091114**
**Date Collected: 09/11/14 11:30**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-6**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **37** | **J** | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Calcium** | **17000** | | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Magnesium** | **5500** | | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Potassium** | **2900** | **J** | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Barium** | **63** | | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Sodium** | **16000** | | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Copper** | **1.9** | **J** | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Iron** | **270** | | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Manganese** | **53** | | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Selenium** | **5.0** | **J** | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| **Zinc** | **9.0** | **J** | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:10 | 1 |

**Client Sample ID: SW-1-091114**
**Date Collected: 09/11/14 12:15**
**Date Received: 09/12/14 09:55**

**Lab Sample ID: 280-59923-7**
**Matrix: Water**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Aluminum** | **20** | **J** | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Calcium** | **18000** | | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Magnesium** | **5600** | | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Potassium** | **3600** | | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Barium** | **61** | | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Sodium** | **15000** | | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Copper** | **1.9** | **J** | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Iron** | **390** | | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Manganese** | **56** | | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| **Zinc** | **7.5** | **J** | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:12 | 1 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Method: 6010C - Metals (ICP)

**Client Sample ID: ER-091114** — **Lab Sample ID: 280-59923-8**
**Date Collected: 09/11/14 14:15** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Sodium | 92 | U | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 20:15 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: SW-3-091114** — **Lab Sample ID: 280-59923-5**
**Date Collected: 09/11/14 09:45** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 21:11 | 1 |

**Client Sample ID: SW-2-091114** — **Lab Sample ID: 280-59923-6**
**Date Collected: 09/11/14 11:30** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 21:13 | 1 |

**Client Sample ID: SW-1-091114** — **Lab Sample ID: 280-59923-7**
**Date Collected: 09/11/14 12:15** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 21:15 | 1 |

**Client Sample ID: ER-091114** — **Lab Sample ID: 280-59923-8**
**Date Collected: 09/11/14 14:15** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 21:17 | 1 |

## Method: 7471B - Mercury (CVAA)

**Client Sample ID: SED-3-091114** — **Lab Sample ID: 280-59923-1**
**Date Collected: 09/11/14 10:30** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 6.2 | U | 19 | 6.2 | ug/Kg | ☼ | 09/17/14 10:30 | 09/17/14 16:38 | 1 |

**Client Sample ID: SED-2-091114** — **Lab Sample ID: 280-59923-2**
**Date Collected: 09/11/14 12:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 67.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Mercury** | **9.7** | **J** | 23 | 7.5 | ug/Kg | ☼ | 09/17/14 10:30 | 09/17/14 16:40 | 1 |

**Client Sample ID: SED-1-091114** — **Lab Sample ID: 280-59923-3**
**Date Collected: 09/11/14 12:20** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 81.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 6.3 | U | 19 | 6.3 | ug/Kg | ☼ | 09/17/14 10:30 | 09/17/14 16:47 | 1 |

**Client Sample ID: SED-99-091114** — **Lab Sample ID: 280-59923-4**
**Date Collected: 09/11/14 17:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 6.7 | U | 21 | 6.7 | ug/Kg | ☼ | 09/17/14 10:30 | 09/17/14 16:49 | 1 |

## General Chemistry

**Client Sample ID: SED-3-091114** — **Lab Sample ID: 280-59923-1**
**Date Collected: 09/11/14 10:30** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Moisture** | **20** | | 0.10 | 0.10 | % | | | 09/13/14 10:16 | 1 |
| **Percent Solids** | **80** | | 0.10 | 0.10 | % | | | 09/13/14 10:16 | 1 |

**Client Sample ID: SED-2-091114** — **Lab Sample ID: 280-59923-2**
**Date Collected: 09/11/14 12:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 67.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Moisture** | **33** | | 0.10 | 0.10 | % | | | 09/13/14 10:16 | 1 |
| **Percent Solids** | **67** | | 0.10 | 0.10 | % | | | 09/13/14 10:16 | 1 |

**Client Sample ID: SED-1-091114** — **Lab Sample ID: 280-59923-3**
**Date Collected: 09/11/14 12:20** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 81.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Moisture** | **18** | | 0.10 | 0.10 | % | | | 09/13/14 10:16 | 1 |
| **Percent Solids** | **82** | | 0.10 | 0.10 | % | | | 09/13/14 10:16 | 1 |

**Client Sample ID: SED-99-091114** — **Lab Sample ID: 280-59923-4**
**Date Collected: 09/11/14 17:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Moisture** | **18** | | 0.10 | 0.10 | % | | | 09/13/14 10:16 | 1 |
| **Percent Solids** | **82** | | 0.10 | 0.10 | % | | | 09/13/14 10:16 | 1 |

## General Chemistry

**Client Sample ID: SW-3-091114** — **Lab Sample ID: 280-59923-5**
**Date Collected: 09/11/14 09:45** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 49 | | 5.0 | 0.23 | mg/L | | | 09/23/14 01:14 | 1 |

**Client Sample ID: SW-2-091114** — **Lab Sample ID: 280-59923-6**
**Date Collected: 09/11/14 11:30** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 38 | | 5.0 | 0.23 | mg/L | | | 09/23/14 02:07 | 1 |

**Client Sample ID: SW-1-091114** — **Lab Sample ID: 280-59923-7**
**Date Collected: 09/11/14 12:15** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 28 | | 5.0 | 0.23 | mg/L | | | 09/23/14 02:24 | 1 |

## General Chemistry - Soluble

**Client Sample ID: SED-3-091114** — **Lab Sample ID: 280-59923-1**
**Date Collected: 09/11/14 10:30** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 7.11 | | 0.100 | 0.100 | SU | | | 09/15/14 17:49 | 1 |
| Temperature | 23.2 | | 1.00 | 1.00 | Degrees C | | | 09/15/14 17:49 | 1 |
| Chloride | 6.7 | J | 36 | 2.4 | mg/Kg | ☼ | | 09/24/14 19:00 | 1 |
| Sulfate | 13 | J | 60 | 2.1 | mg/Kg | ☼ | | 09/24/14 19:00 | 1 |

**Client Sample ID: SED-2-091114** — **Lab Sample ID: 280-59923-2**
**Date Collected: 09/11/14 12:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 67.0**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 6.97 | | 0.100 | 0.100 | SU | | | 09/15/14 17:49 | 1 |
| Temperature | 23.1 | | 1.00 | 1.00 | Degrees C | | | 09/15/14 17:49 | 1 |
| Chloride | 12 | J | 44 | 2.9 | mg/Kg | ☼ | | 09/24/14 19:16 | 1 |
| Sulfate | 9.7 | J | 73 | 2.5 | mg/Kg | ☼ | | 09/24/14 19:16 | 1 |

**Client Sample ID: SED-1-091114** — **Lab Sample ID: 280-59923-3**
**Date Collected: 09/11/14 12:20** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 81.9**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 6.87 | | 0.100 | 0.100 | SU | | | 09/15/14 17:49 | 1 |
| Temperature | 23.3 | | 1.00 | 1.00 | Degrees C | | | 09/15/14 17:49 | 1 |
| Chloride | 6.2 | J | 36 | 2.4 | mg/Kg | ☼ | | 09/24/14 20:18 | 1 |
| Sulfate | 11 | J | 59 | 2.0 | mg/Kg | ☼ | | 09/24/14 20:18 | 1 |

**Client Sample ID: SED-99-091114** — **Lab Sample ID: 280-59923-4**
**Date Collected: 09/11/14 17:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 82.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 7.22 | | 0.100 | 0.100 | SU | | | 09/15/14 17:49 | 1 |
| Temperature | 23.4 | | 1.00 | 1.00 | Degrees C | | | 09/15/14 17:49 | 1 |
| Chloride | 6.6 | J | 35 | 2.3 | mg/Kg | ☼ | | 09/24/14 20:33 | 1 |
| Sulfate | 14 | J | 58 | 2.0 | mg/Kg | ☼ | | 09/24/14 20:33 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-59923-1 | SED-3-091114 | 78 | 81 | 75 |
| 280-59923-2 | SED-2-091114 | 60 | 89 | 48 |
| 280-59923-2 - DL | SED-2-091114 | 58 | 87 | 40 |
| 280-59923-2 MS | SED-2-091114 | 60 | 85 | 56 |
| 280-59923-2 MSD | SED-2-091114 | 62 | 93 | 72 |
| 280-59923-3 | SED-1-091114 | 74 D | 82 D | 84 D |
| 280-59923-4 | SED-99-091114 | 81 | 89 | 81 |
| LCS 280-244099/2-A | Lab Control Sample | 88 | 91 | 98 |
| MB 280-244099/1-A | Method Blank | 90 | 91 | 85 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Water** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (42-120) | (43-120) | (47-120) |
| 280-59923-5 | SW-3-091114 | 67 D | 60 D | 61 D |
| 280-59923-6 | SW-2-091114 | 70 D | 58 D | 58 D |
| 280-59923-7 | SW-1-091114 | 81 D | 80 D | 82 D |
| 280-59923-8 | ER-091114 | 74 D | 70 D | 56 D |
| LCS 280-243333/2-A | Lab Control Sample | 78 | 100 | 98 |
| LCSD 280-243333/3-A | Lab Control Sample Dup | 69 | 96 | 107 |
| MB 280-243333/1-A | Method Blank | 76 | 96 | 102 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-243333/1-A**
**Matrix: Water**
**Analysis Batch: 244782**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 243333**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 5.7 | U | 100 | 5.7 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| 2-Methylnaphthalene | 5.2 | U | 100 | 5.2 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Acenaphthene | 11 | U | 100 | 11 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Acenaphthylene | 10 | U | 100 | 10 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Anthracene | 14 | U | 100 | 14 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Benzo[a]anthracene | 3.2 | U | 100 | 3.2 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Benzo[a]pyrene | 5.1 | U | 100 | 5.1 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Benzo[b]fluoranthene | 3.4 | U | 100 | 3.4 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Benzo[g,h,i]perylene | 3.6 | U | 100 | 3.6 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Benzo[k]fluoranthene | 5.1 | U | 100 | 5.1 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Chrysene | 3.2 | U | 100 | 3.2 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Dibenz(a,h)anthracene | 4.8 | U | 100 | 4.8 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Fluoranthene | 4.5 | U | 100 | 4.5 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Fluorene | 19 | U | 100 | 19 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Indeno[1,2,3-cd]pyrene | 15 | U | 100 | 15 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Naphthalene | 5.3 | U | 100 | 5.3 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Phenanthrene | 9.8 | U | 100 | 9.8 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |
| Pyrene | 8.1 | U | 100 | 8.1 | ng/L | | 09/15/14 17:16 | 09/24/14 17:53 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *76* | | *42 - 120* | *09/15/14 17:16* | *09/24/14 17:53* | *1* |
| *Nitrobenzene-d5* | *96* | | *43 - 120* | *09/15/14 17:16* | *09/24/14 17:53* | *1* |
| *Terphenyl-d14* | *102* | | *47 - 120* | *09/15/14 17:16* | *09/24/14 17:53* | *1* |

**Lab Sample ID: LCS 280-243333/2-A**
**Matrix: Water**
**Analysis Batch: 244782**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243333**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 807 | | ng/L | | 90 | 47 - 120 |
| Acenaphthylene | 900 | 803 | | ng/L | | 89 | 39 - 120 |
| Anthracene | 900 | 853 | | ng/L | | 95 | 28 - 120 |
| Benzo[a]anthracene | 900 | 957 | | ng/L | | 106 | 42 - 120 |
| Benzo[a]pyrene | 900 | 961 | | ng/L | | 107 | 38 - 120 |
| Benzo[b]fluoranthene | 900 | 1020 | | ng/L | | 113 | 44 - 120 |
| Benzo[g,h,i]perylene | 900 | 1080 | | ng/L | | 120 | 39 - 120 |
| Benzo[k]fluoranthene | 900 | 1050 | | ng/L | | 117 | 43 - 120 |
| Chrysene | 900 | 1050 | | ng/L | | 117 | 35 - 120 |
| Dibenz(a,h)anthracene | 900 | 1080 | | ng/L | | 120 | 27 - 126 |
| Fluoranthene | 900 | 965 | | ng/L | | 107 | 46 - 120 |
| Fluorene | 900 | 841 | | ng/L | | 93 | 49 - 120 |
| Indeno[1,2,3-cd]pyrene | 900 | 1010 | | ng/L | | 112 | 38 - 120 |
| Naphthalene | 900 | 658 | | ng/L | | 73 | 37 - 120 |
| Phenanthrene | 900 | 940 | | ng/L | | 104 | 46 - 120 |
| Pyrene | 900 | 946 | | ng/L | | 105 | 49 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-243333/2-A**
**Matrix: Water**
**Analysis Batch: 244782**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243333**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *78* | | *42 - 120* |
| *Nitrobenzene-d5* | *100* | | *43 - 120* |
| *Terphenyl-d14* | *98* | | *47 - 120* |

**Lab Sample ID: LCSD 280-243333/3-A**
**Matrix: Water**
**Analysis Batch: 244782**

**Client Sample ID: Lab Control Sample Dup**
**Prep Type: Total/NA**
**Prep Batch: 243333**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 900 | 727 | | ng/L | | 81 | 47 - 120 | 10 | 50 |
| Acenaphthylene | 900 | 734 | | ng/L | | 82 | 39 - 120 | 9 | 50 |
| Anthracene | 900 | 827 | | ng/L | | 92 | 28 - 120 | 3 | 50 |
| Benzo[a]anthracene | 900 | 1010 | | ng/L | | 112 | 42 - 120 | 6 | 40 |
| Benzo[a]pyrene | 900 | 1020 | | ng/L | | 113 | 38 - 120 | 6 | 21 |
| Benzo[b]fluoranthene | 900 | 1070 | | ng/L | | 119 | 44 - 120 | 5 | 28 |
| Benzo[g,h,i]perylene | 900 | 1160 | * | ng/L | | 129 | 39 - 120 | 7 | 23 |
| Benzo[k]fluoranthene | 900 | 1120 | * | ng/L | | 124 | 43 - 120 | 6 | 28 |
| Chrysene | 900 | 1100 | * | ng/L | | 123 | 35 - 120 | 5 | 41 |
| Dibenz(a,h)anthracene | 900 | 1210 | * | ng/L | | 134 | 27 - 126 | 11 | 25 |
| Fluoranthene | 900 | 977 | | ng/L | | 109 | 46 - 120 | 1 | 24 |
| Fluorene | 900 | 772 | | ng/L | | 86 | 49 - 120 | 9 | 50 |
| Indeno[1,2,3-cd]pyrene | 900 | 1100 | * | ng/L | | 122 | 38 - 120 | 8 | 25 |
| Naphthalene | 900 | 613 | | ng/L | | 68 | 37 - 120 | 7 | 50 |
| Phenanthrene | 900 | 919 | | ng/L | | 102 | 46 - 120 | 2 | 42 |
| Pyrene | 900 | 965 | | ng/L | | 107 | 49 - 120 | 2 | 22 |

| *Surrogate* | *LCSD %Recovery* | *LCSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *69* | | *42 - 120* |
| *Nitrobenzene-d5* | *96* | | *43 - 120* |
| *Terphenyl-d14* | *107* | | *47 - 120* |

**Lab Sample ID: MB 280-244099/1-A**
**Matrix: Solid**
**Analysis Batch: 245546**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 244099**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 240 | U | 4600 | 240 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| 2-Methylnaphthalene | 280 | U | 4600 | 280 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Acenaphthene | 150 | U | 4600 | 150 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Acenaphthylene | 160 | U | 4600 | 160 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Anthracene | 660 | U | 4600 | 660 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Benzo[a]anthracene | 820 | U | 4600 | 820 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Benzo[a]pyrene | 670 | U | 4600 | 670 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Benzo[b]fluoranthene | 1100 | U | 4600 | 1100 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Benzo[g,h,i]perylene | 1000 | U | 4600 | 1000 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Benzo[k]fluoranthene | 910 | U | 4600 | 910 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Chrysene | 910 | U | 4600 | 910 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Dibenz(a,h)anthracene | 1200 | U | 4600 | 1200 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: MB 280-244099/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 245546** — **Prep Batch: 244099**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | 910 | U | 4600 | 910 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Fluorene | 430 | U | 4600 | 430 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Indeno[1,2,3-cd]pyrene | 1000 | U | 4600 | 1000 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Naphthalene | 300 | U | 4600 | 300 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Phenanthrene | 1000 | U | 4600 | 1000 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |
| Pyrene | 1000 | U | 4600 | 1000 | ng/Kg | | 09/19/14 12:30 | 09/30/14 18:26 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *90* | | *39 - 120* | *09/19/14 12:30* | *09/30/14 18:26* | *1* |
| *Nitrobenzene-d5* | *91* | | *42 - 120* | *09/19/14 12:30* | *09/30/14 18:26* | *1* |
| *Terphenyl-d14* | *85* | | *35 - 120* | *09/19/14 12:30* | *09/30/14 18:26* | *1* |

**Lab Sample ID: LCS 280-244099/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 245546** — **Prep Batch: 244099**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 28000 | 25800 | | ng/Kg | | 92 | 35 - 120 |
| Acenaphthylene | 28000 | 24600 | | ng/Kg | | 88 | 41 - 120 |
| Anthracene | 28000 | 24600 | | ng/Kg | | 88 | 43 - 120 |
| Benzo[a]anthracene | 28000 | 26700 | | ng/Kg | | 96 | 36 - 120 |
| Benzo[a]pyrene | 28000 | 28000 | | ng/Kg | | 100 | 20 - 120 |
| Benzo[b]fluoranthene | 28000 | 29900 | | ng/Kg | | 107 | 37 - 120 |
| Benzo[g,h,i]perylene | 28000 | 30200 | | ng/Kg | | 108 | 20 - 123 |
| Benzo[k]fluoranthene | 28000 | 31900 | | ng/Kg | | 114 | 46 - 120 |
| Chrysene | 28000 | 31200 | | ng/Kg | | 111 | 34 - 120 |
| Dibenz(a,h)anthracene | 28000 | 31900 | | ng/Kg | | 114 | 20 - 120 |
| Fluoranthene | 28000 | 24900 | | ng/Kg | | 89 | 45 - 120 |
| Fluorene | 28000 | 25400 | | ng/Kg | | 91 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 28000 | 27500 | | ng/Kg | | 99 | 20 - 127 |
| Naphthalene | 28000 | 28100 | | ng/Kg | | 100 | 44 - 120 |
| Phenanthrene | 28000 | 26000 | | ng/Kg | | 93 | 44 - 120 |
| Pyrene | 28000 | 24500 | | ng/Kg | | 88 | 43 - 120 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *88* | | *39 - 120* |
| *Nitrobenzene-d5* | *91* | | *42 - 120* |
| *Terphenyl-d14* | *98* | | *35 - 120* |

**Lab Sample ID: 280-59923-2 MS** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 245546** — **Prep Batch: 244099**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 18000 | | 43800 | 45300 | | ng/Kg | ☼ | 63 | 35 - 120 |
| Acenaphthylene | 21000 | | 43800 | 38500 | F1 | ng/Kg | ☼ | 40 | 41 - 120 |
| Anthracene | 53000 | | 43800 | 66700 | F1 | ng/Kg | ☼ | 31 | 43 - 120 |
| Benzo[a]anthracene | 190000 | | 43800 | 135000 | 4 | ng/Kg | ☼ | -128 | 36 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: 280-59923-2 MS** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 245546** — **Prep Batch: 244099**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Benzo[a]pyrene | 220000 | | 43800 | 131000 | 4 | ng/Kg | ☼ | -205 | 20 - 120 |
| Benzo[b]fluoranthene | 270000 | E | 43800 | 164000 | 4 | ng/Kg | ☼ | -236 | 37 - 120 |
| Benzo[g,h,i]perylene | 140000 | | 43800 | 87700 | F1 | ng/Kg | ☼ | -124 | 20 - 123 |
| Benzo[k]fluoranthene | 92000 | | 43800 | 83800 | F1 | ng/Kg | ☼ | -20 | 46 - 120 |
| Chrysene | 220000 | | 43800 | 161000 | 4 | ng/Kg | ☼ | -126 | 34 - 120 |
| Dibenz(a,h)anthracene | 41000 | | 43800 | 43500 | F1 | ng/Kg | ☼ | 5 | 20 - 120 |
| Fluoranthene | 370000 | E | 43800 | 257000 | E 4 | ng/Kg | ☼ | -252 | 45 - 120 |
| Fluorene | 22000 | | 43800 | 46300 | | ng/Kg | ☼ | 56 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 170000 | | 43800 | 94800 | F1 | ng/Kg | ☼ | -161 | 20 - 127 |
| Naphthalene | 17000 | | 43800 | 45400 | | ng/Kg | ☼ | 66 | 44 - 120 |
| Phenanthrene | 220000 | | 43800 | 204000 | 4 | ng/Kg | ☼ | -41 | 44 - 120 |
| Pyrene | 310000 | E | 43800 | 225000 | 4 | ng/Kg | ☼ | -199 | 43 - 120 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *60* | | *39 - 120* |
| *Nitrobenzene-d5* | *85* | | *42 - 120* |
| *Terphenyl-d14* | *56* | | *35 - 124* |

**Lab Sample ID: 280-59923-2 MSD** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 245546** — **Prep Batch: 244099**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Acenaphthene | 18000 | | 43800 | 35700 | | ng/Kg | ☼ | 40 | 35 - 120 | 24 | 50 |
| Acenaphthylene | 21000 | | 43800 | 44300 | | ng/Kg | ☼ | 53 | 41 - 120 | 14 | 50 |
| Anthracene | 53000 | | 43800 | 43900 | F1 | ng/Kg | ☼ | -21 | 43 - 120 | 41 | 50 |
| Benzo[a]anthracene | 190000 | | 43800 | 103000 | 4 | ng/Kg | ☼ | -202 | 36 - 120 | 27 | 40 |
| Benzo[a]pyrene | 220000 | | 43800 | 99000 | 4 | ng/Kg | ☼ | -278 | 20 - 120 | 28 | 30 |
| Benzo[b]fluoranthene | 270000 | E | 43800 | 112000 | 4 F2 | ng/Kg | ☼ | -354 | 37 - 120 | 37 | 28 |
| Benzo[g,h,i]perylene | 140000 | | 43800 | 73000 | F1 | ng/Kg | ☼ | -158 | 20 - 123 | 18 | 30 |
| Benzo[k]fluoranthene | 92000 | | 43800 | 61500 | F1 F2 | ng/Kg | ☼ | -71 | 46 - 120 | 31 | 28 |
| Chrysene | 220000 | | 43800 | 129000 | 4 | ng/Kg | ☼ | -200 | 34 - 120 | 22 | 41 |
| Dibenz(a,h)anthracene | 41000 | | 43800 | 39700 | F1 | ng/Kg | ☼ | -3 | 20 - 120 | 9 | 25 |
| Fluoranthene | 370000 | E | 43800 | 184000 | 4 F2 | ng/Kg | ☼ | -419 | 45 - 120 | 33 | 30 |
| Fluorene | 22000 | | 43800 | 40700 | | ng/Kg | ☼ | 44 | 44 - 120 | 13 | 50 |
| Indeno[1,2,3-cd]pyrene | 170000 | | 43800 | 74300 | F1 | ng/Kg | ☼ | -208 | 20 - 127 | 24 | 50 |
| Naphthalene | 17000 | | 43800 | 60900 | | ng/Kg | ☼ | 101 | 44 - 120 | 29 | 50 |
| Phenanthrene | 220000 | | 43800 | 170000 | 4 | ng/Kg | ☼ | -119 | 44 - 120 | 18 | 42 |
| Pyrene | 310000 | E | 43800 | 196000 | 4 | ng/Kg | ☼ | -264 | 43 - 120 | 14 | 30 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *62* | | *39 - 120* |
| *Nitrobenzene-d5* | *93* | | *42 - 120* |
| *Terphenyl-d14* | *72* | | *35 - 124* |

# QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-243230/1-A**
**Matrix: Solid**
**Analysis Batch: 244167**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 243230**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Barium | 0.117 | J | 1.0 | 0.076 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Beryllium | 0.033 | U | 0.50 | 0.033 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Cadmium | 0.041 | U | 0.50 | 0.041 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Chromium | 0.058 | U | 1.5 | 0.058 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Cobalt | 0.10 | U | 1.0 | 0.10 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Iron | 11.4 | J | 15 | 3.8 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Lead | 0.27 | U | 0.80 | 0.27 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Manganese | 0.116 | J | 1.0 | 0.10 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Nickel | 0.12 | U | 4.0 | 0.12 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Selenium | 0.86 | U | 1.3 | 0.86 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Silver | 0.16 | U | 1.0 | 0.16 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Thallium | 0.65 | U | 1.2 | 0.65 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |
| Zinc | 0.40 | U | 3.0 | 0.40 | mg/Kg | | 09/16/14 14:30 | 09/19/14 15:35 | 1 |

**Lab Sample ID: MB 280-243230/1-A**
**Matrix: Solid**
**Analysis Batch: 244438**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 243230**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 1.6 | U | 10 | 1.6 | mg/Kg | | 09/16/14 14:30 | 09/22/14 14:50 | 1 |
| Antimony | 0.38 | U | 1.5 | 0.38 | mg/Kg | | 09/16/14 14:30 | 09/22/14 14:50 | 1 |
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 09/16/14 14:30 | 09/22/14 14:50 | 1 |
| Copper | 0.22 | U | 2.0 | 0.22 | mg/Kg | | 09/16/14 14:30 | 09/22/14 14:50 | 1 |
| Vanadium | 0.094 | U | 2.0 | 0.094 | mg/Kg | | 09/16/14 14:30 | 09/22/14 14:50 | 1 |

**Lab Sample ID: LCS 280-243230/2-A**
**Matrix: Solid**
**Analysis Batch: 244167**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243230**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Barium | 200 | 185 | | mg/Kg | | 92 | 87 - 112 |
| Beryllium | 5.00 | 4.40 | | mg/Kg | | 88 | 84 - 114 |
| Cadmium | 10.0 | 9.27 | | mg/Kg | | 93 | 87 - 110 |
| Chromium | 20.0 | 18.4 | | mg/Kg | | 92 | 84 - 114 |
| Cobalt | 50.0 | 45.1 | | mg/Kg | | 90 | 87 - 110 |
| Iron | 100 | 91.2 | | mg/Kg | | 91 | 87 - 120 |
| Lead | 50.0 | 45.7 | | mg/Kg | | 91 | 86 - 110 |
| Manganese | 50.0 | 44.3 | | mg/Kg | | 89 | 88 - 110 |
| Nickel | 50.0 | 44.3 | | mg/Kg | | 89 | 87 - 110 |
| Selenium | 200 | 183 | | mg/Kg | | 91 | 83 - 110 |
| Silver | 5.00 | 4.85 | | mg/Kg | | 97 | 87 - 114 |
| Thallium | 200 | 184 | | mg/Kg | | 92 | 84 - 110 |
| Zinc | 50.0 | 42.2 | | mg/Kg | | 84 | 76 - 114 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-243230/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 244438** — **Prep Batch: 243230**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 200 | 184 | | mg/Kg | | 92 | 82 - 116 |
| Antimony | 50.0 | 45.4 | | mg/Kg | | 91 | 82 - 110 |
| Arsenic | 100 | 90.6 | | mg/Kg | | 91 | 85 - 110 |
| Copper | 25.0 | 23.4 | | mg/Kg | | 93 | 88 - 110 |
| Vanadium | 50.0 | 45.8 | | mg/Kg | | 92 | 88 - 110 |

**Lab Sample ID: 280-59923-2 MS** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 244167** — **Prep Batch: 243230**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Barium | 39 | B | 267 | 287 | | mg/Kg | ☼ | 93 | 52 - 159 |
| Beryllium | 0.11 | J | 6.66 | 5.76 | | mg/Kg | ☼ | 85 | 72 - 105 |
| Cadmium | 0.085 | J | 13.3 | 11.6 | | mg/Kg | ☼ | 86 | 40 - 130 |
| Chromium | 6.6 | | 26.7 | 28.0 | | mg/Kg | ☼ | 80 | 70 - 200 |
| Cobalt | 3.1 | | 66.6 | 60.2 | | mg/Kg | ☼ | 86 | 72 - 106 |
| Iron | 6300 | B | 133 | 11900 | 4 | mg/Kg | ☼ | 4242 | 70 - 200 |
| Lead | 14 | | 66.6 | 71.2 | | mg/Kg | ☼ | 86 | 70 - 200 |
| Manganese | 210 | B | 66.6 | 326 | | mg/Kg | ☼ | 172 | 40 - 200 |
| Nickel | 3.7 | J | 66.6 | 59.4 | | mg/Kg | ☼ | 84 | 61 - 126 |
| Selenium | 1.3 | U | 267 | 221 | | mg/Kg | ☼ | 83 | 76 - 104 |
| Silver | 0.24 | U | 6.66 | 6.15 | | mg/Kg | ☼ | 92 | 75 - 141 |
| Thallium | 0.97 | U | 267 | 218 | | mg/Kg | ☼ | 82 | 78 - 101 |
| Zinc | 45 | | 66.6 | 122 | | mg/Kg | ☼ | 116 | 70 - 200 |

**Lab Sample ID: 280-59923-2 MS** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 244438** — **Prep Batch: 243230**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 3500 | | 267 | 12800 | 4 | mg/Kg | ☼ | 3505 | 50 - 200 |
| Antimony | 0.57 | U | 66.6 | 41.7 | | mg/Kg | ☼ | 63 | 20 - 200 |
| Arsenic | 1.3 | J | 133 | 115 | | mg/Kg | ☼ | 85 | 76 - 111 |
| Copper | 8.9 | | 33.3 | 42.0 | | mg/Kg | ☼ | 99 | 37 - 187 |
| Vanadium | 10 | | 66.6 | 84.2 | | mg/Kg | ☼ | 111 | 50 - 169 |

**Lab Sample ID: 280-59923-2 MSD** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 244167** — **Prep Batch: 243230**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Barium | 39 | B | 255 | 282 | | mg/Kg | ☼ | 95 | 52 - 159 | 2 | 20 |
| Beryllium | 0.11 | J | 6.38 | 5.44 | | mg/Kg | ☼ | 83 | 72 - 105 | 6 | 20 |
| Cadmium | 0.085 | J | 12.8 | 11.2 | | mg/Kg | ☼ | 87 | 40 - 130 | 3 | 20 |
| Chromium | 6.6 | | 25.5 | 30.0 | | mg/Kg | ☼ | 92 | 70 - 200 | 7 | 20 |
| Cobalt | 3.1 | | 63.8 | 59.5 | | mg/Kg | ☼ | 89 | 72 - 106 | 1 | 20 |
| Iron | 6300 | B | 128 | 8730 | 4 F2 | mg/Kg | ☼ | 1913 | 70 - 200 | 31 | 20 |
| Lead | 14 | | 63.8 | 93.1 | F2 | mg/Kg | ☼ | 124 | 70 - 200 | 27 | 20 |
| Manganese | 210 | B | 63.8 | 478 | F1 F2 | mg/Kg | ☼ | 418 | 40 - 200 | 38 | 20 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-59923-2 MSD** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 244167** — **Prep Batch: 243230**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nickel | 3.7 | J | 63.8 | 57.8 | | mg/Kg | ☼ | 85 | 61 - 126 | 3 | 20 |
| Selenium | 1.3 | U | 255 | 213 | | mg/Kg | ☼ | 83 | 76 - 104 | 4 | 20 |
| Silver | 0.24 | U | 6.38 | 6.09 | | mg/Kg | ☼ | 96 | 75 - 141 | 1 | 20 |
| Thallium | 0.97 | U | 255 | 215 | | mg/Kg | ☼ | 84 | 78 - 101 | 1 | 20 |
| Zinc | 45 | | 63.8 | 112 | | mg/Kg | ☼ | 105 | 70 - 200 | 9 | 20 |

**Lab Sample ID: 280-59923-2 MSD** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 244438** — **Prep Batch: 243230**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 3500 | | 255 | 7060 | 4 F2 | mg/Kg | ☼ | 1394 | 50 - 200 | 58 | 20 |
| Antimony | 0.57 | U | 63.8 | 46.1 | | mg/Kg | ☼ | 72 | 20 - 200 | 10 | 20 |
| Arsenic | 1.3 | J | 128 | 111 | | mg/Kg | ☼ | 86 | 76 - 111 | 3 | 20 |
| Copper | 8.9 | | 31.9 | 38.7 | | mg/Kg | ☼ | 94 | 37 - 187 | 8 | 20 |
| Vanadium | 10 | | 63.8 | 74.4 | | mg/Kg | ☼ | 101 | 50 - 169 | 12 | 20 |

**Lab Sample ID: MB 280-243266/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243610** — **Prep Batch: 243266**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Calcium | 35 | U | 200 | 35 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Magnesium | 11 | U | 200 | 11 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Arsenic | 4.4 | U ^ | 15 | 4.4 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Potassium | 240 | U | 3000 | 240 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Sodium | 92 | U | 1000 | 92 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 09/15/14 14:50 | 09/16/14 19:41 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-243266/2-A**
**Matrix: Water**
**Analysis Batch: 243610**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 243266**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1990 | | ug/L | | 100 | 87 - 111 |
| Calcium | 50000 | 46800 | | ug/L | | 94 | 90 - 111 |
| Antimony | 500 | 489 | | ug/L | | 98 | 88 - 110 |
| Magnesium | 50000 | 47900 | | ug/L | | 96 | 90 - 113 |
| Arsenic | 1000 | 975 | ^ | ug/L | | 98 | 88 - 110 |
| Potassium | 50000 | 49300 | | ug/L | | 99 | 89 - 114 |
| Barium | 2000 | 1910 | | ug/L | | 96 | 90 - 112 |
| Sodium | 50000 | 52800 | | ug/L | | 106 | 90 - 115 |
| Beryllium | 50.0 | 46.9 | | ug/L | | 94 | 89 - 113 |
| Cadmium | 100 | 97.5 | | ug/L | | 98 | 88 - 111 |
| Chromium | 200 | 194 | | ug/L | | 97 | 90 - 113 |
| Cobalt | 500 | 482 | | ug/L | | 96 | 89 - 111 |
| Copper | 250 | 248 | | ug/L | | 99 | 86 - 112 |
| Iron | 1000 | 942 | | ug/L | | 94 | 89 - 115 |
| Lead | 500 | 493 | | ug/L | | 99 | 89 - 110 |
| Manganese | 500 | 471 | | ug/L | | 94 | 90 - 110 |
| Nickel | 500 | 475 | | ug/L | | 95 | 89 - 111 |
| Selenium | 2000 | 1960 | | ug/L | | 98 | 85 - 112 |
| Silver | 50.0 | 54.7 | | ug/L | | 109 | 86 - 115 |
| Thallium | 2000 | 1950 | | ug/L | | 97 | 88 - 110 |
| Vanadium | 500 | 468 | | ug/L | | 94 | 90 - 111 |
| Zinc | 500 | 476 | | ug/L | | 95 | 85 - 111 |

**Lab Sample ID: 280-59923-5 MS**
**Matrix: Water**
**Analysis Batch: 243610**

**Client Sample ID: SW-3-091114**
**Prep Type: Total/NA**
**Prep Batch: 243266**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 140 | | 2000 | 2320 | | ug/L | | 109 | 83 - 119 |
| Calcium | 18000 | | 50000 | 65000 | | ug/L | | 95 | 48 - 153 |
| Antimony | 3.1 | U | 500 | 502 | | ug/L | | 100 | 81 - 124 |
| Magnesium | 5300 | | 50000 | 53600 | | ug/L | | 97 | 62 - 146 |
| Arsenic | 4.8 | J ^ | 1000 | 990 | ^ | ug/L | | 98 | 84 - 124 |
| Potassium | 2900 | J | 50000 | 53100 | | ug/L | | 100 | 76 - 132 |
| Barium | 59 | | 2000 | 2010 | | ug/L | | 98 | 85 - 120 |
| Sodium | 20000 | | 50000 | 72100 | | ug/L | | 105 | 70 - 203 |
| Beryllium | 0.47 | U | 50.0 | 48.2 | | ug/L | | 96 | 79 - 121 |
| Cadmium | 0.45 | U | 100 | 98.8 | | ug/L | | 99 | 82 - 119 |
| Chromium | 0.88 | J | 200 | 198 | | ug/L | | 99 | 73 - 135 |
| Cobalt | 1.2 | U | 500 | 486 | | ug/L | | 97 | 82 - 119 |
| Copper | 2.6 | J | 250 | 253 | | ug/L | | 100 | 82 - 129 |
| Iron | 210 | | 1000 | 1210 | | ug/L | | 100 | 52 - 155 |
| Lead | 2.6 | U | 500 | 491 | | ug/L | | 98 | 89 - 121 |
| Manganese | 13 | | 500 | 490 | | ug/L | | 95 | 79 - 121 |
| Nickel | 1.3 | U | 500 | 479 | | ug/L | | 96 | 84 - 120 |
| Selenium | 4.9 | U | 2000 | 1990 | | ug/L | | 99 | 71 - 140 |
| Silver | 0.93 | U | 50.0 | 55.1 | | ug/L | | 110 | 75 - 141 |
| Thallium | 4.9 | U | 2000 | 1940 | | ug/L | | 97 | 90 - 116 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-59923-5 MS** — **Client Sample ID: SW-3-091114**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243610** — **Prep Batch: 243266**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Vanadium | 1.5 | J | 500 | 477 | | ug/L | | 95 | 85 - 120 |
| Zinc | 10 | J | 500 | 488 | | ug/L | | 96 | 60 - 137 |

**Lab Sample ID: 280-59923-5 MSD** — **Client Sample ID: SW-3-091114**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243610** — **Prep Batch: 243266**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 140 | | 2000 | 2380 | | ug/L | | 112 | 83 - 119 | 2 | 20 |
| Calcium | 18000 | | 50000 | 66500 | | ug/L | | 98 | 48 - 153 | 2 | 20 |
| Antimony | 3.1 | U | 500 | 501 | | ug/L | | 100 | 81 - 124 | 0 | 20 |
| Magnesium | 5300 | | 50000 | 54900 | | ug/L | | 99 | 62 - 146 | 2 | 20 |
| Arsenic | 4.8 | J ^ | 1000 | 1020 | ^ | ug/L | | 101 | 84 - 124 | 3 | 20 |
| Potassium | 2900 | J | 50000 | 54300 | | ug/L | | 103 | 76 - 132 | 2 | 20 |
| Barium | 59 | | 2000 | 2050 | | ug/L | | 100 | 85 - 120 | 2 | 20 |
| Sodium | 20000 | | 50000 | 74000 | | ug/L | | 109 | 70 - 203 | 3 | 20 |
| Beryllium | 0.47 | U | 50.0 | 49.2 | | ug/L | | 98 | 79 - 121 | 2 | 20 |
| Cadmium | 0.45 | U | 100 | 101 | | ug/L | | 101 | 82 - 119 | 2 | 20 |
| Chromium | 0.88 | J | 200 | 204 | | ug/L | | 101 | 73 - 135 | 3 | 20 |
| Cobalt | 1.2 | U | 500 | 499 | | ug/L | | 100 | 82 - 119 | 3 | 20 |
| Copper | 2.6 | J | 250 | 259 | | ug/L | | 103 | 82 - 129 | 2 | 20 |
| Iron | 210 | | 1000 | 1410 | | ug/L | | 120 | 52 - 155 | 15 | 20 |
| Lead | 2.6 | U | 500 | 505 | | ug/L | | 101 | 89 - 121 | 3 | 20 |
| Manganese | 13 | | 500 | 503 | | ug/L | | 98 | 79 - 121 | 3 | 20 |
| Nickel | 1.3 | U | 500 | 492 | | ug/L | | 98 | 84 - 120 | 3 | 20 |
| Selenium | 4.9 | U | 2000 | 2020 | | ug/L | | 101 | 71 - 140 | 2 | 20 |
| Silver | 0.93 | U | 50.0 | 56.4 | | ug/L | | 113 | 75 - 141 | 2 | 20 |
| Thallium | 4.9 | U | 2000 | 1990 | | ug/L | | 100 | 90 - 116 | 3 | 20 |
| Vanadium | 1.5 | J | 500 | 489 | | ug/L | | 97 | 85 - 120 | 2 | 20 |
| Zinc | 10 | J | 500 | 500 | | ug/L | | 98 | 60 - 137 | 2 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-243195/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243777** — **Prep Batch: 243195**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 09/17/14 14:30 | 09/17/14 20:38 | 1 |

