



**REPORT
ON**

**FIRST 2008 GROUND-WATER, SURFACE-WATER AND METHANE
MONITORING PROGRAM**

FOR

**LONGSTREET ROAD MSW LANDFILL AND THE LAMONT ROAD
LCID AND C&D LANDFILL
FORT BRAGG, NORTH CAROLINA**

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LIST OF ACRONYMS

C&D	Construction and Demolition
COCs	Chemicals of Concern
DPW	Directorate of Public Works
EPA	Environmental Protection Agency
IDW	Investigation Derived Waste
LCID	Land Clearing and Inert Debris
µg/L	Micrograms Per Liter
MSWLF	Municipal Solid Waste Landfill Facility
NC2L	North Carolina Administrative Code, Title 15A, SubchapterNC2L
NCDENR	North Carolina Department of Environmental and Natural Resources
PCB	polychlorinated biphenyls
pH	Negative Logarithm of the Hydrogen Ion Activity
RCRA	Resource Conservation and Recovery Act
SAP	Sampling and Analysis Plan
SVOCs	Semi-Volatile Organic Compounds
USACE	US Army Corps of Engineers
VOCs	Volatile Organic Compounds

**Report on the First 2008 Sampling Event For
Ground-Water, Surface-Water, and Methane Monitoring
At Longstreet and Lamont Landfills
Fort Bragg, North Carolina**

1.0 INTRODUCTION

This is the First 2008 Report (performed in May and June, 2008) for ground-water, surface-water, and methane monitoring at Longstreet and Lamont Landfills (Figure 1) performed by the United States Army Corps of Engineers (USACE), Savannah District. The monitoring is required by the North Carolina Department of Environmental and Natural Resources (NCDENR) Solid Waste Management Division. This report summarizes the ground-water, surface-water, and methane sampling activities and the analytical results of the sampling event conducted in May and June of 2008.

The Semi-Volatile Organic Compounds (SVOC) United States Environmental Protection Agency (EPA) method 8270C was not performed for any sample from Lamont Landfill. This oversight was a deviation from the approved Sampling and Analysis Plan (SAP). This problem did not affect the Longstreet Landfill sampling. Only one SVOC compound has been detected at the Lamont landfill in the past three years of monitoring and the compound was not detected over the North Carolina Administrative Code, Title 15A, Subchapter NC2L (NC2L) limit. Therefore, this deviation is considered minor and will be corrected in the next round of sampling.

1.1 Project Background

1.1.1 Longstreet Road MSW Landfill

The Longstreet Road landfill is a Municipal Solid Waste Landfill Facility (MSWLF) located north of Longstreet Road at Fort Bragg in Cumberland County, North Carolina. Figure 1 is a map of the site location. Ground-water, surface-water, and methane monitoring locations are shown on Figure 2. The United States Army Corps of Engineers (USACE), Savannah District has been contracted

by the Fort Bragg Directorate of Public Works (DPW) to conduct water quality sampling for the Environmental Branch to satisfy the following ground-water and surface-water monitoring requirements:

- The first semi-annual Appendix I (to Part 258 of EPA's Title 40: Protection of the Environment Regulation) detection monitoring event for 2008; and
- The annual Appendix II (to Part 258 of EPA's Title 40: Protection of the Environment Regulation), for triggered constituents only, assessment monitoring event for 2008 (First round of sampling only).

To complete these requirements, samples from the nine monitoring wells at the site were analyzed for all Appendix I and triggered Appendix II constituents. Two Longstreet Road MSWLF surface-water monitoring samples were analyzed for all of the constituents in the Appendix I & II lists. This report also includes Appendix I and triggered Appendix II statistical evaluations. This round of sampling follows the SAP approved by NCDENR. The wells included in this sampling event are SLMW-6, SLMW-7, SLMW-8, SLMW-9, SLMW-10, SLMW-11R, SLMW-12AR, SLMW-12BR, and SLMW-13. Monitoring well SLMW-11R is a replacement well that was installed in July 2008. The replacement well was installed because well SLMW-11 had been dry for several events. The well construction diagram for SLMW-11 is included in Appendix A. Ground-water monitoring locations are shown on Figure 2. All sampling was conducted according to North Carolina Solid Waste Management Guidelines.

1.1.2 Lamont Road LCID and C&D Landfill

The USACE was contracted by the DPW, Fort Bragg, North Carolina to sample the ground water from thirteen monitoring wells included in the current permit and approved SAP. The original monitoring well network consisted of 11 wells. Four of the original eleven monitoring wells have been permanently abandoned and replaced with new wells at different locations. Also, an additional

two wells have been installed. The current SAP approved by NCDENR includes sampling these 13 monitoring wells. The LCID and C&D monitoring wells included in this SAP are LMW-3, LMW-3s, LMW-4, LMW-6, LMW-7, LMW-8, LMW-9, LMW-9s, LMW-9d, LMW-10, LMW-14R, LMW-15R, and LMW-16. Ground-water monitoring locations are shown on Figure 3. All sampling was conducted according to North Carolina Solid Waste Management Guidelines.

1.2 Scope and Objectives of this Monitoring Program

- Collect ground-water samples from 9 selected monitoring wells at the Longstreet MSW Landfill for analyses of Appendix I & II constituents.
- Collect ground-water samples from 13 selected monitoring wells at the Lamont Road LCID and C&D Landfill for analyses of Appendix I & II constituents.
- Sample two surface-water monitoring locations at the Longstreet Road MSW Landfill and analyze for Appendix I & II constituents.
- Obtain field sampling measurements (i.e. pH, temperature, etc.).
- Measure ground-water levels for all existing wells and determine ground-water flow directions at the monitoring well locations.
- Sample for methane at 28 selected methane monitoring wells and 6 buildings on site.
- Evaluate the analytical results and determine the concentration changes of chemicals of concern (COCs) with time.
- Prepare progress report with analytical results for this sampling event, including statistical analysis of each constituent as required by NC regulations and all appropriate figures (i.e. potentiometric map).

The annual monitoring program consists of two sampling events (this was the first) conducted six months apart. During the sampling event, low levels of volatile organic compounds (VOCs), SVOCs, pesticides, Appendix I metals, and Appendix II inorganics were detected, but most detections were below NC2L standards. Ground water from seven wells and one surface-water sample at Longstreet had detections of

VOCs that were above the NC2L standards (Table 2). There were six SVOC detections. Only two of the detections, 1,4-dichlorobenzene and 4-methylphenol, were above the NC2L standard. There was one detection of a pesticide (at a very low value), which was not above the NC2L standard. No polychlorinated biphenyls (PCB) or organophosphorous pesticides were detected. There were various low level detections of inorganics, only three of which were above the NC2L standard. In addition, there were no wells with nitrate above the NC2L standard.

2.0 PROJECT HISTORY

2.1 Site Description and History

2.1.1 Longstreet Road MSW Landfill

The MSWLF is located north of Longstreet Road at Fort Bragg in Cumberland County, North Carolina. Figures 1 and 2 show the site location and layout. Sampling consists of collecting nine ground-water samples, two surface-water samples (taken from McPherson Creek), and 21 methane gas samples (taken from 15 wells and 6 buildings). BPA Environmental monitored the ground water and surface water at the site for several sampling events prior to 2005 sampling events. The USACE has monitored the site since 2005.

2.1.2 Lamont Road LCID and C&D Landfill

The Lamont Road LCID and C&D Landfill are on the west side of Cooleyconch Mountain (Figure 3). The site was previously utilized as a maneuver training area (conducted continuously for 50 years), a borrow pit for sands and clays, and a repository for unclassified debris from land clearing and construction demolition. The LCID Landfill started as an uncontrolled dump site which was associated with reclaiming borrow excavation. Its initial operation pre-dated Federal and State regulations governing waste disposal. The LCID Landfill has been operated as a controlled repository for C&D debris as well as for land clearing and inert debris since its permitting under NCDENR Permit No. 26C on August 28, 1987. From February 1993 to date of closure, C&D debris was diverted to the Longstreet Road Sanitary Landfill, and only LCID has been accepted at the LCID Landfill site. It is presumed that asbestos materials are disposed of in this landfill.

Cooleyconch Mountain is the prominent terrain feature west of the main post. The LCID Landfill site is 1.5 miles west of the Longstreet Road MSWLF (closed January 1, 1998) and 200 yards northwest of the Lamont Road C&D Landfill. The area adjacent and east of the LCID Landfill has been excavated to be used as a borrow pit for sandy fill material. To the south of the LCID Landfill, in the C&D Landfill site, petroleum

contaminated soils have been spread, dried, and stored for subsequent removal. To the east of the LCID Landfill, petroleum contaminated sludge has been stored in earthen impoundments for subsequent removal. The LCID Landfill drains north to Cypress Creek, which intersects the Little River a mile upstream of the Fort Bragg Water Plant intake.

2.2 General Site Geology and Hydrology

Lithologic descriptions of soil borings and monitoring well borings from previous investigations at Fort Bragg indicate that in general Fort Bragg is underlain by alternating sands, silty sands, clayey sands, sandy clays, and clays, likely belonging to the Middendorf Formation. The sands and silty sands range in thickness from approximately 2 to 22 ft and are coarse grained. The clay units range in thickness from approximately 2 to 7 ft and are typically plastic.

2.3 Previous Investigation and Results

Several sampling events have been conducted at the two landfills. Initially, four monthly sampling events were conducted in July, August, September, and October 1996 by R,S & H Architect, Engineering, & Planning, Inc. Law & Company, Inc. conducted two sampling events in March and September, 1999 in conjunction with the installation of new wells. Then until 2005, sampling events were conducted by BPA Environmental & Engineering, Inc. The USACE has monitored the site since 2005.

The previous sampling event, performed in November 2008 for Longstreet and Lamont Landfills, was conducted by the USACE, Savannah District. There were low level concentrations of VOCs, SVOCs, pesticides, and other Appendix I & II constituents. However, most were below their NC2L standards. Constituents found above the NC2L standards were: benzene, 4-methylphenol, vinyl chloride, arsenic, 1,4-dichlorobenzene, and Nitrate/Nitrite.

This sampling event, performed in May and June 2008 for Longstreet and Lamont Landfills, was conducted by the USACE, Savannah District. There were low level

concentrations of VOCs, SVOCs, pesticides, and other Appendix I & II constituents.
However, most detections were below their NC2L standards.

3.0 SAMPLING ACIVITY

3.1 Ground-water Sampling

The ground-water sampling was conducted in accordance with the SAP for Longstreet Road MSWLF and the Lamont (NCDENR Landfill Permit #26-02) Road LCID and C&D Landfill (NCDENR Landfill Permit # 26G and #26-08) dated April 2005, which has been updated to reflect the most recent SAP. Ground-water samples were collected from 22 wells, 13 wells for Lamont and 9 wells for Longstreet. In addition, 2 surface-water samples were taken at Longstreet Landfill. Water quality parameters (including pH, specific conductivity, temperature, turbidity, dissolved oxygen (DO), and oxidation-reduction potential (ORP) were measured during the purge cycle of each well. The measurements are summarized in Table 1.

Ground-water samples were collected using a low-flow purge method with a bladder pump. Immediately before purging a well, the static water level below the top of the well casing and the total depth of the well were measured to the nearest 0.01 foot and recorded in the field notebook. The volume of water in the well, including the saturated pore volume (assumed to be 30%) of the sand-packed annulus, was calculated based on the static water level and the well construction information. Well volume calculations were placed in the field notebook. The inlet of the sampling pump was placed at the mid-point of the screened interval. This level was adjusted for wells where the static water level is within the well screen. The monitoring wells were purged using a variable-flow bladder pump at a rate of 500 ml/min or less.

The wells were purged until the water quality had stabilized or five purge volumes were removed. Turbidity readings were considered stable if they were within 10% or were lower than 10 Nephelometric Turbidity Units (NTUs). Temperatrue was considered stable when it remained within a range of 0.5 degrees Celcius, pH was considered stable when it remained within 0.1 Standard Units (SU), and ORP was considered stable when it remained within a range of 10 milivolts. Conductivity and DO were considered stable when the relative percent difference was plus or minus 3% and 10%, respectively.

The rate of pumping was determined and noted in the field notebook. The purge rate was adjusted, as necessary, to avoid purging any well to dryness and to equal the recharge of the aquifer. All sampling equipment was protected from contaminated soil surfaces to prevent contamination of the samples (e.g., equipment may be placed on disposable polyethylene plastic sheeting). Ground-water samples were collected after purging was complete. The tubing was disconnected from the flow through cell and the samples were collected from the pump outlet. The samples were labeled and placed into an ice-filled cooler for preservation.

Ground-water sampling data (including sample number, location, quantity of water purged, field parameters, site conditions, etc.) were documented in the field notebook. Water samples for Resource Conservation and Recovery Act (RCRA) metal analyses were un-filtered. The results of the ground-water sampling are presented in Table 2 and on Figures 4 & 5. The ground-water sampling field data logs are presented in Appendix B.

EPA method 8270C was not performed for any sample from Lamont Landfill. This oversight was a deviation from the approved Sampling and Analysis Plan (SAP). This problem did not affect the Longstreet Landfill sampling. Only one SVOC compound has been detected at the Lamont landfill in the past three years of monitoring and the compound was not detected over the NC2L limit. Therefore, this deviation is considered minor and will be corrected in the next round of sampling.