**Lab Sample ID: LCS 280-243195/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 243777** — **Prep Batch: 243195**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.59 | | ug/L | | 92 | 84 - 120 |

## Method: 7471B - Mercury (CVAA)

**Lab Sample ID: MB 280-243587/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 243784** — **Prep Batch: 243587**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.5 | U | 17 | 5.5 | ug/Kg | | 09/17/14 10:30 | 09/17/14 16:29 | 1 |

**Lab Sample ID: LCS 280-243587/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 243784** — **Prep Batch: 243587**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 417 | 413 | | ug/Kg | | 99 | 87 - 111 |

**Lab Sample ID: 280-59923-2 MS** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 243784** — **Prep Batch: 243587**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 9.7 | J | 622 | 587 | | ug/Kg | ☼ | 93 | 87 - 111 |

**Lab Sample ID: 280-59923-2 MSD** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 243784** — **Prep Batch: 243587**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mercury | 9.7 | J | 592 | 565 | | ug/Kg | ☼ | 94 | 87 - 111 | 4 | 20 |

## Method: 9045D - pH

**Lab Sample ID: LCS 280-243378/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 243378**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 7.00 | 7.050 | | SU | | 101 | 97 - 103 |

**Lab Sample ID: LCSD 280-243378/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 243378**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| pH adj. to 25 deg C | 7.00 | 7.050 | | SU | | 101 | 97 - 103 | 0 | 5 |

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID: MB 280-244374/6** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244374**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 0.23 | U | 5.0 | 0.23 | mg/L | | | 09/22/14 17:08 | 1 |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: LCS 280-244374/4** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244374**

| Analyte | | | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | | | 100 | 97.6 | | mg/L | | 98 | 90 - 110 | | |

**Lab Sample ID: LCSD 280-244374/5** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244374**

| Analyte | | | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | | | 100 | 99.5 | | mg/L | | 100 | 90 - 110 | 2 | 10 |

**Lab Sample ID: MRL 280-244374/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244374**

| Analyte | | | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | | | 2.50 | 3.28 | J | mg/L | | 131 | 50 - 150 | | |

**Lab Sample ID: 280-59923-7 MS** — **Client Sample ID: SW-1-091114**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244374**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 28 | | 25.0 | 51.8 | | mg/L | | 96 | 80 - 120 | | |

**Lab Sample ID: 280-59923-7 MSD** — **Client Sample ID: SW-1-091114**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244374**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 28 | | 25.0 | 52.8 | | mg/L | | 100 | 80 - 120 | 2 | 20 |

**Lab Sample ID: 280-59923-7 DU** — **Client Sample ID: SW-1-091114**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 244374**

| Analyte | Sample Result | Sample Qualifier | | DU Result | DU Qualifier | Unit | D | | | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Sulfate | 28 | | | 28.4 | | mg/L | | | | 2 | 15 |

**Lab Sample ID: MRL 280-244669/3** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 244669**

| Analyte | | | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | | | 2.50 | 2.38 | J | mg/L | | 95 | 50 - 150 | | |
| Sulfate | | | 2.50 | 2.39 | J | mg/L | | 96 | 50 - 150 | | |

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: MB 280-244724/3-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 244669**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 2.0 | U | 30 | 2.0 | mg/Kg | | | 09/24/14 18:45 | 1 |
| Sulfate | 1.7 | U | 50 | 1.7 | mg/Kg | | | 09/24/14 18:45 | 1 |

**Lab Sample ID: LCS 280-244724/1-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 244669**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Chloride | 1000 | 982 | | mg/Kg | | 98 | 90 - 110 |
| Sulfate | 1000 | 981 | | mg/Kg | | 98 | 90 - 110 |

**Lab Sample ID: LCSD 280-244724/2-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 244669**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 1000 | 969 | | mg/Kg | | 97 | 90 - 110 | 1 | 10 |
| Sulfate | 1000 | 966 | | mg/Kg | | 97 | 90 - 110 | 2 | 10 |

**Lab Sample ID: 280-59923-2 MS** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 244669**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Chloride | 12 | J | 367 | 368 | | mg/Kg | ☼ | 97 | 80 - 120 |
| Sulfate | 9.7 | J | 367 | 360 | | mg/Kg | ☼ | 95 | 80 - 120 |

**Lab Sample ID: 280-59923-2 MSD** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 244669**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Chloride | 12 | J | 365 | 367 | | mg/Kg | ☼ | 97 | 80 - 120 | 0 | 20 |
| Sulfate | 9.7 | J | 365 | 358 | | mg/Kg | ☼ | 95 | 80 - 120 | 1 | 20 |

**Lab Sample ID: 280-59923-2 DU** — **Client Sample ID: SED-2-091114**
**Matrix: Solid** — **Prep Type: Soluble**
**Analysis Batch: 244669**

| Analyte | Sample Result | Sample Qualifier | DU Result | DU Qualifier | Unit | D | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|
| Chloride | 12 | J | 11.8 | J | mg/Kg | ☼ | 0.3 | 10 |
| Sulfate | 9.7 | J | 10.6 | J | mg/Kg | ☼ | 9 | 10 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## GC/MS Semi VOA

### Prep Batch: 243333

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-5 | SW-3-091114 | Total/NA | Water | 3510C | |
| 280-59923-6 | SW-2-091114 | Total/NA | Water | 3510C | |
| 280-59923-7 | SW-1-091114 | Total/NA | Water | 3510C | |
| 280-59923-8 | ER-091114 | Total/NA | Water | 3510C | |
| LCS 280-243333/2-A | Lab Control Sample | Total/NA | Water | 3510C | |
| LCSD 280-243333/3-A | Lab Control Sample Dup | Total/NA | Water | 3510C | |
| MB 280-243333/1-A | Method Blank | Total/NA | Water | 3510C | |

### Prep Batch: 244099

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Total/NA | Solid | 3546 | |
| 280-59923-2 - DL | SED-2-091114 | Total/NA | Solid | 3546 | |
| 280-59923-2 | SED-2-091114 | Total/NA | Solid | 3546 | |
| 280-59923-2 MS | SED-2-091114 | Total/NA | Solid | 3546 | |
| 280-59923-2 MSD | SED-2-091114 | Total/NA | Solid | 3546 | |
| 280-59923-3 | SED-1-091114 | Total/NA | Solid | 3546 | |
| 280-59923-4 | SED-99-091114 | Total/NA | Solid | 3546 | |
| LCS 280-244099/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-244099/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Analysis Batch: 244782

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| LCS 280-243333/2-A | Lab Control Sample | Total/NA | Water | 8270D SIM | 243333 |
| LCSD 280-243333/3-A | Lab Control Sample Dup | Total/NA | Water | 8270D SIM | 243333 |
| MB 280-243333/1-A | Method Blank | Total/NA | Water | 8270D SIM | 243333 |

### Analysis Batch: 245546

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Total/NA | Solid | 8270D SIM | 244099 |
| 280-59923-2 | SED-2-091114 | Total/NA | Solid | 8270D SIM | 244099 |
| 280-59923-2 MS | SED-2-091114 | Total/NA | Solid | 8270D SIM | 244099 |
| 280-59923-2 MSD | SED-2-091114 | Total/NA | Solid | 8270D SIM | 244099 |
| 280-59923-3 | SED-1-091114 | Total/NA | Solid | 8270D SIM | 244099 |
| 280-59923-4 | SED-99-091114 | Total/NA | Solid | 8270D SIM | 244099 |
| LCS 280-244099/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 244099 |
| MB 280-244099/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 244099 |

### Analysis Batch: 245548

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-5 | SW-3-091114 | Total/NA | Water | 8270D SIM | 243333 |
| 280-59923-6 | SW-2-091114 | Total/NA | Water | 8270D SIM | 243333 |
| 280-59923-8 | ER-091114 | Total/NA | Water | 8270D SIM | 243333 |

### Analysis Batch: 245937

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-2 - DL | SED-2-091114 | Total/NA | Solid | 8270D SIM | 244099 |
| 280-59923-7 | SW-1-091114 | Total/NA | Water | 8270D SIM | 243333 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Metals

### Prep Batch: 243195

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-5 | SW-3-091114 | Total/NA | Water | 7470A | |
| 280-59923-6 | SW-2-091114 | Total/NA | Water | 7470A | |
| 280-59923-7 | SW-1-091114 | Total/NA | Water | 7470A | |
| 280-59923-8 | ER-091114 | Total/NA | Water | 7470A | |
| LCS 280-243195/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| MB 280-243195/1-A | Method Blank | Total/NA | Water | 7470A | |

### Prep Batch: 243230

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Total/NA | Solid | 3050B | |
| 280-59923-2 | SED-2-091114 | Total/NA | Solid | 3050B | |
| 280-59923-2 MS | SED-2-091114 | Total/NA | Solid | 3050B | |
| 280-59923-2 MSD | SED-2-091114 | Total/NA | Solid | 3050B | |
| 280-59923-3 | SED-1-091114 | Total/NA | Solid | 3050B | |
| 280-59923-4 | SED-99-091114 | Total/NA | Solid | 3050B | |
| LCS 280-243230/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-243230/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Prep Batch: 243266

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-5 | SW-3-091114 | Total/NA | Water | 3010A | |
| 280-59923-5 MS | SW-3-091114 | Total/NA | Water | 3010A | |
| 280-59923-5 MSD | SW-3-091114 | Total/NA | Water | 3010A | |
| 280-59923-6 | SW-2-091114 | Total/NA | Water | 3010A | |
| 280-59923-7 | SW-1-091114 | Total/NA | Water | 3010A | |
| 280-59923-8 | ER-091114 | Total/NA | Water | 3010A | |
| LCS 280-243266/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-243266/1-A | Method Blank | Total/NA | Water | 3010A | |

### Prep Batch: 243587

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Total/NA | Solid | 7471B | |
| 280-59923-2 | SED-2-091114 | Total/NA | Solid | 7471B | |
| 280-59923-2 MS | SED-2-091114 | Total/NA | Solid | 7471B | |
| 280-59923-2 MSD | SED-2-091114 | Total/NA | Solid | 7471B | |
| 280-59923-3 | SED-1-091114 | Total/NA | Solid | 7471B | |
| 280-59923-4 | SED-99-091114 | Total/NA | Solid | 7471B | |
| LCS 280-243587/2-A | Lab Control Sample | Total/NA | Solid | 7471B | |
| MB 280-243587/1-A | Method Blank | Total/NA | Solid | 7471B | |

### Analysis Batch: 243610

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-5 | SW-3-091114 | Total/NA | Water | 6010C | 243266 |
| 280-59923-5 MS | SW-3-091114 | Total/NA | Water | 6010C | 243266 |
| 280-59923-5 MSD | SW-3-091114 | Total/NA | Water | 6010C | 243266 |
| 280-59923-6 | SW-2-091114 | Total/NA | Water | 6010C | 243266 |
| 280-59923-7 | SW-1-091114 | Total/NA | Water | 6010C | 243266 |
| 280-59923-8 | ER-091114 | Total/NA | Water | 6010C | 243266 |
| LCS 280-243266/2-A | Lab Control Sample | Total/NA | Water | 6010C | 243266 |
| MB 280-243266/1-A | Method Blank | Total/NA | Water | 6010C | 243266 |

## Metals (Continued)

### Analysis Batch: 243777

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-5 | SW-3-091114 | Total/NA | Water | 7470A | 243195 |
| 280-59923-6 | SW-2-091114 | Total/NA | Water | 7470A | 243195 |
| 280-59923-7 | SW-1-091114 | Total/NA | Water | 7470A | 243195 |
| 280-59923-8 | ER-091114 | Total/NA | Water | 7470A | 243195 |
| LCS 280-243195/2-A | Lab Control Sample | Total/NA | Water | 7470A | 243195 |
| MB 280-243195/1-A | Method Blank | Total/NA | Water | 7470A | 243195 |

### Analysis Batch: 243784

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Total/NA | Solid | 7471B | 243587 |
| 280-59923-2 | SED-2-091114 | Total/NA | Solid | 7471B | 243587 |
| 280-59923-2 MS | SED-2-091114 | Total/NA | Solid | 7471B | 243587 |
| 280-59923-2 MSD | SED-2-091114 | Total/NA | Solid | 7471B | 243587 |
| 280-59923-3 | SED-1-091114 | Total/NA | Solid | 7471B | 243587 |
| 280-59923-4 | SED-99-091114 | Total/NA | Solid | 7471B | 243587 |
| LCS 280-243587/2-A | Lab Control Sample | Total/NA | Solid | 7471B | 243587 |
| MB 280-243587/1-A | Method Blank | Total/NA | Solid | 7471B | 243587 |

### Analysis Batch: 244167

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-2 | SED-2-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-2 MS | SED-2-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-2 MSD | SED-2-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-3 | SED-1-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-4 | SED-99-091114 | Total/NA | Solid | 6010C | 243230 |
| LCS 280-243230/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 243230 |
| MB 280-243230/1-A | Method Blank | Total/NA | Solid | 6010C | 243230 |

### Analysis Batch: 244438

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-2 | SED-2-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-2 MS | SED-2-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-2 MSD | SED-2-091114 | Total/NA | Solid | 6010C | 243230 |
| 280-59923-3 | SED-1-091114 | Total/NA | Solid | 6010C | 243230 |
| LCS 280-243230/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 243230 |
| MB 280-243230/1-A | Method Blank | Total/NA | Solid | 6010C | 243230 |

### Analysis Batch: 244802

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-4 | SED-99-091114 | Total/NA | Solid | 6010C | 243230 |

## General Chemistry

### Analysis Batch: 243165

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Total/NA | Solid | Moisture | |
| 280-59923-2 | SED-2-091114 | Total/NA | Solid | Moisture | |
| 280-59923-3 | SED-1-091114 | Total/NA | Solid | Moisture | |

## General Chemistry (Continued)

### Analysis Batch: 243165 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-4 | SED-99-091114 | Total/NA | Solid | Moisture | |

### Leach Batch: 243363

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Soluble | Solid | DI Leach | |
| 280-59923-2 | SED-2-091114 | Soluble | Solid | DI Leach | |
| 280-59923-3 | SED-1-091114 | Soluble | Solid | DI Leach | |
| 280-59923-4 | SED-99-091114 | Soluble | Solid | DI Leach | |

### Analysis Batch: 243378

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Soluble | Solid | 9045D | 243363 |
| 280-59923-2 | SED-2-091114 | Soluble | Solid | 9045D | 243363 |
| 280-59923-3 | SED-1-091114 | Soluble | Solid | 9045D | 243363 |
| 280-59923-4 | SED-99-091114 | Soluble | Solid | 9045D | 243363 |
| LCS 280-243378/4 | Lab Control Sample | Total/NA | Solid | 9045D | |
| LCSD 280-243378/5 | Lab Control Sample Dup | Total/NA | Solid | 9045D | |

### Analysis Batch: 244374

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-5 | SW-3-091114 | Total/NA | Water | 9056A | |
| 280-59923-6 | SW-2-091114 | Total/NA | Water | 9056A | |
| 280-59923-7 | SW-1-091114 | Total/NA | Water | 9056A | |
| 280-59923-7 DU | SW-1-091114 | Total/NA | Water | 9056A | |
| 280-59923-7 MS | SW-1-091114 | Total/NA | Water | 9056A | |
| 280-59923-7 MSD | SW-1-091114 | Total/NA | Water | 9056A | |
| LCS 280-244374/4 | Lab Control Sample | Total/NA | Water | 9056A | |
| LCSD 280-244374/5 | Lab Control Sample Dup | Total/NA | Water | 9056A | |
| MB 280-244374/6 | Method Blank | Total/NA | Water | 9056A | |
| MRL 280-244374/3 | Lab Control Sample | Total/NA | Water | 9056A | |

### Analysis Batch: 244669

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Soluble | Solid | 9056A | 244724 |
| 280-59923-2 | SED-2-091114 | Soluble | Solid | 9056A | 244724 |
| 280-59923-2 DU | SED-2-091114 | Soluble | Solid | 9056A | 244724 |
| 280-59923-2 MS | SED-2-091114 | Soluble | Solid | 9056A | 244724 |
| 280-59923-2 MSD | SED-2-091114 | Soluble | Solid | 9056A | 244724 |
| 280-59923-3 | SED-1-091114 | Soluble | Solid | 9056A | 244724 |
| 280-59923-4 | SED-99-091114 | Soluble | Solid | 9056A | 244724 |
| LCS 280-244724/1-A | Lab Control Sample | Soluble | Solid | 9056A | 244724 |
| LCSD 280-244724/2-A | Lab Control Sample Dup | Soluble | Solid | 9056A | 244724 |
| MB 280-244724/3-A | Method Blank | Soluble | Solid | 9056A | 244724 |
| MRL 280-244669/3 | Lab Control Sample | Total/NA | Solid | 9056A | |

### Leach Batch: 244724

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-1 | SED-3-091114 | Soluble | Solid | DI Leach | |
| 280-59923-2 | SED-2-091114 | Soluble | Solid | DI Leach | |
| 280-59923-2 DU | SED-2-091114 | Soluble | Solid | DI Leach | |
| 280-59923-2 MS | SED-2-091114 | Soluble | Solid | DI Leach | |

## General Chemistry (Continued)

### Leach Batch: 244724 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-59923-2 MSD | SED-2-091114 | Soluble | Solid | DI Leach | |
| 280-59923-3 | SED-1-091114 | Soluble | Solid | DI Leach | |
| 280-59923-4 | SED-99-091114 | Soluble | Solid | DI Leach | |
| LCS 280-244724/1-A | Lab Control Sample | Soluble | Solid | DI Leach | |
| LCSD 280-244724/2-A | Lab Control Sample Dup | Soluble | Solid | DI Leach | |
| MB 280-244724/3-A | Method Blank | Soluble | Solid | DI Leach | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Client Sample ID: SED-3-091114 — Lab Sample ID: 280-59923-1

**Date Collected: 09/11/14 10:30** — **Matrix: Solid**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 40.35 g | 40 mL | 243363 | 09/15/14 17:11 | MRB | TAL DEN |
| Soluble | Analysis | 9045D | | 1 | 1 mL | 1 mL | 243378 | 09/15/14 17:49 | MRB | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 243165 | 09/13/14 10:16 | AJS | TAL DEN |

## Client Sample ID: SED-3-091114 — Lab Sample ID: 280-59923-1

**Date Collected: 09/11/14 10:30** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 80.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 30.4 g | 1 mL | 244099 | 09/19/14 12:30 | DFB1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 30.4 g | 1 mL | 245546 | 09/30/14 19:22 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 243230 | 09/16/14 14:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.04 g | 100 mL | 244167 | 09/19/14 15:40 | CRR | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.04 g | 100 mL | 243230 | 09/16/14 14:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.04 g | 100 mL | 244438 | 09/22/14 14:54 | CRR | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.67 g | 50 mL | 243587 | 09/17/14 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.67 g | 50 mL | 243784 | 09/17/14 16:38 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.32 g | 100 mL | 244724 | 09/24/14 14:39 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244669 | 09/24/14 19:00 | PS1 | TAL DEN |

## Client Sample ID: SED-2-091114 — Lab Sample ID: 280-59923-2

**Date Collected: 09/11/14 12:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 40.19 g | 40 mL | 243363 | 09/15/14 17:11 | MRB | TAL DEN |
| Soluble | Analysis | 9045D | | 1 | 1 mL | 1 mL | 243378 | 09/15/14 17:49 | MRB | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 243165 | 09/13/14 10:16 | AJS | TAL DEN |

## Client Sample ID: SED-2-091114 — Lab Sample ID: 280-59923-2

**Date Collected: 09/11/14 12:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 67.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | DL | | 31.4 g | 1 mL | 244099 | 09/19/14 12:30 | DFB1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 2 | 31.4 g | 1 mL | 245937 | 10/02/14 13:09 | KGV | TAL DEN |
| Total/NA | Prep | 3546 | | | 31.4 g | 1 mL | 244099 | 09/19/14 12:30 | DFB1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.4 g | 1 mL | 245546 | 09/30/14 19:50 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.00 g | 100 mL | 243230 | 09/16/14 14:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.00 g | 100 mL | 244167 | 09/19/14 15:42 | CRR | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.00 g | 100 mL | 243230 | 09/16/14 14:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.00 g | 100 mL | 244438 | 09/22/14 14:57 | CRR | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.66 g | 50 mL | 243587 | 09/17/14 10:30 | CGG | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Client Sample ID: SED-2-091114 — Lab Sample ID: 280-59923-2

**Date Collected: 09/11/14 12:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 67.0**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 7471B | | 1 | 0.66 g | 50 mL | 243784 | 09/17/14 16:40 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.28 g | 100 mL | 244724 | 09/24/14 14:39 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244669 | 09/24/14 19:16 | PS1 | TAL DEN |

## Client Sample ID: SED-1-091114 — Lab Sample ID: 280-59923-3

**Date Collected: 09/11/14 12:20** — **Matrix: Solid**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 40.12 g | 40 mL | 243363 | 09/15/14 17:11 | MRB | TAL DEN |
| Soluble | Analysis | 9045D | | 1 | 1 mL | 1 mL | 243378 | 09/15/14 17:49 | MRB | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 243165 | 09/13/14 10:16 | AJS | TAL DEN |

## Client Sample ID: SED-1-091114 — Lab Sample ID: 280-59923-3

**Date Collected: 09/11/14 12:20** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 81.9**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.4 g | 1 mL | 244099 | 09/19/14 12:30 | DFB1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 10 | 31.4 g | 1 mL | 245546 | 09/30/14 21:13 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.05 g | 100 mL | 243230 | 09/16/14 14:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.05 g | 100 mL | 244167 | 09/19/14 15:55 | CRR | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.05 g | 100 mL | 243230 | 09/16/14 14:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.05 g | 100 mL | 244438 | 09/22/14 15:09 | CRR | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.64 g | 50 mL | 243587 | 09/17/14 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.64 g | 50 mL | 243784 | 09/17/14 16:47 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.28 g | 100 mL | 244724 | 09/24/14 14:39 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244669 | 09/24/14 20:18 | PS1 | TAL DEN |

## Client Sample ID: SED-99-091114 — Lab Sample ID: 280-59923-4

**Date Collected: 09/11/14 17:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Soluble | Leach | DI Leach | | | 40.26 g | 40 mL | 243363 | 09/15/14 17:11 | MRB | TAL DEN |
| Soluble | Analysis | 9045D | | 1 | 1 mL | 1 mL | 243378 | 09/15/14 17:49 | MRB | TAL DEN |
| Total/NA | Analysis | Moisture | | 1 | | | 243165 | 09/13/14 10:16 | AJS | TAL DEN |

## Client Sample ID: SED-99-091114 — Lab Sample ID: 280-59923-4

**Date Collected: 09/11/14 17:00** — **Matrix: Solid**
**Date Received: 09/12/14 09:55** — **Percent Solids: 82.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 31.6 g | 1 mL | 244099 | 09/19/14 12:30 | DFB1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 31.6 g | 1 mL | 245546 | 09/30/14 21:41 | KGV | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.00 g | 100 mL | 243230 | 09/16/14 14:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.00 g | 100 mL | 244167 | 09/19/14 15:57 | CRR | TAL DEN |
| Total/NA | Prep | 3050B | | | 1.00 g | 100 mL | 243230 | 09/16/14 14:30 | WAW | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.00 g | 100 mL | 244802 | 09/24/14 13:40 | CRR | TAL DEN |
| Total/NA | Prep | 7471B | | | 0.60 g | 50 mL | 243587 | 09/17/14 10:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7471B | | 1 | 0.60 g | 50 mL | 243784 | 09/17/14 16:49 | CGG | TAL DEN |
| Soluble | Leach | DI Leach | | | 10.56 g | 100 mL | 244724 | 09/24/14 14:39 | TLP | TAL DEN |
| Soluble | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244669 | 09/24/14 20:33 | PS1 | TAL DEN |

## Client Sample ID: SW-3-091114 — Lab Sample ID: 280-59923-5

**Date Collected: 09/11/14 09:45** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 870.8 mL | 1 mL | 243333 | 09/15/14 17:16 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 10 | 870.8 mL | 1 mL | 245548 | 09/30/14 15:19 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 243266 | 09/15/14 14:50 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243610 | 09/16/14 19:46 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 21:11 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244374 | 09/23/14 01:14 | MRB | TAL DEN |

## Client Sample ID: SW-2-091114 — Lab Sample ID: 280-59923-6

**Date Collected: 09/11/14 11:30** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1046.6 mL | 1 mL | 243333 | 09/15/14 17:16 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 10 | 1046.6 mL | 1 mL | 245548 | 09/30/14 15:47 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 243266 | 09/15/14 14:50 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243610 | 09/16/14 20:10 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 21:13 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244374 | 09/23/14 02:07 | MRB | TAL DEN |

## Client Sample ID: SW-1-091114 — Lab Sample ID: 280-59923-7

**Date Collected: 09/11/14 12:15** — **Matrix: Water**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 869.1 mL | 1 mL | 243333 | 09/15/14 17:16 | AH1 | TAL DEN |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Client Sample ID: SW-1-091114

**Lab Sample ID: 280-59923-7**

**Date Collected: 09/11/14 12:15**
**Matrix: Water**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8270D SIM | | 20 | 869.1 mL | 1 mL | 245937 | 10/02/14 12:41 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 243266 | 09/15/14 14:50 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243610 | 09/16/14 20:12 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 21:15 | CGG | TAL DEN |
| Total/NA | Analysis | 9056A | | 1 | 5 mL | 5 mL | 244374 | 09/23/14 02:24 | MRB | TAL DEN |

## Client Sample ID: ER-091114

**Lab Sample ID: 280-59923-8**

**Date Collected: 09/11/14 14:15**
**Matrix: Water**
**Date Received: 09/12/14 09:55**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3510C | | | 1052.9 mL | 1 mL | 243333 | 09/15/14 17:16 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 10 | 1052.9 mL | 1 mL | 245548 | 09/30/14 16:42 | KGV | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 243266 | 09/15/14 14:50 | SEJ | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 243610 | 09/16/14 20:15 | SJS | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 243195 | 09/17/14 14:30 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 243777 | 09/17/14 21:17 | CGG | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-59923-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-15 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-15 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-16 |
| Arizona | State Program | 9 | AZ0713 | 12-19-15 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-15 * |
| Illinois | NELAP | 5 | 200017 | 04-30-16 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-15 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 10-30-15 |
| New Mexico | State Program | 6 | CO00026 | 01-09-15 |
| New York | NELAP | 2 | 11964 | 04-01-16 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-15 |
| North Dakota | State Program | 8 | R-034 | 01-09-16 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-16 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-15 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-15 |

* Certification renewal pending - certification considered valid.

# Chain of Custody Record

Sampler ID _____

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☐

TestAmeri

THE LEADER IN ENVIRONMENTAL T

280-59923 Chain of Custody

TAL-4124-280 (0508)

| | | | |
|---|---|---|---|
| Client: Geosyntec Consultants | Project Manager: Beau Hodge | Date: 9/11/14 | Chain of Custody Number: 183738 |
| Address: 2501 Blue Ridge Rd | Telephone Number (Area Code)/Fax Number: 919-412-5118 | Lab Number | Page 1 of 1 |
| City: Raleigh; State: NC; Zip Code: 27607 | Site Contact: Rachel Donahue | Lab Contact: Patrick McGuire | |
| Project Name and Location (State): UNC Cogen, NC | Carrier/Waybill Number | | |
| Contract/Purchase Order/Quote No. | | | |

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Air | Aqueous | Sed | Soil | Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | 6010C-Total 4x | 8270D-SIM | 8290 | Moisture | 9045D | 9056A-28D |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SED-3-091114 | 9/11/14 | 1030 | | | X | | 3 | | | | | | X | X | X | X | X | X |
| SED-2-091114 | 9/11/14 | 1200 | | | X | | 3 | | | | | | X | X | X | X | X | X |
| SED-1-091114 | 9/11/14 | 1220 | | | X | | 3 | | | | | | X | X | X | X | X | X |
| SED-99-091114 | 9/11/14 | 1700 | | | X | | 3 | | | | | | X | X | X | X | X | X |
| SED-2-091114MS | 9/11/14 | 1200 | | | X | | 3 | | | | | | X | X | X | X | X | X |
| SED-2-091114MSD | 9/11/14 | 1200 | | | X | | 3 | | | | | | X | X | X | X | X | X |

Analysis (Attach list if more space is needed)

Special Instructions/ Conditions of Receipt

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify)

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By: [signature] | Date: 9/11/14 | Time: 1800 | 1. Received By: FEDEX | Date | Time |
| 2. Relinquished By | Date | Time | 2. Received By: Maria A Soto | Date: 9/12/14 | Time: 955 |
| 3. Relinquished By | Date | Time | 3. Received By | Date | Time |

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Transfer by: Maria Soto 0.4, 1.4, 0.3, 1.9, 1.2 IR6 +.0 9/12/14

# Chain of Custody Record

Sampler ID _____

Temperature on Receipt _____

Drinking Water? Yes ☐ No ☐

**TestAmerica**

THE LEADER IN ENVIRONMENTAL TESTING

TAL-4124-280 (0508)

| | | | |
|---|---|---|---|
| Client: Geosyntec Consultants | Project Manager: Bcay Hodge | Date: 9/11/14 | Chain of Custody Number: 183737 |
| Address: 2501 Blue Ridge Rd Suite 430 | Telephone Number (Area Code)/Fax Number: 919-412-5118 | | Lab Number: |
| City: Raleigh; State: NC; Zip Code: 27607 | Site Contact: Rachel Donohue | Lab Contact: Patrick M | Page 1 of 1 |
| Project Name and Location (State): UNC Chapel Hill, NC | Carrier/Waybill Number: | | |
| Contract/Purchase Order/Quote No. | | | |

Analysis (Attach list if more space is needed): 8270-SIM PAHs; 8290-D/F; 6010C-Metals; 7470A-Hg; TDS; RD; Alm; SO4

| Sample I.D. No. and Description (Containers for each sample may be combined on one line) | Date | Time | Matrix: Air | Aqueous | Sed. | Soil | Containers & Preservatives: Unpres. | H2SO4 | HNO3 | HCl | NaOH | ZnAc/NaOH | 8270-SIM PAHs | 8290-D/F | 6010C-Metals | 7470A-Hg | TDS | RD | Alm | SO4 | Special Instructions/ Conditions of Receipt |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SW-3-091114 | 9/11/14 | 945 | | X | | | 5 | | 1 | | | | X | X | X | X | X | X | | | NO TDS for |
| SW-2-091114 | 9/11/14 | 1130 | | X | | | 5 | | 1 | | | | X | X | X | X | X | X | | | These samples |
| SW-1-091114 | 9/11/14 | 1215 | | X | | | 5 | | 1 | | | | X | X | X | X | X | X | | | |
| GR-091114 | 9/11/14 | 1415 | | X | | | 4 | | 1 | | | | X | X | X | X | | | | | |

Possible Hazard Identification: ☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal: ☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: ☐ 24 Hours ☐ 48 Hours ☐ 7 Days ☐ 14 Days ☐ 21 Days ☐ Other _____

QC Requirements (Specify):

| | | | | | |
|---|---|---|---|---|---|
| 1. Relinquished By: Rachel Donohue | Date: 9/11/14 | Time: 1800 | 1. Received By: Peak | Date: ~~9/12/14~~ 9/15/14 | Time: ~~0955~~ am |
| 2. Relinquished By | Date | Time | 2. Received By: Maynacsoto | Date: 9/12/14 | Time: 0955 |
| 3. Relinquished By | Date | Time | 3. Received By | Date | Time |

Comments: Shipped in 4 coolers

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

Transfer by: MS 0.4, 1.4, 0.3, 1.9, 1.2 JRC+.0 9/12/14

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 431-7171

# Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information (Sub Contract Lab) | Sampler: | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-265155.1 |
|---|---|---|---|---|
| Client Contact: Shipping/Receiving | Phone: | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: TestAmerica Laboratories, Inc. | | | | Job #: 280-59923-1 |
| Address: 5815 Middlebrook Pike, | Due Date Requested: 9/30/2014 | | | |
| City: Knoxville | TAT Requested (days): | | | |
| State, Zip: TN, 37921 | | | | |
| Phone: 865-291-3000(Tel) 865-584-4315(Fax) | PO #: | | | |
| Email: | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: | SSOW#: | | | |

**Analysis Requested**

Preservation Codes:
A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2SO3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - ph 4-5, Z - other (specify)
Other:

| Sample Identification - Client ID (Lab ID) | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | SUB (SW8290 - 17 Dioxins and Furans)/ SW8290 - 17 Dioxins and Furans | SUB (% Moisture (TA Knoxville))/ % Moisture (TA Knoxville) | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | |
| SED-3-091114 (280-59923-1) | 9/11/14 | 10:30 Eastern | | Solid | | | X | X | | |
| SED-2-091114 (280-59923-2) | 9/11/14 | 12:00 Eastern | | Solid | | | X | X | | |
| SED-2-091114 (280-59923-2MS) | 9/11/14 | 12:00 Eastern | MS | Solid | | | X | | | |
| SED-2-091114 (280-59923-2MSD) | 9/11/14 | 12:00 Eastern | MSD | Solid | | | X | | | |
| SED-1-091114 (280-59923-3) | 9/11/14 | 12:20 Eastern | | Solid | | | X | X | | |
| SED-99-091114 (280-59923-4) | 9/11/14 | 17:00 Eastern | | Solid | | | X | X | | |
| SW-3-091114 (280-59923-5) | 9/11/14 | 09:45 Eastern | | Water | | | X | | | |
| SW-2-091114 (280-59923-6) | 9/11/14 | 11:30 Eastern | | Water | | | X | | | |
| SW-1-091114 (280-59923-7) | 9/11/14 | 12:15 Eastern | | Water | | | X | | | |
| ER-091114 (280-59923-8) | 9/11/14 | 14:15 Eastern | | Water | | | X | | | |

Ref:
Dep:
Date: 15Sep14
Wgt: 18.75 LBS
DV:
Svcs STANDARD OVERNIGHT Master 6139 9216 4006
TRCK. 6139 9216 4006
0.00
SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
TOTAL: 0.00

Ref:
Dep:
Date: 15Sep14
Wgt: 50.60 LBS
DV:
Svcs. STANDARD OVERNIGHT Master 6139 9216 4006
TRCK: 6139 9216 4017
0.00
SHIPPING: 0.00
SPECIAL: 0.00
HANDLING: 0.00
TOTAL: 0.00

*Possible Hazard Identification*
*Unconfirmed*

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: [signature] | Date/Time: 9-15-14 1600 | Company: TA | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals intact: Δ Yes Δ No
Custody Seal No.:
Cooler Temperature(s) °C and Other Remarks:

Temp 0.4 IR# 6

CF 0.0 Initals

Date: 9/12/14

Temp 1.4 IR# 6

CF 0.0 Initals

Date: 9/12/14

Temp 0.3 IR# 6

CF 0.0 Initals

Date: 9/12/14

Temp 1.0 IR# 6

CF 0.0 Initals

Date: 9/12/14

Temp 1.2 IR# 6

CF 0.0 Initals

Date: 9/12/14

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-59923-1

**Login Number: 59923**
**List Number: 1**
**Creator: Soto, Mayra A**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | False | Field on COC is blank. |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Denver
4955 Yarrow Street
Arvada, CO 80002
Tel: (303)736-0100

TestAmerica Job ID: 280-64928-1
Client Project/Site: UNC Cogen

For:
Geosyntec Consultants, Inc.
2501 Blue Ridge Rd.
Suite 430
Raleigh, North Carolina 27607

Attn: Beau Hodge

*Authorized for release by:*
*10/9/2015 1:00:28 PM*

Patrick McEntee, Manager of Project Management
(303)736-0107
patrick.mcentee@testamericainc.com

LINKS

Review your project results through TotalAccess

Have a Question? Ask The Expert

Visit us at: www.testamericainc.com

*The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.*

*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*Results relate only to the items tested and the sample(s) as received by the laboratory.*

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# Definitions/Glossary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

## Qualifiers

### GC/MS Semi VOA

| Qualifier | Qualifier Description |
|---|---|
| D | Sample results are obtained from a dilution; the surrogate or matrix spike recoveries reported are calculated from diluted samples. |
| U | Indicates the analyte was analyzed for but not detected. |

### Metals

| Qualifier | Qualifier Description |
|---|---|
| J | Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value. |
| U | Indicates the analyte was analyzed for but not detected. |

## Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|---|---|
| ¤ | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CNF | Contains no Free Liquid |
| DER | Duplicate error ratio (normalized absolute difference) |
| Dil Fac | Dilution Factor |
| DL, RA, RE, IN | Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample |
| DLC | Decision level concentration |
| MDA | Minimum detectable activity |
| EDL | Estimated Detection Limit |
| MDC | Minimum detectable concentration |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| NC | Not Calculated |
| ND | Not detected at the reporting limit (or MDL or EDL if shown) |
| PQL | Practical Quantitation Limit |
| QC | Quality Control |
| RER | Relative error ratio |
| RL | Reporting Limit or Requested Limit (Radiochemistry) |
| RPD | Relative Percent Difference, a measure of the relative difference between two points |
| TEF | Toxicity Equivalent Factor (Dioxin) |
| TEQ | Toxicity Equivalent Quotient (Dioxin) |

## Job ID: 280-64928-1

**Laboratory: TestAmerica Denver**

**Narrative**

# CASE NARRATIVE

## Client: Geosyntec Consultants, Inc.

## Project: UNC Cogen

## Report Number: 280-64928-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

**REVISION CHANGES**
The original data submission contained dioxin results from unrelated samples. The report was revised to include the correct dioxin data.

**RECEIPT**
The samples were received on 1/30/2015 9:10 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 5.2º C.

Dioxin analysis by EPA SW-846 Method 8290 was performed by TA Knoxville, located at 5815 MIddlebrook Pike, Knoxville TN, 37921, tel (865) 291-3000. The Dioxin report is presented in it's entirety in the Subcontracted Data section of this data package. The sample was received at TA Knoxville on 2/3/2015 09:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.6º C .

**SEMIVOLATILE ORGANIC COMPOUNDS - SELECTED ION MODE (SIM)**
Sample SED-3R (280-64928-3) was analyzed for Semivolatile organic compounds - Selected Ion Mode (SIM) in accordance with EPA SW-846 Method 8270D SIM. The samples were prepared on 02/11/2015 and analyzed on 02/13/2015.

Due to target analyte concentration, sample SED-3R (280-64928-3)[4X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**
Sample SB-37-2-2.5 (280-64928-1) was analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared and analyzed on 02/03/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**TOTAL METALS (ICP)**
Sample SW-3R (280-64928-2) was analyzed for Total Metals (ICP) in accordance with EPA SW-846 Method 6010C. The samples were prepared on 02/02/2015 and analyzed on 02/03/2015 and 02/04/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

## Job ID: 280-64928-1 (Continued)

### Laboratory: TestAmerica Denver (Continued)

**TOTAL MERCURY**
Sample SW-3R (280-64928-2) was analyzed for total mercury in accordance with EPA SW-846 Methods 7470A. The samples were prepared and analyzed on 02/02/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

**PERCENT SOLIDS**
Samples SB-37-2-2.5 (280-64928-1) and SED-3R (280-64928-3) were analyzed for percent solids in accordance with ASTM D2216-90. The samples were analyzed on 02/02/2015.

No analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

# Detection Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

## Client Sample ID: SB-37-2-2.5 — Lab Sample ID: 280-64928-1

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.9 | J | 2.4 | 0.78 | mg/Kg | 1 | ☼ | 6010C | Total/NA |

## Client Sample ID: SW-3R — Lab Sample ID: 280-64928-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 90 | J | 100 | 18 | ug/L | 1 | | 6010C | Total/NA |
| Barium | 68 | | 10 | 0.58 | ug/L | 1 | | 6010C | Total/NA |
| Chromium | 0.71 | J | 10 | 0.66 | ug/L | 1 | | 6010C | Total/NA |
| Iron | 130 | | 100 | 22 | ug/L | 1 | | 6010C | Total/NA |
| Manganese | 6.4 | J | 10 | 0.25 | ug/L | 1 | | 6010C | Total/NA |
| Zinc | 6.9 | J | 20 | 4.5 | ug/L | 1 | | 6010C | Total/NA |

## Client Sample ID: SED-3R — Lab Sample ID: 280-64928-3

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 24000 | | 5700 | 300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| 2-Methylnaphthalene | 21000 | | 5700 | 350 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthene | 7600 | | 5700 | 180 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Acenaphthylene | 97000 | | 5700 | 190 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Anthracene | 77000 | | 5700 | 820 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]anthracene | 160000 | | 5700 | 1000 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[a]pyrene | 150000 | | 5700 | 850 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[b]fluoranthene | 160000 | | 5700 | 1400 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[g,h,i]perylene | 74000 | | 5700 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Benzo[k]fluoranthene | 50000 | | 5700 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Chrysene | 190000 | | 5700 | 1100 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Dibenz(a,h)anthracene | 21000 | | 5700 | 1500 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluorene | 31000 | | 5700 | 540 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Indeno[1,2,3-cd]pyrene | 84000 | | 5700 | 1300 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Naphthalene | 16000 | | 5700 | 370 | ng/Kg | 1 | ☼ | 8270D SIM | Total/NA |
| Fluoranthene - DL | 300000 | | 23000 | 4600 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |
| Phenanthrene - DL | 270000 | | 23000 | 5000 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |
| Pyrene - DL | 360000 | | 23000 | 5000 | ng/Kg | 4 | ☼ | 8270D SIM | Total/NA |

This Detection Summary does not include radiochemical test results.

# Method Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

| Method | Method Description | Protocol | Laboratory |
|---|---|---|---|
| 8270D SIM | Semivolatile Organic Compounds (GC/MS SIM) | SW846 | TAL DEN |
| 6010C | Metals (ICP) | SW846 | TAL DEN |
| 7470A | Mercury (CVAA) | SW846 | TAL DEN |
| Moisture | Percent Moisture | EPA | TAL DEN |

**Protocol References:**

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Sample Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 280-64928-1 | SB-37-2-2.5 | Solid | 01/29/15 12:45 | 01/30/15 09:10 |
| 280-64928-2 | SW-3R | Water | 01/29/15 13:15 | 01/30/15 09:10 |
| 280-64928-3 | SED-3R | Solid | 01/29/15 13:35 | 01/30/15 09:10 |

# Client Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Client Sample ID: SED-3R** — **Lab Sample ID: 280-64928-3**
**Date Collected: 01/29/15 13:35** — **Matrix: Solid**
**Date Received: 01/30/15 09:10** — **Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 24000 | | 5700 | 300 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| 2-Methylnaphthalene | 21000 | | 5700 | 350 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Acenaphthene | 7600 | | 5700 | 180 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Acenaphthylene | 97000 | | 5700 | 190 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Anthracene | 77000 | | 5700 | 820 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Benzo[a]anthracene | 160000 | | 5700 | 1000 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Benzo[a]pyrene | 150000 | | 5700 | 850 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Benzo[b]fluoranthene | 160000 | | 5700 | 1400 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Benzo[g,h,i]perylene | 74000 | | 5700 | 1300 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Benzo[k]fluoranthene | 50000 | | 5700 | 1100 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Chrysene | 190000 | | 5700 | 1100 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Dibenz(a,h)anthracene | 21000 | | 5700 | 1500 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Fluorene | 31000 | | 5700 | 540 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Indeno[1,2,3-cd]pyrene | 84000 | | 5700 | 1300 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |
| Naphthalene | 16000 | | 5700 | 370 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 12:23 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | | *39 - 120* | *02/11/15 21:56* | *02/13/15 12:23* | *1* |
| *Nitrobenzene-d5* | *99* | | *42 - 120* | *02/11/15 21:56* | *02/13/15 12:23* | *1* |
| *Terphenyl-d14* | *91* | | *35 - 124* | *02/11/15 21:56* | *02/13/15 12:23* | *1* |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) - DL

**Client Sample ID: SED-3R** — **Lab Sample ID: 280-64928-3**
**Date Collected: 01/29/15 13:35** — **Matrix: Solid**
**Date Received: 01/30/15 09:10** — **Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Fluoranthene | 300000 | | 23000 | 4600 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 15:23 | 4 |
| Phenanthrene | 270000 | | 23000 | 5000 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 15:23 | 4 |
| Pyrene | 360000 | | 23000 | 5000 | ng/Kg | ☼ | 02/11/15 21:56 | 02/13/15 15:23 | 4 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *85* | *D* | *39 - 120* | *02/11/15 21:56* | *02/13/15 15:23* | *4* |
| *Nitrobenzene-d5* | *96* | *D* | *42 - 120* | *02/11/15 21:56* | *02/13/15 15:23* | *4* |
| *Terphenyl-d14* | *83* | *D* | *35 - 124* | *02/11/15 21:56* | *02/13/15 15:23* | *4* |

## Method: 6010C - Metals (ICP)

**Client Sample ID: SB-37-2-2.5** — **Lab Sample ID: 280-64928-1**
**Date Collected: 01/29/15 12:45** — **Matrix: Solid**
**Date Received: 01/30/15 09:10** — **Percent Solids: 82.4**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.9 | J | 2.4 | 0.78 | mg/Kg | ☼ | 02/03/15 08:15 | 02/03/15 19:05 | 1 |

**Client Sample ID: SW-3R** — **Lab Sample ID: 280-64928-2**
**Date Collected: 01/29/15 13:15** — **Matrix: Water**
**Date Received: 01/30/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 90 | J | 100 | 18 | ug/L | | 02/02/15 08:45 | 02/03/15 19:12 | 1 |
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |

## Method: 6010C - Metals (ICP) (Continued)

**Client Sample ID: SW-3R** — **Lab Sample ID: 280-64928-2**
**Date Collected: 01/29/15 13:15** — **Matrix: Water**
**Date Received: 01/30/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 02/02/15 08:45 | 02/04/15 11:56 | 1 |
| **Barium** | **68** | | 10 | 0.58 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 02/02/15 08:45 | 02/03/15 19:12 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| **Chromium** | **0.71** | **J** | 10 | 0.66 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| **Iron** | **130** | | 100 | 22 | ug/L | | 02/02/15 08:45 | 02/03/15 19:12 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| **Manganese** | **6.4** | **J** | 10 | 0.25 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 02/02/15 08:45 | 02/03/15 19:12 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| **Zinc** | **6.9** | **J** | 20 | 4.5 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 02/02/15 08:45 | 02/03/15 01:07 | 1 |

## Method: 7470A - Mercury (CVAA)

**Client Sample ID: SW-3R** — **Lab Sample ID: 280-64928-2**
**Date Collected: 01/29/15 13:15** — **Matrix: Water**
**Date Received: 01/30/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 02/02/15 12:05 | 02/02/15 18:44 | 1 |

## General Chemistry

**Client Sample ID: SB-37-2-2.5** — **Lab Sample ID: 280-64928-1**
**Date Collected: 01/29/15 12:45** — **Matrix: Solid**
**Date Received: 01/30/15 09:10**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Moisture** | **18** | | 0.10 | 0.10 | % | | | 02/02/15 10:49 | 1 |
| **Percent Solids** | **82** | | 0.10 | 0.10 | % | | | 02/02/15 10:49 | 1 |

**Client Sample ID: SED-3R** — **Lab Sample ID: 280-64928-3**
**Date Collected: 01/29/15 13:35** — **Matrix: Solid**
**Date Received: 01/30/15 09:10** — **Percent Solids: 80.2**

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| **Percent Moisture** | **20** | | 0.10 | 0.10 | % | | | 02/02/15 10:49 | 1 |
| **Percent Solids** | **80** | | 0.10 | 0.10 | % | | | 02/02/15 10:49 | 1 |

# Surrogate Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Matrix: Solid** **Prep Type: Total/NA**

| | | Percent Surrogate Recovery (Acceptance Limits) | | |
|---|---|---|---|---|
| | | FBP | NBZ | TPH |
| Lab Sample ID | Client Sample ID | (39-120) | (42-120) | (35-124) |
| 280-64928-3 | SED-3R | 85 | 99 | 91 |
| 280-64928-3 - DL | SED-3R | 85 D | 96 D | 83 D |
| LCS 280-263970/2-A | Lab Control Sample | 89 | 103 | 86 |
| MB 280-263970/1-A | Method Blank | 93 | 105 | 119 |

**Surrogate Legend**

FBP = 2-Fluorobiphenyl
NBZ = Nitrobenzene-d5
TPH = Terphenyl-d14

# QC Sample Results

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM)

**Lab Sample ID: MB 280-263970/1-A**
**Matrix: Solid**
**Analysis Batch: 264244**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 263970**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1-Methylnaphthalene | 260 | U | 5000 | 260 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| 2-Methylnaphthalene | 310 | U | 5000 | 310 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Acenaphthene | 160 | U | 5000 | 160 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Acenaphthylene | 170 | U | 5000 | 170 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Anthracene | 720 | U | 5000 | 720 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Benzo[a]anthracene | 900 | U | 5000 | 900 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Benzo[a]pyrene | 740 | U | 5000 | 740 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Benzo[b]fluoranthene | 1200 | U | 5000 | 1200 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Benzo[g,h,i]perylene | 1100 | U | 5000 | 1100 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Benzo[k]fluoranthene | 1000 | U | 5000 | 1000 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Chrysene | 1000 | U | 5000 | 1000 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Dibenz(a,h)anthracene | 1300 | U | 5000 | 1300 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Fluoranthene | 1000 | U | 5000 | 1000 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Fluorene | 470 | U | 5000 | 470 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Indeno[1,2,3-cd]pyrene | 1100 | U | 5000 | 1100 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Naphthalene | 330 | U | 5000 | 330 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Phenanthrene | 1100 | U | 5000 | 1100 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |
| Pyrene | 1100 | U | 5000 | 1100 | ng/Kg | | 02/11/15 21:56 | 02/13/15 09:24 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *2-Fluorobiphenyl* | *93* | | *39 - 120* | *02/11/15 21:56* | *02/13/15 09:24* | *1* |
| *Nitrobenzene-d5* | *105* | | *42 - 120* | *02/11/15 21:56* | *02/13/15 09:24* | *1* |
| *Terphenyl-d14* | *119* | | *35 - 124* | *02/11/15 21:56* | *02/13/15 09:24* | *1* |

**Lab Sample ID: LCS 280-263970/2-A**
**Matrix: Solid**
**Analysis Batch: 264244**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 263970**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Acenaphthene | 30000 | 27300 | | ng/Kg | | 91 | 35 - 120 |
| Acenaphthylene | 30000 | 27700 | | ng/Kg | | 92 | 41 - 120 |
| Anthracene | 30000 | 29000 | | ng/Kg | | 97 | 43 - 120 |
| Benzo[a]anthracene | 30000 | 29900 | | ng/Kg | | 100 | 36 - 120 |
| Benzo[a]pyrene | 30000 | 30600 | | ng/Kg | | 102 | 20 - 120 |
| Benzo[b]fluoranthene | 30000 | 28700 | | ng/Kg | | 96 | 37 - 120 |
| Benzo[g,h,i]perylene | 30000 | 22300 | | ng/Kg | | 74 | 20 - 123 |
| Benzo[k]fluoranthene | 30000 | 28300 | | ng/Kg | | 94 | 46 - 120 |
| Chrysene | 30000 | 28500 | | ng/Kg | | 95 | 34 - 120 |
| Dibenz(a,h)anthracene | 30000 | 24300 | | ng/Kg | | 81 | 20 - 120 |
| Fluoranthene | 30000 | 27900 | | ng/Kg | | 93 | 45 - 120 |
| Fluorene | 30000 | 27200 | | ng/Kg | | 91 | 44 - 120 |
| Indeno[1,2,3-cd]pyrene | 30000 | 25900 | | ng/Kg | | 86 | 20 - 127 |
| Naphthalene | 30000 | 28000 | | ng/Kg | | 93 | 44 - 120 |
| Phenanthrene | 30000 | 26400 | | ng/Kg | | 88 | 44 - 120 |
| Pyrene | 30000 | 27000 | | ng/Kg | | 90 | 43 - 120 |

## Method: 8270D SIM - Semivolatile Organic Compounds (GC/MS SIM) (Continued)

**Lab Sample ID: LCS 280-263970/2-A**
**Matrix: Solid**
**Analysis Batch: 264244**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 263970**

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *2-Fluorobiphenyl* | *89* | | *39 - 120* |
| *Nitrobenzene-d5* | *103* | | *42 - 120* |
| *Terphenyl-d14* | *86* | | *35 - 124* |

## Method: 6010C - Metals (ICP)

**Lab Sample ID: MB 280-262501/1-A**
**Matrix: Water**
**Analysis Batch: 262737**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 262501**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 20 | 3.1 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Barium | 0.58 | U | 10 | 0.58 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Cadmium | 0.45 | U | 5.0 | 0.45 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Chromium | 0.66 | U | 10 | 0.66 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Copper | 1.4 | U | 15 | 1.4 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Cobalt | 1.2 | U | 10 | 1.2 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Lead | 2.6 | U | 9.0 | 2.6 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Manganese | 0.25 | U | 10 | 0.25 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Nickel | 1.3 | U | 40 | 1.3 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Silver | 0.93 | U | 10 | 0.93 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Thallium | 4.9 | U | 15 | 4.9 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Zinc | 4.5 | U | 20 | 4.5 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |
| Vanadium | 1.1 | U | 10 | 1.1 | ug/L | | 02/02/15 08:45 | 02/03/15 01:02 | 1 |

**Lab Sample ID: MB 280-262501/1-A**
**Matrix: Water**
**Analysis Batch: 262886**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 262501**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 18 | U | 100 | 18 | ug/L | | 02/02/15 08:45 | 02/03/15 19:08 | 1 |
| Beryllium | 0.47 | U | 1.0 | 0.47 | ug/L | | 02/02/15 08:45 | 02/03/15 19:08 | 1 |
| Iron | 22 | U | 100 | 22 | ug/L | | 02/02/15 08:45 | 02/03/15 19:08 | 1 |
| Selenium | 4.9 | U | 15 | 4.9 | ug/L | | 02/02/15 08:45 | 02/03/15 19:08 | 1 |

**Lab Sample ID: MB 280-262501/1-A**
**Matrix: Water**
**Analysis Batch: 262968**

**Client Sample ID: Method Blank**
**Prep Type: Total/NA**
**Prep Batch: 262501**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 4.4 | U | 15 | 4.4 | ug/L | | 02/02/15 08:45 | 02/04/15 11:51 | 1 |

**Lab Sample ID: LCS 280-262501/2-A**
**Matrix: Water**
**Analysis Batch: 262737**

**Client Sample ID: Lab Control Sample**
**Prep Type: Total/NA**
**Prep Batch: 262501**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Antimony | 500 | 492 | | ug/L | | 98 | 88 - 110 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: LCS 280-262501/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262737** — **Prep Batch: 262501**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Barium | 2000 | 2080 | | ug/L | | 104 | 90 - 112 |
| Cadmium | 100 | 99.8 | | ug/L | | 100 | 88 - 111 |
| Chromium | 200 | 192 | | ug/L | | 96 | 90 - 113 |
| Copper | 250 | 253 | | ug/L | | 101 | 86 - 112 |
| Cobalt | 500 | 495 | | ug/L | | 99 | 89 - 111 |
| Lead | 500 | 502 | | ug/L | | 100 | 89 - 110 |
| Manganese | 500 | 476 | | ug/L | | 95 | 90 - 110 |
| Nickel | 500 | 495 | | ug/L | | 99 | 89 - 111 |
| Silver | 50.0 | 52.3 | | ug/L | | 105 | 86 - 115 |
| Thallium | 2000 | 2020 | | ug/L | | 101 | 88 - 110 |
| Zinc | 500 | 478 | | ug/L | | 96 | 85 - 111 |
| Vanadium | 500 | 499 | | ug/L | | 100 | 90 - 111 |

**Lab Sample ID: LCS 280-262501/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262886** — **Prep Batch: 262501**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Aluminum | 2000 | 1880 | | ug/L | | 94 | 87 - 111 |
| Beryllium | 50.0 | 48.4 | | ug/L | | 97 | 89 - 113 |
| Iron | 1000 | 957 | | ug/L | | 96 | 89 - 115 |
| Selenium | 2000 | 1920 | | ug/L | | 96 | 85 - 112 |

**Lab Sample ID: LCS 280-262501/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262968** — **Prep Batch: 262501**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 1000 | 946 | | ug/L | | 95 | 88 - 110 |

**Lab Sample ID: 280-64928-2 MS** — **Client Sample ID: SW-3R**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262737** — **Prep Batch: 262501**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 500 | 503 | | ug/L | | 101 | 81 - 124 |
| Barium | 68 | | 2000 | 2160 | | ug/L | | 105 | 85 - 120 |
| Cadmium | 0.45 | U | 100 | 102 | | ug/L | | 102 | 82 - 119 |
| Chromium | 0.71 | J | 200 | 196 | | ug/L | | 98 | 73 - 135 |
| Copper | 1.4 | U | 250 | 259 | | ug/L | | 103 | 82 - 129 |
| Cobalt | 1.2 | U | 500 | 493 | | ug/L | | 99 | 82 - 119 |
| Lead | 2.6 | U | 500 | 501 | | ug/L | | 100 | 89 - 121 |
| Manganese | 6.4 | J | 500 | 481 | | ug/L | | 95 | 79 - 121 |
| Nickel | 1.3 | U | 500 | 492 | | ug/L | | 98 | 84 - 120 |
| Silver | 0.93 | U | 50.0 | 53.5 | | ug/L | | 107 | 75 - 141 |
| Thallium | 4.9 | U | 2000 | 2020 | | ug/L | | 101 | 90 - 116 |
| Zinc | 6.9 | J | 500 | 473 | | ug/L | | 93 | 60 - 137 |
| Vanadium | 1.1 | U | 500 | 498 | | ug/L | | 100 | 85 - 120 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: 280-64928-2 MS** — **Client Sample ID: SW-3R**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262886** — **Prep Batch: 262501**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 90 | J | 2000 | 2060 | | ug/L | | 98 | 83 - 119 |
| Beryllium | 0.47 | U | 50.0 | 49.2 | | ug/L | | 98 | 79 - 121 |
| Iron | 130 | | 1000 | 1120 | | ug/L | | 99 | 52 - 155 |
| Selenium | 4.9 | U | 2000 | 1930 | | ug/L | | 97 | 71 - 140 |

**Lab Sample ID: 280-64928-2 MS** — **Client Sample ID: SW-3R**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262968** — **Prep Batch: 262501**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 4.4 | U | 1000 | 960 | | ug/L | | 96 | 84 - 124 |

**Lab Sample ID: 280-64928-2 MSD** — **Client Sample ID: SW-3R**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262737** — **Prep Batch: 262501**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Antimony | 3.1 | U | 500 | 498 | | ug/L | | 100 | 81 - 124 | 1 | 20 |
| Barium | 68 | | 2000 | 2160 | | ug/L | | 105 | 85 - 120 | 0 | 20 |
| Cadmium | 0.45 | U | 100 | 101 | | ug/L | | 101 | 82 - 119 | 1 | 20 |
| Chromium | 0.71 | J | 200 | 195 | | ug/L | | 97 | 73 - 135 | 1 | 20 |
| Copper | 1.4 | U | 250 | 260 | | ug/L | | 104 | 82 - 129 | 1 | 20 |
| Cobalt | 1.2 | U | 500 | 490 | | ug/L | | 98 | 82 - 119 | 1 | 20 |
| Lead | 2.6 | U | 500 | 497 | | ug/L | | 99 | 89 - 121 | 1 | 20 |
| Manganese | 6.4 | J | 500 | 479 | | ug/L | | 95 | 79 - 121 | 0 | 20 |
| Nickel | 1.3 | U | 500 | 489 | | ug/L | | 98 | 84 - 120 | 1 | 20 |
| Silver | 0.93 | U | 50.0 | 52.6 | | ug/L | | 105 | 75 - 141 | 2 | 20 |
| Thallium | 4.9 | U | 2000 | 2010 | | ug/L | | 100 | 90 - 116 | 1 | 20 |
| Zinc | 6.9 | J | 500 | 470 | | ug/L | | 93 | 60 - 137 | 1 | 20 |
| Vanadium | 1.1 | U | 500 | 499 | | ug/L | | 100 | 85 - 120 | 0 | 20 |

**Lab Sample ID: 280-64928-2 MSD** — **Client Sample ID: SW-3R**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262886** — **Prep Batch: 262501**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Aluminum | 90 | J | 2000 | 2070 | | ug/L | | 99 | 83 - 119 | 1 | 20 |
| Beryllium | 0.47 | U | 50.0 | 49.1 | | ug/L | | 98 | 79 - 121 | 0 | 20 |
| Iron | 130 | | 1000 | 1110 | | ug/L | | 98 | 52 - 155 | 1 | 20 |
| Selenium | 4.9 | U | 2000 | 1950 | | ug/L | | 98 | 71 - 140 | 1 | 20 |

**Lab Sample ID: 280-64928-2 MSD** — **Client Sample ID: SW-3R**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262968** — **Prep Batch: 262501**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 4.4 | U | 1000 | 968 | | ug/L | | 97 | 84 - 124 | 1 | 20 |

## Method: 6010C - Metals (ICP) (Continued)

**Lab Sample ID: MB 280-262505/1-A** — **Client Sample ID: Method Blank**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 262918** — **Prep Batch: 262505**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 0.66 | U | 2.0 | 0.66 | mg/Kg | | 02/03/15 08:15 | 02/03/15 19:00 | 1 |

**Lab Sample ID: LCS 280-262505/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 262918** — **Prep Batch: 262505**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Arsenic | 100 | 103 | | mg/Kg | | 103 | 85 - 110 |

**Lab Sample ID: 280-64928-1 MS** — **Client Sample ID: SB-37-2-2.5**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 262918** — **Prep Batch: 262505**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS Result | MS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.9 | J | 113 | 109 | | mg/Kg | ☼ | 94 | 76 - 111 |

**Lab Sample ID: 280-64928-1 MSD** — **Client Sample ID: SB-37-2-2.5**
**Matrix: Solid** — **Prep Type: Total/NA**
**Analysis Batch: 262918** — **Prep Batch: 262505**

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 1.9 | J | 110 | 107 | | mg/Kg | ☼ | 96 | 76 - 111 | 1 | 20 |

## Method: 7470A - Mercury (CVAA)

**Lab Sample ID: MB 280-262613/1-A** — **Client Sample ID: Method Blank**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262747** — **Prep Batch: 262613**

| Analyte | MB Result | MB Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 0.027 | U | 0.20 | 0.027 | ug/L | | 02/02/15 12:05 | 02/02/15 18:23 | 1 |

**Lab Sample ID: LCS 280-262613/2-A** — **Client Sample ID: Lab Control Sample**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262747** — **Prep Batch: 262613**

| Analyte | Spike Added | LCS Result | LCS Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.63 | | ug/L | | 93 | 84 - 120 |

**Lab Sample ID: LCSD 280-262613/3-A** — **Client Sample ID: Lab Control Sample Dup**
**Matrix: Water** — **Prep Type: Total/NA**
**Analysis Batch: 262747** — **Prep Batch: 262613**

| Analyte | Spike Added | LCSD Result | LCSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|
| Mercury | 5.00 | 4.67 | | ug/L | | 93 | 84 - 120 | 1 | 15 |

# QC Association Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

## GC/MS Semi VOA

### Prep Batch: 263970

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-3 - DL | SED-3R | Total/NA | Solid | 3546 | |
| 280-64928-3 | SED-3R | Total/NA | Solid | 3546 | |
| LCS 280-263970/2-A | Lab Control Sample | Total/NA | Solid | 3546 | |
| MB 280-263970/1-A | Method Blank | Total/NA | Solid | 3546 | |

### Analysis Batch: 264244

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-3 | SED-3R | Total/NA | Solid | 8270D SIM | 263970 |
| 280-64928-3 - DL | SED-3R | Total/NA | Solid | 8270D SIM | 263970 |
| LCS 280-263970/2-A | Lab Control Sample | Total/NA | Solid | 8270D SIM | 263970 |
| MB 280-263970/1-A | Method Blank | Total/NA | Solid | 8270D SIM | 263970 |

## Metals

### Prep Batch: 262501

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-2 | SW-3R | Total/NA | Water | 3010A | |
| 280-64928-2 MS | SW-3R | Total/NA | Water | 3010A | |
| 280-64928-2 MSD | SW-3R | Total/NA | Water | 3010A | |
| LCS 280-262501/2-A | Lab Control Sample | Total/NA | Water | 3010A | |
| MB 280-262501/1-A | Method Blank | Total/NA | Water | 3010A | |

### Prep Batch: 262505

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-1 | SB-37-2-2.5 | Total/NA | Solid | 3050B | |
| 280-64928-1 MS | SB-37-2-2.5 | Total/NA | Solid | 3050B | |
| 280-64928-1 MSD | SB-37-2-2.5 | Total/NA | Solid | 3050B | |
| LCS 280-262505/2-A | Lab Control Sample | Total/NA | Solid | 3050B | |
| MB 280-262505/1-A | Method Blank | Total/NA | Solid | 3050B | |

### Prep Batch: 262613

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-2 | SW-3R | Total/NA | Water | 7470A | |
| LCS 280-262613/2-A | Lab Control Sample | Total/NA | Water | 7470A | |
| LCSD 280-262613/3-A | Lab Control Sample Dup | Total/NA | Water | 7470A | |
| MB 280-262613/1-A | Method Blank | Total/NA | Water | 7470A | |

### Analysis Batch: 262737

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-2 | SW-3R | Total/NA | Water | 6010C | 262501 |
| 280-64928-2 MS | SW-3R | Total/NA | Water | 6010C | 262501 |
| 280-64928-2 MSD | SW-3R | Total/NA | Water | 6010C | 262501 |
| LCS 280-262501/2-A | Lab Control Sample | Total/NA | Water | 6010C | 262501 |
| MB 280-262501/1-A | Method Blank | Total/NA | Water | 6010C | 262501 |

### Analysis Batch: 262747

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-2 | SW-3R | Total/NA | Water | 7470A | 262613 |
| LCS 280-262613/2-A | Lab Control Sample | Total/NA | Water | 7470A | 262613 |
| LCSD 280-262613/3-A | Lab Control Sample Dup | Total/NA | Water | 7470A | 262613 |

## Metals (Continued)

### Analysis Batch: 262747 (Continued)

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| MB 280-262613/1-A | Method Blank | Total/NA | Water | 7470A | 262613 |

### Analysis Batch: 262886

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-2 | SW-3R | Total/NA | Water | 6010C | 262501 |
| 280-64928-2 MS | SW-3R | Total/NA | Water | 6010C | 262501 |
| 280-64928-2 MSD | SW-3R | Total/NA | Water | 6010C | 262501 |
| LCS 280-262501/2-A | Lab Control Sample | Total/NA | Water | 6010C | 262501 |
| MB 280-262501/1-A | Method Blank | Total/NA | Water | 6010C | 262501 |

### Analysis Batch: 262918

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-1 | SB-37-2-2.5 | Total/NA | Solid | 6010C | 262505 |
| 280-64928-1 MS | SB-37-2-2.5 | Total/NA | Solid | 6010C | 262505 |
| 280-64928-1 MSD | SB-37-2-2.5 | Total/NA | Solid | 6010C | 262505 |
| LCS 280-262505/2-A | Lab Control Sample | Total/NA | Solid | 6010C | 262505 |
| MB 280-262505/1-A | Method Blank | Total/NA | Solid | 6010C | 262505 |

### Analysis Batch: 262968

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-2 | SW-3R | Total/NA | Water | 6010C | 262501 |
| 280-64928-2 MS | SW-3R | Total/NA | Water | 6010C | 262501 |
| 280-64928-2 MSD | SW-3R | Total/NA | Water | 6010C | 262501 |
| LCS 280-262501/2-A | Lab Control Sample | Total/NA | Water | 6010C | 262501 |
| MB 280-262501/1-A | Method Blank | Total/NA | Water | 6010C | 262501 |

## General Chemistry

### Analysis Batch: 262645

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 280-64928-1 | SB-37-2-2.5 | Total/NA | Solid | Moisture | |
| 280-64928-3 | SED-3R | Total/NA | Solid | Moisture | |

# Lab Chronicle

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

## Client Sample ID: SB-37-2-2.5 — Lab Sample ID: 280-64928-1

**Date Collected: 01/29/15 12:45**
**Date Received: 01/30/15 09:10**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 262645 | 02/02/15 10:49 | SVC | TAL DEN |

## Client Sample ID: SB-37-2-2.5 — Lab Sample ID: 280-64928-1

**Date Collected: 01/29/15 12:45**
**Date Received: 01/30/15 09:10**
**Matrix: Solid**
**Percent Solids: 82.4**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3050B | | | 1.02 g | 100 mL | 262505 | 02/03/15 08:15 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 1.02 g | 100 mL | 262918 | 02/03/15 19:05 | LLB | TAL DEN |

## Client Sample ID: SW-3R — Lab Sample ID: 280-64928-2

**Date Collected: 01/29/15 13:15**
**Date Received: 01/30/15 09:10**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 262501 | 02/02/15 08:45 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 262737 | 02/03/15 01:07 | CRR | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 262501 | 02/02/15 08:45 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 262886 | 02/03/15 19:12 | CRR | TAL DEN |
| Total/NA | Prep | 3010A | | | 50 mL | 50 mL | 262501 | 02/02/15 08:45 | WDS | TAL DEN |
| Total/NA | Analysis | 6010C | | 1 | 50 mL | 50 mL | 262968 | 02/04/15 11:56 | CRR | TAL DEN |
| Total/NA | Prep | 7470A | | | 30 mL | 30 mL | 262613 | 02/02/15 12:05 | CGG | TAL DEN |
| Total/NA | Analysis | 7470A | | 1 | 30 mL | 30 mL | 262747 | 02/02/15 18:44 | CGG | TAL DEN |

## Client Sample ID: SED-3R — Lab Sample ID: 280-64928-3

**Date Collected: 01/29/15 13:35**
**Date Received: 01/30/15 09:10**
**Matrix: Solid**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | Moisture | | 1 | | | 262645 | 02/02/15 10:49 | SVC | TAL DEN |

## Client Sample ID: SED-3R — Lab Sample ID: 280-64928-3

**Date Collected: 01/29/15 13:35**
**Date Received: 01/30/15 09:10**
**Matrix: Solid**
**Percent Solids: 80.2**

| Prep Type | Batch Type | Batch Method | Run | Dil Factor | Initial Amount | Final Amount | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|---|---|
| Total/NA | Prep | 3546 | | | 32.7 g | 1 mL | 263970 | 02/11/15 21:56 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | | 1 | 32.7 g | 1 mL | 264244 | 02/13/15 12:23 | NRC | TAL DEN |
| Total/NA | Prep | 3546 | DL | | 32.7 g | 1 mL | 263970 | 02/11/15 21:56 | AH1 | TAL DEN |
| Total/NA | Analysis | 8270D SIM | DL | 4 | 32.7 g | 1 mL | 264244 | 02/13/15 15:23 | NRC | TAL DEN |

**Laboratory References:**

TAL DEN = TestAmerica Denver, 4955 Yarrow Street, Arvada, CO 80002, TEL (303)736-0100

# Certification Summary

Client: Geosyntec Consultants, Inc.
Project/Site: UNC Cogen

TestAmerica Job ID: 280-64928-1

## Laboratory: TestAmerica Denver

All certifications held by this laboratory are listed. Not all certifications are applicable to this report.

| Authority | Program | EPA Region | Certification ID | Expiration Date |
|---|---|---|---|---|
| A2LA | DoD ELAP | | 2907.01 | 10-31-15 |
| A2LA | ISO/IEC 17025 | | 2907.01 | 10-31-15 |
| Alabama | State Program | 4 | 40730 | 09-30-12 * |
| Alaska (UST) | State Program | 10 | UST-30 | 04-05-16 |
| Arizona | State Program | 9 | AZ0713 | 12-19-15 |
| Arkansas DEQ | State Program | 6 | 88-0687 | 06-01-16 |
| California | State Program | 9 | 2513 | 08-31-16 |
| Connecticut | State Program | 1 | PH-0686 | 09-30-16 |
| Florida | NELAP | 4 | E87667 | 06-30-16 |
| Georgia | State Program | 4 | N/A | 01-09-15 * |
| Illinois | NELAP | 5 | 200017 | 04-30-16 |
| Iowa | State Program | 7 | 370 | 11-30-16 |
| Kansas | NELAP | 7 | E-10166 | 04-30-16 |
| Louisiana | NELAP | 6 | 02096 | 06-30-16 |
| Maine | State Program | 1 | CO0002 | 03-03-17 |
| Minnesota | NELAP | 5 | 8-999-405 | 12-31-15 |
| Nevada | State Program | 9 | CO0026 | 07-31-16 |
| New Hampshire | NELAP | 1 | 205310 | 04-28-16 |
| New Jersey | NELAP | 2 | CO004 | 10-30-15 |
| New York | NELAP | 2 | 11964 | 04-01-16 |
| North Carolina (WW/SW) | State Program | 4 | 358 | 12-31-15 |
| North Dakota | State Program | 8 | R-034 | 01-09-16 |
| Oklahoma | State Program | 6 | 8614 | 08-31-16 |
| Oregon | NELAP | 10 | 4025 | 01-09-16 |
| Pennsylvania | NELAP | 3 | 68-00664 | 07-31-16 |
| South Carolina | State Program | 4 | 72002001 | 01-09-16 |
| Texas | NELAP | 6 | T104704183-15-11 | 09-30-16 |
| USDA | Federal | | P330-13-00202 | 07-02-16 |
| Utah | NELAP | 8 | CO00026 | 07-31-16 |
| Virginia | NELAP | 3 | 460232 | 06-14-16 |
| Washington | State Program | 10 | C583 | 08-03-16 |
| West Virginia DEP | State Program | 3 | 354 | 11-30-15 |
| Wisconsin | State Program | 5 | 999615430 | 08-31-16 |
| Wyoming (UST) | A2LA | 8 | 2907.01 | 10-31-15 |

* Certification renewal pending - certification considered valid.

**TestAmerica Denver**
4955 Yarrow Street
Arvada, CO 80002
Phone (303) 736-0100 Fax (303) 43

280-64928 Chain of Custody

# of Custody Record

4.7+0.5 IR-5 Transfer by TCO 1/30/15

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

| Client Information | Sampler: Matt Jenny | Lab PM: McEntee, Patrick J | Carrier Tracking No(s): | COC No: 280-38841-15576.1 |
|---|---|---|---|---|
| Client Contact: ~~Lauren Wellborn~~ Mike Schott | Phone: 919 424 1826 | E-Mail: patrick.mcentee@testamericainc.com | | Page: Page 1 of 1 |
| Company: Geosyntec Consultants, Inc. | | | | Job #: |
| Address: ~~8980 Six Forks Road Suite 201~~ 2501 Blue Ridge Road Suite 430 | Due Date Requested: | | | |
| City: Raleigh | TAT Requested (days): Normal | | | |
| State, Zip: NC, ~~27615~~ 27607 | | | | |
| Phone: ~~919-870-0570(Tel)~~ 919 424 1824 | PO #: GN5219 | | | |
| Email: ~~lwellborn@geosyntec.com~~ mschott@geosyntec.com | WO #: | | | |
| Project Name: UNC Cogen | Project #: 28010940 | | | |
| Site: UNC Cogen | SSOW#: | | | |

**Analysis Requested**

MSS

NO

| Sample Identification | Sample Date | Sample Time | Sample Type (C=comp, G=grab) | Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air) | Field Filtered Sample (Yes or No) | Perform MS/MSD (Yes or No) | Total Metals 6010C (18 Metals)/6010C (4 Metals)/7470A | Dioxins 8290 (TA-Knoxville) | Total Arsenic 6010C | PAH 8270D_SIM | % Moisture | 7470A | Total Number of containers | Special Instructions/Note: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Preservation Code: | | | | | | | | | | | |
| SB-37-2-2.5 | 1/29/15 | 1245 | G | S | N | N | X | | X | | X | | 1 | 6010C Arsenic only not other metals |
| SW-3R | 1/29/15 | 1315 | G | W | N | N | X | X | | | | | 3 | |
| SED-3R | 1/29/15 | 1335 | G | S | N | N | | | | X | | | 1 | |

**Preservation Codes:**

| | |
|---|---|
| A - HCL | M - Hexane |
| B - NaOH | N - None |
| C - Zn Acetate | O - AsNaO2 |
| D - Nitric Acid | P - Na2O4S |
| E - NaHSO4 | Q - Na2SO3 |
| F - MeOH | R - Na2S2SO3 |
| G - Amchlor | S - H2SO4 |
| H - Ascorbic Acid | T - TSP Dodecahydrate |
| I - Ice | U - Acetone |
| J - DI Water | V - MCAA |
| K - EDTA | W - ph 4-5 |
| L - EDA | Z - other (specify) |

Other:

*Possible Hazard Identification*
☒ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

*Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month)*
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

| Empty Kit Relinquished by: | Date: | Time: | Method of Shipment: | | |
|---|---|---|---|---|---|
| Relinquished by: Matt Jenny | Date/Time: 1/29/15 16:00 | Company: Geosyntec | Received by: | Date/Time: 1/30/15 910 | Company: TAD |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |
| Relinquished by: | Date/Time: | Company | Received by: | Date/Time: | Company |

Custody Seals Intact: Δ Yes Δ No

Custody Seal No.:

Cooler Temperature(s) °C and Other Remarks:

# Login Sample Receipt Checklist

Client: Geosyntec Consultants, Inc.