3.2 Methane Monitoring

The methane levels were measured at 21 locations at Longstreet. Eight methane monitoring wells showed high levels of methane with six reading above 30% methane by volume. Methane vent flares were recommended for this landfill in the 2005 Report.

3.3 Water Level Measurement and Ground-water Mapping

During this sampling event, USACE personnel measured the water levels in 21 existing monitoring wells. Measured water levels and calculated ground-water elevations are presented in Table 4.

Potentiometric maps were developed based on the ground-water elevations, these maps and are presented as Figures 7 & 8. The maps show that the general direction of the ground-water flow at the Longstreet Landfill is towards the east, and that the general direction of the ground-water flow at the Lamont Landfill is towards the west-northwest.

3.3 Investigation Derived Wastes (IDW)

The IDW, including the waste water from well purging and decontamination water, was containerized in 55-gallon drums. Those drums were appropriately labeled, sealed, and staged within designated areas until analytical results had been received and reviewed. Based on the analytical results of the ground-water samples, the IDW was classified as non-hazardous. With the concurrence of the Fort Bragg IRP Manager, the IDW was disposed of at an appropriate disposal facility.

4.0 ANALYTICAL RESULTS

Ground-water samples collected in May and June 2008 were analyzed for VOCs, SVOCs (*with the exception of Lamont samples as noted in Section 3.1*), Pesticides, PCBs, Organophosphorous Pesticides, and, Appendix I Metals or Appendix II Inorganics. The summary of detections of the COCs is presented in Table 2. Figures 4 & 5 show the distribution of the detections and their concentrations from this sampling event. The report of chemical data quality assessment prepared by the Project Chemist is included as Appendix C. The laboratory reports of analytical results are included as Appendix D. For comparison, the analytical results of previous investigations are also presented in the Statistical Analyses Summary Report included in Appendix E.

In accordance with North Carolina guidance, analytical results are compared to North Carolina Ground-water NC2L Standards (NC2L standards). The analytical data of the first 2008 sampling event indicated that some VOCs, SVOCs, a pesticide, and inorganics were detected at low levels, and most detections were below NC2L standards (Table 2). Seven wells and one surface-water sample had detections exceeding the NC2L standards (excluding the two nitrate/nitrite exceedances): SLMW-6, SLMW-8, SLMW-9, SLMW-10, SLMW-11, SLMW-12A, and SW-1. The analytical results for each of those wells are discussed as follows:

4.1 Longstreet Road MSW Landfill

- Well SLMW-6

In May 2008, chloroform and Heptachlor were detected above their NC2L standards of 0.19micrograms per liter ($\mu\text{g/L}$) and 0.0078 $\mu\text{g/L}$ with concentrations of 0.21 $\mu\text{g/L}$ and 0.17 $\mu\text{g/L}$ respectively.

No other constituents were above their NC2L standard.

- Well SLMW -7

In May 2008 heptachlor, dieldrin, 4-methylphenol, acetone and vinyl chloride

were detected above their NC2L standards of 0.0078 µg/L, 0.0022 µg/L, 3.5 µg/L, 700 µg/L, and 0.015 µg/L with concentrations of 0.18 µg/L, 0.06 µg/L, 90.4 µg/L, 1270 µg/L, and 0.47 µg/L.

No other constituents were above their NC2L standard.

- Well SLMW-8

In May 2008, benzene, cis-1,2-dichloroethene, tetrachloroethene and vinyl chloride were detected above their NC2L standards of 1.0 µg/L, 70 µg/L, 0.7 µg/L, and 0.015 µg/L with concentrations of 4.07 µg/L, 79.1 µg/L, 0.84 µg/L and 21.8 µg/L respectively.

No other constituents were above their NC2L standard.

- Well SLMW-9

In May 2008, vinyl chloride was detected above their NC2L standard 0.015 µg/L with a concentration of 1.6 µg/L.

No other constituents were above their NC2L standard.

- Well SLMW-10

In May 2008, 1,2-dichloroethane, 1,2-dichloropropane, and vinyl chloride were detected above their NC2L standards of 0.38 µg/L, 0.56 µg/L, and 0.015 µg/L with concentrations of 0.67 µg/L, 3.51 µg/L and 1.65 µg/L respectively

No other constituents were above their NC2L standard.

- Well SLMW-12-AR

In May 2008, vinyl chloride and heptachlor were detected above their NC2L standards of 0.015 µg/L and 0.0078 µg/L with concentrations of 0.8 µg/L, and 0.02 µg/L.

No other constituents were above their NC2L standard.

- Well SLMW -12-BR

In May 2008, vinyl chloride and heptachlor was detected above its NC2L standard of 0.0078 µg/L with a concentration of 0.32 µg/L.

No other constituents were above their NC2L standard.

- SW-2

In May 2008, 1,2-dichloroethane, 1,2-dichloropropane, tetrachloroethene, vinyl chloride, and heptachlor were detected above their NC2L standard of 0.38 µg/L, 0.56 µg/L, 0.7 µg/L, and 0.0078 µg/L with concentrations of 0.4 µg/L, 0.57 µg/L, 1.67 µg/L, 2.95 µg/L, and 0.03 µg/L respectively

No other constituents were above their NC2L standard

4.2 Lamont Road LCID and C&D Landfill

- Well LMW-3

In May 2008, chloroform was detected at a concentration of 0.27 µg/L, above its NC2L standard of 0.19 µg/L.

Though other wells had constituent detections above reporting limits, all are below the NC2L standard, and most were qualified as estimated values (Table 2).

5.0 CONCLUSIONS AND RECOMMENATIONS FOR GROUND-WATER SAMPLING

This was the first 2008 sampling event for ground-water, surface-water, and methane monitoring performed by the USACE, Savannah District at this site. It was the 23rd sampling event to be performed at the Longstreet Road Landfill and the 16th sampling event at the Lamont Road Landfill. Low levels of VOCs, SVOCs, pesticides, Appendix I & II metals, and inorganics were detected, but most detections were below NC2L standards. Twenty five detections were found to exceed NC2L standards.

Longstreet Road MSW Landfill

The VOC, benzene, was detected above its NC2L standard at monitoring well SLMW-8. Vinyl chloride was found to be above the NC2L standard at monitoring wells SLMW-7, SLMW-8, SLMW-9, SLMW-10, SLMW-11, SLMW-12AR, and in SW-2. The requirement for long term monitoring was triggered by the NC Solid Waste Landfill Regulations. Even though some decrease in concentrations is indicated, the long term monitoring should be continued for the Longstreet Road Landfill site since regulatory requirements have not been met.

Eight methane monitoring wells contained high levels of methane with six reading above 30% methane by volume. Methane vent flares were recommended for this landfill in the 2005 Report.

Lamont Road LCID and C&D Landfill

Low levels of VOCs, SVOCs, and Appendix I & II metals and inorganics were detected; the chloroform contamination of 0.27 µg/L was the only detection above NC2L standards. This year 13 monitoring wells were sampled.

According to the Statistical Analysis of Ground-water Data (Appendix E), there is no evidence of an upward trend in constituent concentrations. The concentrations either trend downward or fluctuate with no apparent trend. The statistical findings at the Lamont Road Landfill demonstrated that any statistical abnormalities were due to

downward or variable results with no indications of upward trending. The concentration levels and number of detections at the Lamont Road Landfill have been consistently low.

Long-term monitoring should continue at the Lamont Road Landfill because it is still an active site and NC Solid Waste Regulations require it.

6.0 REFERENCES

North Carolina Administrative Code, Title 15A, Department of Environment, Health, and Natural Resources, Division of Solid Waste, Management, Subchapter 13B, Solid Waste Management, Section .1600 (January 4, 1994).

North Carolina Administrative Code, Title 15A, Department of Environment, Health, and Natural Resources, Division of Solid Waste, Management, SubchapterNC2L, Classifications and Water Quality Standards Applicable to the Ground waters of North Carolina, Sections .0100, .0200, and .0300 (November 8, 1993): from the Environmental Management Commission, Raleigh, North Carolina.

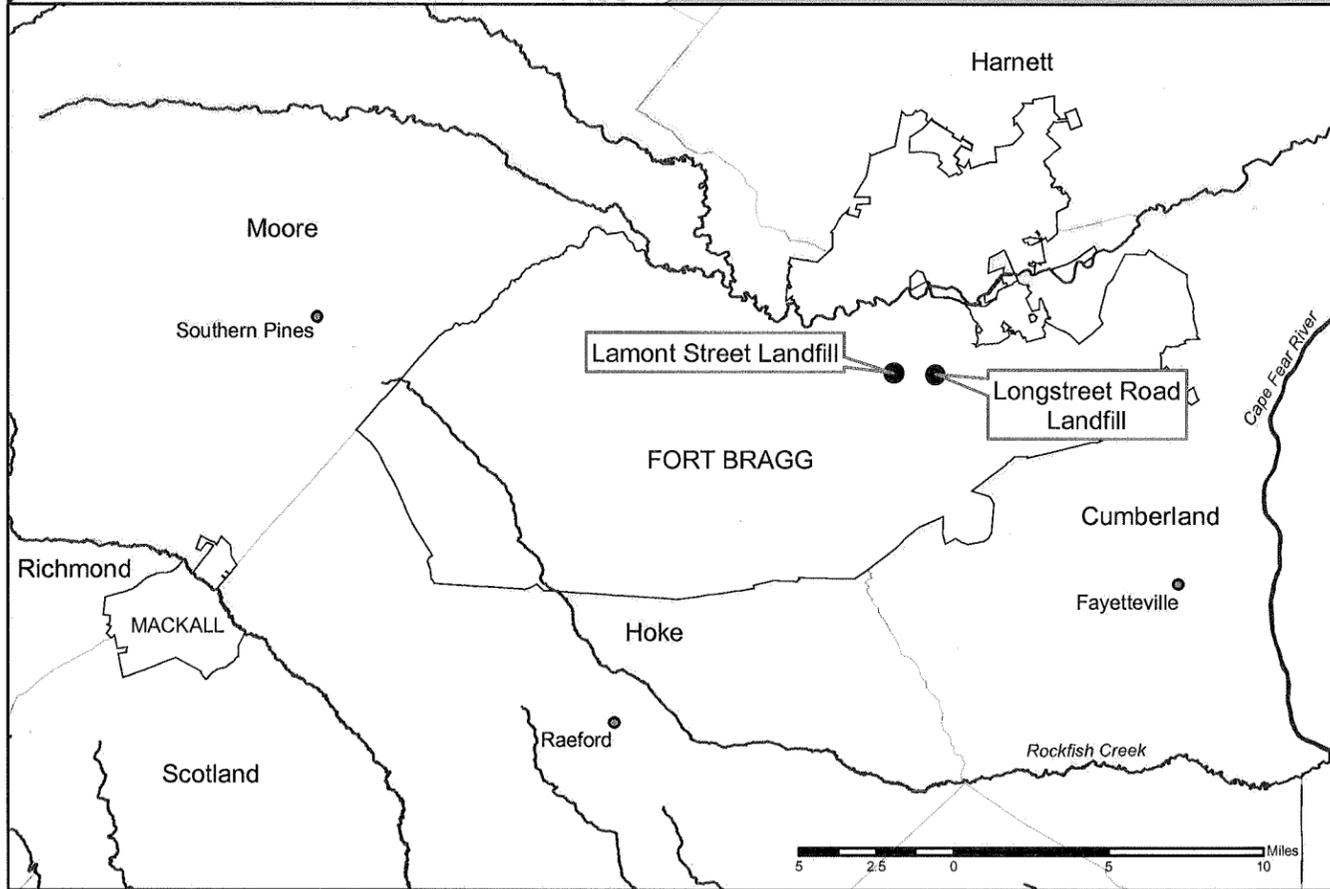
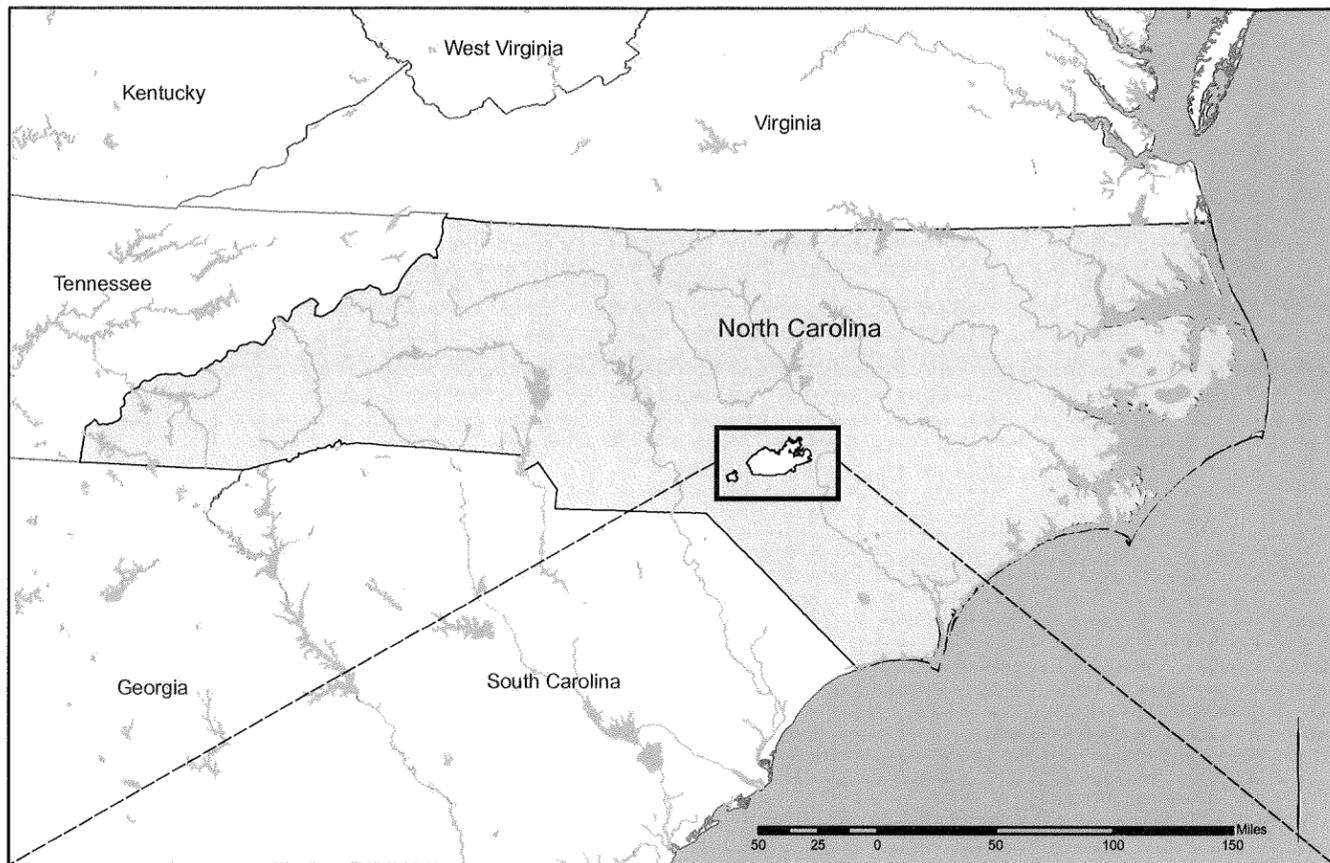
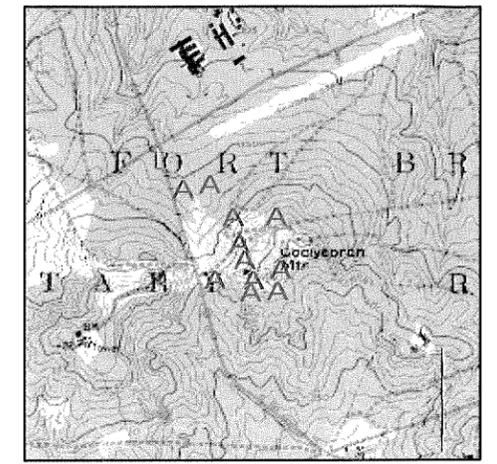
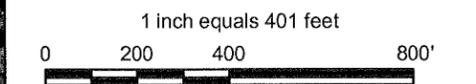