Job Number: 280-64928-1

**Login Number: 64928**
**List Number: 1**
**Creator: Orfield, Tayler C**

**List Source: TestAmerica Denver**

| Question | Answer | Comment |
|---|---|---|
| Radioactivity wasn't checked or is </= background as measured by a survey meter. | N/A | |
| The cooler's custody seal, if present, is intact. | True | |
| Sample custody seals, if present, are intact. | True | |
| The cooler or samples do not appear to have been compromised or tampered with. | True | |
| Samples were received on ice. | True | |
| Cooler Temperature is acceptable. | True | |
| Cooler Temperature is recorded. | True | |
| COC is present. | True | |
| COC is filled out in ink and legible. | True | |
| COC is filled out with all pertinent information. | True | |
| Is the Field Sampler's name present on COC? | True | |
| There are no discrepancies between the containers received and the COC. | True | |
| Samples are received within Holding Time. | True | |
| Sample containers have legible labels. | True | |
| Containers are not broken or leaking. | True | |
| Sample collection date/times are provided. | True | |
| Appropriate sample containers are used. | True | |
| Sample bottles are completely filled. | True | |
| Sample Preservation Verified. | N/A | |
| There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs | True | |
| Containers requiring zero headspace have no headspace or bubble is <6mm (1/4"). | N/A | |
| Multiphasic samples are not present. | True | |
| Samples do not require splitting or compositing. | True | |
| Residual Chlorine Checked. | N/A | |

# APPENDIX B

# Data Validation Report

Geosyntec consultants

2240 Sutherland Avenue, Suite 107
Knoxville, TN 37919
PH 865.330.0037
FAX 865.330.9949
www.geosyntec.com

# Memorandum

Date: 20 November 2014

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3510C/8270D Selective Ion Monitoring and 3546/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C and 3050B/6010C, Mercury by EPA Methods 7470A and 7471B, Anions by EPA Method 9056A, pH by EPA Method 9045D, and Percent Moisture/Solids by EPA Moisture – TestAmerica Work Order Number 280-59923-1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of three solid samples, three water samples, one matrix spike/matrix spike duplicate (MS/MSD) pair, one field duplicate sample, and one equipment blank, collected on September 11, 2014, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans which were performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3510C/8270D Selective Ion Monitoring (SIM) and 3546/8270D SIM - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C and 3050B/6010C – Metals
- EPA Methods 7470A and 7471B – Mercury
- EPA Method 9056A – Anions (Chloride and Sulfate)

- EPA Method 9045D - pH
- EPA Moisture - Percent Moisture/Solids

**EXECUTIVE SUMMARY**

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, OSWER 9240.1-51, EPA 540-R-10-011, January 2010, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-59923-1 | SED-3-091114 |
| 280-59923-2 | SED-2-091114 |
| 280-59923-2MS | SED-2-091114MS |
| 280-59923-2MSD | SED-2-091114MSD |
| 280-59923-3 | SED-1-091114 |

| Laboratory ID | Client ID |
|---|---|
| 280-59923-4 | SED-99-091114 |
| 280-59923-5 | SW-3-091114 |
| 280-59923-6 | SW-2-091114 |
| 280-59923-7 | SW-1-091114 |
| 280-59923-8EB | ER-091114 |

The samples were received by the laboratory at 0.3ºC, 0.4ºC, 1.2ºC, 1.4ºC and 1.9ºC, outside the QAPP criteria of 4$^{o}$C + 2$^{o}$C. However, since the samples were received below 6$^{o}$C and above freezing, no qualifications were applied to the data based on professional judgment. No sample preservation issues were noted by the laboratory.

Incorrect error corrections were observed on the chain of custody (COC). The proper procedure of a single strike-through correction and initials and date of the person making the correction was not followed.

The solids data, used to report the samples on a dry weight bases, were not validated.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

Three solid samples, three water samples, one MS/MSD pair, one field duplicate sample, and one equipment blank were analyzed for PAHs per EPA Methods 3510C/8270D SIM and 3546/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
⊗ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 1.1 Overall Assessment

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 1.2 Holding Times

The holding times for the PAH analysis of a solid sample are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times for the PAH analysis of a water sample are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 243333 and 244099). PAHs were not detected in the method blanks above the method detection limits (MDLs).

### 1.4 Matrix Spike/Matrix Spike Duplicate

One sample set specific MS/MSD pair, using sample SED-2-091114, was reported. 1-methylnaphthalene and 2-methylnaphthalene were spiked in the MS/MSD pair but not reported in the MS/MSD summaries. The recoveries and relative percent differences (RPD) for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The MS/MSD pairs had recovery and RPD results within the QAPP specified acceptance criteria, with the following exceptions.

One or both the recoveries of acenaphthylene, anthracene, benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, phenanthrene, and pyrene were low and outside the QAPP specified acceptance criteria in the MS/MSD pair. Also the recovery of 2-methylnaphthalene in the MSD and the RPDs for 2-methylnaphthalene, benzo[b]fluoranthene, benzo[k]fluoranthene, and fluoranthene in the MS/MSD pair were high and outside the QAPP specified acceptance criteria. Since the sample concentrations of benzo[a]pyrene, chrysene, phenanthrene, benzo[b]fluoranthene, fluoranthene, and pyrene exceeded five times the spiked amounts, no qualifications were applied to these compounds based on professional judgment. However, the detected concentrations of 2-methylnaphthalene, acenaphthylene, anthracene, benzo[a]anthracene, benzo[g,h,i]perylene, benzo[k]fluoranthene, dibenz(a,h)anthracene, and indeno[1,2,3-cd]pyrene in sample SED-2-091114 were J qualified as estimated.

| Sample ID | Compound | Laboratory Result (ng/kg) | Laboratory Flag | Validation Result (ng/kg) | Validation Qualifier* | Reason Code** |
|---|---|---|---|---|---|---|
| SED-2-091114 | 2-Methylnaphthalene | 18000 | NA | 18000 | J | 4 |
| SED-2-091114 | Acenaphthylene | 21000 | NA | 21000 | J | 4 |
| SED-2-091114 | Anthracene | 53000 | NA | 53000 | J | 4 |
| SED-2-091114 | Benzo[a]anthracene | 190000 | NA | 190000 | J | 4 |
| SED-2-091114 | Benzo[g,h,i]perylene | 140000 | NA | 140000 | J | 4 |
| SED-2-091114 | Benzo[k]fluoranthene | 92000 | NA | 92000 | J | 4 |

| Sample ID | Compound | Laboratory Result (ng/kg) | Laboratory Flag | Validation Result (ng/kg) | Validation Qualifier* | Reason Code** |
|---|---|---|---|---|---|---|
| SED-2-091114 | Dibenz(a,h)anthracene | 41000 | NA | 41000 | J | 4 |
| SED-2-091114 | Indeno[1,2,3-cd]pyrene | 170000 | NA | 170000 | J | 4 |

ng/kg-nanogram per kilogram
NA-not applicable
*-Validation qualifiers are defined in Attachment 1 at the end of this report
**-EDD reason codes are defined in Attachment 2 at the end of this report

### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS and one LCS/LCS duplicate (LCSD) pair were reported. 1-methylnaphthalene and 2-methylnaphthalene were spiked in the LCS and LCS/LCSD pair but not reported in the LCS and LCS/LCSD summaries. The recoveries and RPDs for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCSs and LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD, with the following exceptions.

The recoveries of benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenz(a,h)anthracene, and indeno[1,2,3-cd]pyrene in the LCSD in batch 243333 were high and outside the QAPP specified acceptance criteria. Since these compounds were not detected in the associated samples, no qualifications were applied to the data.

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses.

### 1.7 Equipment Blank

One equipment blank, ER-091114, was collected with the samples. PAHs were not detected in the equipment blank above the MDLs, with the following exceptions.

Fluorene, naphthalene, and phenanthrene were detected at estimated concentrations greater than the MDLs and less than the reporting limits (RLs) in the equipment blank. Therefore, the estimated concentrations of fluorene, naphthalene, and phenanthrene in the associated samples were U qualified as not detected at the RLs.

| Sample ID | Compound | Laboratory Result (ng/kg) | Laboratory Flag | Validation Result (ng/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SED-1-091114 | Naphthalene | 21000 | J | 58000 | U | 3 |
| SED-3-091114 | Fluorene | 3600 | J | 6200 | U | 3 |
| SED-3-091114 | Naphthalene | 4200 | J | 6200 | U | 3 |
| SED-99-091114 | Fluorene | 4200 | J | 5800 | U | 3 |
| SED-99-091114 | Naphthalene | 3100 | J | 5800 | U | 3 |

ng/kg-nanogram per kilogram
J-estimated concentration less than the RL and greater than the MDL

| Sample ID | Compound | Laboratory Result (ng/L) | Laboratory Flag | Validation Result (ng/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SW-3-091114 | Phenanthrene | 120 | J | 1100 | U | 3 |

ng/L-nanogram per liter
J-estimated concentration less than the RL and greater than the MDL

## 1.8 Field Duplicate

One field duplicate sample, SED-99-091114, was collected with the soil samples. Acceptable precision (RPD ≤40%) was demonstrated between the field duplicate and the original sample, SED-3-091114, with the following exceptions.

Compounds with RPDs greater than 40% in the field duplicate pair were J qualified as estimated. For compounds with both a detected and not detected result in the field duplicate pair, the RPDs were not calculable. Therefore, the detected concentrations were J qualified as estimated and the non-detect values were UJ qualified as estimated less than the MDLs. For compounds with both an estimated concentration greater than the MDL and less than the RL and a concentration greater than the RL in the field duplicate pair, the RPDs were not calculable. Therefore, these concentrations were J qualified as estimated. For compounds in the field duplicate with both results that were estimated concentrations greater than the MDL and less than the RL, the RPDs were not calculable. However, no qualifications were applied to these data based on professional and technical judgment.

| Sample ID | Compound | Laboratory Result (ng/kg) | Laboratory Flag | RPD | Validation Result (ng/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| SED-3-091114 | 1-Methylnaphthalene | 4300 | J | NC | NA | NA | NA |

| Sample ID | Compound | Laboratory Result (ng/kg) | Laboratory Flag | RPD | Validation Result (ng/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| SED-99-091114 | 1-Methylnaphthalene | 4000 | J | | NA | NA | NA |
| SED-3-091114 | 2-Methylnaphthalene | 4100 | J | NC | NA | NA | NA |
| SED-99-091114 | 2-Methylnaphthalene | 3700 | J | | NA | NA | NA |
| SED-3-091114 | Acenaphthene | 200 | U | NC | 200 | UJ | 7 |
| SED-99-091114 | Acenaphthene | 2100 | J | | 2100 | J | 7 |
| SED-3-091114 | Acenaphthylene | 4200 | J | NC | 4200 | J | 7 |
| SED-99-091114 | Acenaphthylene | 8000 | NA | | 8000 | J | 7 |
| SED-3-091114 | Anthracene | 4300 | J | NC | 4300 | J | 7 |
| SED-99-091114 | Anthracene | 6900 | NA | | 6900 | J | 7 |
| SED-3-091114 | Benzo[a]anthracene | 17000 | NA | 45 | 17000 | J | 7 |
| SED-99-091114 | Benzo[a]anthracene | 27000 | NA | | 27000 | J | 7 |
| SED-3-091114 | Benzo[a]pyrene | 17000 | NA | 49 | 17000 | J | 7 |
| SED-99-091114 | Benzo[a]pyrene | 28000 | NA | | 28000 | J | 7 |
| SED-3-091114 | Benzo[b]fluoranthene | 21000 | NA | 44 | 21000 | J | 7 |
| SED-99-091114 | Benzo[b]fluoranthene | 33000 | NA | | 33000 | J | 7 |
| SED-3-091114 | Benzo[g,h,i]perylene | 10000 | NA | 57 | 10000 | J | 7 |
| SED-99-091114 | Benzo[g,h,i]perylene | 18000 | NA | | 18000 | J | 7 |
| SED-3-091114 | Benzo[k]fluoranthene | 7600 | NA | 45 | 7600 | J | 7 |
| SED-99-091114 | Benzo[k]fluoranthene | 12000 | NA | | 12000 | J | 7 |
| SED-3-091114 | Chrysene | 22000 | NA | 43 | 22000 | J | 7 |
| SED-99-091114 | Chrysene | 34000 | NA | | 34000 | J | 7 |
| SED-3-091114 | Dibenz(a,h)anthracene | 2500 | J | NC | NA | NA | NA |
| SED-99-091114 | Dibenz(a,h)anthracene | 4700 | J | | NA | NA | NA |
| SED-3-091114 | Fluoranthene | 39000 | NA | 41 | 39000 | J | 7 |
| SED-99-091114 | Fluoranthene | 59000 | NA | | 59000 | J | 7 |
| SED-3-091114 | Fluorene | 3600 | J | NC | NA | NA | NA |
| SED-99-091114 | Fluorene | 4200 | J | | NA | NA | NA |
| SED-3-091114 | Indeno[1,2,3-cd]pyrene | 11000 | NA | 53 | 11000 | J | 7 |
| SED-99-091114 | Indeno[1,2,3-cd]pyrene | 19000 | NA | | 19000 | J | 7 |
| SED-3-091114 | Naphthalene | 4200 | J | NC | NA | NA | NA |
| SED-99-091114 | Naphthalene | 3100 | J | | NA | NA | NA |
| SED-3-091114 | Phenanthrene | 36000 | NA | 24 | NA | NA | NA |
| SED-99-091114 | Phenanthrene | 46000 | NA | | NA | NA | NA |
| SED-3-091114 | Pyrene | 38000 | NA | 45 | 38000 | J | 7 |
| SED-99-091114 | Pyrene | 60000 | NA | | 60000 | J | 7 |

ng/kg-nanogram per kilogram
U-not detected at the reported MDL
J-estimated concentration less than the RL and greater than the MDL
NC-not calculable
NA-not applicable



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### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were reported for samples SW-1-091114, SW-2-091114, SW-3-091114, and ER-091114 due to dilutions analyzed. Also, the soil samples were reported based on dry weight. Therefore, the MDLs and RLs were not the same as those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

Three solid samples, three water samples, one MS/MSD pair, one field duplicate sample, and one equipment blank were analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
⊗ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

## 2.1 Overall Assessment

### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 2.1.2 Analysis Anomaly

Several results in the samples were flagged Q by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on professional and technical judgment.

| Sample ID | Compound | Laboratory Result (pg/g) | Laboratory Flag | Validation Result (pg/g) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SED-1-091114 | 1,2,3,4,6,7,8-HpCDF | 0.55 | QBJ | 0.55 | J | 13 |
| SED-1-091114 | 1,2,3,7,8,9-HxCDD | 0.26 | QJ | 0.26 | J | 13 |
| SED-1-091114 | 1,2,3,7,8-PeCDD | 0.21 | QBJ | 0.21 | J | 13 |
| SED-1-091114 | 2,3,4,7,8-PeCDF | 0.10 | QBJ | 0.10 | J | 13 |
| SED-2-091114 | 1,2,3,4,6,7,8-HpCDF | 1.9 | QBJ | 1.9 | J | 13 |
| SED-2-091114 | 1,2,3,4,7,8-HxCDD | 0.19 | QJ | 0.19 | J | 13 |
| SED-2-091114 | 1,2,3,4,7,8-HxCDF | 0.20 | QBJ | 0.20 | J | 13 |
| SED-2-091114 | 1,2,3,6,7,8-HxCDD | 0.27 | QJ | 0.27 | J | 13 |
| SED-2-091114 | 1,2,3,6,7,8-HxCDF | 0.74 | QBJ | 0.74 | J | 13 |
| SED-2-091114 | 1,2,3,7,8,9-HxCDD | 0.28 | QJ | 0.28 | J | 13 |
| SED-2-091114 | 2,3,7,8-TCDF | 0.076 | QJ | 0.076 | J | 13 |
| SED-3-091114 | 1,2,3,4,6,7,8-HpCDF | 0.48 | QBJ | 0.48 | J | 13 |
| SED-3-091114 | 1,2,3,6,7,8-HxCDD | 0.082 | QJ | 0.082 | J | 13 |
| SED-3-091114 | 1,2,3,6,7,8-HxCDF | 0.11 | QBJ | 0.11 | J | 13 |
| SED-3-091114 | 2,3,4,6,7,8-HxCDF | 0.092 | QBJ | 0.092 | J | 13 |
| SED-3-091114 | OCDF | 1.7 | QBJ | 1.7 | J | 13 |
| SED-99-091114 | 1,2,3,4,6,7,8-HpCDF | 0.94 | QBJ | 0.94 | J | 13 |
| SED-99-091114 | 1,2,3,7,8,9-HxCDF | 0.12 | QJ | 0.12 | J | 13 |
| SED-99-091114 | 1,2,3,4,7,8-HxCDD | 0.13 | QJ | 0.13 | J | 13 |
| SED-99-091114 | 1,2,3,4,7,8-HxCDF | 0.15 | QBJ | 0.15 | J | 13 |

| Sample ID | Compound | Laboratory Result (pg/g) | Laboratory Flag | Validation Result (pg/g) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SED-99-091114 | 1,2,3,6,7,8-HxCDF | 0.23 | QBJ | 0.23 | J | 13 |
| SED-99-091114 | 1,2,3,7,8,9-HxCDD | 0.16 | QJ | 0.16 | J | 13 |

pg/g-picograms per gram
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SW-1-091114 | 1,2,3,4,6,7,8-HpCDD | 0.52 | QBJ | 0.52 | J | 13 |
| SW-1-091114 | 1,2,3,4,6,7,8-HpCDF | 0.27 | QBJ | 0.27 | J | 13 |
| SW-1-091114 | 1,2,3,4,7,8,9-HpCDF | 0.17 | QBJ | 0.17 | J | 13 |
| SW-1-091114 | OCDF | 0.98 | QBJ | 0.98 | J | 13 |
| SW-2-091114 | 1,2,3,4,6,7,8-HpCDD | 0.69 | QBJ | 0.69 | J | 13 |
| SW-2-091114 | 1,2,3,4,6,7,8-HpCDF | 0.32 | QBJ | 0.32 | J | 13 |
| SW-2-091114 | 1,2,3,4,7,8,9-HpCDF | 0.41 | QBJ | 0.41 | J | 13 |
| SW-2-091114 | 1,2,3,6,7,8-HxCDF | 0.44 | QJ | 0.44 | J | 13 |
| SW-2-091114 | OCDF | 1.7 | QBJ | 1.7 | J | 13 |
| SW-3-091114 | 1,2,3,4,7,8,9-HpCDF | 0.72 | QBJ | 0.72 | J | 13 |
| SW-3-091114 | 1,2,3,6,7,8-HxCDF | 2.1 | QJ | 2.1 | J | 13 |
| SW-3-091114 | 1,2,3,7,8,9-HxCDD | 4.4 | QBJ | 4.4 | J | 13 |
| SW-3-091114 | OCDF | 18 | QBJ | 18 | J | 13 |
| ER-091114 | 1,2,3,4,6,7,8-HpCDF | 0.24 | QBJ | 0.24 | J | 13 |
| ER-091114 | 1,2,3,6,7,8-HxCDF | 0.13 | QJ | 0.13 | J | 13 |
| ER-091114 | 2,3,4,7,8-PeCDF | 0.13 | QJ | 0.13 | J | 13 |
| ER-091114 | OCDD | 1.4 | QBJ | 1.4 | J | 13 |
| ER-091114 | OCDF | 0.37 | QBJ | 0.37 | J | 13 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water and solid samples are 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 4261016 and 4262030). The dioxins and furans were not detected in the method blanks above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 2,3,4,7,8-PeCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the RLs in the method blank in batch 4261016. Therefore, the estimated concentrations of these compounds in the associated samples were U qualified as not detected at the estimated concentrations.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8-PeCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the RLs in the method blank in batch 4262030. Therefore, the estimated concentrations of these compounds in the associated samples were U qualified as not detected at the estimated concentrations.

| Sample ID | Compound | Laboratory Result (pg/g) | Laboratory Flag | Validation Result (pg/g) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SED-1-091114 | 1,2,3,4,6,7,8-HpCDD | 2.5 | BJ | 2.5 | U | 3 |
| SED-1-091114 | 1,2,3,4,6,7,8-HpCDF | 0.55 | QBJ | 0.55 | U | 3 |
| SED-1-091114 | 1,2,3,7,8-PeCDD | 0.21 | QBJ | 0.21 | U | 3 |
| SED-1-091114 | 2,3,4,7,8-PeCDF | 0.10 | QBJ | 0.10 | U | 3 |
| SED-1-091114 | OCDF | 2.4 | BJ | 2.4 | U | 3 |
| SED-2-091114 | 1,2,3,4,6,7,8-HpCDF | 1.9 | QBJ | 1.9 | U | 3 |
| SED-2-091114 | 1,2,3,4,7,8,9-HpCDF | 0.12 | BJ | 0.12 | U | 3 |
| SED-2-091114 | 1,2,3,4,7,8-HxCDF | 0.20 | QBJ | 0.20 | U | 3 |
| SED-2-091114 | 1,2,3,6,7,8-HxCDF | 0.74 | QBJ | 0.74 | U | 3 |
| SED-2-091114 | 2,3,4,6,7,8-HxCDF | 0.26 | BJ | 0.26 | U | 3 |
| SED-2-091114 | OCDF | 5.0 | BJ | 5.0 | U | 3 |
| SED-3-091114 | 1,2,3,4,6,7,8-HpCDD | 3.3 | BJ | 3.3 | U | 3 |
| SED-3-091114 | 1,2,3,4,6,7,8-HpCDF | 0.48 | QBJ | 0.48 | U | 3 |
| SED-3-091114 | 1,2,3,4,7,8,9-HpCDF | 0.33 | BJ | 0.33 | U | 3 |
| SED-3-091114 | 1,2,3,4,7,8-HxCDF | 0.12 | BJ | 0.12 | U | 3 |
| SED-3-091114 | 1,2,3,6,7,8-HxCDF | 0.11 | QBJ | 0.11 | U | 3 |
| SED-3-091114 | 2,3,4,6,7,8-HxCDF | 0.092 | QBJ | 0.092 | U | 3 |
| SED-3-091114 | OCDF | 1.7 | QBJ | 1.7 | U | 3 |

| Sample ID | Compound | Laboratory Result (pg/g) | Laboratory Flag | Validation Result (pg/g) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SED-99-091114 | 1,2,3,4,6,7,8-HpCDF | 0.94 | QBJ | 0.94 | U | 3 |
| SED-99-091114 | 1,2,3,4,7,8,9-HpCDF | 0.30 | BJ | 0.30 | U | 3 |
| SED-99-091114 | 1,2,3,4,7,8-HxCDF | 0.15 | QBJ | 0.15 | U | 3 |
| SED-99-091114 | 1,2,3,6,7,8-HxCDF | 0.23 | QBJ | 0.23 | U | 3 |
| SED-99-091114 | 1,2,3,7,8-PeCDD | 0.19 | BJ | 0.19 | U | 3 |
| SED-99-091114 | 2,3,4,6,7,8-HxCDF | 0.14 | BJ | 0.14 | U | 3 |
| SED-99-091114 | OCDF | 3.6 | BJ | 3.6 | U | 3 |

pg/g-picograms per gram
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| ER-091114 | 1,2,3,4,6,7,8-HpCDF | 0.24 | QBJ | 0.24 | U | 3 |
| ER-091114 | OCDD | 1.4 | QBJ | 1.4 | U | 3 |
| ER-091114 | OCDF | 0.37 | QBJ | 0.37 | U | 3 |
| SW-1-091114 | 1,2,3,4,6,7,8-HpCDD | 0.52 | QBJ | 0.52 | U | 3 |
| SW-1-091114 | 1,2,3,4,6,7,8-HpCDF | 0.27 | QBJ | 0.27 | U | 3 |
| SW-1-091114 | 1,2,3,4,7,8,9-HpCDF | 0.17 | QBJ | 0.17 | U | 3 |
| SW-1-091114 | OCDD | 9.8 | BJ | 9.8 | U | 3 |
| SW-1-091114 | OCDF | 0.98 | QBJ | 0.98 | U | 3 |
| SW-2-091114 | 1,2,3,4,6,7,8-HpCDD | 0.69 | QBJ | 0.69 | U | 3 |
| SW-2-091114 | 1,2,3,4,6,7,8-HpCDF | 0.32 | QBJ | 0.32 | U | 3 |
| SW-2-091114 | 1,2,3,4,7,8,9-HpCDF | 0.41 | QBJ | 0.41 | U | 3 |
| SW-2-091114 | OCDD | 26 | BJ | 26 | U | 3 |
| SW-2-091114 | OCDF | 1.7 | QBJ | 1.7 | U | 3 |
| SW-3-091114 | 1,2,3,4,6,7,8-HpCDD | 49 | BJ | 49 | U | 3 |
| SW-3-091114 | 1,2,3,4,6,7,8-HpCDF | 5.3 | BJ | 5.3 | U | 3 |
| SW-3-091114 | 1,2,3,4,7,8,9-HpCDF | 0.72 | QBJ | 0.72 | U | 3 |
| SW-3-091114 | 1,2,3,7,8,9-HxCDD | 4.4 | QBJ | 4.4 | U | 3 |
| SW-3-091114 | OCDF | 18 | QBJ | 18 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL



engineers | scientists | innovators

## 2.4 Matrix Spike/Matrix Spike Duplicate

One sample set specific MS/MSD pair, using sample SED-2-091114, was reported. The MS/MSD pairs had recovery and RPD results within the QAPP specified acceptance criteria.

## 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were reported. The results for the LCSs were within the QAPP specified acceptance criteria for recovery.

## 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

## 2.7 Equipment Blank

One equipment blank, ER-091114, was collected with the samples. The dioxins and furans were not detected in the equipment blank above the MDLs, with the following exceptions.

1,2,3,4,6,7,8-HpCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,7,8-PeCDF, OCDD, and OCDF were detected in the equipment blank at estimated concentrations greater than the EDLs and less than the RLs. The concentrations of 1,2,3,4,6,7,8-HpCDF, OCDD, and OCDF in the equipment blank were U qualified as not detected at the reported concentrations, due to the method blank contamination Therefore, no further qualifications were applied for 1,2,3,4,6,7,8-HpCDF, OCDD, and OCDF in the associated samples. Also, the estimated concentrations of 1,2,3,6,7,8-HxCDF and 2,3,4,7,8-PeCDF in the associated soil samples were U qualified at the reported concentrations based on the method blank contamination associated with the soil samples. Therefore, no additional qualifications were applied to the soil samples. 2,3,4,7,8-PeCDF was not detected in the associated water samples. Therefore, no qualifications were applied for 2,3,4,7,8-PeCDF in the water samples; however, the estimated concentrations of 1,2,3,6,7,8-HxCDF in the associated water samples were U qualified as not detected at the reported concentrations.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SW-2-091114 | 1,2,3,6,7,8-HxCDF | 0.44 | QJ | 0.44 | U | 3 |
| SW-3-091114 | 1,2,3,6,7,8-HxCDF | 2.1 | QJ | 2.1 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
J-estimated concentration greater than the MDL and less than the RL

## 2.8 Field Duplicate

One field duplicate sample, SED-99-091114, was collected with the soil samples. Acceptable precision (RPD ≤40%) was demonstrated between the field duplicate and the original sample, SED-3-091114, with the following exceptions.

Compounds with RPDs greater than 40% in the field duplicate pair were J qualified as estimated. For compounds with both a detected and not detected result in the field duplicate pair, the RPDs were not calculable. Therefore, the detected concentrations were J qualified as estimated and the not detected values were UJ qualified as estimated less than the EDLs. For compounds with both an estimated concentration greater than the EDL and less than the RL and a concentration greater than the RL in the field duplicate pair, the RPDs were not calculable. Therefore, these concentrations were J qualified as estimated. For compounds in the field duplicate with both results that were estimated concentrations greater than the EDL and less than the RL, the RPDs were not calculable. However, no qualifications were applied to these data based on professional and technical judgment.

| Sample ID | Compound | Laboratory Result (pg/g) | Laboratory Flag | RPD | Validation Result (pg/g) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| SED-3-091114 | 1,2,3,4,6,7,8-HpCDD | 3.3 | BJ | NC | 3.3 | J | 7 |
| SED-99-091114 | 1,2,3,4,6,7,8-HpCDD | 5.7 | B | | 5.7 | J | 7 |
| SED-3-091114 | 1,2,3,4,6,7,8-HpCDF | 0.48 | QBJ | NC | NA | NA | NA |
| SED-99-091114 | 1,2,3,4,6,7,8-HpCDF | 0.94 | QBJ | | NA | NA | NA |
| SED-3-091114 | 1,2,3,4,7,8,9-HpCDF | 0.33 | BJ | NC | NA | NA | NA |
| SED-99-091114 | 1,2,3,4,7,8,9-HpCDF | 0.30 | BJ | | NA | NA | NA |
| SED-3-091114 | 1,2,3,4,7,8-HxCDD | 0.097 | J | NC | NA | NA | NA |
| SED-99-091114 | 1,2,3,4,7,8-HxCDD | 0.13 | QJ | | NA | NA | NA |
| SED-3-091114 | 1,2,3,4,7,8-HxCDF | 0.12 | BJ | NC | NA | NA | NA |
| SED-99-091114 | 1,2,3,4,7,8-HxCDF | 0.15 | QBJ | | NA | NA | NA |
| SED-3-091114 | 1,2,3,6,7,8-HxCDD | 0.082 | QJ | NC | NA | NA | NA |
| SED-99-091114 | 1,2,3,6,7,8-HxCDD | 0.27 | J | | NA | NA | NA |
| SED-3-091114 | 1,2,3,6,7,8-HxCDF | 0.11 | QBJ | NC | NA | NA | NA |
| SED-99-091114 | 1,2,3,6,7,8-HxCDF | 0.23 | QBJ | | NA | NA | NA |
| SED-3-091114 | 1,2,3,7,8,9-HxCDD | 0.22 | J | NC | NA | NA | NA |
| SED-99-091114 | 1,2,3,7,8,9-HxCDD | 0.16 | QJ | | NA | NA | NA |
| SED-3-091114 | 1,2,3,7,8,9-HxCDF | 0.021 | U | NC | 0.021 | UJ | 7 |

| Sample ID | Compound | Laboratory Result (pg/g) | Laboratory Flag | RPD | Validation Result (pg/g) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| SED-99-091114 | 1,2,3,7,8,9-HxCDF | 0.12 | QJ | | 0.12 | J | 7 |
| SED-3-091114 | 1,2,3,7,8-PeCDD* | 0.012 | U | NC | NA | NA | NA |
| SED-99-091114 | 1,2,3,7,8-PeCDD* | 0.19 | BJ | | NA | NA | NA |
| SED-3-091114 | 2,3,4,6,7,8-HxCDF | 0.092 | QBJ | NC | NA | NA | NA |
| SED-99-091114 | 2,3,4,6,7,8-HxCDF | 0.14 | BJ | | NA | NA | NA |
| SED-3-091114 | OCDD | 35 | B | 65 | 35 | J | 7 |
| SED-99-091114 | OCDD | 69 | B | | 69 | J | 7 |
| SED-3-091114 | OCDF | 1.7 | QBJ | NC | NA | NA | NA |
| SED-99-091114 | OCDF | 3.6 | BJ | | NA | NA | NA |
| SED-3-091114 | The other total dioxins and furans | ND | NA | 0 | NA | NA | NA |
| SED-99-091114 | The other total dioxins and furans | ND | NA | | NA | NA | NA |

pg/g-picogram per gram
NA-not applicable
NC-not calculable
*no qualifications since validated results were both not detected
U-not detected at the reported MDL
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL
ND-not detected at the MDL

### 2.9 Sensitivity

The samples were reported to the EDLs. Elevated nondetect results were not reported. The RLs were the same as those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC.

## 3.0 METALS

Three solid samples, three water samples, one MS/MSD pair, one field duplicate sample, and one equipment blank were analyzed for metals per EPA Methods 3010A/6010C and 3050B/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
⊗ Serial Dilution
✓ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

## 3.1 Overall Assessment

### 3.1.1 Completion

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.1.2 Analysis Anomaly

The recovery of antimony in a continuing calibration verification low level (CCVLL) associated with batch 244802 was high and above the laboratory limits. Therefore, the concentration of antimony in the associated sample was J+ qualified as estimated with a high bias.

The recovery of arsenic in a CCVLL associated with batch 243610 was high and above the laboratory limits. Therefore, the concentration of arsenic in the associated sample was J+ qualified as estimated with a high bias.

| Sample ID | Compound | Laboratory Result (mg/kg) | Laboratory Flag | Validation Result (mg/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SED-99-091114 | Antimony | 0.73 | J^ | 0.73 | J+ | 9 |

mg/kg-milligram per kilogram
^-instrument related QC exceeds the control limits.
J-estimated concentration less than the RL and greater than the MDL

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SW-3-091114 | Arsenic | 4.8 | J^ | 4.8 | J+ | 9 |

µg/L-microgram per liter
^-instrument related QC exceeds the control limits.
J-estimated concentration less than the RL and greater than the MDL

## 3.2 Holding Times

The holding times for metals analyses of water and solid samples are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

## 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 243230 and 243266). The metals were not detected in the method blanks above the MDLs, with the following exceptions.

Barium, iron, and manganese were detected at estimated concentrations above the MDLs and below the RLs in the method blank in batch 243230. However, since barium, iron, and manganese were detected above the RLs in the associated samples, no qualifications were applied to the data.

## 3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples SED-2-091114 and SW-3-091114, were reported. The recovery and RPD results were within the QAPP specified acceptance criteria, with the following exceptions.

The recovery of manganese in the MSD and the RPDs for manganese and lead were high and outside the QAPP specified acceptance criteria in the MS/MSD pair using sample SED-2-091114. A post digestion spike (PDS) was also analyzed. However, since the digestate concentration was greater than four times the spiked amount, the recovery was not applicable. Therefore, the concentration of manganese in sample SED-2-091114 was J qualified as estimated.

It was noted that the recovery criteria for aluminum and iron were not applicable for the MS/MSD using sample SED-2-091114 since the concentrations of aluminum and iron in sample SED-2-091114 were greater than four times the spike concentrations. No qualifications were applied to the data.

| Sample ID | Compound | Laboratory Result (mg/kg) | Laboratory Flag | Validation Result (mg/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SED-2-091114 | Manganese | 210 | NA | 210 | J | 4 |

mg/kg-milligram per kilogram
NA-not applicable

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were analyzed. The results for the LCSs were within the QAPP specified acceptance criteria for recovery.

### 3.6 Serial Dilution

Two sample set specific serial dilutions, using samples SED-2-091114 and SW-3-091114, were reported. The percent differences (%Ds) were within the laboratory specified acceptance criteria, with the following exceptions.

The %D for aluminum was high and outside the laboratory limits in the serial dilution using sample SED-2-091114. Therefore, the concentration of aluminum in sample SED-2-091114 was J qualified as estimated.

The %Ds for barium and manganese were high and outside the laboratory limits in the serial dilution using sample SW-3-091114. Therefore, the concentrations of barium and manganese in sample SW-3-091114 were J qualified as estimated.

| Sample ID | Compound | Laboratory Result (mg/kg) | Laboratory Flag | Validation Result (mg/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SED-2-091114 | Aluminum | 3500 | NA | 3500 | J | 8 |

mg/kg-milligram per kilogram
NA-not applicable

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SW-3-091114 | Barium | 59 | NA | 59 | J | 8 |
| SW-3-091114 | Manganese | 13 | NA | 13 | J | 8 |

µg/L-micrograms per liter
NA-not applicable

### 3.7 Equipment Blank

One equipment blank, ER-091114, was collected with the samples. Metals were not detected in the equipment blank above the MDLs.

### 3.8 Field Duplicate

One field duplicate sample, SED-99-091114, was collected with the soil samples. Acceptable precision (RPD ≤40%) was demonstrated between the field duplicate and the original sample, SED-3-091114, with the following exceptions.

Compounds with RPDs greater than 40% in the field duplicate pair were J qualified as estimated. For compounds with both detect and non-detect result in the field duplicate pair, the RPDs were not calculable. Therefore, the detected concentrations were J qualified as estimated and the non-detect values were UJ qualified as estimated less than the MDLs. For compounds in the field duplicate with both results that were estimated concentrations greater than the MDL and less than the RL, the RPDs were not calculable. However, no qualifications were applied to these data based on professional and technical judgment.

| Sample ID | Compound | Laboratory Result (mg/kg) | Laboratory Flag | RPD | Validation Result (mg/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| SED-3-091114 | Aluminum | 2400 | NA | 22 | NA | NA | NA |
| SED-99-091114 | Aluminum | 3000 | NA | | NA | NA | NA |
| SED-3-091114 | Antimony | 0.46 | U | NC | 0.46 | UJ | 7 |
| SED-99-091114 | Antimony | 0.73 | J^ | | 0.73 | J | 7 |
| SED-3-091114 | Arsenic | 1.4 | J | NC | 1.4 | J | 7 |
| SED-99-091114 | Arsenic | 0.80 | U | | 0.80 | UJ | 7 |
| SED-3-091114 | Barium | 100 | B | 148 | 100 | J | 7 |
| SED-99-091114 | Barium | 15 | B | | 15 | J | 7 |

| Sample ID | Compound | Laboratory Result (mg/kg) | Laboratory Flag | RPD | Validation Result (mg/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| SED-3-091114 | Beryllium | 0.15 | J | NC | 0.15 | J | 7 |
| SED-99-091114 | Beryllium | 0.040 | U | | 0.040 | UJ | 7 |
| SED-3-091114 | Cadmium | 0.052 | J | NC | NA | NA | NA |
| SED-99-091114 | Cadmium | 0.072 | J | | NA | NA | NA |
| SED-3-091114 | Chromium | 8.0 | NA | 88 | 8.0 | J | 7 |
| SED-99-091114 | Chromium | 3.1 | NA | | 3.1 | J | 7 |
| SED-3-091114 | Cobalt | 7.0 | NA | 98 | 7.0 | J | 7 |
| SED-99-091114 | Cobalt | 2.4 | NA | | 2.4 | J | 7 |
| SED-3-091114 | Copper | 6.0 | NA | 33 | NA | NA | NA |
| SED-99-091114 | Copper | 4.3 | NA | | NA | NA | NA |
| SED-3-091114 | Iron | 4400 | B | 19 | NA | NA | NA |
| SED-99-091114 | Iron | 5300 | B | | NA | NA | NA |
| SED-3-091114 | Lead | 14 | NA | 67 | 14 | J | 7 |
| SED-99-091114 | Lead | 7.0 | NA | | 7.0 | J | 7 |
| SED-3-091114 | Manganese | 590 | B | 123 | 590 | J | 7 |
| SED-99-091114 | Manganese | 140 | B | | 140 | J | 7 |
| SED-3-091114 | Nickel | 2.6 | J | NC | NA | NA | NA |
| SED-99-091114 | Nickel | 2.5 | J | | NA | NA | NA |
| SED-3-091114 | Selenium | 1.3 | J | NC | 1.3 | J | 7 |
| SED-99-091114 | Selenium | 1.0 | U | | 1.0 | UJ | 7 |
| SED-3-091114 | Silver | 0.19 | U | NC | 0.19 | UJ | 7 |
| SED-99-091114 | Silver | 0.20 | J | | 0.20 | J | 7 |
| SED-3-091114 | Thallium | 0.78 | U | 0 | NA | NA | NA |
| SED-99-091114 | Thallium | 0.79 | U | | NA | NA | NA |
| SED-3-091114 | Vanadium | 8.5 | NA | 27 | NA | NA | NA |
| SED-99-091114 | Vanadium | 6.5 | NA | | NA | NA | NA |
| SED-3-091114 | Zinc | 23 | NA | 0 | NA | NA | NA |
| SED-99- | Zinc | 23 | NA | | NA | NA | NA |

| Sample ID | Compound | Laboratory Result (mg/kg) | Laboratory Flag | RPD | Validation Result (mg/kg) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| 091114 | | | | | | | |

mg/kg-milligram per kilogram
J-estimated concentration less than the RL and greater than the MDL
U-not detected at the reported MDL
NA-not applicable
NC-not calculable
ND-not detected at the MDL

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the sample as those listed in Table 6.2 of the QAPP. The soil samples were reported based on dry weight. Therefore, the soil sample MDLs and RLs were not the same as those listed in Table 6.2 in the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

Three solid samples, three water samples, one MS/MSD pair, one field duplicate sample, and one equipment blank were analyzed for mercury per EPA Methods 7470A and 7471B.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Equipment Blank
- ✓ Field Duplicate

✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 4.2 Holding Times

The holding times for mercury analyses of water and solid samples are 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 243195 and 243587). Mercury was not detected in the method blanks above the MDLs.

### 4.4 Matrix Spike/Matrix Spike Duplicate

One sample set specific MS/MSD pair, using sample SED-2-091114, was reported. The recovery and RPD results were within the QAPP specified acceptance criteria.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were analyzed. The results for the LCSs were within the QAPP specified acceptance criteria for recovery.

### 4.6 Equipment Blank

One equipment blank, ER-091114, was collected with the samples. Mercury was not detected in the equipment blank above the MDL.

### 4.7 Field Duplicate

One field duplicate sample, SED-99-091114, was collected with the soil samples. Acceptable precision (RPD ≤40%) was demonstrated between the field duplicate and the original sample, SED-3-091114, the RPD was 0%.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the same as those listed in Table 6.2 of the QAPP. The soil samples were reported based on dry weight. Therefore, the soil sample MDLs and RLs were not the same as those listed in Table 6.2 in the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 5.0 WET CHEMISTRY

Three solid samples, three water samples, one MS/MSD pair, one field duplicate sample, and one equipment blank were analyzed for anions per EPA Method 9056 and pH by EPA Method 9045D.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity

⊗ Electronic Data Deliverable Review

## 5.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 5.2 Holding Times

The holding times are listed below. The holding times were met for the sample analyses. The pH was analyzed four days after sample collection. No qualifications were applied based on professional judgment.

| Parameter | Holding Time |
|---|---|
| pH by EPA Method 9045D | As soon as possible |
| Chloride and Sulfate (soil and waters) by EPA Method 9056A | 28 days from sample collection to analysis |

## 5.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported for the anions (batches 244374 and 244669). The anions were not detected in the method blanks above the MDLs.

## 5.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples SED-2-091114 and SW-1-091114, were reported (anions). The recovery and RPD results were within the laboratory specified acceptance; there were no acceptance criteria in the QAPP for the wet chemistry parameters.

## 5.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCSD pair was reported for pH and two LCS/LCSD pairs were reported for the anions. Also, two method reporting limit checks (MRLCs) were reported for the anions. The results for the LCS/LCSD pairs and MRLCs were within the laboratory specified acceptance criteria for recovery; there were no acceptance criteria in the QAPP for the wet chemistry parameters.

## 5.6 Laboratory Duplicate

Two sample set specific laboratory duplicates, using samples SED-2-091114 and SW-1-091114, were reported. The RPD results were within the laboratory specified acceptance criteria.

## 5.7 `Equipment Blank

One equipment blank, ER-091114, was collected with the samples. The wet chemistry parameters were not reported for the equipment blank.

## 5.8 Field Duplicate

One field duplicate sample, SED-99-091114, was collected with the soil samples. Acceptable precision (RPD $\leq$40%) was demonstrated between the field duplicate and the original sample, SED-3-091114.

For compounds in the field duplicate with both results that were estimated concentrations greater than the MDL and less than the RL, the RPDs were not calculable. However, no qualifications were applied to the data based on professional and technical judgment.

| Sample ID | Compound | Units | Laboratory Result | Laboratory Flag | RPD |
|---|---|---|---|---|---|
| SED-3-091114 | Chloride | mg/Kg | 6.7 | J | NC |
| SED-99-091114 | Chloride | mg/Kg | 6.6 | J | |
| SED-3-091114 | pH adjusted to 25$^{o}$C | SU | 7.11 | NA | 2 |
| SED-99-091114 | pH adjusted to 25$^{o}$C | SU | 7.22 | NA | |
| SED-3-091114 | Sulfate | mg/Kg | 13 | J | NC |
| SED-99-091114 | Sulfate | mg/Kg | 14 | J | |

mg/kg-milligram per kilogram

SU-standard units
J-estimated concentration less than the RL and greater than the MDL
NA-not applicable
NC-not calculable

### 5.9 Sensitivity

The samples were reported to the MDLs (anions). Elevated nondetect results were not reported. MDLs and RLs for the wet chemistry parameters were not listed in Table 6.2 of the QAPP.

### 5.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

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# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

# ATTACHMENT 2
# DATA VALIDATION REASON CODES
## Assigned by Geosyntec's Data Validation Team

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference

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# Memorandum

Date: 12 March 2015

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3546/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C and 3050B/6010C, Mercury by EPA Method 7470A, and Percent Moisture/Solids by EPA Moisture – TestAmerica Work Order Number 280-64928-1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of two solid samples and one water sample collected on January 29, 2015, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans analysis which was performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3546/8270D Selective Ion Monitoring (SIM) - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C and 3050B/6010C – Metals
- EPA Methods 7470A – Mercury
- EPA Moisture - Percent Moisture/Solids

## EXECUTIVE SUMMARY

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, OSWER 9240.1-51, EPA 540-R-10-011, January 2010, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-64928-1 | SB-37-2-2.5 |
| 280-64928-2 | SW-3R |

| Laboratory ID | Client ID |
|---|---|
| 280-64928-3 | SED-3R |

The samples were received by the laboratory at 5.2ºC and 0.6ºC, within the QAPP criteria of <6$^{o}$C. No sample preservation issues were noted by the laboratory.

Incorrect error corrections were observed on the chain of custody (COC). The proper procedure of a single strike-through correction and initials and date of the person making the correction was not followed.

The report was revised on March 12, 2015 to replace unrelated EPA Method 8290 Dioxins and Furans data. The report was identified as 280-64928-1 Revision 1.

The solids data, used to report the samples on a dry weight bases, were not validated.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

One solid sample was analyzed for PAHs per EPA Methods 3546/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### 1.1 Overall Assessment

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 1.2 Holding Times

The holding times for the PAH analysis of a solid sample are 14 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 263970). PAHs were not detected in the method blank above the method detection limits (MDLs).

### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported with the data set.

### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. 1-methylnaphthalene and 2-methylnaphthalene were spiked in the LCS but not reported in the LCS summary. The recoveries for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses.

### 1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 1.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The soil sample was reported based on dry weight. Therefore, the MDLs and reporting limits (RLs) were not the same as those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. No discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

One water sample was analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
✓ Electronic Data Deliverable Review

## 2.1 Overall Assessment

### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 2.1.2 Analysis Anomaly

The results below were Q flagged by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on professional and technical judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier* | Reason Code** |
|---|---|---|---|---|---|---|
| SW-3R | 2,3,4,7,8-PeCDF | 0.30 | Q J | 0.30 | J | 13 |
| SW-3R | 1,2,3,4,7,8-HxCDF | 0.38 | Q B J | 0.38 | J | 13 |
| SW-3R | 1,2,3,6,7,8-HxCDF | 0.17 | Q J | 0.17 | J | 13 |
| SW-3R | 1,2,3,7,8,9-HxCDF | 0.44 | Q J | 0.44 | J | 13 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL
*-Validation qualifiers are defined in Attachment 1 at the end of this report
**-EDD reason codes are defined in Attachment 2 at the end of this report

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water is 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 5037019). The dioxins and furans were not detected in the method blank above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,7,8,9-HxCDD, 1,2,3,4,6,7,8-HpCDD, OCDD, 1,2,3,7,8-PeCDF, 1,2,3,4,7,8-HxCDF, 2,3,4,6,7,8-HxCDF, 1,2,3,4,6,7,8-HpCDF, and OCDF were detected at estimated concentrations greater than the EDLs and less than the RLs in the method blank. Therefore, the estimated concentrations of these compounds in the associated samples were U qualified as not detected at the reporting limit.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| SW-3R | OCDD | 31 | B J | 95 | U | 3 |
| SW-3R | 1,2,3,4,6,7,8-HpCDD | 3.7 | B J | 47 | U | 3 |
| SW-3R | OCDF | 4.5 | B J | 95 | U | 3 |
| SW-3R | 1,2,3,4,6,7,8-HpCDF | 0.92 | B J | 47 | U | 3 |
| SW-3R | 1,2,3,4,7,8-HxCDF | 0.38 | Q B J | 47 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

### 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

### 2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 2.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 2.9 Sensitivity

The samples were reported to the EDLs. Elevated nondetect results were not reported. The RLs were the same as those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. No discrepancies were identified between the level IV report and the EDD.

## 3.0 METALS

One solid sample and one water sample were analyzed for metals per EPA Methods 3010A/6010C and 3050B/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### 3.1 Overall Assessment

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.2 Holding Times

The holding times for metals analyses of water and solid samples are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 262501 and 262505). The metals were not detected in the method blanks above the MDLs.

### 3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples SB-37-2-2.5 and SW-3R, were reported. The recovery and relative percent difference (RPD) results were within the QAPP specified acceptance criteria.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were analyzed. The results for the LCSs were within the QAPP specified acceptance criteria for recovery.

### 3.6 Serial Dilution

Two sample set specific serial dilutions, using samples SB-37-2-2.5 and SW-3R, were reported. The percent differences (%Ds) were within the laboratory specified acceptance criteria.

### 3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 3.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the same as those listed in Table 6.2 of the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. No discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

One water sample was analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ✓ Electronic Data Deliverable Review

### 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 4.2 Holding Times

The holding times for mercury analyses of water samples are 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 262613). Mercury was not detected in the method blank above the MDL.

### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCS duplicate (LCSD) pair was analyzed. The results for the LCS/LCSD were within the QAPP specified acceptance criteria for recovery and RPD.

### 4.6 Equipment Blank

Equipment blanks were not collected with the sample set.

### 4.7 Field Duplicate

Field duplicates were not collected with the sample set.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs were the same as those listed in Table 6.2 of the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. No discrepancies were identified between the level IV report and the EDD.

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# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**
**DATA VALIDATION REASON CODES**
**Assigned by Geosyntec's Data Validation Team**

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference

# APPENDIX C

# Supporting Calculations for Dioxins and PAHs

Appendix C - Table 1
Calculation of TCDD TEQ
Drainage Feature Sediment
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Analyte | CAS | Units | TEF Fish[1] | TEF Mammals[2] | TEF Birds[1] | Analytical Data | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SED-1 Upstream 9/11/2014 | | SED-2 Middle 9/11/2014 | | SED-3 Downstream 9/11/2014 | | SED-3 DUP Downstream 9/11/2014 | |
| Dioxin | 1,2,3,4,6,7,8,9-Octachlorooxanthrene | 3268-87-9 | ng/kg | 0.0001 | 0.0003 | 0.0001 | **29** | | **75** | | **35** | **J** | **69** | **J** |
| | 1,2,3,4,6,7,8-Heptachlorooxanthrene | 35822-46-9 | ng/kg | 0.001 | 0.01 | 0.001 | 2.5 | U | **6.6** | **B** | 3.3 | U | **5.7** | **J** |
| | 1,2,3,4,7,8-Hexachlorooxanthrene | 39227-28-6 | ng/kg | 0.5 | 0.1 | 0.05 | 0.077 | U | **0.19** | **J** | **0.097** | **J** | **0.13** | **J** |
| | 1,2,3,6,7,8-Hexachlorooxanthrene | 57653-85-7 | ng/kg | 0.01 | 0.1 | 0.01 | 0.081 | U | **0.27** | **J** | **0.082** | **J** | **0.27** | **J** |
| | 1,2,3,7,8,9-Hexachlorooxanthrene | 19408-74-3 | ng/kg | 0.01 | 0.1 | 0.1 | **0.26** | **J** | **0.28** | **J** | **0.22** | **J** | **0.16** | **J** |
| | 1,2,3,7,8-Pentachlorooxanthrene | 40321-76-4 | ng/kg | 1 | 1 | 1 | 0.21 | U | 0.04 | U | 0.012 | U | 0.19 | U |
| | 2,3,7,8-Tetrachlorooxanthrene | 1746-01-6 | ng/kg | 1 | 1 | 1 | 0.088 | U | 0.072 | U | 0.059 | U | 0.045 | U |
| Furan | 1,2,3,4,6,7,8,9-Octachlorodibenzofuran | 39001-02-0 | ng/kg | 0.0001 | 0.0003 | 0.0001 | 2.4 | U | 5 | U | 1.7 | U | 3.6 | U |
| | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | ng/kg | 0.01 | 0.01 | 0.01 | 0.55 | U | 1.9 | U | 0.48 | U | 0.94 | U |
| | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | ng/kg | 0.01 | 0.01 | 0.01 | 0.084 | U | 0.12 | U | 0.33 | U | 0.3 | U |
| | 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | ng/kg | 0.1 | 0.1 | 0.1 | 0.068 | U | 0.2 | U | 0.12 | U | 0.15 | U |
| | 1,2,3,6,7,8-Hexachlorodibenzofuran | 57117-44-9 | ng/kg | 0.1 | 0.1 | 0.1 | 0.068 | U | 0.74 | U | 0.11 | U | 0.23 | U |
| | 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | ng/kg | 0.1 | 0.1 | 0.1 | 0.086 | U | 0.039 | U | 0.021 | UJ | **0.12** | **J** |
| | 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | ng/kg | 0.05 | 0.03 | 0.1 | 0.047 | U | 0.039 | U | 0.023 | U | 0.019 | U |
| | 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | ng/kg | 0.1 | 0.1 | 0.1 | 0.07 | U | 0.26 | U | 0.092 | U | 0.14 | U |
| | 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | ng/kg | 0.5 | 0.3 | 1 | 0.1 | U | 0.042 | U | 0.02 | U | 0.017 | U |
| | 2,3,7,8-Tetrachlorodibenzofuran | 51207-31-9 | ng/kg | 0.05 | 0.1 | 1 | 0.024 | U | **0.076** | **J** | 0.0094 | U | 0.019 | U |
| | | | | | | **Fish TEQ [3]** | **0.0055** | | **0.118** | | **0.0550** | | **0.0939** | |
| | | | | | | **Mammal TEQ [3]** | **0.0347** | | **0.170** | | **0.0504** | | **0.146** | |
| | | | | | | **Bird TEQ [3]** | **0.0289** | | **0.130** | | **0.0312** | | **0.0498** | |

**Notes**
(1) Toxic Equivalency Factors for fish and birds obtained form Van den Berg, et al., 1998.
(2) Toxic Equivalency Factors for mammals obtained from Van den Berg et al., 2005.
(3) $TEQ = \Sigma (TEF_i \times Csed_i)$
TEQ = TCDD toxic equivalent
$TEF_i$ = toxic equivalency factor for constituent "i"
$Csed_i$ = detected concentration of constituent "i" in sediment

**Definitions**
TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin
ng/kg = nanogram per kilogram
TEF = toxic equivalency factor
TEQ = toxic equivalent

Appendix C - Table 2
Calculation of TCDD TEQ
Drainage Feature Surface Water
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Analyte | CAS | Units | TEF Fish[1] | TEF Mammals[2] | TEF Birds[1] | Analytical Data | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SED-1 Upstream 9/11/2014 | SED-2 Middle 9/11/2014 | SED-3 Downstream 9/11/2014 | SED-3R Downstream 1/15/2015 |
| Dioxin | 1,2,3,4,6,7,8,9-Octachlorooxanthrene | 3268-87-9 | µg/L | 0.0001 | 0.0003 | 0.0001 | 9.8E-06 U | 2.6E-05 U | **5.5E-04** | 9.5E-05 U |
| | 1,2,3,4,6,7,8-Heptachlorooxanthrene | 35822-46-9 | µg/L | 0.001 | 0.01 | 0.001 | 5.2E-07 U | 6.9E-07 U | 4.9E-05 U | 4.7E-05 U |
| | 1,2,3,4,7,8-Hexachlorooxanthrene | 39227-28-6 | µg/L | 0.5 | 0.1 | 0.05 | 7.4E-08 U | 1.6E-07 U | 2.7E-07 U | 6.0E-08 U |
| | 1,2,3,6,7,8-Hexachlorooxanthrene | 57653-85-7 | µg/L | 0.01 | 0.1 | 0.01 | 7.6E-08 U | 1.7E-07 U | **1.5E-06 J** | 6.0E-08 U |
| | 1,2,3,7,8,9-Hexachlorooxanthrene | 19408-74-3 | µg/L | 0.01 | 0.1 | 0.1 | 7.1E-08 U | 1.6E-07 U | 4.4E-06 U | 5.7E-08 U |
| | 1,2,3,7,8-Pentachlorooxanthrene | 40321-76-4 | µg/L | 1 | 1 | 1 | 7.2E-08 U | 6.0E-08 U | 1.3E-07 U | 2.7E-08 U |
| | 2,3,7,8-Tetrachlorooxanthrene | 1746-01-6 | µg/L | 1 | 1 | 1 | 3.7E-08 U | 2.7E-08 U | 4.6E-08 U | 2.1E-08 U |
| Furan | 1,2,3,4,6,7,8,9-Octachlorodibenzofuran | 39001-02-0 | µg/L | 0.0001 | 0.0003 | 0.0001 | 9.8E-07 U | 1.7E-06 U | 1.8E-05 U | 9.5E-05 U |
| | 1,2,3,4,6,7,8-Heptachlorodibenzofuran | 67562-39-4 | µg/L | 0.01 | 0.01 | 0.01 | 2.7E-07 U | 3.2E-07 U | 5.3E-06 U | 4.7E-05 U |
| | 1,2,3,4,7,8,9-Heptachlorodibenzofuran | 55673-89-7 | µg/L | 0.01 | 0.01 | 0.01 | 1.7E-07 U | 4.1E-07 U | 7.2E-07 U | **2.5E-07 J** |
| | 1,2,3,4,7,8-Hexachlorodibenzofuran | 70648-26-9 | µg/L | 0.1 | 0.1 | 0.1 | 9.5E-08 U | 9.7E-08 U | 1.2E-07 U | 4.7E-05 U |
| | 1,2,3,6,7,8-Hexachlorodibenzofuran | 57117-44-9 | µg/L | 0.1 | 0.1 | 0.1 | 8.4E-08 U | 4.4E-07 U | 2.1E-06 U | **1.7E-07 J** |
| | 1,2,3,7,8,9-Hexachlorodibenzofuran | 72918-21-9 | µg/L | 0.1 | 0.1 | 0.1 | 1.0E-07 U | 1.2E-07 U | 1.4E-07 U | **4.4E-07 J** |
| | 1,2,3,7,8-Pentachlorodibenzofuran | 57117-41-6 | µg/L | 0.05 | 0.03 | 0.1 | 8.1E-08 U | 1.2E-07 U | 1.6E-07 U | 4.7E-08 U |
| | 2,3,4,6,7,8-Hexachlorodibenzofuran | 60851-34-5 | µg/L | 0.1 | 0.1 | 0.1 | 8.9E-08 U | 9.8E-08 U | **6.8E-07 J** | 1.0E-07 U |
| | 2,3,4,7,8-Pentachlorodibenzofuran | 57117-31-4 | µg/L | 0.5 | 0.3 | 1 | 8.0E-08 U | 1.1E-07 U | 1.4E-07 U | **3.0E-07 J** |
| | 2,3,7,8-Tetrachlorodibenzofuran | 51207-31-9 | µg/L | 0.05 | 0.1 | 1 | 2.9E-08 U | 7.5E-08 U | 1.1E-07 U | 3.5E-08 U |
| | | | | | | **Fish TEQ [3]** | ND | ND | **1.4E-07** | **2.1E-07** |
| | | | | | | **Mammal TEQ [3]** | ND | ND | **3.8E-07** | **1.5E-07** |
| | | | | | | **Bird TEQ [3]** | ND | ND | **1.4E-06** | **3.9E-07** |

**Notes**

(1) Toxic Equivalency Factors for fish and birds obtained form Van den Berg, et al., 1998.

(2) Toxic Equivalency Factors for mammals obtained from Van den Berg et al., 2005.

(3) $TEQ = \Sigma (TEF_i \times Csw_i)$

TEQ = TCDD toxic equivalent

$TEF_i$ = toxic equivalency factor for constituent "i"

$Csw_i$ = detected concentration of constituent "i" in surface water

**Definitions**

TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin
µg/L = microgram per liter
ND = non-detect
TEF = toxic equivalency factor
TEQ = toxic equivalent

Appendix C - Table 3
Calculation of B(a)P TEQ
Drainage Feature Sediment
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Analyte | CAS | Units | TEF [1] | Analytical Data | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | **SED-1** Upstream 9/11/2014 | | **SED-2** Middle 9/11/2014 | | **SED-3** Downstream 9/11/2014 | | **SED-3 DUP** Downstream 9/11/2014 | | **SED-3R** Downstream 1/29/2015 |
| PAH | Benz(a)anthracene | 56-55-3 | µg/kg | 0.1 | **220** | | **190** | **J** | **17** | **J** | **27** | **J** | **160** |
| PAH | Benzo(a)pyrene | 50-32-8 | µg/kg | 1 | **210** | | **220** | | **17** | **J** | **28** | **J** | **150** |
| PAH | Benzo(b)fluoranthene | 205-99-2 | µg/kg | 0.1 | **230** | | **260** | | **21** | **J** | **33** | **J** | **160** |
| PAH | Benzo(k)fluoranthene | 207-08-9 | µg/kg | 0.01 | **64** | | **92** | **J** | **7.6** | **J** | **12** | **J** | **50** |
| PAH | Chrysene | 218-01-9 | µg/kg | 0.001 | **280** | | **220** | | **22** | **J** | **34** | **J** | **190** |
| PAH | Dibenz(a,h)anthracene | 53-70-3 | µg/kg | 1 | **33** | **J** | **41** | **J** | **2.5** | **J** | **4.7** | **J** | **21** |
| PAH | Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/kg | 0.1 | **130** | | **170** | **J** | **11** | **J** | **19** | **J** | **84** |
| | | | | **B(a)P TEQ [2]** | **302** | | **324** | | **24.5** | | **40.8** | | **212** |

**Notes**
(1) Toxic Equivalency Factors for human exposure (EPA, 1993).
(2) $TEQ = \Sigma (TEF_i \times Csed_i)$
TEQ = benzo(a)pyrene toxic equivalent
$TEF_i$ = toxic equivalency factor for constituent "i"
$Csed_i$ = detected concentration of constituent "i" in sediment

**Definitions**
B(a)P = benzo(a)pyrene
µg/kg = microgram per kilogram
TEF = toxic equivalency factor
TEQ = toxic equivalent

# APPENDIX D

# Selection of Ecological Benchmarks

Appendix D - Table 1
Selection of Ecological Benchmarks for Sediment
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Target Analytes | CAS | Units | Candidate Sediment Benchmarks | | | | | Selected Benchmarks [1] | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | "No Effect" | | | "Low Effect" | | | | | |
| | | | | Region 3 [2a] | TEC [2b] | NOAEL [2c] | PEC [3a] | LOAEL [3b] | No Effect [2] | | Low Effect [3] | |
| Dioxin/Furan | TCDD Equivalent [4] | TCDD Eq | ng/kg | 0.85 | -- | 0.36 | -- | 2.4 | 0.85 | (a) | 2.4 | (b) |
| Metals | Aluminium | 7429-90-5 | mg/kg | -- | -- | 25000 | -- | 58000 | 25000 | (c) | 58000 | (b) |
| | Antimony | 7440-36-0 | mg/kg | 2 | -- | 0.36 | -- | 3.6 | 2 | (a) | 3.6 | (b) |
| | Arsenic | 7440-38-2 | mg/kg | 9.8 | 9.79 | 9.7 | 33 | 33 | 9.8 | (a) | 33 | (a,b) |
| | Barium | 7440-39-3 | mg/kg | -- | -- | 150 | -- | 300 | 150 | (c) | 300 | (b) |
| | Beryllium | 7440-41-7 | mg/kg | -- | -- | 73 | -- | 730 | 73 | (c) | 730 | (b) |
| | Cadmium | 7440-43-9 | mg/kg | 0.99 | 0.99 | 0.33 | 4.98 | 3.3 | 0.99 | (a,b) | 4.98 | (a) |
| | Chromium (III+VI) | 16065-83-1 | mg/kg | 43.4 | 43.4 | 43 | 111 | 110 | 43.4 | (a,b) | 111 | (a) |
| | Cobalt | 7440-48-4 | mg/kg | 50 | -- | 230 | -- | 2300 | 50 | (a) | 2300 | (b) |
| | Copper | 7440-50-8 | mg/kg | 31.6 | 31.6 | 23 | 149 | 70 | 31.6 | (a,b) | 149 | (a) |
| | Iron | 7439-89-6 | mg/kg | 20000 | -- | 20000 | -- | 40000 | 20000 | (a) | 40000 | (b) |
| | Lead | 7439-92-1 | mg/kg | 35.8 | 35.8 | 27 | 128 | 54 | 35.8 | (a,b) | 128 | (a) |
| | Manganese | 7439-96-5 | mg/kg | 460 | -- | 460 | -- | 1100 | 460 | (a) | 1100 | (b) |
| | Mercury | 7439-97-6 | mg/kg | 0.18 | 0.18 | 0.018 | 1.06 | 0.18 | 0.18 | (a,b) | 1.06 | (a) |
| | Nickel | 7440-02-0 | mg/kg | 22.7 | 22.7 | 13 | 48.6 | 27 | 22.7 | (a,b) | 48.6 | (a) |
| | Selenium | 7782-49-2 | mg/kg | 2 | -- | 0.72 | -- | 2.9 | 2 | (a) | 2.9 | (b) |
| | Silver | 7440-22-4 | mg/kg | 1 | -- | 0.5 | -- | 5 | 1 | (a) | 5 | (b) |
| | Thallium | 7440-28-0 | mg/kg | -- | -- | 0.044 | -- | 0.44 | 0.044 | (c) | 0.44 | (b) |
| | Vanadium | 7440-62-2 | mg/kg | -- | -- | 30 | -- | 61 | 30 | (c) | 61 | (b) |
| | Zinc | 7440-66-6 | mg/kg | 121 | 121 | 65 | 459 | 650 | 121 | (a,b) | 459 | (a) |
| PAHs | Total PAH | PAH SUM | µg/kg | 1610 | 1610 | -- | 22800 | -- | 1610 | (a,b) | 22800 | (a) |
| | 1-Methylnaphthalene | 90-12-0 | µg/kg | -- | -- | 76 | -- | 760 | 76 | (c) | 760 | (b) |
| | 2-Methylnaphthalene | 91-57-6 | µg/kg | 20.2 | -- | 76 | -- | 760 | 20.2 | (a) | 760 | (b) |
| | Acenaphthene | 83-32-9 | µg/kg | 6.7 | -- | 76 | -- | 760 | 6.7 | (a) | 760 | (b) |
| | Acenaphthylene | 208-96-8 | µg/kg | 5.9 | -- | 76 | -- | 760 | 5.9 | (a) | 760 | (b) |
| | Anthracene | 120-12-7 | µg/kg | 57.2 | 57.2 | 57 | 845 | 570 | 57.2 | (a,b) | 845 | (a) |
| | Benz(a)anthracene | 56-55-3 | µg/kg | 108 | 108 | 100 | 1050 | 1000 | 108 | (a,b) | 1050 | (a) |
| | Benzo(a)pyrene | 50-32-8 | µg/kg | 150 | 150 | 150 | 1450 | 1400 | 150 | (a,b) | 1450 | (a) |
| | Benzo(b)fluoranthene [5] | 205-99-2 | µg/kg | 27.2 | -- | 190 | -- | 1900 | 27.2 | (a) | 1900 | (b) |
| | Benzo(g,h,i)perylene | 191-24-2 | µg/kg | 170 | -- | 170 | -- | 1700 | 170 | (a) | 1700 | (b) |
| | Benzo(k)fluoranthene | 207-08-9 | µg/kg | 240 | -- | 240 | -- | 2400 | 240 | (a) | 2400 | (b) |
| | Chrysene | 218-01-9 | µg/kg | 166 | 166 | 160 | -- | 1200 | 166 | (a,b) | 1200 | (b) |
| | Dibenz(a,h)anthracene | 53-70-3 | µg/kg | 33 | 33 | 33 | 1290 | 330 | 33 | (a,b) | 1290 | (a) |
| | Fluoranthene | 206-44-0 | µg/kg | 423 | 423 | 420 | 2230 | 2200 | 423 | (a,b) | 2230 | (a) |
| | Fluorene | 86-73-7 | µg/kg | 77.4 | 77.4 | 77 | 536 | 530 | 77.4 | (a,b) | 536 | (a) |
| | Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/kg | 17 | -- | 200 | -- | 2000 | 17 | (a) | 2000 | (b) |
| | Naphthalene | 91-20-3 | µg/kg | 176 | 176 | 170 | 561 | 560 | 176 | (a,b) | 561 | (a) |
| | Phenanthrene | 85-01-8 | µg/kg | 204 | 204 | 200 | 1170 | 1100 | 204 | (a,b) | 1170 | (a) |
| | Pyrene | 129-00-0 | µg/kg | 195 | 195 | 190 | 1520 | 1500 | 195 | (a,b) | 1520 | (a) |

* Table notes follow Appendix D - Table 2

Appendix D - Table 2
Selection of Ecological Benchmarks for Surface Water
UNC-CH Cogeneration Facility - Chapel Hill, North Carolina

| Class | Analyte | CAS | UNITS | North Carolina [a] | | AWQC Chronic [b] | AWQC Acute [b] | Region 4 Chronic [c] | Region 4 Acute [c] | OSWER [d] | | Region 3 [e] | Region 5 [f] | Selected Benchmark [1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | Value | Source |
| Dioxin | TCDD Equivalent [4] | TCDD Eq | µg/L | -- | | -- | -- | 1.00E-05 | 0.1 | -- | | 3.1E-09 | 3.0E-09 | 1.00E-05 | Region 4 |
| Metals | Aluminium | 7429-90-5 | µg/L | 87 | C | 87 | 750 | 87 | 750 | -- | | 87 | -- | 87 | NCDENR |
| | Antimony | 7440-36-0 | µg/L | -- | | -- | -- | 160 | 1300 | -- | | 30 | 80 | 160 | Region 4 |
| | Arsenic | 7440-38-2 | µg/L | 50 | S | 150 | 340 | 190 | 360 | 190 | (i) | 5 | 148 | 50 | NCAC |
| | Barium | 7440-39-3 | µg/L | -- | | -- | -- | -- | -- | 3.9 | (ii) | 4 | 220 | 3.9 | OSWER |
| | Beryllium | 7440-41-7 | µg/L | 6.5 | S | -- | -- | 0.53 | 16 | 5.1 | (ii) | 0.66 | 3.6 | 6.5 | NCAC |
| | Cadmium | 7440-43-9 | µg/L | 2 | S | 0.25 | 2 | 0.66 | 1.79 | 1 | (i) | 0.25 | 0.15 | 2 | NCAC |
| | Chromium (III+VI) | 16065-83-1 | µg/L | 50 | S | 11 | 16 | 11 | 16 | 10 | (i) | 11 | 42 | 50 | NCAC |
| | Cobalt | 7440-48-4 | µg/L | -- | | -- | -- | -- | -- | 3 | (ii) | 23 | 24 | 3 | OSWER |
| | Copper | 7440-50-8 | µg/L | 7 | S | BLM | BLM | 6.54 | 9.22 | 11 | (i) | 9 | 1.58 | 7 | NCAC |
| | Iron | 7439-89-6 | µg/L | 1000 | S | 1000 | -- | 1000 | -- | 1000 | (i) | 300 | -- | 1000 | NCAC |
| | Lead | 7439-92-1 | µg/L | 25 | S | 2.5 | 65 | 1.32 | 33.78 | 2.5 | (i) | 2.5 | 1.17 | 25 | NCAC |
| | Manganese | 7439-96-5 | µg/L | -- | | -- | -- | -- | -- | 80 | (ii) | 120 | -- | 80 | OSWER |
| | Mercury | 7439-97-6 | µg/L | 0.012 | S | 0.77 | 1.4 | 0.012 | 2.4 | 1.3 | (i) | 0.026 | 0.0013 | 0.012 | NCAC |
| | Nickel | 7440-02-0 | µg/L | 88 | S | 52 | 470 | 87.71 | 789 | 160 | (i) | 52 | 28.9 | 88 | NCAC |
| | Selenium | 7782-49-2 | µg/L | 5 | S | 5 | -- | 5 | 20 | 5 | (i) | 1 | 5 | 5 | NCAC |
| | Silver | 7440-22-4 | µg/L | 0.06 | S | -- | 3.2 | 0.012 | 1.23 | -- | | 3.2 | 0.12 | 0.06 | NCAC |
| | Thallium | 7440-28-0 | µg/L | -- | | -- | -- | 4 | 140 | -- | | 0.8 | 10 | 4 | Region 4 |
| | Vanadium | 7440-62-2 | µg/L | -- | | -- | -- | -- | -- | 19 | (ii) | 20 | 12 | 19 | OSWER |
| | Zinc | 7440-66-6 | µg/L | 50 | S | 120 | 120 | 58.91 | 65.04 | 100 | (i) | 120 | 65.7 | 50 | NCAC |
| Other | Calcium | 7440-70-2 | µg/L | -- | | -- | -- | -- | -- | -- | | 116000 | -- | 116000 | Region 3 |
| | Magnesium | 7439-95-4 | µg/L | -- | | -- | -- | -- | -- | -- | | 82000 | -- | 82000 | Region 3 |
| | Potassium | 7440-09-7 | µg/L | -- | | -- | -- | -- | -- | -- | | 53000 | -- | 53000 | Region 3 |
| | Sodium | 7440-23-5 | µg/L | -- | | -- | -- | -- | -- | -- | | 680000 | -- | 680000 | Region 3 |
| | Sulphate | 18785-72-3 | µg/L | -- | | -- | -- | -- | -- | -- | | -- | -- | -- | |
| | 1-Methylnaphthalene | 90-12-0 | µg/L | -- | | -- | -- | -- | -- | -- | | 2.1 | -- | 2.1 | Region 3 |
| | 2-Methylnaphthalene | 91-57-6 | µg/L | -- | | -- | -- | -- | -- | -- | | 4.7 | 330 | 4.7 | Region 3 |
| | Acenaphthene | 83-32-9 | µg/L | 60 | C | -- | -- | 17 | 1700 | 23 | (i) | 5.8 | 38 | 60 | NCDENR |
| | Acenaphthylene | 208-96-8 | µg/L | -- | | -- | -- | -- | -- | -- | | -- | 4840 | 4840 | Region 5 |
| | Anthracene | 120-12-7 | µg/L | 0.05 | C | -- | -- | -- | -- | -- | | 0.012 | 0.035 | 0.05 | NCDENR |
| | Benz(a)anthracene | 56-55-3 | µg/L | -- | | -- | -- | -- | -- | -- | | 0.018 | 0.025 | 0.018 | Region 3 |
| | Benzo(a)pyrene | 50-32-8 | µg/L | -- | | -- | -- | -- | -- | 0.014 | (ii) | 0.015 | 0.014 | 0.014 | OSWER |
| | Benzo(b)fluoranthene | 205-99-2 | µg/L | -- | | -- | -- | -- | -- | -- | | -- | 9.07 | 9.07 | Region 5 |
| | Benzo(g,h,i)perylene | 191-24-2 | µg/L | -- | | -- | -- | -- | -- | -- | | -- | 7.64 | 7.64 | Region 5 |
| | Benzo(k)fluoranthene | 207-08-9 | µg/L | -- | | -- | -- | -- | -- | -- | | -- | -- | -- | |
| | Chrysene | 218-01-9 | µg/L | -- | | -- | -- | -- | -- | -- | | -- | -- | -- | |
| | Dibenz(a,h)anthracene | 53-70-3 | µg/L | -- | | -- | -- | -- | -- | -- | | -- | -- | -- | |
| | Fluoranthene | 206-44-0 | µg/L | 0.11 | C | -- | -- | 39.8 | 398 | 8.1 | (i) | 0.04 | 1.9 | 0.11 | NCDENR |
| | Fluorene | 86-73-7 | µg/L | 30 | C | -- | -- | -- | -- | 3.9 | (ii) | 3 | 19 | 30 | NCDENR |
| | Indeno(1,2,3-c,d)pyrene | 193-39-5 | µg/L | -- | | -- | -- | -- | -- | -- | | -- | 4.31 | 4.31 | Region 5 |
| | Naphthalene | 91-20-3 | µg/L | 12 | C | -- | -- | 62 | 230 | 24 | | 1.1 | 13 | 12 | NCDENR |
| | Phenanthrene | 85-01-8 | µg/L | 0.7 | C | -- | -- | -- | -- | 6.3 | (i) | 0.4 | 3.6 | 0.7 | NCDENR |
| | Pyrene | 129-00-0 | µg/L | -- | | -- | -- | -- | -- | -- | | 0.025 | 0.3 | 0.025 | Region 3 |

**Table 1 Notes**

(1) The drainage feature does not support populations of aquatic-dependent receptors. However, as a point-of-departure for evaluating the need for further investigation/evaluation, sediment data from the channel were compared to risk-based benchmarks for the protection of benthic/aquatic receptors.

(2) "No Effect" benchmarks were selected from the following sources, in the order in which they are listed:

a. Region 3 - EPA Region 3 Biological Technical Assistance Group freshwater sediment benchmarks (EPA, 2006).
b. TEC - threshold effects concentration (MacDonald et al., 2000).
c. NOAEL - no observable adverse effect level (LANL, 2012).

(3) "Low Effect" benchmarks were selected from the following sources, in the order in which they are listed:

a. PEC - probable effects concentration (MacDonald et al., 2000).
b. LOAEL - lowest observable adverse effect level (LANL, 2012).

(4) Dioxin/furan congeners ("dioxins") were normalized to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) using toxic equivalency factors (TEFs) and evaluated using TCDD benchmarks.

(5) The selected benchmark for benzo(b)fluoranthene is the "benzo(b+k)fluoranthene" available from EPA Region 3.

**Table 2 Notes**

(1) The drainage channel does not support populations of aquatic-dependent receptors. However, as a point-of-departure for evaluating the need for further investigation/evaluation, surface water data from the channel were compared to risk-based benchmarks for the protection of aquatic receptors. Benchmarks were selected from the following sources, in the order in which they are listed:

a. North Carolina - Standards (S) from the North Carolina Administrative Code (NCAC, 2007) or Criteria (C) from the Department of Environment and Natural Resources (NCDENR, 2013).
b. AWQC - EPA Aquatic Life Water Quality Criteria, lower of chronic and acute values (EPA, 2015).
c. Region 4 - EPA Region 4 freshwater sediment benchmarks, lower of chronic and acute values (EPA, 2001).
d. OSWER - EPA Office of Solid Waste and Emergency Response, Ecotox Thresholds for Freshwater: (i) Ambient Water Quality Criterion or (ii) Tier II value (EPA, 1996)
e. Region 3 - EPA Region 3 Biological Technical Assistance Group freshwater benchmarks (EPA, 2006).
f. Region 5 - EPA Region 5 Ecological Screening Levels for surface water (EPA, 2003).

(2) Dioxin/furan congeners ("dioxins") were normalized to 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) using toxic equivalency factors (TEFs) and evaluated using the TCDD benchmark.