Figure 1
 Site Map -- Ft. Bragg, NC



LEGEND

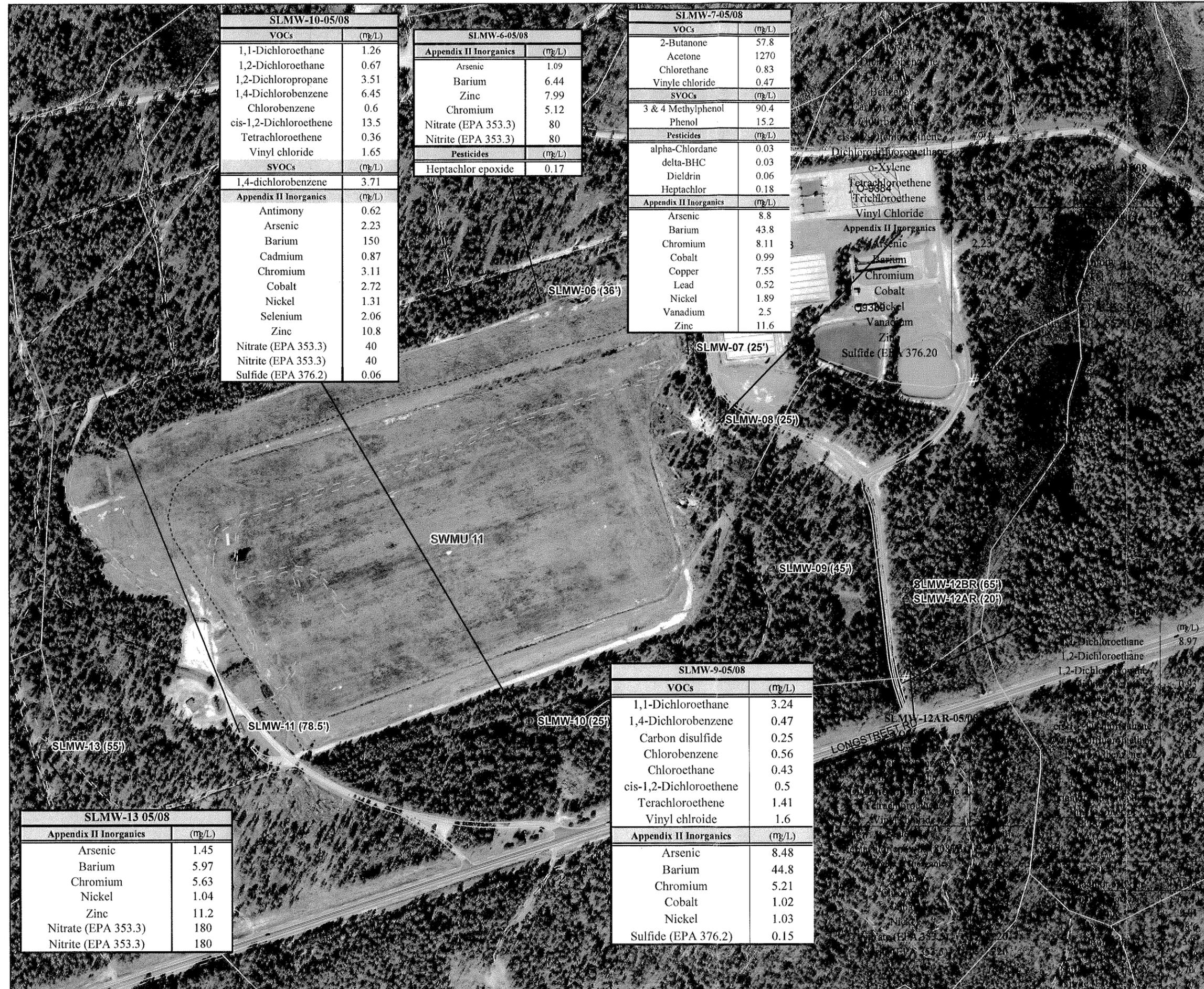
-  METHANE SAMPLE
-  MONITORING WELL
-  MONITORING WELL (REMOVED)
-  STREAM
-  PAVED ROAD
-  DIRT ROAD
-  BUILDING
-  SWMU AREA



U.S. ARMY ENGINEER DISTRICT
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SAVANNAH, GEORGIA

LAMONT ST LANDFILL, FORT BRAGG, NC

**SITE MAP
LAMONT ST LANDFILL**



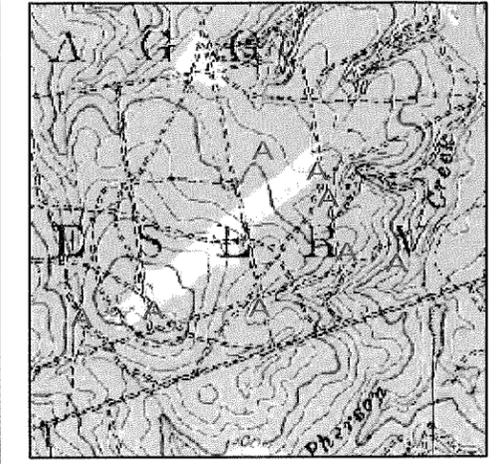
SLMW-10-05/08	
VOCs	(mg/L)
1,1-Dichloroethane	1.26
1,2-Dichloroethane	0.67
1,2-Dichloropropane	3.51
1,4-Dichlorobenzene	6.45
Chlorobenzene	0.6
cis-1,2-Dichloroethene	13.5
Tetrachloroethene	0.36
Vinyl chloride	1.65
SVOCs	(mg/L)
1,4-dichlorobenzene	3.71
Appendix II Inorganics	(mg/L)
Antimony	0.62
Arsenic	2.23
Barium	150
Cadmium	0.87
Chromium	3.11
Cobalt	2.72
Nickel	1.31
Selenium	2.06
Zinc	10.8
Nitrate (EPA 353.3)	40
Nitrite (EPA 353.3)	40
Sulfide (EPA 376.2)	0.06

SLMW-6-05/08	
Appendix II Inorganics	(mg/L)
Arsenic	1.09
Barium	6.44
Zinc	7.99
Chromium	5.12
Nitrate (EPA 353.3)	80
Nitrite (EPA 353.3)	80
Pesticides	(mg/L)
Heptachlor epoxide	0.17

SLMW-7-05/08	
VOCs	(mg/L)
2-Butanone	57.8
Acetone	1270
Chloroethane	0.83
Vinyle chloride	0.47
SVOCs	(mg/L)
3 & 4 Methylphenol	90.4
Phenol	15.2
Pesticides	(mg/L)
alpha-Chlordane	0.03
delta-BHC	0.03
Dieldrin	0.06
Heptachlor	0.18
Appendix II Inorganics	(mg/L)
Arsenic	8.8
Barium	43.8
Chromium	8.11
Cobalt	0.99
Copper	7.55
Lead	0.52
Nickel	1.89
Vanadium	2.5
Zinc	11.6

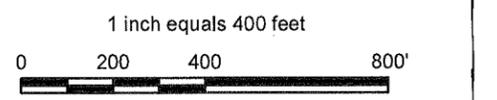
SLMW-9-05/08	
VOCs	(mg/L)
1,1-Dichloroethane	3.24
1,4-Dichlorobenzene	0.47
Carbon disulfide	0.25
Chlorobenzene	0.56
Chloroethane	0.43
cis-1,2-Dichloroethene	0.5
Tetrachloroethene	1.41
Vinyl chloride	1.6
Appendix II Inorganics	(mg/L)
Arsenic	8.48
Barium	44.8
Chromium	5.21
Cobalt	1.02
Nickel	1.03
Sulfide (EPA 376.2)	0.15

SLMW-13 05/08	
Appendix II Inorganics	(mg/L)
Arsenic	1.45
Barium	5.97
Chromium	5.63
Nickel	1.04
Zinc	11.2
Nitrate (EPA 353.3)	180
Nitrite (EPA 353.3)	180



- LEGEND**
- A MONITORING WELL
 - SURFACE-WATER SAMPLE
 - STREAM
 - PAVED ROAD
 - DIRT ROAD
 - WASH RACK AREA
 - BUILDING
 - SWMU AREA

NOTE: Only detected analytes shown. Well labels show total well depth below ground surface in parenthesis. NA - Not Available U - Target analytes were not detected above the reporting limits J - Analyte was present but concentration is an estimated value. B - Observed in Method Blank Bold - Concentrations exceed NC 2L standards. *IMAC - Interim maximum allowable concentration **PRG based on carcinogenic factor.

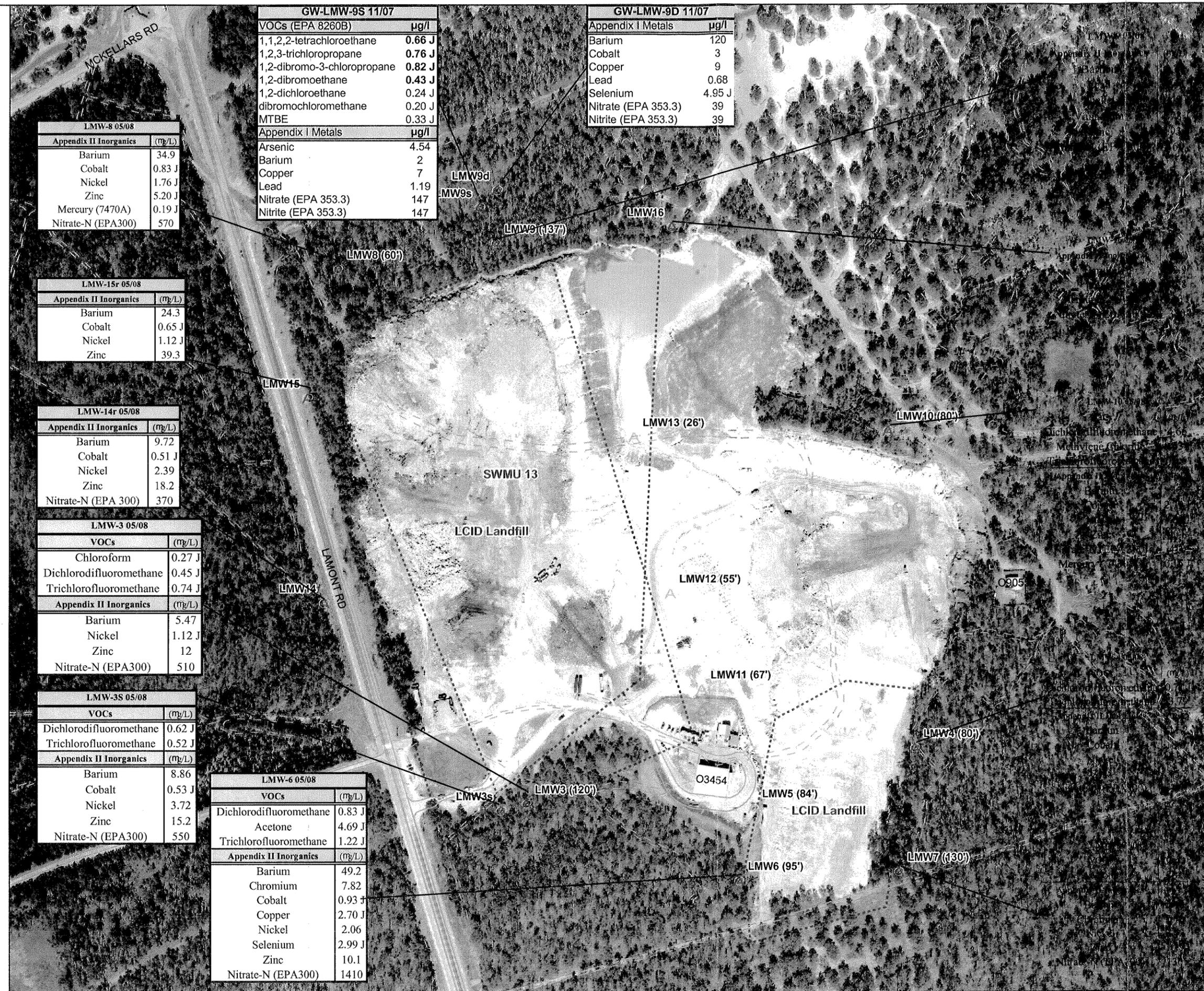


U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

LONGSTREET RD LANDFILL, FORT BRAGG, NC

**SECOND SAMPLING EVENT
FOR 2007
GROUND-WATER
ANALYTICAL RESULTS**

MAY 2008



GW-LMW-9S 11/07	
VOCs (EPA 8260B) $\mu\text{g/l}$	
1,1,2,2-tetrachloroethane	0.66 J
1,2,3-trichloropropane	0.76 J
1,2-dibromo-3-chloropropane	0.82 J
1,2-dibromoethane	0.43 J
1,2-dichloroethane	0.24 J
dibromochloromethane	0.20 J
MTBE	0.33 J
Appendix I Metals $\mu\text{g/l}$	
Arsenic	4.54
Barium	2
Copper	7
Lead	1.19
Nitrate (EPA 353.3)	147
Nitrite (EPA 353.3)	147

GW-LMW-9D 11/07	
Appendix I Metals $\mu\text{g/l}$	
Barium	120
Cobalt	3
Copper	9
Lead	0.68
Selenium	4.95 J
Nitrate (EPA 353.3)	39
Nitrite (EPA 353.3)	39

LMW-8 05/08	
Appendix II Inorganics (mg/L)	
Barium	34.9
Cobalt	0.83 J
Nickel	1.76 J
Zinc	5.20 J
Mercury (7470A)	0.19 J
Nitrate-N (EPA300)	570

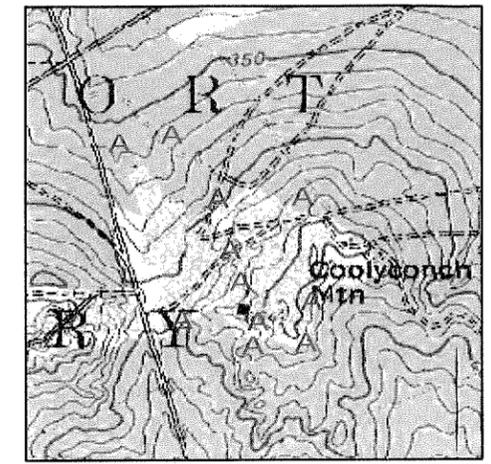
LMW-15r 05/08	
Appendix II Inorganics (mg/L)	
Barium	24.3
Cobalt	0.65 J
Nickel	1.12 J
Zinc	39.3

LMW-14r 05/08	
Appendix II Inorganics (mg/L)	
Barium	9.72
Cobalt	0.51 J
Nickel	2.39
Zinc	18.2
Nitrate-N (EPA 300)	370

LMW-3 05/08	
VOCs (mg/L)	
Chloroform	0.27 J
Dichlorodifluoromethane	0.45 J
Trichlorofluoromethane	0.74 J
Appendix II Inorganics (mg/L)	
Barium	5.47
Nickel	1.12 J
Zinc	12
Nitrate-N (EPA300)	510

LMW-3S 05/08	
VOCs (mg/L)	
Dichlorodifluoromethane	0.62 J
Trichlorofluoromethane	0.52 J
Appendix II Inorganics (mg/L)	
Barium	8.86
Cobalt	0.53 J
Nickel	3.72
Zinc	15.2
Nitrate-N (EPA300)	550

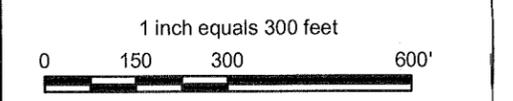
LMW-6 05/08	
VOCs (mg/L)	
Dichlorodifluoromethane	0.83 J
Acetone	4.69 J
Trichlorofluoromethane	1.22 J
Appendix II Inorganics (mg/L)	
Barium	49.2
Chromium	7.82
Cobalt	0.93 J
Copper	2.70 J
Nickel	2.06
Selenium	2.99 J
Zinc	10.1
Nitrate-N (EPA300)	1410



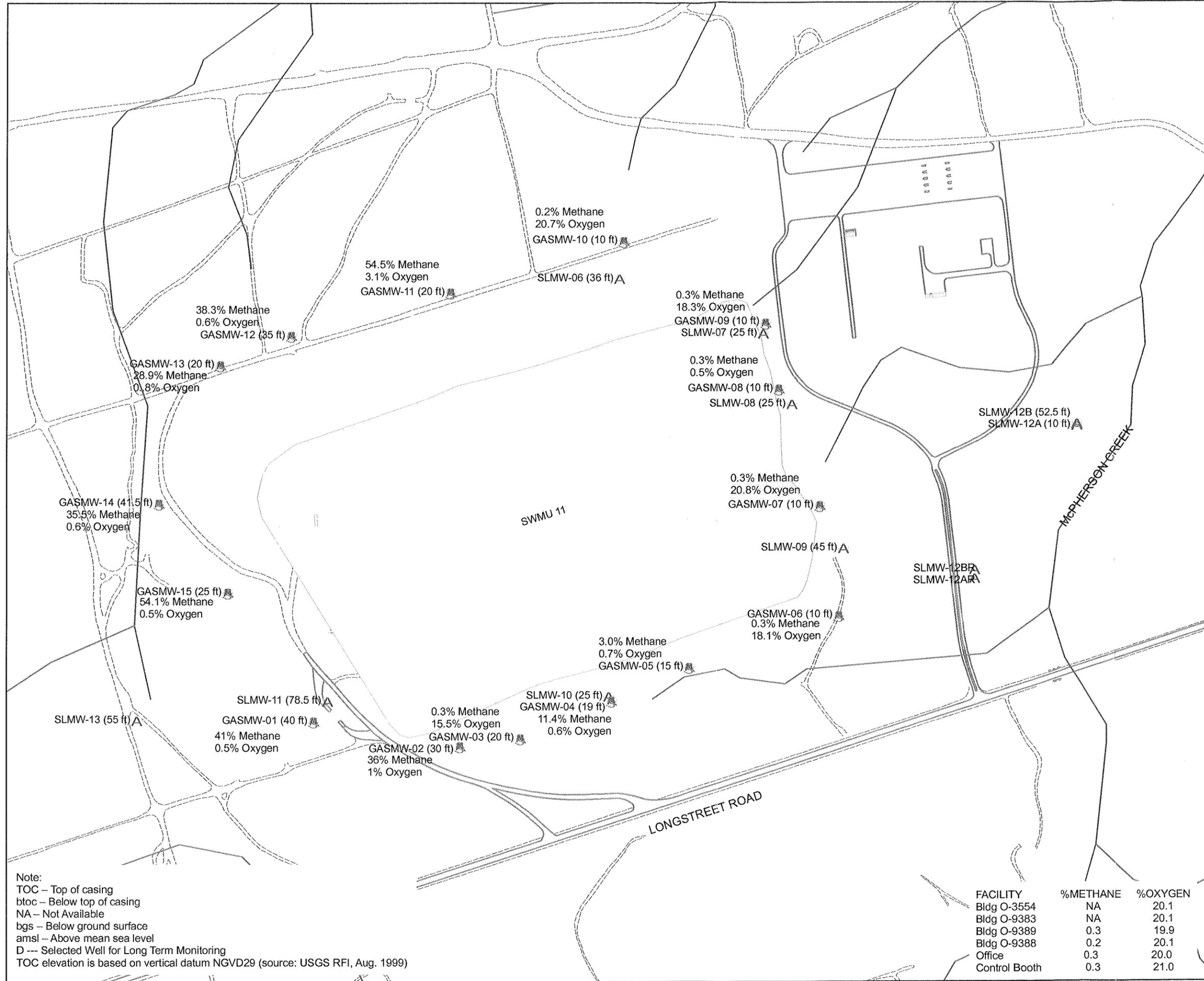
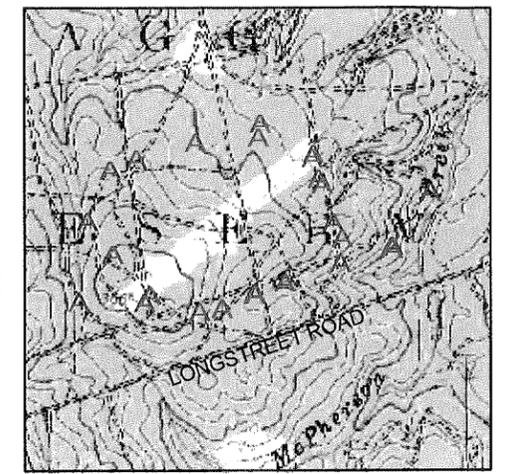
LEGEND

- A MONITORING WELL
- A MONITORING WELL (REMOVED)
- PAVED ROAD
- DIRT ROAD
- WASH RACK AREA
- BUILDING
- SWMU AREA

NOTE: Only detected analytes shown. Well labels show total well depth below ground surface in parenthesis.
 NA - Not Available
 U - Target analytes were not detected above the reporting limits
 J - Analyte was present but concentration is an estimated value.
 Bold - Concentrations exceed NC 2L standards.
 *IMAC - Interim maximum allowable concentration
 **PRG based on carcinogenic factor.

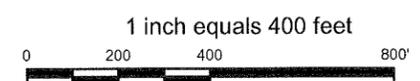



**U.S. ARMY ENGINEER DISTRICT
 CORPS OF ENGINEERS
 SAVANNAH, GEORGIA**
 LAMONT ST LANDFILL, FORT BRAGG, NC
**SECOND SAMPLING EVENT
 FOR 2007
 GROUND-WATER ANALYTICAL
 RESULTS MAP**
 MAY 2008
 DATE: OCT 2008 FIGURE 5