**Definitions**

ng/kg = nanogram per kilogram
µg/kg = microgram per kilogram
µg/L = microgram per liter
mg/kg = microgram per kilogram
PAH = polynuclear aromatic hydrocarbon
"--" = value not available
EPA = United States Environmental Protection Agency

# APPENDIX O

# Data Validation Reports

Geosyntec consultants

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# Memorandum

Date: 07 July 2015

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3510C/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C, Mercury by EPA Method 7470A, Sulfide by EPA Methods 9030B/9034, Sulfate by EPA Method 9056A, Alkalinity by Standard Method 2320B, Total Dissolved Solids by Standard Method 2540C, and Total Suspended Solids by Standard Method 2540D – TestAmerica Work Order Number 280-52940-1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of two water samples, one field duplicate sample, and one equipment blank collected on March 10, 2014, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans which were performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3510C/8270D Selective Ion Monitoring (SIM) - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C – Metals
- EPA Methods 7470A – Mercury
- EPA Methods 9030B/9034 - Sulfide
- EPA Method 9056A –Sulfate
- Standard Method 2320B - Alkalinity
- Standard Method 2540C – Total Dissolved Solids (TDS)

- Standard Method 2540D – Total Suspended Solids (TSS)

**EXECUTIVE SUMMARY**

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The dioxins and furans data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs) Data Review, OSWER 9240.1-53, EPA 540-R-11-016, September 2011, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, OSWER 9240.1-51, EPA 540-R-10-011, January 2010, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-52940-1 | ER01-140310 |
| 280-52940-2 | GWA-MW01-140310 |

| Laboratory ID | Client ID |
|---|---|
| 280-52940-3 | GWA-MW03-140310 |
| 280-52940-4 | GWA-MW99-140310 |

The samples were received by the laboratory at 1.0ºC, 1.8ºC, 4.3ºC, 4.5ºC and 0.9ºC (TA Knoxville), some outside of the QAPP criteria of 4ºC + 2ºC. However, since the samples were received below 6ºC and above freezing, no qualifications were applied to the data based on professional judgment. No sample preservation issues were noted by the laboratory.

Incorrect error corrections were observed on the chain of custody (COC). The proper procedure of a single strike-through correction and initials and date of the person making the correction was not followed.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

Two water samples, one field duplicate sample, and one equipment blank were analyzed for PAHs per EPA Methods 3510C/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 1.1 Overall Assessment

#### 1.1.1 Completeness

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### 1.1.2 Analysis Anomaly

Sample GWA-MW99-140310 was re-extracted outside of holding time due to low surrogate recovery in the initial analysis. Also, laboratory noted that the method blank for the re-extraction evaporated completely before it was analyzed. Therefore, since the initial analysis was within

holding time and the remaining surrogates were within laboratory limits, the original analysis was considered the best result.

### 1.2 Holding Times

The holding times for the PAH analysis of a water sample are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses, with the following exception.

Sample GWA-MW99-140310 was re-extracted outside the 7 day holding times. However, the initial analysis was considered for validation and no qualifications were applied to the data.

### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 216749). PAHs were not detected in the method blank above the method detection limits (MDLs).

### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported with the data set.

### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS and one LCS/LCS duplicate (LCSD) pair were reported. 1-Methylnaphthalene and 2-methylnaphthalene were spiked in the LCS and LCS/LCSD pair but not reported in the LCS and LCS/LCSD summaries. The recoveries and relative percent differences (RPDs) for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCS and LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD.

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses, with the following exceptions.

The recovery of 2-fluorobiphenyl in sample GWA-MW99-140310 was low and outside the laboratory specified acceptance criteria. However, since the other two surrogates were within laboratory limits, no qualifications were applied to the data.

### 1.7 Equipment Blank

One equipment blank, ER01-140310, was reported. PAHs were not detected in the equipment blank above the MDLs, with the following exceptions.

1-Methylnaphthalene, 2-methylnaphthalene, naphthalene, and phenanthrene were detected at estimated concentrations greater than the MDLs and less than the reporting limits (RLs) in the equipment blank. Since these compounds were not detected in the associated samples, no qualifications were applied to the data.

### 1.8 Field Duplicate

One field duplicate sample, GWA-MW99-140310, was collected with the samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, GWA-MW03-140310. The RPDs were 0%.

### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs were similar to those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

Two water samples, one field duplicate sample, and one equipment blank were analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
⊗ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 2.1 Overall Assessment

#### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### 2.1.2 Analysis Anomaly

Several results in the samples were flagged Q by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on technical and professional judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | RPD | Validation Result (pg/L) | Validation Qualifier |
|---|---|---|---|---|---|---|
| ER01-140310 | 1,2,3,4,6,7,8-HpCDF | 0.47 | Q B J | 0.47 | J | 13 |
| ER01-140310 | 1,2,3,4,7,8-HxCDD | 0.36 | Q J | 0.36 | J | 13 |
| ER01-140310 | 1,2,3,4,7,8-HxCDF | 0.11 | Q B J | 0.11 | J | 13 |
| ER01-140310 | 1,2,3,6,7,8-HxCDF | 0.27 | Q B J | 0.27 | J | 13 |
| ER01-140310 | 1,2,3,7,8-PeCDD | 0.22 | Q B J | 0.22 | J | 13 |
| ER01-140310 | 1,2,3,7,8-PeCDF | 0.42 | Q B J | 0.42 | J | 13 |
| ER01-140310 | 2,3,4,6,7,8-HxCDF | 0.30 | Q B J | 0.30 | J | 13 |
| ER01-140310 | 2,3,4,7,8-PeCDF | 0.51 | Q B J | 0.51 | J | 13 |
| ER01-140310 | OCDD | 2.0 | Q B J | 2.0 | J | 13 |
| ER01-140310 | OCDF | 0.19 | Q B J | 0.19 | J | 13 |
| GWA-MW01-140310 | 1,2,3,4,6,7,8-HpCDD | 0.29 | Q B J | 0.29 | J | 13 |
| GWA-MW01-140310 | 1,2,3,4,6,7,8-HpCDF | 0.32 | Q B J | 0.32 | J | 13 |
| GWA-MW01-140310 | 1,2,3,4,7,8,9-HpCDF | 0.33 | Q B J | 0.33 | J | 13 |
| GWA-MW01-140310 | 1,2,3,4,7,8-HxCDD | 0.47 | Q J | 0.47 | J | 13 |
| GWA-MW01-140310 | 1,2,3,4,7,8-HxCDF | 0.38 | Q B J | 0.38 | J | 13 |
| GWA-MW01-140310 | 1,2,3,6,7,8-HxCDD | 0.12 | Q B J | 0.12 | J | 13 |
| GWA-MW01-140310 | 1,2,3,6,7,8-HxCDF | 0.23 | Q B J | 0.23 | J | 13 |
| GWA-MW01-140310 | 1,2,3,7,8-PeCDD | 0.36 | Q B J | 0.36 | J | 13 |
| GWA-MW01-140310 | 1,2,3,7,8-PeCDF | 0.33 | Q B J | 0.33 | J | 13 |
| GWA-MW01-140310 | 2,3,4,6,7,8-HxCDF | 0.33 | Q B J | 0.33 | J | 13 |
| GWA-MW01-140310 | 2,3,4,7,8-PeCDF | 0.28 | Q B J | 0.28 | J | 13 |
| GWA-MW01-140310 | 2,3,7,8-TCDF | 0.093 | Q B J | 0.093 | J | 13 |
| GWA-MW01-140310 | OCDD | 2.4 | Q B J | 2.4 | J | 13 |
| GWA-MW01-140310 | OCDF | 0.44 | Q B J | 0.44 | J | 13 |
| GWA-MW03- | 1,2,3,4,6,7,8- | 0.38 | Q B J | 0.38 | J | 13 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | RPD | Validation Result (pg/L) | Validation Qualifier |
|---|---|---|---|---|---|---|
| 140310 | HpCDD | | | | | |
| GWA-MW03-140310 | 1,2,3,4,7,8,9-HpCDF | 0.33 | Q B J | 0.33 | J | 13 |
| GWA-MW03-140310 | 1,2,3,4,7,8-HxCDF | 0.22 | Q B J | 0.22 | J | 13 |
| GWA-MW03-140310 | 1,2,3,6,7,8-HxCDF | 0.22 | Q B J | 0.22 | J | 13 |
| GWA-MW03-140310 | 1,2,3,7,8,9-HxCDD | 0.42 | Q B J | 0.42 | J | 13 |
| GWA-MW03-140310 | 1,2,3,7,8-PeCDF | 0.58 | Q B J | 0.58 | J | 13 |
| GWA-MW03-140310 | 2,3,4,6,7,8-HxCDF | 0.035 | Q B J | 0.035 | J | 13 |
| GWA-MW03-140310 | 2,3,4,7,8-PeCDF | 0.34 | Q B J | 0.34 | J | 13 |
| GWA-MW03-140310 | OCDD | 0.51 | Q B J | 0.51 | J | 13 |
| GWA-MW03-140310 | OCDF | 0.13 | Q B J | 0.13 | J | 13 |
| GWA-MW99-140310 | 1,2,3,4,6,7,8-HpCDF | 0.36 | Q B J | 0.36 | J | 13 |
| GWA-MW99-140310 | 1,2,3,6,7,8-HxCDD | 0.28 | Q B J | 0.28 | J | 13 |
| GWA-MW99-140310 | 1,2,3,6,7,8-HxCDF | 0.055 | Q B J | 0.055 | J | 13 |
| GWA-MW99-140310 | 1,2,3,7,8,9-HxCDF | 0.17 | Q B J | 0.17 | J | 13 |
| GWA-MW99-140310 | 1,2,3,7,8-PeCDD | 0.11 | Q B J | 0.11 | J | 13 |
| GWA-MW99-140310 | 2,3,4,7,8-PeCDF | 0.18 | Q B J | 0.18 | J | 13 |
| GWA-MW99-140310 | OCDD | 0.52 | Q B J | 0.52 | J | 13 |

pg/L-picograms per gram
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water samples are 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 4081010). The dioxins and furans were not detected in the method blank above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8,9-HxCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 2,3,4,7,8-PeCDF, 2,3,7,8-TCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the reporting limits (RLs) in the method blank. Therefore, the estimated concentrations of these compounds less than the method blank results in the associated samples were U qualified as not detected at the estimated concentrations and the results greater than the method blank results but less than the RLs were J qualified as estimated.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| ER01-140310 | 1,2,3,4,6,7,8-HpCDD | 0.58 | B J | 0.58 | U | 3 |
| ER01-140310 | 1,2,3,4,6,7,8-HpCDF | 0.47 | Q B J | 0.47 | U | 3 |
| ER01-140310 | 1,2,3,4,7,8-HxCDF | 0.11 | Q B J | 0.11 | U | 3 |
| ER01-140310 | 1,2,3,6,7,8-HxCDD | 0.49 | B J | 0.49 | U | 3 |
| ER01-140310 | 1,2,3,6,7,8-HxCDF | 0.27 | Q B J | 0.27 | U | 3 |
| ER01-140310 | 1,2,3,7,8,9-HxCDD | 0.68 | B J | 0.68 | J | 3 |
| ER01-140310 | 1,2,3,7,8-PeCDD | 0.22 | Q B J | 0.22 | U | 3 |
| ER01-140310 | 1,2,3,7,8-PeCDF | 0.42 | Q B J | 0.42 | U | 3 |
| ER01-140310 | 2,3,4,6,7,8-HxCDF | 0.30 | Q B J | 0.30 | U | 3 |
| ER01-140310 | 2,3,4,7,8-PeCDF | 0.51 | Q B J | 0.51 | U | 3 |
| ER01-140310 | OCDD | 2.0 | Q B J | 2.0 | U | 3 |
| ER01-140310 | OCDF | 0.19 | Q B J | 0.19 | U | 3 |
| GWA-MW01-140310 | 1,2,3,4,6,7,8-HpCDD | 0.29 | Q B J | 0.29 | U | 3 |
| GWA-MW01-140310 | 1,2,3,4,6,7,8-HpCDF | 0.32 | Q B J | 0.32 | U | 3 |
| GWA-MW01-140310 | 1,2,3,4,7,8,9-HpCDF | 0.33 | Q B J | 0.33 | U | 3 |
| GWA-MW01-140310 | 1,2,3,4,7,8-HxCDF | 0.38 | Q B J | 0.38 | U | 3 |
| GWA-MW01-140310 | 1,2,3,6,7,8-HxCDD | 0.12 | Q B J | 0.12 | U | 3 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| GWA-MW01-140310 | 1,2,3,6,7,8-HxCDF | 0.23 | Q B J | 0.23 | U | 3 |
| GWA-MW01-140310 | 1,2,3,7,8,9-HxCDD | 0.45 | B J | 0.45 | U | 3 |
| GWA-MW01-140310 | 1,2,3,7,8,9-HxCDF | 0.53 | B J | 0.53 | U | 3 |
| GWA-MW01-140310 | 1,2,3,7,8-PeCDD | 0.36 | Q B J | 0.36 | U | 3 |
| GWA-MW01-140310 | 1,2,3,7,8-PeCDF | 0.33 | Q B J | 0.33 | U | 3 |
| GWA-MW01-140310 | 2,3,4,6,7,8-HxCDF | 0.33 | Q B J | 0.33 | U | 3 |
| GWA-MW01-140310 | 2,3,4,7,8-PeCDF | 0.28 | Q B J | 0.28 | U | 3 |
| GWA-MW01-140310 | 2,3,7,8-TCDF | 0.093 | Q B J | 0.093 | J | 3 |
| GWA-MW01-140310 | OCDD | 2.4 | Q B J | 2.4 | U | 3 |
| GWA-MW01-140310 | OCDF | 0.44 | Q B J | 0.44 | U | 3 |
| GWA-MW03-140310 | 1,2,3,4,6,7,8-HpCDD | 0.38 | Q B J | 0.38 | U | 3 |
| GWA-MW03-140310 | 1,2,3,4,6,7,8-HpCDF | 0.37 | B J | 0.37 | U | 3 |
| GWA-MW03-140310 | 1,2,3,4,7,8,9-HpCDF | 0.33 | Q B J | 0.33 | U | 3 |
| GWA-MW03-140310 | 1,2,3,4,7,8-HxCDF | 0.22 | Q B J | 0.22 | U | 3 |
| GWA-MW03-140310 | 1,2,3,6,7,8-HxCDF | 0.22 | Q B J | 0.22 | U | 3 |
| GWA-MW03-140310 | 1,2,3,7,8,9-HxCDD | 0.42 | Q B J | 0.42 | U | 3 |
| GWA-MW03-140310 | 1,2,3,7,8,9-HxCDF | 0.19 | B J | 0.19 | U | 3 |
| GWA-MW03-140310 | 1,2,3,7,8-PeCDF | 0.58 | Q B J | 0.58 | J | 3 |
| GWA-MW03-140310 | 2,3,4,6,7,8-HxCDF | 0.035 | Q B J | 0.035 | U | 3 |
| GWA-MW03-140310 | 2,3,4,7,8-PeCDF | 0.34 | Q B J | 0.34 | U | 3 |
| GWA-MW03-140310 | OCDD | 0.51 | Q B J | 0.51 | U | 3 |
| GWA-MW03-140310 | OCDF | 0.13 | Q B J | 0.13 | U | 3 |
| GWA-MW99-140310 | 1,2,3,4,6,7,8-HpCDF | 0.36 | Q B J | 0.36 | U | 3 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| GWA-MW99-140310 | 1,2,3,6,7,8-HxCDD | 0.28 | Q B J | 0.28 | U | 3 |
| GWA-MW99-140310 | 1,2,3,6,7,8-HxCDF | 0.055 | Q B J | 0.055 | U | 3 |
| GWA-MW99-140310 | 1,2,3,7,8,9-HxCDF | 0.17 | Q B J | 0.17 | U | 3 |
| GWA-MW99-140310 | 1,2,3,7,8-PeCDD | 0.11 | Q B J | 0.11 | U | 3 |
| GWA-MW99-140310 | 2,3,4,7,8-PeCDF | 0.18 | Q B J | 0.18 | U | 3 |
| GWA-MW99-140310 | OCDD | 0.52 | Q B J | 0.52 | U | 3 |
| GWA-MW99-140310 | OCDF | 0.32 | B J | 0.32 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

## 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCSD pair was reported. The results for the LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD.

## 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

## 2.7 Equipment Blank

One equipment blank, ER01-140310, was reported. The dioxins and furans were not detected in the equipment blank above the MDLs, with the following exceptions.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8-PeCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 2,3,4,7,8-PeCDF, OCDD, and OCDF were detected in the

equipment blank at estimated concentrations greater than the EDLs and less than the RLs. The concentrations of 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8-PeCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, 2,3,4,7,8-PeCDF, OCDD, and OCDF in the equipment blank were U qualified as not detected at the reported concentrations, due to the method blank contamination; therefore, no additional qualifications were applied to these compounds. However, the estimated concentrations of 1,2,3,4,7,8-HxCDD and 1,2,3,7,8,9-HxCDD greater than the equipment blank results were J qualified as estimated and the concentrations less than the equipment blank results were U qualified at the reported result.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| GWA-MW01-140310 | 1,2,3,4,7,8-HxCDD | 0.47 | Q J | 0.47 | J | 3 |
| GWA-MW01-140310 | 1,2,3,7,8,9-HxCDD | 0.45 | B J | 0.45 | U | 3 |
| GWA-MW03-140310 | 1,2,3,7,8,9-HxCDD | 0.42 | Q B J | 0.42 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.8 Field Duplicate

One field duplicate sample, GWA-MW99-140310, was collected with the samples. Acceptable precision (RPD ≤30%) was demonstrated between the field duplicate and the original sample, GWA-MW03-140310, with the following exceptions.

1,2,3,7,8-PeCDF was detected in the original sample and was not detected in the field duplicate sample; resulting in an RPD that was not calculable. Therefore, the detected concentration was J qualified as estimated and the non-detect value was UJ qualified as estimated less than the EDL. The remaining dioxins and furans were either not detected in the field duplicate pair or were U qualified based on method blank or equipment blank contaminations, resulting in RPDs of 0%.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | RPD | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| GWA-MW03-140310 | 1,2,3,7,8-PeCDF | 0.58 | Q B J | NC | 0.58 | J | 7 |
| GWA-MW99-140310 | 1,2,3,7,8-PeCDF | 0.069 | U | | 0.069 | UJ | 7 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | RPD | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| GWA-MW03-140310 | The other dioxins and furans | ND | NA | 0 | NA | NA | NA |
| GWA-MW99-140310 | The other dioxins and furans | ND | NA | | NA | NA | NA |

pg/L-picogram per liter
NA-not applicable
NC-not calculable
U-not detected at the reported MDL
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL
ND-not detected at the MDL

### 2.9 Sensitivity

The samples were reported to the EDLs. Elevated nondetect results were not reported. The RLs were similar to those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC.

## 3.0 METALS

Two water samples, one field duplicate sample, and one equipment blank were analyzed for metals per EPA Methods 3010A/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate

- ✓ Laboratory Control Sample
- ✓ Serial Dilution
- ✓ Equipment Blank
- ⊗ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverable Review

## 3.1 Overall Assessment

### 3.1.1 Completion

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.1.2 Analysis Anomaly

The recovery of selenium in a continuous calibration verification low level (CCVL) associated with batch 217114 was high and above the laboratory limits. Since selenium was not detected in the associated samples, no qualifications were applied to the data.

Antimony was detected at estimated concentrations in continuous calibration blanks (CCBs) in batch 217114. Since antimony was not detected in the associated samples, no qualifications were applied to the data.

## 3.2 Holding Times

The holding times for metals analyses of water samples are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

## 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 216411 and 216639). Metals were not detected in the method blanks above the MDLs, with the following exceptions.

Selenium, sodium, and zinc were detected in the method blank in batch 216411 at estimated concentrations greater than the MDLs and less than the RLs. Since selenium and sodium were detected above the RLs in the associated samples, no qualifications were applied to the selenium and sodium data. However, the estimated concentration of zinc in the associated sample was U qualified as not detected at the RL.

Zinc was detected in the method blank in batch 216639 at an estimated concentration greater than the MDL and less than the RL. Therefore, the estimated concentration of zinc in the associated sample was U qualified as not detected at the RL.

| **Sample ID** | **Compound** | **Laboratory Result (µg/L)** | **Laboratory Flag** | **Validation Result (µg/L)** | **Validation Qualifier** | **Reason Code** |
|---|---|---|---|---|---|---|
| ER01-140310 | Zinc | 8.8 | J | 20 | U | 3 |
| GWA-MW01-140310 | Zinc | 14 | J | 20 | U | 3 |

µg/L-micrograms per liter
J-laboratory flag indicating an estimated concentration greater than the MDL and less than the RL

### 3.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair and post digestion spike were reported using sample GWA-MW99-140310. The recovery and RPD results for the sample specific MS/MSD pair and post digestion spike were within the QAPP specified acceptance criteria, with the following exceptions.

The recoveries of manganese were low in the MS/MSD pair. However, since the manganese concentration in the sample was greater than four times the spiked amount, no qualifications were applied to the data.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 3.6 Serial Dilution

A serial dilution was reported using sample GWA-MW99-140310. The percent difference (%D) results were within the laboratory specified acceptance criteria.

### 3.7 Equipment Blank

One equipment blank, ER01-140310, was reported. Metals were not detected in the equipment blank above the MDLs, with the following exceptions.

Barium, manganese, and zinc were detected at estimated concentrations greater than the MDLs and less than the RLs. Since the zinc concentration in the equipment blank was U qualified as not detect due to the method blank result and barium and manganese were detected above the RLs in the associated samples, no additional qualifications were applied to the data.

### 3.8 Field Duplicate

One field duplicate sample, GWA-MW99-140310, was collected with the samples. Acceptable precision (RPD ≤30%) was demonstrated between the field duplicate and the original sample, GWA-MW03-140310, with the following exceptions.

Aluminum and copper were detected in the original sample and not detected in the field duplicate samples, resulting in noncalculable RPDs between the results. Therefore, the detected concentrations of aluminum and copper were J qualified as estimated and the nondetect values were UJ qualified as estimated less than the MDLs in the field duplicate pair. Also, iron was detected above the RL in the original sample and was detected at an estimated concentration greater than the MDL and less than the RL in the field duplicate sample; therefore, the concentrations of iron were J qualified as estimated in the field duplicate pair.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | RPD | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| GWA-MW03-140310 | Aluminum | 120 | NA | NC | 120 | J | 7 |
| GWA-MW99-140310 | Aluminum | 18 | U | | 18 | UJ | 7 |
| GWA-MW03-140310 | Barium | 22 | NA | 5 | NA | NA | NA |
| GWA-MW99-140310 | Barium | 21 | NA | | NA | NA | NA |
| GWA-MW03-140310 | Beryllium | 0.53 | J | NC | NA | NA | NA |
| GWA-MW99-140310 | Beryllium | 0.55 | J | | NA | NA | NA |
| GWA-MW03-140310 | Cadmium | 0.67 | J | NC | NA | NA | NA |
| GWA-MW99-140310 | Cadmium | 0.91 | J | | NA | NA | NA |
| GWA-MW03-140310 | Cobalt | 150 | NA | 0 | NA | NA | NA |
| GWA-MW99-140310 | Cobalt | 150 | NA | | NA | NA | NA |
| GWA-MW03-140310 | Copper | 1.5 | J | NC | 1.5 | J | 7 |
| GWA-MW99-140310 | Copper | 1.4 | U | | 1.4 | UJ | 7 |

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | RPD | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| GWA-MW03-140310 | Iron | 200 | NA | NC | 200 | J | 7 |
| GWA-MW99-140310 | Iron | 67 | J | | 67 | J | 7 |
| GWA-MW03-140310 | Manganese | 8500 | NA | 0 | NA | NA | NA |
| GWA-MW99-140310 | Manganese | 8500 | NA | | NA | NA | NA |
| GWA-MW03-140310 | Nickel | 31 | J | NC | NA | NA | NA |
| GWA-MW99-140310 | Nickel | 32 | J | | NA | NA | NA |
| GWA-MW03-140310 | Zinc | 52 | NA | 0 | NA | NA | NA |
| GWA-MW99-140310 | Zinc | 52 | NA | | NA | NA | NA |
| GWA-MW03-140310 | The other metals | ND | NA | 0 | NA | NA | NA |
| GWA-MW99-140310 | The other metals | ND | NA | | NA | NA | NA |

µg/L-micrograms per liter
J-estimated concentration less than the RL and greater than the MDL
U-not detected at or above the MDL
NA-not applicable
NC-not calculable
ND-not detected at the MDL

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were similar to those listed in Table 6.2 of the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

Two water samples, one field duplicate sample, and one equipment blank were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues

were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

## 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 4.2 Holding Times

The holding times for mercury analyses of water samples are 28 days from sample collection to analysis. The holding times were met for the sample analyses.

## 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported with the data (batches 216601 and 216837).

Mercury was not detected above the MDL in the method blank in batch 216837; however, mercury was detected in the method blank in batch 216601 at an estimated concentration greater than the MDL and less than the RL. Therefore, the estimated concentration of mercury in the associated sample was U qualified as not detected at the RL.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| ER01-140310 | Mercury | 0.040 | J | 0.20 | U | 3 |

µg/L-micrograms per liter
J-laboratory flag indicating an estimated concentration greater than the MDL and less than the RL

### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCSs were analyzed. The results for the LCSs were within the QAPP specified acceptance criteria for recovery.

### 4.6 Equipment Blank

One equipment blank, ER01-140310, was reported.

Mercury was detected at an estimated concentration greater than the MDL and less than the RL. Since the mercury concentration in the equipment blank was U qualified as not detect due to the method blank result, no additional qualifications were applied to the data.

### 4.7 Field Duplicate

One field duplicate sample, GWA-MW99-140310, was collected with the samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, GWA-MW03-140310. The RPD was 0%.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the same as those listed in Table 6.2 of the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 5.0 WET CHEMISTRY

Two water samples were analyzed for sulfide by EPA Methods 9030B/9034, sulfate by EPA Method 9056A, alkalinity by Standard Method 2320B, TDS by Standard Method 2540C, and TSS by Standard Method 2540D.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Laboratory Duplicate
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 5.1 Overall Assessment

#### 5.1.1 Completeness

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### 5.1.2 Analysis Anomaly

A constant weight was not achieved after three drying cycles for the TDS analysis of GWA-MW03-140310. The laboratory standard operating procedure (SOP) required no further drying. Therefore, the TDS result in sample GWA-MW03-140310 was J qualified as estimated based on professional and technical judgment.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW03-140310 | TDS | 600 | NA | 600 | J | 13 |

mg/L-milligrams per liter

## 5.2 Holding Times

The holding times are listed below. The holding times were met for the sample analyses.

| Parameter | Holding Time |
|---|---|
| Sulfide by EPA Methods 9030B/9034 | 7 days from sample collection to analysis |
| Sulfate by EPA Method 9056A | 28 days from sample collection to analysis |
| Alkalinity by Standard Method 2320B | 14 days from sample collection to analysis |
| TDS by Standard Method 2540C | 7 days from sample collection to analysis |
| TSS by Standard Method 2540D | 7 days from sample collection to analysis |

## 5.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported for each analysis, TSS (batch 216949), alkalinity (batch 217002), sulfide (batch 217004), TDS (batch 217061), and sulfate (batch 218499). The wet chemistry parameters were not detected in the method blanks above the MDLs.

## 5.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

## 5.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCSD pair was reported for each analysis. The results for the LCS/LCSD pairs were within the laboratory specified acceptance criteria for recovery and RPD.

## 5.6 Laboratory Duplicate

Laboratory duplicates were not reported.

### 5.7 Equipment Blank

One equipment blank, ER01-140310, was reported. The wet chemistry parameters were not reported for the equipment blank.

### 5.8 Field Duplicate

One field duplicate sample, GWA-MW99-140310, was collected with the samples. The wet chemistry parameters were not reported for the field duplicate sample.

### 5.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. MDLs and RLs for the wet chemistry parameters were not listed in Table 6.2 of the QAPP.

### 5.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

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# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**
**DATA VALIDATION REASON CODES**
**Assigned by Geosyntec's Data Validation Team**

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference

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# Memorandum

Date: 07 July 2015

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3510C/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C, Mercury by EPA Method 7470A, Sulfide by EPA Methods 9030B/9034, Sulfate by EPA Method 9056A, Alkalinity by Standard Method 2320B, Total Dissolved Solids by Standard Method 2540C, and Total Suspended Solids by Standard Method 2540D – TestAmerica Work Order Number 280-52997-1 Revision 1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of one water sample and one matrix spike/matrix spike duplicate (MS/MSD) collected on March 11, 2014, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans which were performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3510C/8270D Selective Ion Monitoring (SIM) - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C – Metals
- EPA Methods 7470A – Mercury
- EPA Methods 9030B/9034 - Sulfide

- EPA Method 9056A –Sulfate
- Standard Method 2320B - Alkalinity
- Standard Method 2540C – Total Dissolved Solids (TDS)
- Standard Method 2540D – Total Suspended Solids (TSS)

**EXECUTIVE SUMMARY**

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The dioxins and furans data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs) Data Review, OSWER 9240.1-53, EPA 540-R-11-016, September 2011, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, OSWER 9240.1-51, EPA 540-R-10-011, January 2010, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-52997-1 | GWA-MW02-140311 |
| 280-52997-1MS | GWA-MW02-140311MS |

| Laboratory ID | Client ID |
|---|---|
| 280-52997-1MSD | GWA-MW02-140311MSD |

The samples were received by the TestAmerica Denver at 1.5ºC, 2.2ºC, and 3.1ºC; two coolers were shipped to TestAmerica Knoxville and received at 0.5ºC and 0.7ºC. Some samples were



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received outside the QAPP criteria of 4ºC + 2ºC. However, since the samples were received below 6ºC and above freezing, no qualifications were applied to the data based on professional judgment. No sample preservation issues were noted by the laboratory.

Five of six containers on the first shipment to TestAmerica Knoxville were received broken; therefore, a second shipment was made.

The laboratory report was revised on April 18, 2014 to report dioxins and furans sample results from instrument D2A, and was identified as 280-52997-1 Revision 1.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

One water sample and one MS/MSD pair were analyzed for PAHs per EPA Methods 3510C/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 1.1 Overall Assessment

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 1.2 Holding Times

The holding times for the PAH analysis of a water sample are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 216749). PAHs were not detected in the method blank above the method detection limits (MDLs).

### 1.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair was reported using sample GWA-MW02-140311. 1-Methylnaphthalene and 2-methylnaphthalene were spiked in the MS/MSD pair but not reported in the MS/MSD summaries. The recoveries for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The recovery and relative percent difference (RPD) results for the sample specific MS/MD pair were within the QAPP specified acceptance criteria.

### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. 1-methylnaphthalene and 2-methylnaphthalene were spiked in the LCS but not reported in the LCS summary. The recoveries for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses.

### 1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 1.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and reporting limits (RLs) were similar to those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

One water sample and one MS/MSD pair were analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review



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## 2.1 Overall Assessment

### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 2.1.2 Analysis Anomaly

Several results in the samples were flagged Q by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on technical and professional judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| GWA-MW02-140311RE | 1,2,3,7,8,9-HxCDD | 1.1 | Q J | 1.1 | J | 13 |
| GWA-MW02-140311RE | 1,2,3,7,8-PeCDF | 1.0 | Q J | 1.0 | J | 13 |
| GWA-MW02-140311RE | OCDD | 8.2 | Q B J | 8.2 | J | 13 |
| GWA-MW02-140311RE | OCDF | 0.23 | Q B J | 0.23 | J | 13 |

pg/L-picograms per gram
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water samples are 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported, only one method blank was related to the reported data (batch 4107050). The dioxins and furans were not detected in the method blank above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the minimum levels in the method blank. Since 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,7,8,9-HpCDF, 1,2,3,6,7,8-HxCDD, and 1,2,3,6,7,8-HxCDF were not detected in the associated sample, no qualifications were applied for these compounds. Therefore, the estimated concentration of OCDF less than the estimated method blank result in the associated samples was U qualified as not detected at the estimated concentration and the 1,2,3,4,6,7,8-HpCDF and OCDD results greater than the method blank results but less than the RLs were J qualified as estimated.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| GWA-MW02-140311RE | 1,2,3,4,6,7,8-HpCDF | 1.2 | Q B J | 1.2 | J | 3 |
| GWA-MW02-140311RE | OCDD | 8.2 | Q B J | 8.2 | J | 3 |
| GWA-MW02-140311RE | OCDF | 0.23 | Q B J | 0.23 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair was reported using sample GWA-MW02-140311. The recovery and RPD results for the sample specific MS/MD pair were within the QAPP specified acceptance criteria.

## 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

## 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

## 2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 2.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 2.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The RLs were similar to those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC.

## 3.0 METALS

One water sample and one MS/MSD pair were analyzed for metals per EPA Methods 3010A/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Serial Dilution
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

## 3.1 Overall Assessment

### 3.1.1 Completion

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.1.2 Analysis Anomaly

The recovery of sodium in continuing calibration verification (CCV) and CCV low level (CCVL) associated with batch 217623 was high and above the laboratory limits. Therefore the concentration of sodium in the associated sample was J+ qualified as estimated bias high.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| GWA-MW02-140311 | Sodium | 99000 | NA | 99000 | J+ | 9 |

µg/L-micrograms per liter

## 3.2 Holding Times

The holding times for metals analyses of water samples are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

## 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 216823). The metals were not detected in the method blank above the MDLs, with the following exceptions.

Sodium and zinc were detected in the method blank in batch 216823 at estimated concentrations greater than the MDLs and less than the RLs. Since sodium was detected above the RL in the associated sample, no qualifications were applied to the sodium data. However, the estimated concentration of zinc in the associated sample was U qualified as not detected at the RL.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| GWA-MW02-140311 | Zinc | 12 | J | 20 | U | 3 |

µg/L-micrograms per liter
J-estimated concentration greater than the MDL and less than the RL

### 3.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair and post digestion spike were reported using sample GWA-MW02-140311. The recovery and RPD results for the sample specific MS/MD pair and post digestion spike were within the QAPP specified acceptance criteria.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 3.6 Serial Dilution

A serial dilution was reported using sample GWA-MW02-140311. The percent difference (%D) results were within the laboratory specified acceptance criteria.

### 3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 3.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were similar to those listed in Table 6.2 of the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD

included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

One water sample and one MS/MSD pair were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 4.2 Holding Times

The holding times for mercury analyses of water samples are 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 216837). Mercury was not detected in the method blank above the MDL.

### 4.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair was reported using sample GWA-MW02-140311. The recovery and RPD results for the sample specific MS/MSD pair were within the QAPP specified acceptance criteria.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The result for the LCS was within the QAPP specified acceptance criteria for recovery.

### 4.6 Equipment Blank

Equipment blanks were not collected with the sample set.

### 4.7 Field Duplicate

Field duplicates were not collected with the sample set.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the same as those listed in Table 6.2 of the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 5.0 WET CHEMISTRY

One water sample was analyzed for sulfide by EPA Methods 9030B/9034, sulfate by EPA Method 9056A, alkalinity by Standard Method 2320B, TDS by Standard Method 2540C, and TSS by Standard Method 2540D.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues

were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverable Review

## 5.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 5.2 Holding Times

The holding times are listed below. The holding times were met for the sample analyses.

| Parameter | Holding Time |
|---|---|
| Sulfide by EPA Methods 9030B/9034 | 7 days from sample collection to analysis |
| Sulfate by EPA Method 9056A | 28 days from sample collection to analysis |
| Alkalinity by Standard Method 2320B | 14 days from sample collection to analysis |
| TDS by Standard Method 2540C | 7 days from sample collection to analysis |
| TSS by Standard Method 2540D | 7 days from sample collection to analysis |

## 5.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported for each analysis, TSS (batch 216949), alkalinity (batch 217068), sulfide (batch 217004), TDS (batch 217061), and sulfate (batch 218655). The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exceptions.

Bicarbonate alkalinity was detected at an estimated concentration greater than the MDL and less than the RL in the method blank in batch 217068. Since bicarbonate alkalinity was detected above the RL in the associated sample, no qualifications were applied to the data.

### 5.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

### 5.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCSD pair was reported for each analysis. The results for the LCS/LCSD pairs were within the laboratory specified acceptance criteria for recovery and RPD.

### 5.6 Laboratory Duplicate

Laboratory duplicates were not reported.

### 5.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 5.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 5.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. MDLs and RLs for the wet chemistry parameters were not listed in Table 6.2 of the QAPP.

### 5.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

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# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**
**DATA VALIDATION REASON CODES**
**Assigned by Geosyntec's Data Validation Team**

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference

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# Memorandum

Date: 24 November 2014

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3510C/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C, Mercury by EPA Method 7470A, Sulfate by EPA Method 9056A, Total Dissolved Solids by Standard Method 2540C – TestAmerica Work Order Number 280-59878-1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of four water samples, collected on September 10, 2014, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans which were performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3510C/8270D Selective Ion Monitoring (SIM) - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C – Metals
- EPA Methods 7470A – Mercury
- EPA Method 9056A –Sulfate
- Standard Method 2540C – Total Dissolved Solids (TDS)

**EXECUTIVE SUMMARY**

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, OSWER 9240.1-51, EPA 540-R-10-011, January 2010, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-59878-1 | MW-4-091014 |
| 280-59878-2 | MW-3-091014 |

| Laboratory ID | Client ID |
|---|---|
| 280-59878-3 | MW-99-091014 |
| 280-59878-4 | MW-5-091014 |

The samples were received by the laboratory at 0.5ºC, 0.7ºC, 1.8ºC, 5.3ºC, and 2.4ºC (TA Knoxville), some outside the QAPP criteria of 4ºC + 2ºC. However, since the samples were received below 6ºC and above freezing, no qualifications were applied to the data based on professional judgment. No sample preservation issues were noted by the laboratory.

One of four 1L amber bottles for sample MW-99-091014 was received broken. Sufficient volume remained for analysis.

Incorrect error corrections were observed on the chain of custody (COC). The proper procedure of a single strike-through correction and initials and date of the person making the correction was not followed.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

Four water samples were analyzed for PAHs per EPA Methods 3510C/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 1.1 Overall Assessment

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 1.2 Holding Times

The holding times for the PAH analysis of a water sample are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 243122). PAHs were not detected in the method blank above the method detection limits (MDLs).

### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported with the data set.

### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCS duplicate (LCSD) pair was reported. 1-methylnaphthalene and 2-methylnaphthalene were spiked in the LCS/LCSD pair but not reported in the LCS/LCSD summaries. The recoveries and relative percent differences (RPDs) for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD, with the following exceptions.

One or both the recoveries of benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, and pyrene in the LCS/LCSD pair in batch 243122 were high and outside the QAPP specified acceptance criteria. Since these compounds were not detected in the associated samples, no qualifications were applied to the data.

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses.

### 1.7 Equipment Blank

One equipment blank, ER-091114, was reported in report 280-59923. PAHs were not detected in the equipment blank above the MDLs, with the following exceptions.

Fluorene, naphthalene, and phenanthrene were detected at estimated concentrations greater than the MDLs and less than the reporting limits (RLs) in the equipment blank. Since these compounds were not detected in the associated samples, no qualifications were applied to the data.

### 1.8 Field Duplicate

One field duplicate sample, MW-99-091014, was collected with the samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW-3-091014. The RPDs were 0%.

### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs were similar to those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

Four water samples were analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 2.1 Overall Assessment

#### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as

the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 2.1.2 Analysis Anomaly

Several results in the samples were flagged Q by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on professional judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-3-091014 | 1,2,3,4,6,7,8-HpCDF | 0.35 | Q,B,J | 0.35 | J | 13 |
| MW-3-091014 | 1,2,3,4,7,8-HxCDF | 0.35 | Q,J | 0.35 | J | 13 |
| MW-3-091014 | OCDF | 1.4 | Q,B,J | 1.4 | J | 13 |
| MW-4-091014 | 1,2,3,4,7,8,9-HpCDF | 0.19 | Q,B,J | 0.19 | J | 13 |
| MW-4-091014 | 1,2,3,7,8,9-HxCDF | 0.38 | Q,B,J | 0.38 | J | 13 |
| MW-4-091014 | 2,3,4,6,7,8-HxCDF | 0.26 | Q,B,J | 0.26 | J | 13 |
| MW-4-091014 | OCDF | 2.0 | Q,B,J | 2.0 | J | 13 |
| MW-5-091014 | 1,2,3,4,6,7,8-HpCDD | 0.26 | Q,B,J | 0.26 | J | 13 |
| MW-5-091014 | 1,2,3,4,6,7,8-HpCDF | 0.22 | Q,B,J | 0.22 | J | 13 |
| MW-5-091014 | OCDF | 1.1 | Q,B,J | 1.1 | J | 13 |
| MW-99-091014 | 1,2,3,4,6,7,8-HpCDD | 0.45 | Q,B,J | 0.45 | J | 13 |
| MW-99-091014 | 1,2,3,4,6,7,8-HpCDF | 0.094 | Q,B,J | 0.094 | J | 13 |
| MW-99-091014 | 1,2,3,7,8,9-HxCDD | 0.33 | Q,B,J | 0.33 | J | 13 |
| MW-99-091014 | 1,2,3,7,8-PeCDF | 0.28 | Q,J | 0.28 | J | 13 |
| MW-99-091014 | OCDD | 2.5 | Q,B,J | 2.5 | J | 13 |
| MW-99-091014 | OCDF | 1.5 | Q,B,J | 1.5 | J | 13 |

pg/L-picograms per gram
Q-estimated maximum possible concentration



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B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water samples are 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 4258019). The dioxins and furans were not detected in the method blank above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,6,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8,9-HxCDF, 2,3,4,6,7,8-HxCDF, 2,3,4,7,8-PeCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the RLs in the method blank. Therefore, the estimated concentrations of these compounds in the associated samples were U qualified as not detected at the estimated concentrations.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-3-091014 | 1,2,3,4,6,7,8-HpCDD | 2.2 | B,J | 2.2 | U | 3 |
| MW-3-091014 | 1,2,3,4,6,7,8-HpCDF | 0.35 | Q,B,J | 0.35 | U | 3 |
| MW-3-091014 | OCDD | 13 | B,J | 13 | U | 3 |
| MW-3-091014 | OCDF | 1.4 | Q,B,J | 1.4 | U | 3 |
| MW-4-091014 | 1,2,3,4,7,8,9-HpCDF | 0.19 | Q,B,J | 0.19 | U | 3 |
| MW-4-091014 | 1,2,3,7,8,9-HxCDF | 0.38 | Q,B,J | 0.38 | U | 3 |
| MW-4-091014 | 2,3,4,6,7,8-HxCDF | 0.26 | Q,B,J | 0.26 | U | 3 |
| MW-4-091014 | OCDD | 5.4 | B,J | 5.4 | U | 3 |
| MW-4-091014 | OCDF | 2.0 | Q,B,J | 2.0 | U | 3 |
| MW-5-091014 | 1,2,3,4,6,7,8-HpCDD | 0.26 | Q,B,J | 0.26 | U | 3 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-5-091014 | 1,2,3,4,6,7,8-HpCDF | 0.22 | Q,B,J | 0.22 | U | 3 |
| MW-5-091014 | 1,2,3,4,7,8,9-HpCDF | 0.29 | B,J | 0.29 | U | 3 |
| MW-5-091014 | 1,2,3,7,8,9-HxCDD | 0.22 | B,J | 0.22 | U | 3 |
| MW-5-091014 | OCDD | 2.6 | B,J | 2.6 | U | 3 |
| MW-5-091014 | OCDF | 1.1 | Q,B,J | 1.1 | U | 3 |
| MW-99-091014 | 1,2,3,4,6,7,8-HpCDD | 0.45 | Q,B,J | 0.45 | U | 3 |
| MW-99-091014 | 1,2,3,4,6,7,8-HpCDF | 0.094 | Q,B,J | 0.094 | U | 3 |
| MW-99-091014 | 1,2,3,7,8,9-HxCDD | 0.33 | Q,B,J | 0.33 | U | 3 |
| MW-99-091014 | OCDD | 2.5 | Q,B,J | 2.5 | U | 3 |
| MW-99-091014 | OCDF | 1.5 | Q,B,J | 1.5 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

## 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

## 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

## 2.7 Equipment Blank

One equipment blank, ER-091114, was reported in report 280-59923. The dioxins and furans were not detected in the equipment blank above the MDLs, with the following exceptions.

1,2,3,4,6,7,8-HpCDF, 1,2,3,6,7,8-HxCDF, 2,3,4,7,8-PeCDF, OCDD, and OCDF were detected in the equipment blank at estimated concentrations greater than the EDLs and less than the RLs. The concentrations of 1,2,3,4,6,7,8-HpCDF, OCDD, and OCDF in the equipment blank were U qualified as not detected at the reported concentrations, due to the method blank contamination; in addition 2,3,4,7,8-PeCDF and 1,2,3,6,7,8-HxCDF were not detected in the associated samples. Therefore, no additional qualifications were applied to the data.

## 2.8 Field Duplicate

One field duplicate sample, MW-99-091014, was collected with the samples. Acceptable precision (RPD ≤30%) was demonstrated between the field duplicate and the original sample, MW-3-091014, with the following exceptions.

For compounds with both a detected and non-detect result in the field duplicate pair, the RPDs were not calculable. Therefore, the detected concentrations were J qualified as estimated and the non-detect values were UJ qualified as estimated less than the MDLs. For compounds in the field duplicate with both results that were estimated concentrations greater than the MDL and less than the RL, the RPDs were not calculable. However, no qualifications were applied to these data based on professional and technical judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | RPD | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| MW-3-091014 | 1,2,3,4,6,7,8-HpCDD | 2.2 | B,J | NC | NA | NA | NA |
| MW-99-091014 | 1,2,3,4,6,7,8-HpCDD | 0.45 | Q,B,J | | NA | NA | NA |
| MW-3-091014 | 1,2,3,4,6,7,8-HpCDF | 0.35 | Q,B,J | NC | NA | NA | NA |
| MW-99-091014 | 1,2,3,4,6,7,8-HpCDF | 0.094 | Q,B,J | | NA | NA | NA |
| MW-3-091014 | 1,2,3,4,7,8-HxCDF | 0.35 | Q,J | NC | 0.35 | J | 7 |
| MW-99-091014 | 1,2,3,4,7,8-HxCDF | 0.0086 | U | | 0.0086 | UJ | 7 |
| MW-3-091014 | 1,2,3,7,8,9-HxCDD* | 0.12 | U | NC | NA | NA | NA |
| MW-99-091014 | 1,2,3,7,8,9-HxCDD* | 0.33 | Q,B,J | | NA | NA | NA |
| MW-3-091014 | 1,2,3,7,8-PeCDF | 0.066 | U | NC | 0.066 | UJ | 7 |
| MW-99-091014 | 1,2,3,7,8-PeCDF | 0.28 | Q,J | | 0.28 | J | 7 |
| MW-3- | OCDD | 13 | B,J | NC | NA | NA | NA |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | RPD | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| 091014 | | | | | | | |
| MW-99-091014 | OCDD | 2.5 | Q,B,J | | NA | NA | NA |
| MW-3-091014 | OCDF | 1.4 | Q,B,J | NC | NA | NA | NA |
| MW-99-091014 | OCDF | 1.5 | Q,B,J | | NA | NA | NA |
| MW-3-091014 | The other total dioxins and furans | ND | NA | 0 | NA | NA | NA |
| MW-99-091014 | The other total dioxins and furans | ND | NA | | NA | NA | NA |

pg/L-picogram per liter
NA-not applicable
NC-not calculable
U-not detected at the reported MDL
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL
ND-not detected at the MDL

### 2.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The RLs were similar to those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC.

## 3.0 METALS

Four water samples were analyzed for metals per EPA Methods 3010A/6010C (Mercury evaluated separately in Section 4.0, below).



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The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Serial Dilution
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

## 3.1 Overall Assessment

### 3.1.1 Completion

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.1.2 Analysis Anomaly

The recovery of arsenic in a continuous calibration verification low level (CCVLL) associated with batch 243610 was high and above the laboratory limits. Since arsenic was not detected in the associated samples, no qualifications were applied to the data.

## 3.2 Holding Times

The holding times for metals analyses of water samples are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 243266). The metals were not detected in the method blank above the MDLs.

### 3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 3.6 Serial Dilution

Serial dilutions were not reported with the data set.

### 3.7 Equipment Blank

One equipment blank, ER-091114, was reported in report 280-59923. The metals were not detected in the equipment blank above the MDLs.

### 3.8 Field Duplicate

One field duplicate sample, MW-99-091014, was collected with the soil samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW-3-091014.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | RPD |
|---|---|---|---|---|
| MW-3-091014 | Barium | 18 | NA | 5 |
| MW-99-091014 | Barium | 19 | NA | |
| MW-3-091014 | Beryllium | 0.51 | J | NC |
| MW-99-091014 | Beryllium | 0.69 | J | |
| MW-3-091014 | Calcium | 65000 | NA | 3 |
| MW-99-091014 | Calcium | 63000 | NA | |
| MW-3-091014 | Cobalt | 130 | NA | 8 |

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | RPD |
|---|---|---|---|---|
| MW-99-091014 | Cobalt | 120 | NA | |
| MW-3-091014 | Copper | 2.8 | J | NC |
| MW-99-091014 | Copper | 2.5 | J | |
| MW-3-091014 | Iron | 460 | NA | 2 |
| MW-99-091014 | Iron | 450 | NA | |
| MW-3-091014 | Magnesium | 19000 | NA | 5 |
| MW-99-091014 | Magnesium | 18000 | NA | |
| MW-3-091014 | Manganese | 7700 | NA | 1 |
| MW-99-091014 | Manganese | 7600 | NA | |
| MW-3-091014 | Nickel | 27 | J | NC |
| MW-99-091014 | Nickel | 27 | J | |
| MW-3-091014 | Potassium | 8500 | NA | 2 |
| MW-99-091014 | Potassium | 8300 | NA | |
| MW-3-091014 | Silver | 2.4 | J | NC |
| MW-99-091014 | Silver | 1.8 | J | |
| MW-3-091014 | Sodium | 99000 | NA | 2 |
| MW-99-091014 | Sodium | 97000 | NA | |
| MW-3-091014 | Vanadium | 1.1 | J | NC |
| MW-99-091014 | Vanadium | 1.4 | J | |
| MW-3-091014 | Zinc | 38 | NA | 3 |
| MW-99-091014 | Zinc | 37 | NA | |
| MW-3-091014 | The other metals | ND | NA | 0 |
| MW-99-091014 | The other metals | ND | NA | |

µg/L-micrograms per liter
J-estimated concentration less than the RL and greater than the MDL
NA-not applicable
NC-not calculable
ND-not detected at the MDL

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were similar to those listed in Table 6.2 of the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

Four water samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 4.2 Holding Times

The holding times for mercury analyses of water samples are 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 243195). Mercury was not detected in the method blank above the MDL.

### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 4.6 Equipment Blank

One equipment blank, ER-091114, was reported in report 280-59923. Mercury was not detected in the equipment blank above the MDL.

### 4.7 Field Duplicate

One field duplicate sample, MW-99-091014, was collected with the soil samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW-3-091014. The RPD was 0%.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the sample as those listed in Table 6.2 of the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 5.0 WET CHEMISTRY

Four water samples were analyzed for sulfate per EPA Method 9056 and TDS by Standard Method 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Laboratory Duplicate
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 5.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 5.2 Holding Times

The holding times are listed below. The holding times were met for the sample analyses.

| Parameter | Holding Time |
|---|---|
| TDS by Standard Method 2540C | 7 days from sample collection to analysis |
| Sulfate by EPA Method 9056A | 28 days from sample collection to analysis |

### 5.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported for the sulfate (batches 244369 and 244490) and one method blank was reported for TDS (batch 243082). Sulfate and TDS were not detected in the method blanks above the MDLs.

### 5.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two sample set specific MS/MSD pairs, using samples MW-4-091014 and MW-5-091014, were reported for sulfate. The recovery and RPD results were within the laboratory specified acceptance; there were no acceptance criteria in the QAPP for sulfate.

### 5.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two LCS/LCSD pairs and two method reporting limit checks (MRLCs) were reported for the sulfate. One LCS/LCSD pair was reported for TDS. The results for the LCS/LCSD pairs and MRLCs were within the laboratory specified acceptance criteria for recovery; there were no acceptance criteria in the QAPP for the wet chemistry parameters.

### 5.6 Laboratory Duplicate

Sample set specific laboratory duplicates were reported. Two were reported for sulfate using samples MW-4-091014 and MW-5-091014 and one was reported for TDS using sample MW-5-091014. The RPD results were within the laboratory specified acceptance criteria.

### 5.7 `Equipment Blank

One equipment blank, ER-091114, was reported in report 280-59923. The wet chemistry parameters were not reported for the equipment blank.

### 5.8 Field Duplicate

One field duplicate sample, MW-99-091014, was collected with the soil samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW-3-091014.

| Sample ID | Compound | Laboratory Result (mg/L) | Laboratory Flag | RPD |
|---|---|---|---|---|
| MW-3-091014 | TDS | 650 | NA | 2 |
| MW-99-091014 | TDS | 640 | NA | |
| MW-3-091014 | Sulfate | 290 | NA | 4 |
| MW-99-091014 | Sulfate | 280 | NA | |

mg/L-milligram per liter
NA-not applicable

### 5.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. MDLs and RLs for the wet chemistry parameters were not listed in Table 6.2 of the QAPP.

### 5.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

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# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**
**DATA VALIDATION REASON CODES**
**Assigned by Geosyntec's Data Validation Team**

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference

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# Memorandum

Date: 07 July 2015

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3510C/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C, Mercury by EPA Method 7470A, Sulfate by EPA Method 9056A, and Total Dissolved Solids by Standard Method 2540C – TestAmerica Work Order Number 280-68254-1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of four water samples collected on April 20-21, 2015, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans which were performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3510C/8270D Selective Ion Monitoring (SIM) - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C – Metals
- EPA Methods 7470A – Mercury
- EPA Method 9056A –Sulfate
- Standard Method 2540C – Total Dissolved Solids (TDS)

## EXECUTIVE SUMMARY

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The dioxins and furans data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs) Data Review, OSWER 9240.1-53, EPA 540-R-11-016, September 2011, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, OSWER 9240.1-51, EPA 540-R-10-011, January 2010, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-68254-1 | MW-5-20150420 |
| 280-68254-2 | MW-1-20150421 |

| Laboratory ID | Client ID |
|---|---|
| 280-68254-3 | MW-4-20150421 |
| 280-68254-4 | MW-2-20150421 |

The samples were received by the laboratory at 0.5ºC, 1.3ºC, 4.3ºC and 1.1ºC (TA Knoxville). Some samples were received outside the QAPP criteria of 4ºC + 2ºC. However, since the samples were received below 6ºC and above freezing, no qualifications were applied to the data based on professional judgment. No sample preservation issues were noted by the laboratory.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

Four water samples were analyzed for PAHs per EPA Methods 3510C/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 1.1 Overall Assessment

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 1.2 Holding Times

The holding times for the PAH analysis of a water sample are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 274669). PAHs were not detected in the method blank above the method detection limits (MDLs).

### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported.

### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCSD pair was reported. 1-Methylnaphthalene and 2-methylnaphthalene were spiked in the LCS/LCSD pair but not reported in the LCS/LCSD summaries. The recoveries and relative percent differences (RPDs) for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD.

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses, with the following exceptions.

The recoveries of terphenyl-d14 in sample MW-1-20150421 and the LCS in batch 274669 were high and outside the laboratory specified acceptance criteria. However, since the other two surrogates were within laboratory limits, the sample was nondetect and the LCS recoveries were acceptable for PAHs, no qualifications were applied to the data.

### 1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 1.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and reporting limits (RLs) were similar to those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD

included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

Four water samples were analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 2.1 Overall Assessment

#### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### 2.1.2 Analysis Anomaly

Several results in the samples were flagged Q by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on technical and professional judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-1-20150421 | 1,2,3,4,6,7,8-HpCDD | 0.78 | Q,B,J | 0.78 | J | 13 |
| MW-1-20150421 | 1,2,3,4,6,7,8-HpCDF | 1.2 | Q,B,J | 1.2 | J | 13 |
| MW-1-20150421 | 1,2,3,4,7,8,9-HpCDF | 0.26 | Q,B,J | 0.26 | J | 13 |
| MW-1-20150421 | 1,2,3,6,7,8-HxCDF | 0.24 | Q,B,J | 0.24 | J | 13 |
| MW-1-20150421 | 2,3,4,6,7,8-HxCDF | 0.43 | Q,B,J | 0.43 | J | 13 |
| MW-1-20150421 | OCDD | 11 | Q,B,J | 11 | J | 13 |
| MW-2-20150421 | 1,2,3,4,6,7,8-HpCDD | 0.66 | Q,B,J | 0.66 | J | 13 |
| MW-2-20150421 | 1,2,3,4,6,7,8-HpCDF | 0.47 | Q,B,J | 0.47 | J | 13 |
| MW-2-20150421 | 1,2,3,6,7,8-HxCDD | 0.39 | Q,J | 0.39 | J | 13 |
| MW-2-20150421 | 1,2,3,6,7,8-HxCDF | 0.15 | Q,B,J | 0.15 | J | 13 |
| MW-2-20150421 | 1,2,3,7,8-PeCDD | 0.45 | Q,B,J | 0.45 | J | 13 |
| MW-4-20150421 | 1,2,3,4,6,7,8-HpCDD | 0.56 | Q,B,J | 0.56 | J | 13 |
| MW-4-20150421 | 1,2,3,4,6,7,8-HpCDF | 1.0 | Q,B,J | 1.0 | J | 13 |
| MW-4-20150421 | 1,2,3,6,7,8-HxCDD | 0.33 | Q,J | 0.33 | J | 13 |
| MW-4-20150421 | 2,3,4,6,7,8-HxCDF | 0.34 | Q,B,J | 0.34 | J | 13 |
| MW-4-20150421 | OCDD | 3.6 | Q,B,J | 3.6 | J | 13 |
| MW-4-20150421 | OCDF | 7.2 | Q,B,J | 7.2 | J | 13 |
| MW-5-20150420 | 1,2,3,4,6,7,8-HpCDD | 0.65 | Q,B,J | 0.65 | J | 13 |
| MW-5-20150420 | 1,2,3,4,6,7,8-HpCDF | 0.16 | Q,B,J | 0.16 | J | 13 |
| MW-5-20150420 | 1,2,3,7,8,9-HxCDF | 0.16 | Q,B,J | 0.16 | J | 13 |
| MW-5-20150420 | OCDD | 5.8 | Q,B,J | 5.8 | J | 13 |

pg/L-picograms per gram
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water samples are 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). Two method blanks were reported, only one method

blank was related to the reported data (batch 5118034). The dioxins and furans were not detected in the method blank above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the RLs in the method blank. Since 1,2,3,7,8-PeCDF was not detected in the associated sample, no qualifications were applied for this compound. However, the estimated concentrations of the remaining compounds detected in the method blank that were less than the estimated method blank result in the associated samples were U qualified as not detected at the reported estimated concentrations and the results greater than the method blank result but less than the RL were J qualified as estimated.

| **Sample ID** | **Compound** | **Laboratory Result (pg/L)** | **Laboratory Flag** | **Validation Result (pg/L)** | **Validation Qualifier** | **Reason Code** |
|---|---|---|---|---|---|---|
| MW-1-20150421 | 1,2,3,4,6,7,8-HpCDD | 0.78 | Q,B,J | 0.78 | U | 3 |
| MW-1-20150421 | 1,2,3,4,6,7,8-HpCDF | 1.2 | Q,B,J | 1.2 | U | 3 |
| MW-1-20150421 | 1,2,3,4,7,8,9-HpCDF | 0.26 | Q,B,J | 0.26 | U | 3 |
| MW-1-20150421 | 1,2,3,6,7,8-HxCDF | 0.24 | Q,B,J | 0.24 | U | 3 |
| MW-1-20150421 | 2,3,4,6,7,8-HxCDF | 0.43 | Q,B,J | 0.43 | U | 3 |
| MW-1-20150421 | OCDD | 11 | Q,B,J | 11 | J | 3 |
| MW-1-20150421 | OCDF | 17 | B,J | 17 | J | 3 |
| MW-2-20150421 | 1,2,3,4,6,7,8-HpCDD | 0.66 | Q,B,J | 0.66 | U | 3 |
| MW-2-20150421 | 1,2,3,4,6,7,8-HpCDF | 0.47 | Q,B,J | 0.47 | U | 3 |
| MW-2-20150421 | 1,2,3,4,7,8-HxCDD | 0.72 | B,J | 0.72 | J | 3 |
| MW-2-20150421 | 1,2,3,6,7,8-HxCDF | 0.15 | Q,B,J | 0.15 | U | 3 |
| MW-2-20150421 | 1,2,3,7,8-PeCDD | 0.45 | Q,B,J | 0.45 | U | 3 |
| MW-2-20150421 | OCDD | 3.3 | B,J | 3.3 | U | 3 |
| MW-2-20150421 | OCDF | 9.2 | B,J | 9.2 | U | 3 |
| MW-4-20150421 | 1,2,3,4,6,7,8-HpCDD | 0.56 | Q,B,J | 0.56 | U | 3 |
| MW-4-20150421 | 1,2,3,4,6,7,8-HpCDF | 1.0 | Q,B,J | 1.0 | U | 3 |
| MW-4-20150421 | 2,3,4,6,7,8-HxCDF | 0.34 | Q,B,J | 0.34 | U | 3 |
| MW-4-20150421 | OCDD | 3.6 | Q,B,J | 3.6 | U | 3 |
| MW-4-20150421 | OCDF | 7.2 | Q,B,J | 7.2 | U | 3 |
| MW-5-20150420 | 1,2,3,4,6,7,8-HpCDD | 0.65 | Q,B,J | 0.65 | U | 3 |
| MW-5-20150420 | 1,2,3,4,6,7,8-HpCDF | 0.16 | Q,B,J | 0.16 | U | 3 |
| MW-5-20150420 | 1,2,3,7,8,9-HxCDF | 0.16 | Q,B,J | 0.16 | U | 3 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-5-20150420 | 2,3,4,6,7,8-HxCDF | 0.41 | B,J | 0.41 | U | 3 |
| MW-5-20150420 | OCDD | 5.8 | Q,B,J | 5.8 | U | 3 |
| MW-5-20150420 | OCDF | 7.0 | B,J | 7.0 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

## 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

## 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

## 2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

## 2.8 Field Duplicate

Field duplicates were not collected with the sample set.

## 2.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The RLs were similar to those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC.

## 3.0 METALS

Four water samples were analyzed for metals per EPA Methods 3010A/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Serial Dilution
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 3.1 Overall Assessment

#### 3.1.1 Completion

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.1.2 Analysis Anomaly

The recovery of iron in continuing calibration verification low level (CCVL) associated with batch 275022 was high and above the laboratory limits. No qualifications were applied to the iron results greater than the RL based on CCV results within the limits and professional and technical judgment. However, the estimated concentrations of iron greater than the MDL and less than the RL in the associated samples were J+ qualified as estimated bias high.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-4-20150421 | Iron | 35 | J | 35 | J+ | 3 |
| MW-5-20150421 | Iron | 36 | J | 36 | J+ | 3 |

µg/L-micrograms per liter
J-estimated concentration greater than the MDL and less than the RL

## 3.2 Holding Times

The holding times for metals analyses of water samples are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

## 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 274588). The metals were not detected in the method blank above the MDLs, with the following exception.

Barium was detected in the method blank in batch 274588 at estimated concentrations greater than the MDLs and less than the RL. Since barium was detected above the RLs in the associated samples, no qualifications were applied to the data.

## 3.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair and post digestion spike were reported using sample MW-5-20150420. The recovery and RPD results for the sample specific MS/MD pair and post digestion spike were within the QAPP specified acceptance criteria, with the following exception.

The recovery of iron was high in the post digestion spike. However, since the MS/MSD results for iron were within the QAPP limits, no qualifications were applied to the data.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 3.6 Serial Dilution

A serial dilution was reported using sample MW-5-20150420. The percent difference (%D) results were within the laboratory specified acceptance criteria.

### 3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 3.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were similar to those listed in Table 6.2 of the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

Four water samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverable Review

### 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 4.2 Holding Times

The holding times for mercury analyses of water samples are 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 274313). Mercury was not detected in the method blank above the MDL.

### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The result for the LCS was within the QAPP specified acceptance criteria for recovery.

### 4.6 Equipment Blank

Equipment blanks were not collected with the sample set.

### 4.7 Field Duplicate

Field duplicates were not collected with the sample set.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the same as those listed in Table 6.2 of the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 5.0 WET CHEMISTRY

Four water samples were analyzed for sulfate by EPA Method 9056A and TDS by Standard Method 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Laboratory Duplicate
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

## 5.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 5.2 Holding Times

The holding times are listed below. The holding times were met for the sample analyses.

| Parameter | Holding Time |
|---|---|
| Sulfate by EPA Method 9056A | 28 days from sample collection to analysis |
| TDS by Standard Method 2540C | 7 days from sample collection to analysis |

## 5.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported for each analysis, TDS (batch 274405) and sulfate (batch 276172).

TDS was not detected in the method blank above the MDL. However sulfate was detected in the method blank at an estimated concentration greater than the MDL and less than the RL. However, since sulfate was detected above the RL in the associated samples, no qualifications were applied to the data.

## 5.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

## 5.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported for TDS and one LCS/LCSD pair was reported for sulfate. The results for the LCS/LCSD pairs were within the laboratory specified acceptance criteria for recovery and RPD.

### 5.6 Laboratory Duplicate

Laboratory duplicates were not reported.

### 5.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 5.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 5.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. MDLs and RLs for the wet chemistry parameters were not listed in Table 6.2 of the QAPP.

### 5.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

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# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**
**DATA VALIDATION REASON CODES**
**Assigned by Geosyntec's Data Validation Team**

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference

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# Memorandum

Date: 07 July 7, 2015

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3510C/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C, Mercury by EPA Method 7470A, Sulfate by EPA Method 9056A, and Total Dissolved Solids by Standard Method 2540C – TestAmerica Work Order Number 280-68403-1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of one water sample and one field duplicate sample collected on April 24, 2015, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans which were performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3510C/8270D Selective Ion Monitoring (SIM) - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C – Metals
- EPA Methods 7470A – Mercury
- EPA Method 9056A –Sulfate
- Standard Method 2540C – Total Dissolved Solids (TDS)

## EXECUTIVE SUMMARY

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, June 2008 (USEPA-540-R-08-01), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The dioxins and furans data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs) Data Review, OSWER 9240.1-53, EPA 540-R-11-016, September 2011, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review, OSWER 9240.1-51, EPA 540-R-10-011, January 2010, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-68403-1 | MW3-150424 |

| Laboratory ID | Client ID |
|---|---|
| 280-68403-2 | MW93-150424 |

The samples were received by the laboratory at 0.6ºC, 4.3ºC and 1.1ºC (TA Knoxville). Some samples were received outside the QAPP criteria of 4ºC + 2ºC. However, since the samples were received below 6ºC and above freezing, no qualifications were applied to the data based on professional judgment. No sample preservation issues were noted by the laboratory.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

One water sample and one field duplicate sample were analyzed for PAHs per EPA Methods 3510C/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 1.1 Overall Assessment

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 1.2 Holding Times

The holding times for the PAH analysis of a water sample are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

### 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch

275243). PAHs were not detected in the method blank above the method detection limits (MDLs).

### 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported.

### 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. 1-Methylnaphthalene and 2-methylnaphthalene were spiked in the LCS but not reported in the LCS summary. The recoveries for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses.

### 1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 1.8 Field Duplicate

One field duplicate sample, MW93-150424, was collected with the samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW3-150424. The RPDs were 0%.

### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and reporting limits (RLs) were similar to those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

One water sample and one field duplicate sample were analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 2.1 Overall Assessment

#### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

#### 2.1.2 Analysis Anomaly

Several results in the samples were flagged Q by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on professional and technical judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW3-150424 | 1,2,3,7,8-PeCDD | 0.63 | Q,B,J | 0.63 | J | 13 |

| | | | | | | |
|---|---|---|---|---|---|---|
| MW3-150424 | OCDD | 3.7 | Q,B,J | 3.7 | J | 13 |
| MW93-150424 | 1,2,3,4,6,7,8-HpCDD | 0.24 | Q,B,J | 0.24 | J | 13 |
| MW93-150424 | 1,2,3,4,7,8,9-HpCDF | 0.94 | Q,B,J | 0.94 | J | 13 |
| MW93-150424 | 1,2,3,7,8-PeCDD | 0.40 | Q,B,J | 0.40 | J | 13 |
| MW93-150424 | 1,2,3,7,8-PeCDF | 0.12 | Q,B,J | 0.12 | J | 13 |
| MW93-150424 | 2,3,4,6,7,8-HxCDF | 0.48 | Q,B,J | 0.48 | J | 13 |
| MW93-150424 | OCDF | 6.2 | Q,B,J | 6.2 | J | 13 |

pg/L-picograms per gram
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water samples are 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported (batch 5118034). The dioxins and furans were not detected in the method blank above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the reporting limits (RLs) in the method blank. Since 1,2,3,4,7,8-HxCDD and 1,2,3,7,8,9-HxCDF were not detected in the associated sample, no qualifications were applied for these compounds. However, the estimated concentrations of 1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, OCDD, and OCDF greater than the EDLs and less than the method blank results in the associated samples were U qualified as not detected at or above the reported estimated concentrations and the results greater than the method blank results but less than the RLs were J qualified as estimated.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW3-150424 | 1,2,3,4,6,7,8-HpCDD | 0.75 | B,J | 0.75 | U | 3 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW3-150424 | 1,2,3,7,8-PeCDD | 0.63 | Q,B,J | 0.63 | J | 3 |
| MW3-150424 | OCDD | 3.7 | Q,B,J | 3.7 | U | 3 |
| MW3-150424 | OCDF | 8.1 | B,J | 8.1 | U | 3 |
| MW93-150424 | 1,2,3,4,6,7,8-HpCDD | 0.24 | Q,B,J | 0.24 | U | 3 |
| MW93-150424 | 1,2,3,4,6,7,8-HpCDF | 0.80 | B,J | 0.80 | U | 3 |
| MW93-150424 | 1,2,3,4,7,8,9-HpCDF | 0.94 | Q,B,J | 0.94 | U | 3 |
| MW93-150424 | 1,2,3,6,7,8-HxCDF | 0.39 | B,J | 0.39 | U | 3 |
| MW93-150424 | 1,2,3,7,8-PeCDD | 0.40 | Q,B,J | 0.40 | U | 3 |
| MW93-150424 | 1,2,3,7,8-PeCDF | 0.12 | Q,B,J | 0.12 | U | 3 |
| MW93-150424 | 2,3,4,6,7,8-HxCDF | 0.48 | Q,B,J | 0.48 | J | 3 |
| MW93-150424 | OCDD | 7.0 | B,J | 7.0 | U | 3 |
| MW93-150424 | OCDF | 6.2 | Q,B,J | 6.2 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

## 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

## 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

## 2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

## 2.8 Field Duplicate

One field duplicate sample, MW93-150424, was collected with the samples. Acceptable precision (RPD ≤30%) was demonstrated between the field duplicate and the original sample, MW3-150424, with the following exceptions.

1,2,3,6,7,8-HxCDD was detected in the original sample and was not detected in the field duplicate sample; resulting in an RPD that was not calculable. Therefore, the detected concentration of 1,2,3,6,7,8-HxCDD was J qualified as estimated and the non-detect value was UJ qualified as estimated less than the EDL in the field duplicate pair. Compounds with two estimated concentrations resulted in noncalculable RPDs; however, no qualifications were applied based on professional and technical judgment. The remaining dioxins and furans were either not detected in the field duplicate pair or were U qualified based on method blank contaminations, resulting in RPDs of 0%.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | RPD | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| MW3-150424 | 1,2,3,4,6,7,8-HpCDD | 0.75 | B,J | NC* | NA | NA | NA |
| MW93-150424 | 1,2,3,4,6,7,8-HpCDD | 0.24 | Q,B,J | | NA | NA | NA |
| MW3-150424 | 1,2,3,4,6,7,8-HpCDF | 0.17 | U | NC* | NA | NA | NA |
| MW93-150424 | 1,2,3,4,6,7,8-HpCDF | 0.80 | B,J | | NA | NA | NA |
| MW3-150424 | 1,2,3,4,7,8,9-HpCDF | 0.21 | U | NC* | NA | NA | NA |
| MW93-150424 | 1,2,3,4,7,8,9-HpCDF | 0.94 | Q,B,J | | NA | NA | NA |
| MW3-150424 | 1,2,3,6,7,8-HxCDD | 0.72 | J | NC | 0.72 | J | 7 |
| MW93-150424 | 1,2,3,6,7,8-HxCDD | 0.15 | U | | 0.15 | UJ | 7 |
| MW3-150424 | 1,2,3,6,7,8-HxCDF | 0.058 | U | NC* | NA | NA | NA |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | RPD | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| MW93-150424 | 1,2,3,6,7,8-HxCDF | 0.39 | B,J | | NA | NA | NA |
| MW3-150424 | 1,2,3,7,8-PeCDD | 0.63 | Q,B,J | NC | NA | NA | NA |
| MW93-150424 | 1,2,3,7,8-PeCDD | 0.40 | Q,B,J | | NA | NA | NA |
| MW3-150424 | 1,2,3,7,8-PeCDF | 0.068 | U | NC* | NA | NA | NA |
| MW93-150424 | 1,2,3,7,8-PeCDF | 0.12 | Q,B,J | | NA | NA | NA |
| MW3-150424 | 2,3,4,6,7,8-HxCDF | 0.066 | U | NC* | NA | NA | NA |
| MW93-150424 | 2,3,4,6,7,8-HxCDF | 0.48 | Q,B,J | | NA | NA | NA |
| MW3-150424 | OCDD | 3.7 | Q,B,J | NC | NA | NA | NA |
| MW93-150424 | OCDD | 7.0 | B,J | | NA | NA | NA |
| MW3-150424 | OCDF | 8.1 | B,J | NC | NA | NA | NA |
| MW93-150424 | OCDF | 6.2 | Q,B,J | | NA | NA | NA |
| MW3-150424 | The other furans and dioxins | ND | NA | 0 | NA | NA | NA |
| MW93-150424 | The other furans and dioxins | ND | NA | | NA | NA | NA |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL
NA-not applicable
NC-not calculable
ND-not detected at or above the MDL
*no qualifications since detection was U qualified based on method blank result

## 2.9 Sensitivity

The samples were reported to the EDLs. Elevated nondetect results were not reported. The RLs were similar to those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC.

## 3.0 METALS

One water sample and one field duplicate sample were analyzed for metals per EPA Methods 3010A/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Serial Dilution
✓ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 3.1 Overall Assessment

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.2 Holding Times

The holding times for metals analyses of water samples are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

### 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 274810). Metals were not detected in the method blank above the MDLs.

### 3.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair and post digestion spike were reported using sample MW3-150424. The recovery and RPD results for the sample specific MS/MD pair and post digestion spike were within the QAPP specified acceptance criteria, with the following exception.

The MS recovery of manganese was low and outside the laboratory specified acceptance criteria. However, since the sample concentration was greater than four times the spiked amount, no qualifications were applied to the data.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 3.6 Serial Dilution

A serial dilution was reported using sample MW3-150424. The percent difference (%D) results were within the laboratory specified acceptance criteria.

### 3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 3.8 Field Duplicate

One field duplicate sample, MW93-150424, was collected with the samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW3-150424, with the following exception.

Arsenic was detected at an estimated concentration in the field duplicate and not detected in the original sample resulting in a non-calculable RPD. Therefore the detected result was J qualified as estimated and the nondetect result was UJ qualified as estimated less than the MDL.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | RPD | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| MW3-150424 | Arsenic | 4.4 | U | NC | 4.4 | UJ | 7 |
| MW93-150424 | Arsenic | 5.3 | J | | 5.3 | J | 7 |
| MW3-150424 | Barium | 19 | NA | 0 | NA | NA | NA |
| MW93-150424 | Barium | 19 | NA | | NA | NA | NA |
| MW3-150424 | Beryllium | 0.61 | J | NC | NA | NA | NA |
| MW93-150424 | Beryllium | 0.55 | J | | NA | NA | NA |
| MW3-150424 | Cadmium | 0.5 | J | NC | NA | NA | NA |
| MW93-150424 | Cadmium | 0.58 | J | | NA | NA | NA |
| MW3-150424 | Calcium | 78000 | NA | 1 | NA | NA | NA |
| MW93-150424 | Calcium | 77000 | NA | | NA | NA | NA |
| MW3-150424 | Cobalt | 130 | NA | 8 | NA | NA | NA |
| MW93-150424 | Cobalt | 120 | NA | | NA | NA | NA |
| MW3-150424 | Iron | 370 | NA | 8 | NA | NA | NA |
| MW93-150424 | Iron | 340 | NA | | NA | NA | NA |
| MW3-150424 | Magnesium | 20000 | NA | 0 | NA | NA | NA |
| MW93-150424 | Magnesium | 20000 | NA | | NA | NA | NA |
| MW3-150424 | Manganese | 8500 | NA | 4 | NA | NA | NA |
| MW93-150424 | Manganese | 8200 | NA | | NA | NA | NA |
| MW3-150424 | Nickel | 26 | J | NC | NA | NA | NA |
| MW93-150424 | Nickel | 25 | J | | NA | NA | NA |
| MW3-150424 | Potassium | 8800 | NA | 1 | NA | NA | NA |
| MW93-150424 | Potassium | 8700 | NA | | NA | NA | NA |
| MW3-150424 | Silver | 2.1 | J | NC | NA | NA | NA |
| MW93-150424 | Silver | 2.7 | J | | NA | NA | NA |
| MW3-150424 | Sodium | 110000 | NA | 10 | NA | NA | NA |
| MW93-150424 | Sodium | 100000 | NA | | NA | NA | NA |
| MW3-150424 | Zinc | 38 | NA | 8 | NA | NA | NA |
| MW93-150424 | Zinc | 35 | NA | | NA | NA | NA |
| MW3-150424 | The other metals | ND | NA | 0 | NA | NA | NA |
| MW93-150424 | The other metals | ND | NA | | NA | NA | NA |

µg/L-micrograms per liter
U-not detected at or above the MDL
J-estimated concentration greater than the MDL and less than the RL
NA-not applicable
ND-not detected at or above the MDL
NC-not calculable

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were similar to those listed in Table 6.2 of the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

One water sample and one field duplicate sample were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 4.2 Holding Times

The holding times for mercury analyses of water samples are 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 275031). Mercury was not detected in the method blank above the MDL.

### 4.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair and post digestion spike were reported using sample MW3-150424. The recovery and RPD results for the sample specific MS/MD pair and post digestion spike were within the QAPP specified acceptance criteria.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The result for the LCS was within the QAPP specified acceptance criteria for recovery.

### 4.6 Equipment Blank

Equipment blanks were not collected with the sample set.

### 4.7 Field Duplicate

One field duplicate sample, MW93-150424, was collected with the samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW3-150424. The RPD was 0%.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the sample as those listed in Table 6.2 of the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 5.0 WET CHEMISTRY

One water sample and one field duplicate sample were analyzed for sulfate by EPA Method 9056A and total dissolved solids (TDS) by Standard Method 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Laboratory Duplicate
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 5.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 5.2 Holding Times

The holding times are listed below. The holding times were met for the sample analyses.

| Parameter | Holding Time |
|---|---|
| Sulfate by EPA Method 9056A | 28 days from sample collection to analysis |
| TDS by Standard Method 2540C | 7 days from sample collection to analysis |

### 5.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported for each analysis, TDS (batch 275363) and sulfate (batch 276800). TDS and sulfate were not detected in the method blanks above the MDLs.

### 5.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

### 5.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported for TDS and one LCS/LCSD pair was reported for sulfate. The results for the LCS/LCSD pairs were within the laboratory specified acceptance criteria for recovery and RPD.