LEGEND

- METHANE SAMPLE
- MONITORING WELL
- STREAM
- BUILDING
- SWMU AREA
- ROAD
- TRAIL



U.S. ARMY ENGINEER DISTRICT
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SAVANNAH, GEORGIA

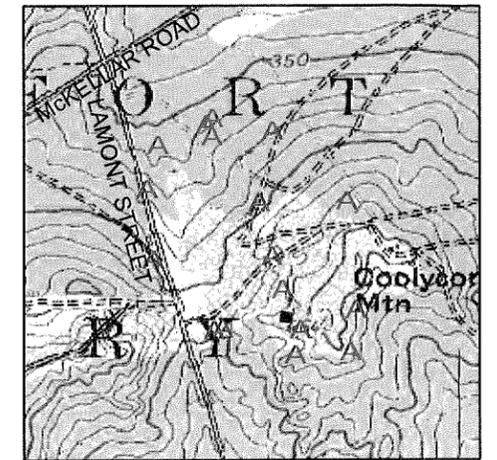
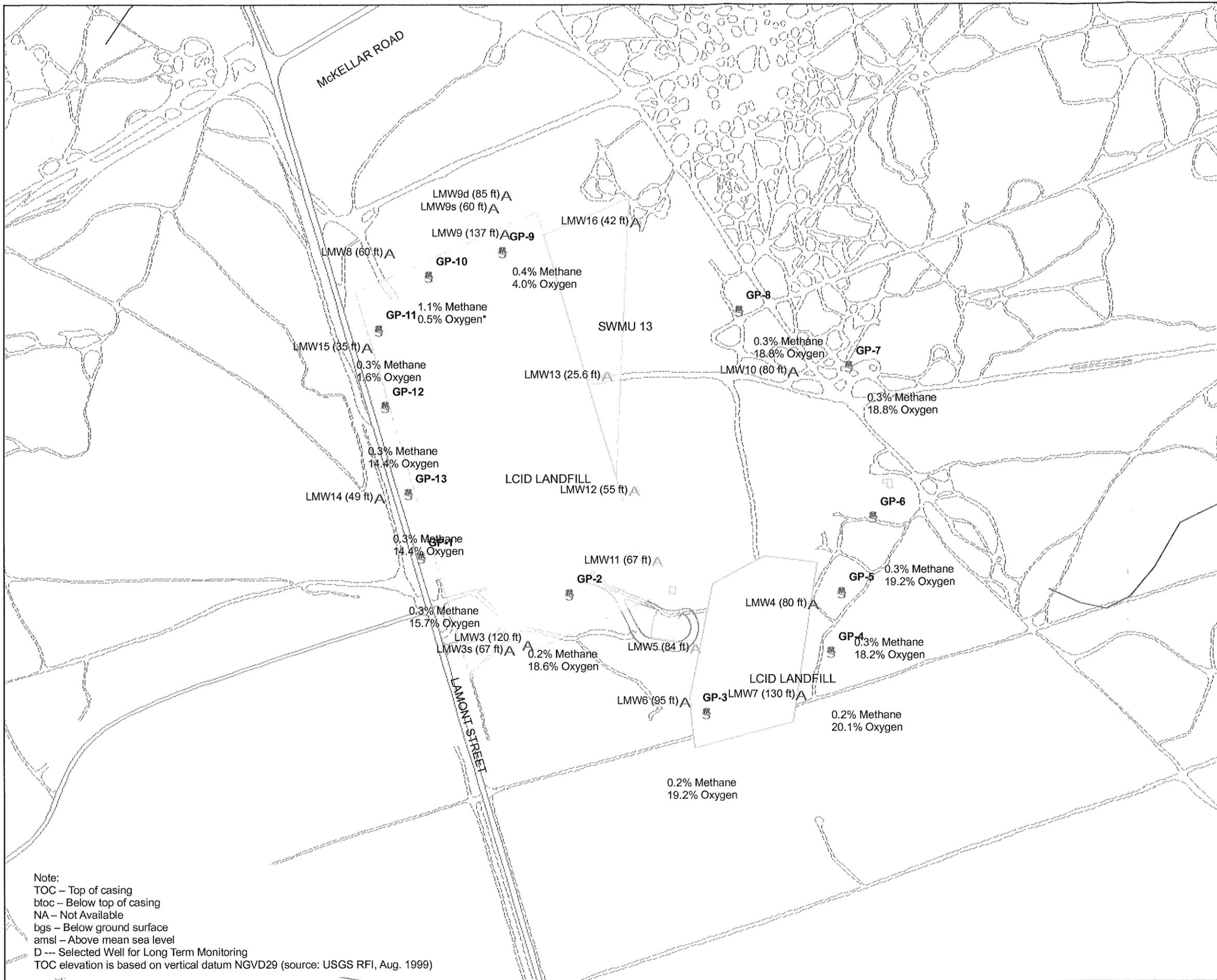
**METHANE RESULTS
FROM THE FIRST SAMPLING
EVENT FOR 2008**

**LONGSTREET LANDFILL
FT. BRAGG, NC**

DATE: OCT 2008 FIGURE 6

Note:
 TOC – Top of casing
 btoc – Below top of casing
 NA – Not Available
 bgs – Below ground surface
 amsl – Above mean sea level
 D --- Selected Well for Long Term Monitoring
 TOC elevation is based on vertical datum NGVD29 (source: USGS RFI, Aug. 1999)

FACILITY	%METHANE	%OXYGEN
Bldg O-3554	NA	20.1
Bldg O-9383	NA	20.1
Bldg O-9389	0.3	19.9
Bldg O-9388	0.2	20.1
Office	0.3	20.0
Control Booth	0.3	21.0



LEGEND

A SWMU Wells

■ Building

Cumberland County DRG

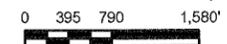
RGB

■ Red: Band_1

■ Green: Band_2

■ Blue: Band_3

1 inch equals 1,667 feet



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SAVANNAH, GEORGIA

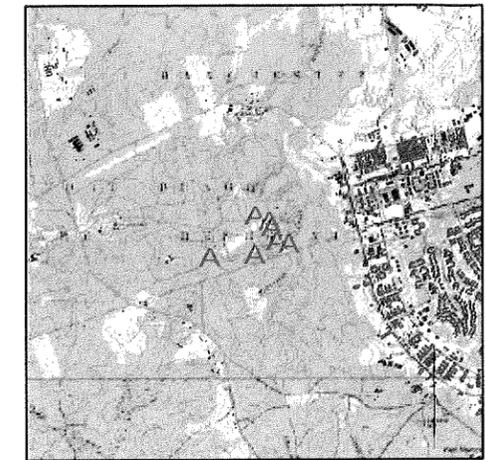
**METHANE RESULTS
FROM THE FIRST SAMPLING
EVENT FOR 2008**

**LAMONT STREET LANDFILL
FT. BRAGG, NC**

DATE: OCT 2008

FIGURE 7

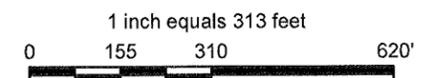
Note:
TOC – Top of casing
btoc – Below top of casing
NA – Not Available
bgs – Below ground surface
amsl – Above mean sea level
D --- Selected Well for Long Term Monitoring
TOC elevation is based on vertical datum NGVD29 (source: USGS RFI, Aug. 1999)



LEGEND

- Monitoring Wells
- Ground-Water Contour
- STREAM
- WASH RACK AREA
- SWMU AREA
- GROUND-WATER FLOW

Note: Monitoring wells used for potentiometric surface are displayed with elevations in feet above MSL in parenthesis below the label.

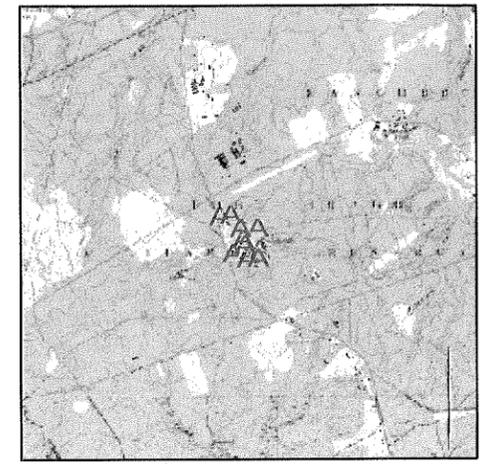
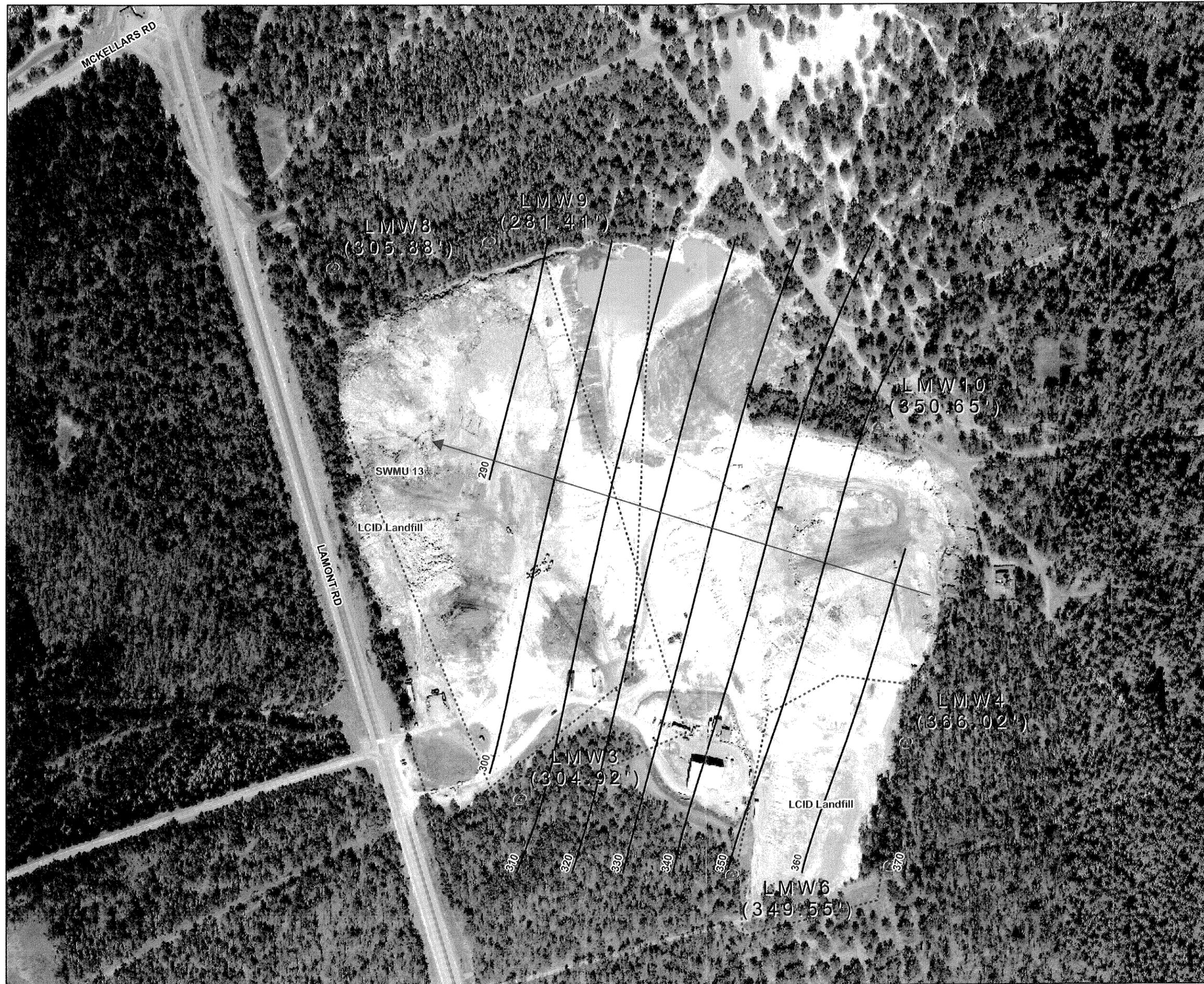


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SAVANNAH, GEORGIA

LONGSTREET RD LANDFILL, FORT BRAGG, NC

FIRST SAMPLING EVENT
FOR 2008
GROUND-WATER CONTOUR MAP

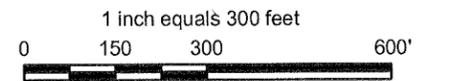
MAY 2008



LEGEND

- MONITORING WELL
- GROUND-WATER CONTOUR
- WASH RACK AREA
- SWMU AREA
- GROUND-WATER FLOW

Note: Monitoring wells used for potentiometric surface are displayed with elevations in feet above MSL in parenthesis below the label.