### 5.6 Laboratory Duplicate

Laboratory duplicates were not reported.

### 5.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 5.8 Field Duplicate

One field duplicate sample, MW93-150424, was collected with the samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW3-150424.

| Sample ID | Compound | Laboratory Result (mg/L) | Laboratory Flag | RPD |
|---|---|---|---|---|
| MW3-150424 | Sulfate | 330 | NA | 6 |
| MW93-150424 | Sulfate | 350 | NA | |

| Sample ID | Compound | Laboratory Result (mg/L) | Laboratory Flag | RPD |
|---|---|---|---|---|
| MW3-150424 | TDS | 670 | NA | 0 |
| MW93-150424 | TDS | 670 | NA | |

mg/L-milligrams per liter
NA-not applicable

### 5.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. MDLs and RLs for the wet chemistry parameters were not listed in Table 6.2 of the QAPP.

### 5.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

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# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**
**DATA VALIDATION REASON CODES**
**Assigned by Geosyntec's Data Validation Team**

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference

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# Memorandum

Date: 4 January 2016

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3510C/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C, Mercury by EPA Method 7470A, Chloride and Sulfate by EPA Method 9056A and Total Dissolved Solids by Standard Method 2540C – TestAmerica Work Order Number 280-77166-1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of two water samples and one field duplicate sample collected on November 20, 2015, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans which were performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3510C/8270D Selective Ion Monitoring (SIM) - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C – Metals
- EPA Methods 7470A – Mercury
- EPA Method 9056A –Chloride and Sulfate
- Standard Method 2540C – Total Dissolved Solids (TDS)

## EXECUTIVE SUMMARY

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA National Functional Guidelines for Superfund Organic Methods Data Review, August 2014 (USEPA-540-R-014-002), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The dioxins and furans data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs) Data Review, EPA 540-R-11-016, September 2011, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-013-001, August 2014, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-77166-1 | MW-2-2015-1120 |
| 280-77166-2 | MW-3-2015-1120 |

| Laboratory ID | Client ID |
|---|---|
| 280-77166-3 | MW-3-2015-1120-DUP |

The samples were received by the laboratory at 0.2ºC, 1.1ºC, and 0.5ºC (TA Knoxville), outside of the QAPP criteria of 4ºC + 2ºC. However, since the samples were received below 6ºC and above freezing, no qualifications were applied to the data based on professional judgment. No sample preservation issues were noted by the laboratory.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

Two water samples and one field duplicate sample were analyzed for PAHs per EPA Methods 3510C/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverable Review

## 1.1 Overall Assessment

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 1.2 Holding Times

The holding times for the PAH analysis of a water sample are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

## 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 305566). PAHs were not detected in the method blank above the method detection limits (MDLs).

## 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported with the data set.

## 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCS duplicate (LCSD) pair was reported. 1-Methylnaphthalene and 2-methylnaphthalene were spiked in the LCS/LCSD pair but not

reported in the LCS/LCSD summaries. The recoveries and relative percent differences (RPDs) for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD, with the following exceptions.

The RPDs for 2-methylnaphthalene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, dibenz(a,h)anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, and pyrene in the LCS/LCSD pair in batch 305566 were high and outside the laboratory specified acceptance criteria. Since these compounds were not detected in the associated samples, no qualifications were applied to the data.

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses.

### 1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 1.8 Field Duplicate

One field duplicate sample, MW-3-2015-1120-DUP, was collected with the samples. Acceptable precision (RPD $\leq$30%) was demonstrated between the field duplicate and the original sample, MW-3-2015-1120. The RPDs were 0%.

### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and reporting limits (RLs) were similar to those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

Two water samples and one field duplicate sample were analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

## 2.1 Overall Assessment

### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 2.1.2 Analysis Anomaly

Several results in the samples were flagged Q by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on technical and professional judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier* | Reason Code** |
|---|---|---|---|---|---|---|
| MW-2-2015-1120 | 1,2,3,6,7,8-HxCDF | 0.57 | Q,J | 0.57 | J | 13 |
| MW-2-2015-1120 | OCDD | 2.4 | Q,B,J | 2.4 | J | 13 |
| MW-2-2015-1120 | OCDF | 1.6 | Q,B,J | 1.6 | J | 13 |
| MW-3-2015-1120 | 1,2,3,4,7,8,9-HpCDF | 0.41 | Q,B,J | 0.41 | J | 13 |
| MW-3-2015- | 1,2,3,4,6,7,8-HpCDF | 0.38 | Q,B,J | 0.38 | J | 13 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier* | Reason Code** |
|---|---|---|---|---|---|---|
| 1120-DUP | | | | | | |
| MW-3-2015-1120-DUP | OCDD | 3.1 | Q,B,J | 3.1 | J | 13 |

pg/L-picograms per gram
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL
* Validation qualifiers are defined in Attachment 1 at the end of this report
**Reason codes are defined in Attachment 2 at the end of this report

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water samples are 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 5334014). The dioxins and furans were not detected in the method blank above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the RLs in the method blank. Therefore, the estimated concentrations of these compounds less than the method blank results in the associated samples were U qualified as not detected at the estimated concentrations and the results greater than the method blank results but less than the RLs were J qualified as estimated.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-2-2015-1120 | 1,2,3,4,6,7,8-HpCDF | 0.58 | B,J | 0.58 | J | 3 |
| MW-2-2015-1120 | OCDD | 2.4 | Q,B,J | 2.4 | J | 3 |
| MW-2-2015-1120 | OCDF | 1.6 | Q,B,J | 1.6 | J | 3 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-3-2015-1120 | 1,2,3,4,7,8,9-HpCDF | 0.41 | Q,B,J | 0.41 | U | 3 |
| MW-3-2015-1120 | OCDD | 1.5 | B,J | 1.5 | U | 3 |
| MW-3-2015-1120-DUP | 1,2,3,4,6,7,8-HpCDF | 0.38 | Q,B,J | 0.38 | J | 3 |
| MW-3-2015-1120-DUP | OCDD | 3.1 | Q,B,J | 3.1 | J | 3 |
| MW-3-2015-1120-DUP | OCDF | 0.93 | B,J | 0.93 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

## 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

## 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

## 2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

## 2.8 Field Duplicate

One field duplicate sample, MW-3-2015-1120-DUP, was collected with the samples. Acceptable precision (RPD <30%) was demonstrated between the field duplicate and the original sample, MW-3-2015-1120, with the following exceptions.

1,2,3,4,6,7,8-HpCDF was detected at an estimated concentration greater than the MDL and less than the RL in the field duplicate and was not detected in the original sample. The RPD was not calculable; therefore, the concentration of 1,2,3,4,6,7,8-HpCDF was J qualified as estimated and the nondetect value was UJ qualified as estimated less than the EDL in the field duplicate pair.

1,2,3,4,7,8,9-HpCDF was detected at an estimated concentration greater than the MDL and less than the RL in the original sample and was not detected in the field duplicate. The RPD was not calculable; however, since the estimated concentration was U qualified as not detected based on the method blank result, no qualifications were applied to the data.

1,2,3,4,7,8,9-HpCDF and OCDF were detected at estimated concentrations greater than the MDLs and less than the RLs in the original sample and were not detected in the field duplicate. The RPDs were not calculable; however, since the estimated concentrations were U qualified as not detected based on the method blank result, no additional qualifications were applied to the data.

| **Sample ID** | **Compound** | **Laboratory Result (pg/L)** | **Laboratory Flag** | **RPD** | **Validation Result (pg/L)** | **Validation Qualifier** | **Reason Code** |
|---|---|---|---|---|---|---|---|
| MW-3-2015-1120 | 1,2,3,4,6,7,8-HpCDF | 0.088 | U | NC | 0.088 | UJ | 7 |
| MW-3-2015-1120-DUP | 1,2,3,4,6,7,8-HpCDF | 0.38 | Q,B,J | | 0.38 | J | 7 |
| MW-3-2015-1120 | 1,2,3,4,7,8,9-HpCDF | 0.41 | Q,B,J | NC* | NA | NA | NA |
| MW-3-2015-1120-DUP | 1,2,3,4,7,8,9-HpCDF | 0.12 | U | | NA | NA | NA |
| MW-3-2015-1120 | OCDD | 1.5 | B,J | NC | NA | NA | NA |
| MW-3-2015-1120-DUP | OCDD | 3.1 | Q,B,J | | NA | NA | NA |
| MW-3-2015-1120 | OCDF | 0.16 | U | NC* | NA | NA | NA |
| MW-3-2015-1120-DUP | OCDF | 0.93 | B,J | | NA | NA | NA |
| MW-3-2015-1120 | The other dioxins and furans | ND | NA | 0 | NA | NA | NA |
| MW-3-2015-1120-DUP | The other dioxins and furans | ND | NA | | NA | NA | NA |

pg/L-picograms per liter
U-not detected at the reported MDL
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL
NA-not applicable

NC-not calculable
ND-not detected at the MDL
*no qualifications since estimated concentration was U qualified as not detected

### 2.9 Sensitivity

The samples were reported to the EDLs. Elevated nondetect results were not reported. The RLs were similar to those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC.

## 3.0 METALS

Two water samples and one field duplicate sample were analyzed for metals per EPA Methods 3010A/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Serial Dilution
✓ Equipment Blank
⊗ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

## 3.1 Overall Assessment

### 3.1.1 Completion

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.1.2 Analysis Anomaly

The recovery of arsenic in a continuing calibration verification low level (CCVL) in batch 307545 was high and outside the laboratory specified acceptance criteria. Therefore, the concentrations of arsenic in the associated samples were J+ qualified as estimated with high bias.

The recovery of chromium in the CCV in batch 307545 was high and outside the laboratory specified acceptance criteria. Therefore, the concentration of chromium in the associated sample was J+ qualified as estimated with high bias.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-2-2015-1120 | Arsenic | 5.0 | J,^ | 5.0 | J+ | 9 |
| MW-2-2015-1120 | Chromium | 2.7 | J,^ | 2.7 | J+ | 9 |
| MW-3-2015-1120 | Arsenic | 12 | J,^ | 12 | J+ | 9 |
| MW-3-2015-1120-DUP | Arsenic | 12 | J,^ | 12 | J+ | 9 |

µg/L-micrograms per liter
J-estimated concentration greater than the MDL and less than the RL
^-laboratory flag indicating instrument related QC was outside acceptance criteria

## 3.2 Holding Times

The holding time for metals analyses of water samples is 180 days from sample collection to analysis. The holding times were met for the sample analyses.

## 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch

305839). Metals were not detected in the method blank above the MDLs, with the following exceptions.

Manganese, silver, and sodium were detected at estimated concentrations greater than the MDLs and less than the RLs. Since these metals were either detected above the RLs or not detected in the associated samples, no qualifications were applied to the data.

### 3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One MS/MSD pair and post digestion spike were reported using sample MW-2-2015-1120. The recovery and RPD results for the sample specific MS/MSD pair and post digestion spike were within the QAPP specified acceptance criteria, with the following exceptions.

The recovery for manganese in the post digestion spike was not calculated since the sample concentration was greater than four times the spiked amount. Therefore, no qualifications were applied to the data based on professional and technical judgment.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCSD pair was analyzed. The results for the LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD.

### 3.6 Serial Dilution

A serial dilution was reported using sample MW-2-2015-1120. The percent difference (%D) results were within the laboratory specified acceptance criteria, with the following exception.

The %D for barium was high and outside the laboratory specified acceptance criteria. Therefore, the concentration of barium in sample MW-2-2015-1120 was J qualified as estimated.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-2-2015-1120 | Barium | 39 | NA | 39 | J | 8 |

µg/L-micrograms per liter
NA-not applicable

### 3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 3.8 Field Duplicate

One field duplicate sample, MW-3-2015-1120-DUP, was collected with the samples. Acceptable precision (RPD <30%) was demonstrated between the field duplicate and the original sample, MW-3-2015-1120, with the following exceptions.

The RPD for zinc was greater than 30%; therefore, the concentrations of zinc in the field duplicate pair were J qualified as estimated.

Selenium was detected at an estimated concentration greater than the MDL and less than the RL in the field duplicate and was detected above the RL in the original sample. The RPD was not calculable. Therefore, the concentrations of selenium in the field duplicate pair were J qualified as estimated.

Vanadium was detected at an estimated concentration greater than the MDL and less than the RL in the field duplicate and was not detected in the original sample. The RPD was not calculable. Therefore, the concentration of vanadium was J qualified as estimated and the nondetected value was UJ qualified as estimated less than the MDL in the field duplicate pair.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | RPD | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| MW-3-2015-1120 | Arsenic | 12 | J,^ | NC | NA | NA | NA |
| MW-3-2015-1120-DUP | Arsenic | 12 | J,^ | | NA | NA | NA |
| MW-3-2015-1120 | Barium | 19 | NA | 0 | NA | NA | NA |
| MW-3-2015-1120-DUP | Barium | 19 | NA | | NA | NA | NA |
| MW-3-2015-1120 | Beryllium | 0.52 | J | NC | NA | NA | NA |
| MW-3-2015-1120-DUP | Beryllium | 0.48 | J | | NA | NA | NA |
| MW-3-2015-1120 | Calcium | 73000 | NA | 1 | NA | NA | NA |
| MW-3-2015-1120-DUP | Calcium | 74000 | NA | | NA | NA | NA |
| MW-3-2015-1120 | Chromium | 2.0 | J | NC | NA | NA | NA |
| MW-3-2015-1120-DUP | Chromium | 1.8 | J | | NA | NA | NA |
| MW-3-2015-1120 | Cobalt | 120 | NA | 0 | NA | NA | NA |
| MW-3-2015-1120-DUP | Cobalt | 120 | NA | | NA | NA | NA |
| MW-3-2015-1120 | Iron | 360 | NA | 9 | NA | NA | NA |

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | RPD | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|---|
| MW-3-2015-1120-DUP | Iron | 330 | NA | | NA | NA | NA |
| MW-3-2015-1120 | Magnesium | 20000 | NA | 0 | NA | NA | NA |
| MW-3-2015-1120-DUP | Magnesium | 20000 | NA | | NA | NA | NA |
| MW-3-2015-1120 | Manganese | 7800 | B | 1 | NA | NA | NA |
| MW-3-2015-1120-DUP | Manganese | 7900 | B | | NA | NA | NA |
| MW-3-2015-1120 | Nickel | 25 | J | NC | NA | NA | NA |
| MW-3-2015-1120-DUP | Nickel | 25 | J | | NA | NA | NA |
| MW-3-2015-1120 | Potassium | 9500 | NA | 5 | NA | NA | NA |
| MW-3-2015-1120-DUP | Potassium | 10000 | NA | | NA | NA | NA |
| MW-3-2015-1120 | Selenium | 16 | NA | NC | 16 | J | 7 |
| MW-3-2015-1120-DUP | Selenium | 14 | J | | 14 | J | 7 |
| MW-3-2015-1120 | Sodium | 97000 | B | 0 | NA | NA | NA |
| MW-3-2015-1120-DUP | Sodium | 97000 | B | | NA | NA | NA |
| MW-3-2015-1120 | Thallium | 18 | NA | 15 | NA | NA | NA |
| MW-3-2015-1120-DUP | Thallium | 21 | NA | | NA | NA | NA |
| MW-3-2015-1120 | Vanadium | 1.1 | U | NC | 1.1 | UJ | 7 |
| MW-3-2015-1120-DUP | Vanadium | 1.4 | J | | 1.4 | J | 7 |
| MW-3-2015-1120 | Zinc | 88 | NA | 86 | 88 | J | 7 |
| MW-3-2015-1120-DUP | Zinc | 220 | NA | | 220 | J | 7 |
| MW-3-2015-1120 | The other metals | ND | NA | 0 | NA | NA | NA |
| MW-3-2015-1120-DUP | The other metals | ND | NA | | NA | NA | NA |

µg/L-micrograms per liter
J-estimated concentration less than the RL and greater than the MDL
U-not detected at or above the MDL
B-laboratory flag indicating the compound was detected in both the method blank and sample
^-laboratory flag indicating instrument related QC was outside acceptance criteria
NA-not applicable
NC-not calculable
ND-not detected at the MDL

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were similar to those listed in Table 6.2 of the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

Two water samples and one field duplicate sample were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 4.2 Holding Times

The holding time for mercury analyses of water samples is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batches 305729). Mercury was not detected above the MDL in the method blank.

### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One MS/MSD pair was reported using sample MW-2-2015-1120. The recovery and RPD results for the sample specific MS/MSD pair were within the QAPP specified acceptance criteria.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was analyzed. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

### 4.6 Equipment Blank

Equipment blanks were not collected with the sample set.

### 4.7 Field Duplicate

One field duplicate sample, MW-3-2015-1120-DUP, was collected with the samples. Acceptable precision (RPD <30%) was demonstrated between the field duplicate and the original sample, MW-3-2015-1120. The RPD was 0%.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the same as those listed in Table 6.2 of the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 5.0 WET CHEMISTRY

Two water samples and one field duplicate sample were analyzed for sulfate by EPA Method 9056A and TDS by Standard Method 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Laboratory Duplicate
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 5.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 5.2 Holding Times

The holding times are listed below. The holding times were met for the sample analyses.

| Parameter | Holding Time |
|---|---|
| Sulfate by EPA Method 9056A | 28 days from sample collection to analysis |
| TDS by Standard Method 2540C | 7 days from sample collection to analysis |

### 5.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported for each analysis, TDS (batch 305703) and sulfate (batch 307106). The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exception.

Chloride and sulfate were detected at estimated concentrations greater than the MDLs and less than the RLs in the method blank in batch 307106. Since chloride and sulfate were detected above the RLs in the associated samples, no qualifications were applied to the data.

### 5.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported.

### 5.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported for TDS and one LCS/LCSD pair was reported for chloride and sulfate. The results for the LCS and LCS/LCSD pair were within the laboratory specified acceptance criteria for recovery and RPD.

### 5.6 Laboratory Duplicate

One sample specific laboratory duplicate was reported for TDS using sample MW-3-2015-1120-DUP. The results for the laboratory duplicate were within the laboratory specified acceptance criteria for RPD.

### 5.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 5.8 Field Duplicate

One field duplicate sample, MW-3-2015-1120-DUP, was collected with the samples. Acceptable precision (RPD <30%) was demonstrated between the field duplicate and the original sample, MW-3-2015-1120.

| Sample ID | Compound | Laboratory Result (mg/L) | Laboratory Flag | RPD |
|---|---|---|---|---|
| MW-3-2015-1120 | TDS | 680 | NA | 0 |
| MW-3-2015-1120-DUP | TDS | 680 | NA | |
| MW-3-2015-1120 | Chloride | 54 | B | 2 |
| MW-3-2015-1120-DUP | Chloride | 53 | B | |
| MW-3-2015-1120 | Sulfate | 340 | B | 0 |
| MW-3-2015-1120-DUP | Sulfate | 340 | B | |

mg/L-milligrams per liter
B-compound was detected in both the method blank and sample
NA-not applicable

### 5.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. MDLs and RLs for the wet chemistry parameters were not listed in Table 6.2 of the QAPP.

### 5.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

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# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**
**DATA VALIDATION REASON CODES**
**Assigned by Geosyntec's Data Validation Team**

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference

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# Memorandum

Date: 4 January 2016

To: Michael Schott

Erin Nesbit

From: Kristoffer Henderson

CC: J. Caprio

**Subject: Stage 2A Data Validation - Level IV Data Deliverable – Polycyclic Aromatic Hydrocarbons by EPA Methods 3510C/8270D Selective Ion Monitoring, Dioxins and Furans by EPA Method 8290, Metals by EPA Methods 3010A/6010C, Mercury by EPA Method 7470A, Sulfate by EPA Method 9056A and Total Dissolved Solids by Standard Method 2540C – TestAmerica Work Order Number 280-77042-1**

**SITE: UNC-CH Cogeneration Facility**

## INTRODUCTION

This report summarizes the findings of the Stage 2A data validation of three water samples collected on November 18, 2015, as part of the UNC-CH Cogeneration Facility sampling event. The analyses were performed at TestAmerica Denver, Arvada, Colorado with the exception of the Dioxins and Furans which were performed by TestAmerica Knoxville, Knoxville, Tennessee. The samples were analyzed for the following tests:

- EPA Methods 3510C/8270D Selective Ion Monitoring (SIM) - Polycyclic Aromatic Hydrocarbons (PAHs)
- EPA Method 8290 - Dioxins and Furans
- EPA Methods 3010A/6010C – Metals
- EPA Methods 7470A – Mercury
- EPA Method 9056A –Sulfate
- Standard Method 2540C – Total Dissolved Solids (TDS)

## EXECUTIVE SUMMARY

The samples were handled, prepared and measured in the same manner under similar prescribed conditions.

Overall, based on this Stage 2A data validation covering the quality control (QC) parameters listed below, the data as qualified are usable for meeting project objectives. Qualified data should be used within the limitations of the qualification.

The organic data were reviewed based on the Quality Assurance Project Plan (QAPP), UNC-CH Cogeneration Facility, Chapel Hill, North Carolina, Site ID # NCR000010272, Geosyntec Project Number GN5219, October 2013, USEPA National Functional Guidelines for Superfund Organic Methods Data Review, August 2014 (USEPA-540-R-014-002), as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The dioxins and furans data were reviewed based on the QAPP, USEPA Contract Laboratory Program National Functional Guidelines for chlorinated dibenzo-p-dioxins (CDDs) and chlorinated dibenzofurans (CDFs) Data Review, EPA 540-R-11-016, September 2011, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The inorganic data were reviewed based on the QAPP, USEPA National Functional Guidelines for Inorganic Superfund Data Review, EPA 540-R-013-001, August 2014, as well as by the pertinent methods referenced by the data package and professional and technical judgment.

The following samples were analyzed and validated at a Stage 2A level in the data set:

| Laboratory ID | Client ID |
|---|---|
| 280-77042-1 | MW-1-20151118 |
| 280-77042-2 | MW-5-20151118 |

| Laboratory ID | Client ID |
|---|---|
| 280-77042-3 | MW-4-20151118 |

The samples were received by the laboratory at 1.1ºC, 1.9ºC, and 2.3ºC (TA Knoxville), outside of the QAPP criteria of 4ºC + 2ºC. However, since the samples were received below 6ºC and above freezing, no qualifications were applied to the data based on professional judgment. No sample preservation issues were noted by the laboratory.

## 1.0 POLYCYLIC AROMATIC HYDROCARBONS

Three water samples were analyzed for PAHs per EPA Methods 3510C/8270D SIM.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ⊗ Laboratory Control Sample
- ✓ Surrogates
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverable Review

## 1.1 Overall Assessment

The PAH data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 1.2 Holding Times

The holding times for the PAH analysis of a water sample are 7 days from sample collection to extraction and 40 days from extraction to analysis. The holding times were met for the sample analyses.

## 1.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 305566). PAHs were not detected in the method blank above the method detection limits (MDLs).

## 1.4 Matrix Spike/Matrix Spike Duplicate (MS/MSD)

MS/MSD pairs were not reported with the data set.

## 1.5 Laboratory Control Sample (LCS)

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCS duplicate (LCSD) pair was reported. 1-Methylnaphthalene and 2-methylnaphthalene were spiked in the LCS/LCSD pair but not

reported in the LCS/LCSD summaries. The recoveries and relative percent differences (RPDs) for 1-methylnaphthalene and 2-methylnaphthalene were calculated by the data validator and compared to the QAPP limits. The results for the LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD, with the following exceptions.

The RPDs for 2-methylnaphthalene, benzo[a]pyrene, benzo[b]fluoranthene, benzo[g,h,i]perylene, benzo[k]fluoranthene, dibenz(a,h)anthracene, fluoranthene, indeno[1,2,3-cd]pyrene, and pyrene in the LCS/LCSD pair in batch 305566 were high and outside the laboratory specified acceptance criteria. Since 2-methylnaphthalene was not detected in the associated samples, no qualifications were applied to the 2-methylnaphthalene data. However, the concentrations of the remaining compounds in the associated samples were J qualified as estimated.

| **Sample ID** | **Compound** | **Laboratory Result (ng/L)** | **Laboratory Flag** | **Validation Result (ng/L)** | **Validation Qualifier**** | **Reason Code***** |
|---|---|---|---|---|---|---|
| MW-1-20151118 | Benzo[b]fluoranthene | 40 | J,* | 40 | J | 5 |
| MW-1-20151118 | Benzo[k]fluoranthene | 13 | J,* | 13 | J | 5 |
| MW-1-20151118 | Fluoranthene | 66 | J,* | 66 | J | 5 |
| MW-1-20151118 | Pyrene | 41 | J,* | 41 | J | 5 |
| MW-5-20151118 | Benzo[a]pyrene | 36 | J,* | 36 | J | 5 |
| MW-5-20151118 | Benzo[b]fluoranthene | 49 | J,* | 49 | J | 5 |
| MW-5-20151118 | Benzo[g,h,i]perylene | 67 | J,* | 67 | J | 5 |
| MW-5-20151118 | Benzo[k]fluoranthene | 49 | J,* | 49 | J | 5 |
| MW-5-20151118 | Dibenz(a,h)anthracene | 70 | J,* | 70 | J | 5 |
| MW-5-20151118 | Indeno[1,2,3-cd]pyrene | 61 | J,* | 61 | J | 5 |
| MW-5-20151118 | Pyrene | 27 | J,* | 27 | J | 5 |

ng/L-nanograms per liter
J-estimated concentration greater than the MDL and less than the reporting limit (RL)
*laboratory flag indicating RPD of the LCS/LCSD pair was outside the laboratory limits
** Validation qualifiers are defined in Attachment 1 at the end of this report
***Reason codes are defined in Attachment 2 at the end of this report

### 1.6 Surrogate

Acceptable surrogate recoveries were reported for the sample analyses, with the following exceptions.

The recoveries of terphenyl-d14 in samples MW-1-20151118 and MW-4-20151118 were high and outside the laboratory specified acceptance criteria. However, since the other two surrogates were within laboratory limits, no qualifications were applied to the data.

### 1.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 1.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 1.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs were similar to those listed in Table 6.2 in the QAPP.

### 1.10 Electronic Data Deliverable (EDD) Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 2.0 DIOXINS AND FURANS

Three water samples were analyzed for chlorinated dibenzo-p-dioxins (PCDDs) and chlorinated dibenzofurans (PCDFs), per EPA method 8290.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times

⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Surrogates
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
✓ Electronic Data Deliverable Review

## 2.1 Overall Assessment

### 2.1.1 Completion

The dioxins and furans data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 2.1.2 Analysis Anomaly

Several results in the samples were flagged Q by the laboratory indicating an estimated maximum possible concentration. Therefore, these results were J qualified as estimated based on technical and professional judgment.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-1-20151118 | 1,2,3,4,6,7,8-HpCDD | 1.5 | Q,B,J | 1.5 | J | 13 |
| MW-1-20151118 | 1,2,3,4,7,8,9-HpCDF | 0.41 | Q,B,J | 0.41 | J | 13 |
| MW-1-20151118 | 1,2,3,7,8-PeCDF | 0.37 | Q,B,J | 0.37 | J | 13 |
| MW-1-20151118 | 2,3,4,7,8-PeCDF | 0.30 | Q,J | 0.30 | J | 13 |
| MW-1-20151118 | OCDF | 1.6 | Q,B,J | 1.6 | J | 13 |
| MW-4-20151118 | 1,2,3,7,8,9-HxCDD | 0.41 | Q,B,J | 0.41 | J | 13 |
| MW-4-20151118 | OCDF | 0.36 | Q,B,J | 0.36 | J | 13 |
| MW-5-20151118 | 1,2,3,4,6,7,8-HpCDF | 0.22 | Q,B,J | 0.22 | J | 13 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-5-20151118 | OCDF | 0.85 | Q,B,J | 0.85 | J | 13 |

pg/L-picograms per gram
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.2 Holding Times

The holding times for the PCDD and PCDF analysis of water samples are 30 days from sample collection to extraction and 45 days from extraction to analysis. The holding times were met for the sample analyses.

## 2.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 5329015). The dioxins and furans were not detected in the method blank above the estimated detection limits (EDLs), with the following exceptions.

1,2,3,4,6,7,8-HpCDD, 1,2,3,4,6,7,8-HpCDF, 1,2,3,4,7,8,9-HpCDF, 1,2,3,4,7,8-HxCDF, 1,2,3,6,7,8-HxCDF, 1,2,3,7,8,9-HxCDD, 1,2,3,7,8,9-HxCDF, 1,2,3,7,8-PeCDD, 1,2,3,7,8-PeCDF, 2,3,4,6,7,8-HxCDF, OCDD, and OCDF were detected at estimated concentrations greater than the EDLs and less than the RLs in the method blank. Therefore, the estimated concentrations of these compounds less than the method blank results in the associated samples were U qualified as not detected at the estimated concentrations and the results greater than the method blank results but less than the RLs were J qualified as estimated.

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-1-20151118 | 1,2,3,4,6,7,8-HpCDD | 1.5 | Q,B,J | 1.5 | J | 3 |
| MW-1-20151118 | 1,2,3,4,6,7,8-HpCDF | 0.50 | B,J | 0.50 | U | 3 |
| MW-1-20151118 | 1,2,3,4,7,8,9-HpCDF | 0.41 | Q,B,J | 0.41 | U | 3 |
| MW-1-20151118 | 1,2,3,7,8-PeCDD | 0.31 | B,J | 0.31 | U | 3 |
| MW-1-20151118 | 1,2,3,7,8-PeCDF | 0.37 | Q,B,J | 0.37 | U | 3 |
| MW-1-20151118 | OCDD | 14 | B,J | 14 | J | 3 |
| MW-1-20151118 | OCDF | 1.6 | Q,B,J | 1.6 | U | 3 |

| Sample ID | Compound | Laboratory Result (pg/L) | Laboratory Flag | Validation Result (pg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-4-20151118 | 1,2,3,7,8,9-HxCDD | 0.41 | Q,B,J | 0.41 | U | 3 |
| MW-4-20151118 | OCDD | 2.1 | B,J | 2.1 | U | 3 |
| MW-4-20151118 | OCDF | 0.36 | Q,B,J | 0.36 | U | 3 |
| MW-5-20151118 | 1,2,3,4,6,7,8-HpCDF | 0.22 | Q,B,J | 0.22 | U | 3 |
| MW-5-20151118 | OCDD | 2.0 | B,J | 2.0 | U | 3 |
| MW-5-20151118 | OCDF | 0.85 | Q,B,J | 0.85 | U | 3 |

pg/L-picograms per liter
Q-estimated maximum possible concentration
B-compound was detected in both method blank and sample
J-estimated concentration greater than the MDL and less than the RL

## 2.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

## 2.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported. The results for the LCS were within the QAPP specified acceptance criteria for recovery.

## 2.6 Surrogate`

The surrogate recoveries were within the laboratory specified acceptance criteria.

## 2.7 Equipment Blank

Equipment blanks were not collected with the sample set.

## 2.8 Field Duplicate

Field duplicates were not collected with the sample set.

## 2.9 Sensitivity

The samples were reported to the EDLs. Elevated nondetect results were not reported. The RLs were similar to those listed in Table 6.2 in the QAPP. The EDLs were below the MDLs listed in Table 6.2 of the QAPP.

### 2.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC.

## 3.0 METALS

Three water samples were analyzed for metals per EPA Methods 3010A/6010C (Mercury evaluated separately in Section 4.0, below).

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

⊗ Overall Assessment
✓ Holding Times
⊗ Method Blank
✓ Matrix Spike/Matrix Spike Duplicate
✓ Laboratory Control Sample
✓ Serial Dilution
✓ Equipment Blank
✓ Field Duplicate
✓ Sensitivity
⊗ Electronic Data Deliverable Review

### 3.1 Overall Assessment

#### 3.1.1 Completion

The metals data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 3.1.2 Analysis Anomaly

The recovery of arsenic in a continuing calibration verification low level (CCVL) in batch 307545 was high and outside the laboratory specified acceptance criteria. Therefore, the concentrations of arsenic in the associated samples were J+ qualified as estimated with high bias.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-4-20151118 | Arsenic | 7.1 | J,^ | 7.1 | J+ | 9 |
| MW-5-20151118 | Arsenic | 5.1 | J,^ | 5.1 | J+ | 9 |

µg/L-micrograms per liter
J-estimated concentration greater than the MDL and less than the RL
^-laboratory flag indicating instrument related QC was outside acceptance criteria

## 3.2 Holding Times

The holding times for metals analyses of water samples are 180 days from sample collection to analysis. The holding times were met for the sample analyses.

## 3.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batch 305839). Metals were not detected in the method blank above the MDLs, with the following exceptions.

Manganese, silver, and sodium were detected at estimated concentrations greater than the MDLs and less than the RLs. Since silver and sodium were either detected above the RLs or not detected in the associated samples, no qualifications were applied to the silver and sodium data. However, the estimated concentration of manganese in the associated sample was U qualified as not detected at the RL.

| Sample ID | Compound | Laboratory Result (µg/L) | Laboratory Flag | Validation Result (µg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-4-20151118 | Manganese | 4.0 | J,B | 10 | U | 3 |

µg/L-micrograms per liter
J-laboratory flag indicating an estimated concentration greater than the MDL and less than the RL
B-laboratory flag indicating the compound was detected in both the method blank and sample

### 3.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

### 3.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCSD pair was analyzed. The results for the LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD.

### 3.6 Serial Dilution

Serial dilutions were not reported with the data set.

### 3.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 3.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 3.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were similar to those listed in Table 6.2 of the QAPP.

### 3.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 4.0 MERCURY

Three water samples were analyzed for mercury per EPA Method 7470A.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues

were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

- ✓ Overall Assessment
- ✓ Holding Times
- ✓ Method Blank
- ✓ Matrix Spike/Matrix Spike Duplicate
- ✓ Laboratory Control Sample
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverable Review

### 4.1 Overall Assessment

The mercury data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

### 4.2 Holding Times

The holding time for mercury analyses of a water samples is 28 days from sample collection to analysis. The holding times were met for the sample analyses.

### 4.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported with the data (batches 305316). Mercury was not detected above the MDL in the method blank.

### 4.4 Matrix Spike/Matrix Spike Duplicate

MS/MSD pairs were not reported with the data set.

### 4.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS/LCSD pair was analyzed. The results for the LCS/LCSD pair were within the QAPP specified acceptance criteria for recovery and RPD.

### 4.6 Equipment Blank

Equipment blanks were not collected with the sample set.

### 4.7 Field Duplicate

Field duplicates were not collected with the sample set.

### 4.8 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. The MDLs and RLs reported for the water samples were the same as those listed in Table 6.2 of the QAPP.

### 4.9 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

## 5.0 WET CHEMISTRY

Three water samples were analyzed for sulfate by EPA Method 9056A and TDS by Standard Method 2540C.

The areas of data review are listed below. A leading check mark (✓) indicates an area of review in which the data were acceptable. A preceding crossed circle (⊗) signifies areas where issues were raised during the course of the validation review and should be considered to determine any impact on data quality and usability.

✓ Overall Assessment
✓ Holding Times
✓ Method Blank
⊗ Matrix Spike/Matrix Spike Duplicate

- ✓ Laboratory Control Sample
- ✓ Laboratory Duplicate
- ✓ Equipment Blank
- ✓ Field Duplicate
- ✓ Sensitivity
- ⊗ Electronic Data Deliverable Review

## 5.1 Overall Assessment

The wet chemistry data reported in this package are considered to be usable for meeting project objectives. The results are considered to be valid; the analytical completeness, defined as the ratio of the number of valid analytical results (valid analytical results include values qualified as estimated) to the total number of analytical results requested on samples submitted for analysis, for the project is 100%.

## 5.2 Holding Times

The holding times are listed below. The holding times were met for the sample analyses.

| Parameter | Holding Time |
|---|---|
| Sulfate by EPA Method 9056A | 28 days from sample collection to analysis |
| TDS by Standard Method 2540C | 7 days from sample collection to analysis |

## 5.3 Method Blank

Method blanks were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One method blank was reported for each analysis, TDS (batch 305111) and sulfate (batch 306950). The wet chemistry parameters were not detected in the method blanks above the MDLs, with the following exception.

Sulfate was detected at an estimated concentration greater than the MDL and less than the RL in the method blank in batch 306950. Since sulfate was detected above the RL in the associated samples, no qualifications were applied to the data.

## 5.4 Matrix Spike/Matrix Spike Duplicate

One MS/MSD pair was reported for sulfate using sample MW-5-20151118. The RPD was within laboratory specified acceptance criteria. However, the MS/MSD recoveries were high and outside the laboratory specified acceptance criteria. Therefore, the concentrations of sulfate in sample MW-5-20151118 was J+ qualified as estimated with high bias.

| Sample ID | Compound | Laboratory Result (mg/L) | Laboratory Flag | Validation Result (mg/L) | Validation Qualifier | Reason Code |
|---|---|---|---|---|---|---|
| MW-5-20151118 | Sulfate | 200 | F1,B | 200 | J+ | 4 |

mg/L-milligrams per liter
F1-laboratory flag indicating MS/MSD recovery was outside the laboratory limits
B-laboratory flag indicating compound was detected in both the method blank and sample

### 5.5 Laboratory Control Sample

LCSs were analyzed at the proper frequency for the number and types of samples analyzed (one per batch of 20 samples). One LCS was reported for TDS and one LCS/LCSD pair was reported for sulfate. The results for the LCS and LCS/LCSD pair were within the laboratory specified acceptance criteria for recovery and RPD.

### 5.6 Laboratory Duplicate

One laboratory duplicate was reported for sulfate using sample MW-5-20151118. The results for the laboratory duplicate was within the laboratory specified acceptance criteria for RPD.

### 5.7 Equipment Blank

Equipment blanks were not collected with the sample set.

### 5.8 Field Duplicate

Field duplicates were not collected with the sample set.

### 5.9 Sensitivity

The samples were reported to the MDLs. Elevated nondetect results were not reported. MDLs and RLs for the wet chemistry parameters were not listed in Table 6.2 of the QAPP.

### 5.10 Electronic Data Deliverable Review

Results and sample IDs in the EDD were reviewed against the information provided by the associated level IV report at a minimum of 20%. It was noted that the sample IDs in the EDD included the date and time of laboratory receipt in the prefix; this prefix was not listed on the COC. No other discrepancies were identified between the level IV report and the EDD.

* * * * *

# ATTACHMENT 1
# DATA VALIDATION QUALIFIER DEFINITIONS AND INTERPRETATION KEY
## Assigned by Geosyntec's Data Validation Team

**DATA QUALIFIER DEFINITIONS**

U The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

J+ The analyte was positively identified; however, the associated numerical value is likely to be higher that the concentration of the analyte in the sample due to positive bias of associated QC or calibration data or attributable to matrix interference.

J- The analyte was positively identified; however, the associated numerical value is likely to be lower that the concentration of the analyte in the sample due to negative bias of associated QC or calibration data or attributable to matrix interference.

UJ The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

**ATTACHMENT 2**
**DATA VALIDATION REASON CODES**
**Assigned by Geosyntec's Data Validation Team**

| Valid Value | Description |
|---|---|
| 1 | Preservation requirement not met |
| 2 | Analysis holding time exceeded |
| 3 | Blank contamination (i.e., method, trip, equipment, etc.) |
| 4 | Matrix spike/matrix spike duplicate recovery or RPD outside limits |
| 5 | LCS recovery outside limits |
| 6 | Surrogate recovery outside limits |
| 7 | Field Duplicate RPD exceeded |
| 8 | Serial dilution percent difference exceeded |
| 9 | Calibration criteria not met |
| 10 | Linear range exceeded |
| 11 | Internal standard criteria not met |
| 12 | Lab duplicates RPD exceeded |
| 13 | Other |

RPD-relative percent difference