U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
SAVANNAH, GEORGIA

LAMONT ST LANDFILL, FORT BRAGG, NC

**FIRST SAMPLING EVENT
FOR 2008
GROUND-WATER CONTOUR MAP**

MAY 2008

Table 2. Summary of Ground-Water Detections from First Monitoring Event

COMPOUNDS (µg/L)	Groundwater NC 2L Standard (µg/l)	EPA Drinking water MCL (µg/l)	Monitoring Events					
			CW-LMW-ISR 06/07	CW-LMW-ISR 11/07	L-MW-ISR 05/08	CW-BLK 06/07	CW-BLK 11/07	Trip Blank 11/07
1,1,2,2-tetrachloroethane	0.17	NA	<2	<2	<2	<2	<2	<2
1,2,3-trichloropropane	0.005	NA	<2	<2	<2	<2	<2	<2
1,2-dibromo-3-chloropropane	0.025	0.2	<2	<2	<2	<2	<2	<2
1,2-dibromoethane	0.0004	0.05	<2	<2	<2	<2	<2	<2
1,1-dichloroethane	700	810*	<2	<2	<2	<2	<2	<2
1,2-dichloroethane	0.38	5	<2	<2	<2	<2	<2	<2
1,2-dichloropropane	0.56	5	<2	<2	<2	<2	<2	<2
1,4-dichlorobenzene	75	75	<2	<2	<2	<2	<2	<2
benzene	1	5	<2	<2	<2	<2	<2	<2
2-butanone	NA	NA	<2	<2	<2	<2	<2	<2
chlorobenzene	50	100	<2	<2	<2	<2	<2	<2
chloroethane	2800	4.6*	<2	<2	<2	<2	<2	<2
chloromethane (methyl chloride)	2.6	NA	<2	<2	<2	<2	<2	<2
chloroform	0.19	80	<2	<2	<2	<2	<2	<2
dibromochloromethane	0.41	80	<2	<2	<2	<2	<2	<2
cis-1,2-dichloroethene	70	70	<2	<2	<2	<2	<2	<2
dichlorodifluoromethane	1400	390*	<2	<2	<2	<2	<2	<2
diisopropyl ether	70	NA	<2	<2	<2	<2	<2	<2
isopropylbenzene	70	660*	<2	<2	<2	<2	<2	<2
methylene chloride (dichloromethane)	4.6	5	<2	<2	<2	<2	<2	<2
MTBE	200	13*	<2	<2	<2	<2	<2	<2
sec-butylbenzene	70	NA	<2	<2	<2	<2	<2	<2
m&p xylene	530#	10000#	<2	<2	<2	<2	<2	<2
o-xylene	530#	10000#	<2	<2	<2	<2	<2	<2
tetrachloroethene	0.7	5	<2	<2	<2	<2	<2	<2
toluene	1000	1000	<2	<2	<2	<2	<2	<2
trans-1,2-dichloroethene	70	100	<2	<2	<2	<2	<2	<2
trichloroethene	2.8	5	<2	<2	<2	<2	<2	<2
trichlorofluoromethane	2100	1300*	<2	<2	<2	<2	<2	<2
vinyl chloride	0.015	2	<2	<2	<2	<2	<2	<2
acetone	700	NA	<2	<2	<2	<2	<2	<2
acrolein	NA	NA	<2	<2	<2	<2	<2	<2
carbon disulfide	700	NA	<2	<2	<2	<2	<2	<2
SVOCs (EPA 8270C)								
1,4-dichlorobenzene (para)	1.4	75	<10	NS	NS	<10	NS	NS
4-methylphenol (p-cresol)	3.5	180*	<10	NS	NS	<10	NS	NS
diethylphthalate	5000	29000*	<10	NS	NS	<10	NS	NS
di-n-butylphthalate	700	3600*	<10	NS	NS	<10	NS	NS
bis(2-Ethylhexyl)phthalate	2.5	6	<10	NS	NS	<10	NS	NS
phenol	300	NA	<10	NS	NS	<10	NS	NS
Pesticides (EPA 8081)								
delta-BHC	NA	NA						
alpha-Chlordane*	0.1	2						
gamma-Chlordane*	0.1	2						
Aldrin	NA	NA						
Dieldrin	0.0022	NA						
Endosulfan I	NA	NA						
Heptachlor	0.0078	0.4						
PCBs (EPA 8082)								
No Detections								
Organophosphorus Pesticides (EPA 8141A)								
No Detections								
Appendix I Metals (EPA 6010B/6020A)								
Arsenic	10	10	<2	<2	<2	<2	NS	<2
Barium	2000	2000	38.5	27	24.3	<10	NS	<10
Cadmium	5	5	<1	<1	<1	<1	NS	<1
Cobalt	NA	NA	<2	<2	0.65 J	<2	NS	<2
Chromium	50	100	<20	<20	<20	<20	NS	<20
Copper	1000	1000	5.33 J	5 J	<20	<20	NS	<20
Lead	15	15	<1	<1	<1	<1	NS	<1
Nickel	100	730*	<50	<50	1.12 J	<50	NS	<50
Selenium	50	50	<2	<2	<2	<2	NS	<2
Vanadium	NA	260*	<20	<20	<20	<20	NS	<20
Zinc	2100	5000	<60	<60	39.3	<60	NS	<60
Appendix II Inorganics (EPA 6010B/6020A)								
Arsenic	10	10						
Barium	2000	2000						
Chromium	50	100						
Cobalt	NA	NA						
Copper	1000	1000						
Cadmium	5	5						
Lead	15	15						
Nickel	100	730*						
Selenium	50	50						
Silver	18	100*						
Vanadium	NA	NA						
Zinc	2100	5000						
Analyses								
Sulfide (EPA 376.1)	250,000	250,000	<200	<200	<200	<200	NS	<200
Cyanide (EPA 335.2)	154	200	<20	<20	<20	<20	NS	<20
Mercury	1.05	2	0.12 J	20	20	<0.20	NS	<0.20
Nitrate (EPA 353.3)	10,000	10,000	1,400	1620	<40	<40	NS	<40
Nitrite (EPA 353.3)	1000	1000	1,400	1620	<40	<40	NS	<40

Table 1. Field Measurements of Ground-Water Sampling
at Long Street (June 2008) and Lamont (May 2008) Landfills, Ft. Bragg, NC

Well ID	Sample Identification	pH	Specific Conductivity (µs/cm)	Temperature (°C)	Turbidity (N.T.U.)	Dissolved Oxygen (mg/L)	ORP
Longstreet							
SLMW-6	GW-SLMW-6-05-08	4.57	0.02	18.35	1.61	7.79	346
SLMW-7	GW-SLMW-7-05-08	5.60	0.23	27.8	18.1	3.84	-24
SLMW-8	GW-SLMW-8-05-08	5.97	0.55	32.15	4.76	4.78	-97
SLMW-9	GW-SLMW-9-05-08	6.22	0.51	20.60	4.34	4.13	-77
SLMW-10	GW-SLMW-10-05-08	5.86	0.53	23.18	2.32	-	-61
SLMW-11	GW-SLMW-11-05-08	N/A	N/A	N/A	N/A	N/A	N/A
SLMW-12AR	GW-SLMW-12AR-5-08	5.85	0.19	18.56	16.9	1.81	79
SLMW-12BR	GW-SLMW-12BR-5-08	4.80	0.07	21.70	16.0	1.81	79
SLMW-13	GW-SLMW-13-05-08	4.87	0.02	20.83	69.7	9.41	492
SW-1	SW-1-05-08	6.20	0.15	21.98	3.50	8.05	87
SW-2	SW-2-05-08	5.88	0.27	20.35	12.7	2.14	12

Table 1 Cont'. Field Measurements of Ground-Water Sampling
at Long Street (June 2008) and Lamont (May 2008) Landfills, Ft. Bragg, NC

Well ID	Sample Identification	pH	Specific Conductivity (µs/cm)	Temperature (°C)	Turbidity (N.T.U.)	Dissolved Oxygen (mg/L)	ORP
Lamont							
LMW-3	GW-LMW-3-05-08	5.02	0.01	17.24	4.40	7.82	332
LMW-3s	GW-LMW-3s-05-08	4.99	0.02	16.95	106*	7.06	348
LMW-4	GW-LMW-4-05-08	4.73	0.02	24.34	34.1	7.38	350
LMW-6	GW-LMW-6-05-08	4.64	0.19	27.05	8.20	2.51	300
LMW-7	GW-LMW-7-05-08	6.01	0.02	29.84	12.0	5.38	192
LMW-8	GW-LMW-8-05-08	5.68	0.25	20.64	1.57	3.44	116
LMW-9	GW-LMW-9-05-08	4.92	0.01	20.15	53.3	9.03	379
LMW-9s	GW-LMW-9s-05-08	4.43	0.14	19.06	5.28	3.61	321
LMW-9d	GW-LMW-9d-05-08	6.11	0.03	19.00	116	8.53	331
LMW-10	GW-LMW-10-05-08	4.80	0.04	18.11	7.81	8.90	350
LMW-14R	GW-LMW-14R-05-08	5.08	0.01	17.12	9.3	9.61	333
LMW-15R	GW-LMW-15R-05-08	4.66	0.03	19.75	10.0	8.80	379
LMW-16	GW-LMW-16-05-08	5.71	0.13	18.66	198	3.93	224

Note:

N.T.U. --- Nephelometric Turbidity Unit; ORP --- Oxidation Reduction Potential
#Monitoring Wells Permanently Abandoned

*High turbidity has been a continuing problem with this well.

**Table 3. Methane Monitoring Results
Longstreet and Lamont Landfills, Ft. Bragg, NC**

Well ID	Date Sampled	Time Sampled	%Methane by Volume	%Oxygen	% CO ₂
Longstreet					
Gas-MW-1	June 2008	1702	41.0	0.5	38.0
Gas-MW-2	June 2008	1652	36.0	1.0	29.7
Gas-MW-3	June 2008	1637	0.3	15.5	5.3
Gas-MW-4	June 2008	1625	11.4	0.6	20.8
Gas-MW-5	June 2008	1630	3.0	0.7	15.1
Gas-MW-6	June 2008	1653	0.3	18.1	2.7
Gas-MW-7	June 2008	1647	.03	20.8	0.0
Gas-MW-8	June 2008	1640	0.3	0.5	39.0
Gas-MW-9	June 2008	1736	0.3	18.3	2.0
Gas-MW-10	June 2008	1731	.02	20.7	.02
Gas-MW-11	June 2008	1727	54.5	3.1	13.7
Gas-MW-12	June 2008	1724	38.3	0.6	35.8
Gas-MW-13	June 2008	1718	28.9	0.8	30.2
Gas-MW-14	June 2008	1710	35.5	0.6	33.3
Gas-MW-15	June 2008	1706	54.1	0.5	40.9
Bldg O-3554	June 2008	NA	NA	NA	NA
Bldg O-9383	June 2008	NA	NA	NA	NA
Bldg O-9389	June 2008	1751	0.3	20.9	0.0
Bldg O-9388	June 2008	1750	0.2	21.0	0.0
Office	June 2008	1743	0.3	20.9	0.0
Control Booth	June 2008	1747	0.3	21.0	0.0
Lamont					
Gas-MW-1	June 2008	1507	0.3	15.7	3.1
Gas-MW-2	June 2008	1451	0.2	18.6	0.0
Gas-MW-3	June 2008	1454	0.2	19.2	1.2
Gas-MW-4	June 2008	1615	0.2	20.1	1.0
Gas-MW-5	June 2008	16.11	0.3	18.2	1.5
Gas-MW-6	June 2008	1607	0.3	19.2	1.3
Gas-MW-7	June 2008	1603	0.3	18.8	1.3
Gas-MW-8	June 2008	1600	0.3	18.8	1.2
Gas-MW-9	June 2008	1555	0.4	4.0	15.1
Gas-MW-10	June 2008	1552	1.1	0.5	21.5
Gas-MW-11	June 2008	1545	0.3	1.6	19.0
Gas-MW-12	June 2008	1543	0.3	14.4	3.1
Gas-MW-13	June 2008	1543	0.3	14.4	3.1

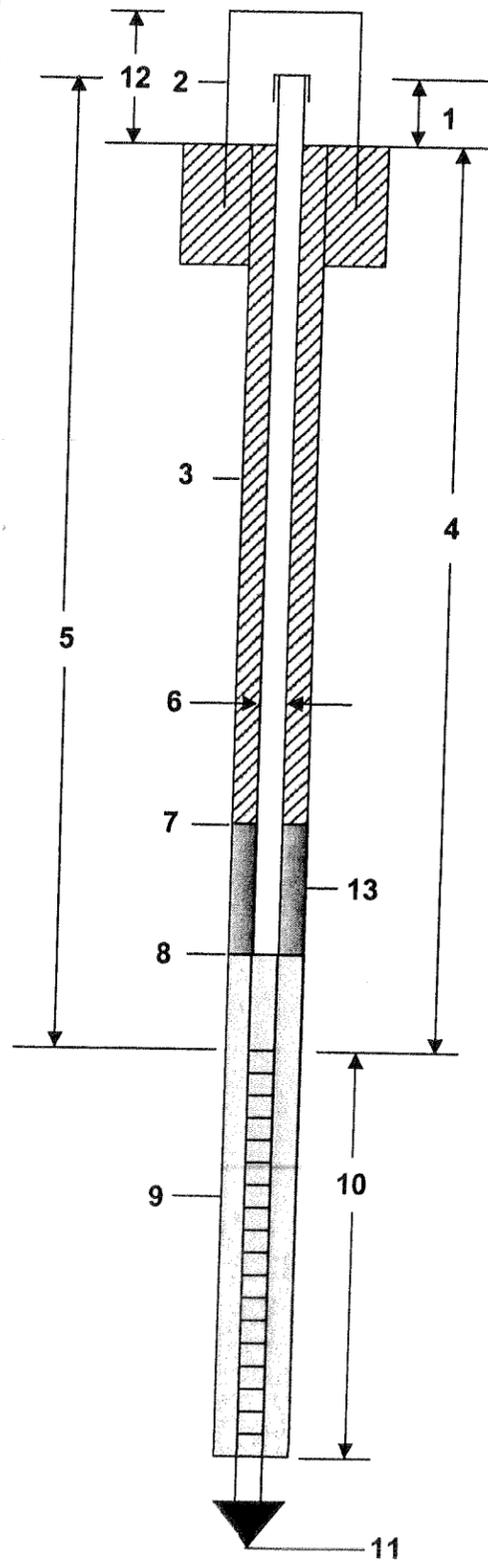
Note:

TOC – Top of casing, btoc – Below top of casing, NA – Not Available
bgs – Below ground surface, amsl – Above mean sea level
Δ --- Selected Well for Long Term Monitoring
TOC elevation is based on vertical datum NGVD29 (source: USGS RFI, Aug. 1999)
*Not accessible.

DIRECT-PUSH WELLPOINT COMPLETION LOG

HOLE NO:
SLMW-11R

SHEET 1
OF 1 SHEETS



1. COMPANY NAME	U.S. ARMY CORPS OF ENGINEERS
2. DRILLING CONTRACTOR	SAVANNAH DISTRICT, U.S. ARMY CORPS OF ENGINEERS
3. PROJECT	Longstreet Landfill
4. LOCATION	Fort Bragg, North Carolina
5. NAME OF DRILLER/INSPECTOR	J. Howley/T. Tapley
6. COORDINATES:	NORTHING (Y): 506218.37 EASTING (X): 1983726.35
7. ELEVATION	(TOP OF CASING): 354.61 (GROUND SURFACE): 358.18
8. INSTALLATION DATE:	13 July 2008

WELLPOINT CONSTRUCTION DETAILS

1 - HEIGHT OF CASING ABOVE GROUND:	3.57'
2 - TYPE OF WELLPOINT PROTECTION:	Stand Up Cover
3 - GROUT MIXTURE:	Portland-Bentonite
METHOD OF PLACEMENT:	Tremied
4 - DEPTH TO TOP OF SCREEN:	72.9' bgs
5 - TOTAL LENGTH OF RISER:	76.5' TOC
6 - DIAMETER OF WELLPOINT:	2.00"
7 - DEPTH TO TOP OF SEAL:	68.3' bgs
8 - DEPTH TO TOP OF FILTER PACK:	70.3' bgs
9 - TYPE OF FILTER PACK:	PRE-PACK PVC AND STAINLESS STEEL GEOPROBE SCREEN
SIZE:	40/70 SILICA SAND IN SCREEN
10 - LENGTH OF SCREEN:	10.0'
11 - TOTAL DEPTH OF WELLPOINT:	87.0' TOC
12 - CASING DEPTH BELOW SURFACE:	N/A
13 - TYPE OF SEAL:	1/4" BENTONITE PELLETS
QUANTITY USED:	10.0 Lbs.

COMMENTS/LOCATION SKETCH

Water Level Below Top of Casing: **80.41'** 08/05/2008
Water Level During Drilling: **78.5'**

Note: Original measurements showed the bottom of the monitoring well to be 86.7' (TOC). Due to several of the riser sections being more than 5 foot the measured depth shows the monitoring well to be 87.0' (TOC). Additionally, the original monitoring well was left for further study in non-drought conditions.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
 DATE: 5/20/08 TIME: 1040
 SAMPLED BY: Jon Coombs
 WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-3-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
 ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
 # OF CONTAINERS: 6
 SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
 SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**
 MEASURING POINT: Top of casing Other:
 METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd):	122.90 (ft)	Diameter (d):	2.00 (in)	
Depth to Water (dw):	103.40 (ft)	Diameter (d):	0.167 (ft)	
Well Volume = (5.904 × d ² (wd-dw)) =			3.2 (gallons)	
Flow Rate :	500 (ml/min)	Purge vol:	N/A (gallons)	
Length of Time Purged:	40 (minutes)	Purge time:	1000	
Amount Purged=	5.3 (gallons)			

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter –Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature – Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter – Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter – Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter – Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ – Hach Digital Titrator	<input type="checkbox"/>

Time	1020	1025	1030	1035	1040
pH	4.98	5.04	5.05	5.05	5.02
Sp. Cond	0.01	0.01	0.01	0.01	0.01
Temp. °C	17.21	17.26	17.27	17.16	17.24
Turbidity	7.73	5.99	4.16	4.23	4.40
DO	8.34	8.00	7.79	7.73	7.82
ORP	326	327	325	330	332

5. **COMMENTS:** Dup taken, LMW-Dup-5-08: 0945
 N₂ Cylinder used.



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/20/08 TIME: 1135
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-3s-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice

ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260

OF CONTAINERS: 12

SAMPLING METHOD: Peristaltic Pump

Bladder Pump

LOW FLOW: YES NO

SAMPLES FILTERED: YES NO

DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:

METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 67.00 (ft) Diameter (d): 2.00 (in)

Depth to Water (dw): 60.22 (ft) Diameter (d): 0.167 (ft)

Well Volume = $(5.904 \times d^2 \times (wd-dw)) =$ 1.1 (gallons)

Flow Rate: 500 (ml/min) Purge vol: N/A (gallons)

Length of Time Purged: 35 (minutes) Purge time: 1100

Amount Purged = 4.6 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1110	1115	1123	1130	1135
pH	4.84	4.94	4.98	4.98	4.99
Sp. Cond	0.02	0.02	0.02	0.02	0.02
Temp. °C	17.08	16.98	16.90	16.93	16.95
Turbidity	122	865	449	256	106
DO	6.76	6.64	6.95	7.12	7.06
ORP	350	336	337	343	348

5. COMMENTS: MS/MSD taken. Well has history of turbidity problems.



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/20/08 TIME: 1350
 SAMPLED BY: Jon Coombs
 WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill	Sample ID: GW-LMW-4-05-08
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PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
 ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
 # OF CONTAINERS: 6
 SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
 SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
 METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd):	82.37 (ft)	Diameter (d):	2.00 (in)	
Depth to Water (dw):	75.77 (ft)	Diameter (d):	0.167 (ft)	
Well Volume = (5.904 × d ² (wd-dw)) =			1.1 (gallons)	
Flow Rate :	500 (ml/min)	Purge vol:	N/A (gallons)	
Length of Time Purged:	35 (minutes)	Purge time:	1315	
Amount Purged=	4.6 (gallons)			

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter -Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1330	1340	1345	1350		
pH	4.79	4.71	4.73	4.73		
Sp. Cond	0.02	0.02	0.02	0.02		
Temp. °C	22.23	23.12	23.90	24.34		
Turbidity	67.3	36.6	33.6	34.1		
DO	7.80	7.39	7.47	7.38		
ORP	351	350	351	350		

5. **COMMENTS:** N₂ cylinder used.



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/05/08 TIME: 1130
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-6-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 94.45 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 81.90 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 2.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 35 (minutes) Purge time: 1055
Amount Purged = 4.6 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1105	1110	1115	1120	1125	1130
pH	4.27	4.35	4.33	4.38	4.64	4.64
Sp. Cond	0.17	0.17	0.18	0.18	0.19	0.19
Temp. °C	28.41	27.10	26.09	26.64	27.07	27.05
Turbidity	39.6	25.0	19.8	14.2	9.88	8.20
DO	1.15	1.01	1.26	1.35	2.56	2.51
ORP	305	307	310	308	299	300

5. COMMENTS: N₂ cylinder used.



**U.S. ARMY CORPS OF ENGINEERS
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GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
 DATE: 6/07/08 TIME: 1055
 SAMPLED BY: Jon Coombs
 WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-7-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
 ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
 # OF CONTAINERS: 6
 SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
 SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
 METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 130.06 (ft) Diameter (d): 2.00 (in)
 Depth to Water (dw): 126.00 (ft) Diameter (d): 0.167 (ft)
 Well Volume = (5.904 × d² (wd-dw)) = 0.7 (gallons)
 Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
 Length of Time Purged: 37 (minutes) Purge time: 1018
 Amount Purged= 4.9 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter -Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1040	1045	1050	1055		
pH	6.08	6.00	5.99	6.01		
Sp. Cond	0.02	0.02	0.02	0.02		
Temp. °C	27.67	28.08	28.57	29.84		
Turbidity	31.9	25.0	22.5	12.0		
DO	5.62	5.49	5.40	5.38		
ORP	202	199	195	192		

5. COMMENTS: N₂ cylinder used.



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/20/08 TIME: 1655
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-8-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 69.21 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 48.19 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 3.4 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 55 (minutes) Purge time: 1600
Amount Purged= 7.3 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1610	1620	1630	1640	1650
pH	5.80	5.75	5.70	5.67	5.68
Sp. Cond	0.27	0.26	0.25	0.25	0.25
Temp. °C	21.40	21.10	21.14	20.83	20.64
Turbidity	5.93	3.52	1.93	1.57	1.57
DO	3.51	3.54	3.63	3.50	3.44
ORP	113	116	117	117	116

5. COMMENTS: None



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/20/08 TIME: 1535
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-9-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 137.90 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 83.38 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 8.9 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 70 (minutes) Purge time: 1425
Amount Purged= 9.2 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter -Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1440	1450	1500	1510	1520	1530
pH	4.96	5.01	4.95	4.92	4.92	4.92
Sp. Cond	0.01	0.01	0.01	0.01	0.01	0.01
Temp. °C	20.28	21.00	20.26	20.40	20.00	20.15
Turbidity	81.5	82.4	73.7	72.6	58.4	53.3
DO	9.80	9.85	9.64	8.98	9.08	9.03
ORP	363	358	367	373	376	379

5. COMMENTS: N₂ cylinder used.



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/21/08 TIME: 0920
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-9d-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 85.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 78.05 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 1.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 30 (minutes) Purge time: 850
Amount Purged= 4.0 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter -Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0830	0840	0845	0850		
pH	6.46	6.27	6.17	6.11		
Sp. Cond	0.04	0.03	0.03	0.03		
Temp. °C	18.92	18.98	19.01	19.00		
Turbidity	138	140	128	116		
DO	8.53	8.33	8.53	8.53		
ORP	304	317	325	331		

5. COMMENTS: Very difficult access, very hard on vehicles. N₂ cylinder used.



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/21/08 TIME: 1035
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-9s-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 60.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 53.23 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 1.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 27 (minutes) Purge time: 1008
Amount Purged= 3.6 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1020	1030	1035			
pH	4.39	4.41	4.43			
Sp. Cond	0.14	0.14	0.14			
Temp. °C	18.98	19.01	19.06			
Turbidity	20.8	6.73	5.28			
DO	3.93	3.61	3.61			
ORP	327	319	321			

5. COMMENTS: Dup taken, LMW-Dup2-5-08: 1045.

Very difficult access. Very hard on vehicles.



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/21/08 TIME: 1300
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-10-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 82.75 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 78.03 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 0.8 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 26 (minutes) Purge time: 1237
Amount Purged= 3.4 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1245	1250	1255	1300
pH	4.78	4.78	4.78	4.80
Sp. Cond	0.04	0.04	0.04	0.04
Temp. °C	18.70	18.46	17.99	18.11
Turbidity	65.2	25.9	13.8	7.81
DO	9.87	9.59	9.17	8.90
ORP	342	342	348	350

5. **COMMENTS:** Entrance drive has become severely eroded and dangerous. There is a potential hazard of vehicle rollover. Any further erosion will render this well inaccessible to the sample vehicle. N₂ cylinder used.



**U.S. ARMY CORPS OF ENGINEERS
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GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/21/08 TIME: 1503
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-14r-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 54.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 50.81 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 0.5 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 28 (minutes) Purge time: 1435
Amount Purged= 3.7 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1440	1445	1450	1455	1500	1503
pH	5.15	5.07	5.12	5.08	5.09	5.08
Sp. Cond	0.01	0.01	0.01	0.01	0.01	0.01
Temp. °C	18.04	17.46	17.37	17.31	17.21	17.12
Turbidity	80.6	68.1	74.3	26.4	12.2	9.3
DO	10.11	9.88	9.74	9.81	9.61	9.61
ORP	306	315	310	323	332	333

5. COMMENTS: None



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/21/08 TIME: 1555
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-15r-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 46.55 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 39.91 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 1.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 32 (minutes) Purge time: 1523
Amount Purged= 4.2 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter -Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1530	1535	1540	1545	1550	1555
pH	4.54	4.59	4.63	4.64	4.65	4.66
Sp. Cond	0.03	0.03	0.03	0.03	0.03	0.03
Temp. °C	20.13	19.65	19.51	19.86	19.64	19.75
Turbidity	90.8	50.8	26.0	18.5	13.7	10.0
DO	9.00	8.94	8.91	8.82	8.86	8.80
ORP	393	384	382	380	379	379

5. COMMENTS: Blank taken, GW-LMW-Blank: 1600, 5/22/08



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 5/21/08 TIME: 1355
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Lamont Landfill Sample ID: GW-LMW-16-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, Ice
ANALYSES REQUESTED: Nitrate (1 unpreserved, 1 preserved), Appendix I Metals, VOC 8260
OF CONTAINERS: 6
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 42.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 36.90 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 0.8 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 25 (minutes) Purge time: 1330
Amount Purged= 3.3 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter –Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature – Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter – Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter – Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter – Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ – Hach Digital Titrator	<input type="checkbox"/>

Time	1335	1340	1345	1350	1355
pH	4.97	5.11	5.37	5.65	5.71
Sp. Cond	0.11	0.11	0.12	0.13	0.13
Temp. °C	18.28	18.54	18.47	18.49	18.66
Turbidity	81.4	176	87.2	70.9	198
DO	5.21	4.57	4.05	3.95	3.93
ORP	292	281	249	233	224

5. COMMENTS: None



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/09/08 TIME: 1640
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: GW-SLMW-6-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 14

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 37.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 27.01 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 1.6 (gallons)
Flow Rate: 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 37 (minutes) Purge time: 1603
Amount Purged = 4.9 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1615	1625	1635	1640
pH	3.55	3.69	4.52	4.57
Sp. Cond	0.02	0.02	0.02	0.02
Temp. °C	18.50	18.41	18.49	18.35
Turbidity	2.33	2.70	2.41	1.61
DO	8.03	7.95	7.75	7.79
ORP	374	370	343	346

5. COMMENTS: None



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/05/08 – 6/06/08 TIME: 1335, 6/05/08: 0825, 6/06/08
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: GW-SLMW-7-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 14

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 23.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 19.68 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 0.5 (gallons)
Flow Rate: N/A (ml/min) Purge vol: 1.50 (gallons)
Length of Time Purged: 25 (minutes) Purge time: 1310
Amount Purged = 2.0 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter – Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature – Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter – Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter – Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter – Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ – Hach Digital Titrator	<input type="checkbox"/>

Time	1325	1330	1335			
pH	5.60	5.59	5.60			
Sp. Cond	0.23	0.23	0.23			
Temp. °C	27.76	28.08	27.80			
Turbidity	13.1	13.8	18.1			
DO	4.07	3.96	3.84			
ORP	-13	-19	-24			

5. **COMMENTS:** Containers for all required samples not yet on hand at sample time on 6/05/08. Sampled App II metals, 8260, 8270, 8081, 8082, Nitrate. Sampled remaining analytes (8141, Sulfide, Cyanide) 0825, 6/06/08



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/05/08 TIME: 1510, 6/05: 0855, 6/06
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: GW-SLMW-8-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 14

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump
LOW FLOW: YES NO
SAMPLES FILTERED: YES NO
DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 27.43 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 25.77 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 0.3 (gallons)
Flow Rate: N/A (ml/min) Purge vol: 0.90 (gallons)
Length of Time Purged: 20 (minutes) Purge time: 1450
Amount Purged = 3.0 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1500	1505	1510			
pH	5.47	5.97	5.97			
Sp. Cond	0.55	0.55	0.55			
Temp. °C	27.43	30.18	32.15			
Turbidity	5.60	5.07	4.76			
DO	5.58	5.07	4.78			
ORP	-54	-92	-97			

5. **COMMENTS:** Took VOC's and App II metals before well went to dryness on 6/05. Sampled for all remaining analytes 0855, 6/06. (8141, 8081, 8082, 8270, Nitrate, Sulfide, Cyanide).



**U.S. ARMY CORPS OF ENGINEERS
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GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/06/08 TIME: 1100
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: GW-SLMW-9-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 14

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 45.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 38.52 (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = 1.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 30 (minutes) Purge time: 1030
Amount Purged= 4.0 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter --Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature -- Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter -- Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter -- Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter -- Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ -- Hach Digital Titrator	<input type="checkbox"/>

Time	1040	1045	1055	1100
pH	5.73	6.12	6.23	6.22
Sp. Cond	0.50	0.50	0.51	0.51
Temp. °C	20.25	20.60	20.48	20.60
Turbidity	23.8	52.2	5.60	4.34
DO	1.01	3.07	4.15	4.13
ORP	-82	-86	-78	-77

5. **COMMENTS:** Dup taken, SLMW-Dup: 0800

Increased growth of foliage has made this well even more difficult to access than on previous sample events. Getting to the well is very hard on vehicles.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

**GROUND WATER
FIELD DATA LOG**

1. CLIENT: Ft Bragg, NC
DATE: 6/09/08 TIME: 1425
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: GW-SLMW-10-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 14

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. WATER LEVEL DATA

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. WELL EVACUATION DATA

Well Depth (wd): 25.00 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 19.80 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 0.9 (gallons)
Flow Rate: N/A (ml/min) Purge vol: 2.70 (gallons)
Length of Time Purged: 20 (minutes) Purge time: 1405
Amount Purged = 3.0 (gallons)

4. FIELD PARAMETERS

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1410	1420	1425			
pH	5.41	5.88	5.86			
Sp. Cond	0.51	0.53	0.53			
Temp. °C	20.73	23.45	23.18			
Turbidity	3.96	7.24	2.32			
DO	19.22	19.99	-			
ORP	-23	-60	-61			

5. COMMENTS: Replaced "AAA" batteries in sonde. DO reading failed.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/10/08 TIME: 1025
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: GW-SLMW-11-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 0

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): N/A (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): N/A (ft) Diameter (d): 0.167 (ft)
Well Volume = (5.904 × d² (wd-dw)) = N/A (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: N/A (minutes) Purge time: 1025
Amount Purged= N/A (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter –Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature – Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter – Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter – Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter – Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ – Hach Digital Titrator	<input type="checkbox"/>

Time	N/A					
pH	N/A					
Sp. Cond	N/A					
Temp. °C	N/A					
Turbidity	N/A					
DO	N/A					
ORP	N/A					

5. **COMMENTS:** Made two attempts to sample this well. Was unable to bring any water out of well on first attempt. On second attempt, after 30 min., sonde was less than half full and flow rate was insufficient for purging or sampling. N₂ cylinder used.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/09/08 TIME: 1035
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill	Sample ID: GW-SLMW-12AR-5-08
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PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)
OF CONTAINERS: 14
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 20.12 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 6.61 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 2.2 (gallons)
Flow Rate: 500 (ml/min) Purge vol: _____ (gallons)
Length of Time Purged: 22 (minutes) Purge time: 1244
Amount Purged = 2.9 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	1010	1020	1025	1030	1035	
pH	5.47	5.74	5.80	5.81	5.85	
Sp. Cond	0.17	0.18	0.19	0.19	0.19	
Temp. °C	18.51	18.48	18.48	18.52	18.56	
Turbidity	69.3	42.5	28.6	21.9	16.9	
DO	2.51	2.17	1.97	1.88	1.81	
ORP	101	85	80	79	79	

5. COMMENTS: None



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/09/08 TIME: 0915
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill	Sample ID: GW-SLMW-12BR-5-08
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PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)
OF CONTAINERS: 30
SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 20.12 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 9.08 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 1.8 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 40 (minutes) Purge time: 955
Amount Purged= 5.3 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0835	0845	0855	0905	0915
pH	4.51	4.66	4.73	4.77	4.80
Sp. Cond	0.07	0.07	0.07	0.07	0.07
Temp. °C	19.33	19.31	20.72	22.16	21.70
Turbidity	17.9	20.8	16.4	15.4	16.0
DO	2.51	2.17	1.97	1.88	1.81
ORP	101	85	80	79	79

5. COMMENTS: None



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/10/08 TIME: 0840
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: GW-SLMW-13-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 14

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): 59.45 (ft) Diameter (d): 2.00 (in)
Depth to Water (dw): 58.90 (ft) Diameter (d): 0.167 (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ 0.1 (gallons)
Flow Rate : 500 (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: 30 (minutes) Purge time: 810
Amount Purged= 4.0 (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0815	0825	0830	0835
pH	4.77	4.77	4.85	4.87
Sp. Cond	0.02	0.02	0.02	0.02
Temp. °C	20.39	20.57	20.72	20.83
Turbidity	122	114	94.3	69.7
DO	9.67	9.33	9.35	9.41
ORP	556	523	507	492

5. **COMMENTS:** Well became very slow during sampling. Took approx. 1.5 hr to take all samples. Water level is 5.5' below level during 11/07 sample event.



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/11/08 TIME: 0900
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: SW-1-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 14

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): N/A (ft) Diameter (d): N/A (in)
Depth to Water (dw): N/A (ft) Diameter (d): N/A (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ N/A (gallons)
Flow Rate: N/A (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: N/A (minutes) Purge time: N/A
Amount Purged = N/A (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0900					
pH	6.20					
Sp. Cond	0.15					
Temp. °C	21.98					
Turbidity	3.50					
DO	8.05					
ORP	87					

5. COMMENTS: Surface water



**U.S. ARMY CORPS OF ENGINEERS
SAVANNAH DISTRICT
GEOLOGY and HYDROGEOLOGY**

GROUND WATER
FIELD DATA LOG

1. CLIENT: Ft Bragg, NC
DATE: 6/11/08 TIME: 0815
SAMPLED BY: Jon Coombs
WEATHER CONDITIONS: PC to sunny. 95-100+F.

Location: Longstreet Landfill Sample ID: SW-2-05-08

PRESERVATIVE: HCl, HNO₃, H₂SO₄, NaOH, NaOH/ZnAc, Ice
ANALYSES REQUESTED: SVOC 8270, Pesticide 8081, PCB 8082, Organophosphorus 8141, VOC 8260, App II Metals, Cyanide, Sulfide, Nitrate (Preserved and unpreserved)

OF CONTAINERS: 14

SAMPLING METHOD: Peristaltic Pump
 Bladder Pump LOW FLOW: YES NO
SAMPLES FILTERED: YES NO DUPLICATE SAMPLE: YES NO

2. **WATER LEVEL DATA**

MEASURING POINT: Top of casing Other:
METHOD OF MEASUREMENT: Water Level Indicator

3. **WELL EVACUATION DATA**

Well Depth (wd): N/A (ft) Diameter (d): N/A (in)
Depth to Water (dw): N/A (ft) Diameter (d): N/A (ft)
Well Volume = $(5.904 \times d^2 (wd-dw)) =$ N/A (gallons)
Flow Rate: N/A (ml/min) Purge vol: N/A (gallons)
Length of Time Purged: N/A (minutes) Purge time: N/A
Amount Purged = N/A (gallons)

4. **FIELD PARAMETERS**

INSTRUMENT	CALIBRATED
pH Meter - Horiba U-22	<input checked="" type="checkbox"/>
Conductivity Meter - Horiba U-22	<input checked="" type="checkbox"/>
Temperature - Horiba U-22	<input checked="" type="checkbox"/>
Turbidity Meter - Hach 2100 P	<input checked="" type="checkbox"/>
DO Meter - Horiba U-22	<input checked="" type="checkbox"/>
ORP Meter - Horiba U-22	<input checked="" type="checkbox"/>
CO ₂ - Hach Digital Titrator	<input type="checkbox"/>

Time	0815					
pH	5.88					
Sp. Cond	0.27					
Temp. °C	20.35					
Turbidity	12.7					
DO	2.14					
ORP	12					

5. COMMENTS: Surface water. Blank taken, SLMW-Blank: 0830

CVAA Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in any of the laboratory blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the required QC limits. No qualification of the data was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the required QC limits. No qualification of the data was required.

VI. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the required QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the required QC limits. No qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

ICP-MS Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the required QC limits. No qualification of the data was required.

V. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the required QC limits. No qualification of the data was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the required QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the required QC limits. No qualification of the data was required.

VIII. ICP Serial Dilution

The serial dilution of samples quantitated by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) determines whether or not significant physical or chemical interferences exist due to sample matrix. The serial dilution results were all within the required QC limits. No qualification of the data was required.

IX. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

Wet Chemistry Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the method blank associated with this sample with the following exceptions. There was Nitrate reported in the method blank. Any positive results in the associated field samples less than ten times the blank concentration should be considered non-detect UJ. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the required QC limits with the following exceptions. The Sulfide recovery was greater than the required QC limits. This may indicate a matrix effect and a high bias to the data. Since no positive results were reported in the associated field samples, no qualification of the data was required.

V. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the required QC limits. No qualification of the data was required.

VI. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

GC/MS Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that instrument sensitivity and response are stable during each analysis. The IS were all within the required QC limits. No qualification of the data was required.

V. Surrogate Compounds

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits with the following exception. Sample SW-2-5-08 was reanalyzed for SVOCs due to a surrogate failure in the original analysis. The second analysis was acceptable so the results of the original SVOC analysis should be not be used. No qualification of the results was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the required QC. No qualification of the data was required.

VII. Laboratory Control Samples

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the required QC limits with the following exceptions. The recoveries for

Hexachlorocyclopentadiene were less than the required QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ. No further qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

GC Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that instrument sensitivity and response are stable during each analysis. The IS were all within the required QC limits. No qualification of the data was required.

V. Surrogate Spikes

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits. No qualification of the results was required.

VI. Laboratory Control Samples

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the required QC limits with the following exceptions. The recoveries for delta-BHC were less than the required QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ. No further qualification of the data was required.

VII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no

Data Validation Report
Longstreet Landfill – Fort Bragg
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field duplicated collected as part of this sample group. No qualification of the data was required.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
SLMW-BLANK	Delta-BHC	0.0250 U	0.0250 UJ
SLMW-BLANK	Hexachlorocyclopentadiene	10.0 U	10.0 UJ
SLMW-BLANK	Nitrate/Nitrite as N	0.038 B,J	0.040 UJ
SW-1-5-08	Delta-BHC	0.0263 U	0.0263 UJ
SW-1-5-08	Hexachlorocyclopentadiene	10.0 U	10.0 UJ
SW-1-5-08	Nitrate/Nitrite as N	0.214 B	0.214
SW-2-5-08	Delta-BHC	0.0250 U	0.0250 UJ
SW-2-5-08	Hexachlorocyclopentadiene	10.0 U	10.0 UJ
SW-2-5-08	Nitrate/Nitrite as N	0.070 B	0.040 UJ

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.

CVAA Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There was a positive result in only one the method blanks associated with this sample group. The mercury results in the associated field sample (LMW-8-5-08) was flagged "B" by the laboratory but should be considered 0.2U (non-detect).

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VI. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicates collected as part of this sample group.

ICP-MS Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. ICP Serial Dilution

The serial dilution of samples quantitated by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) determines whether or not significant physical or chemical interferences exist due to sample matrix. The serial dilution results were all within the associated QC limits. No qualification of the data was required

IX. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicates collected as part of this sample group.

Wet Chemistry Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the method blank(s) associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The recovery for Nitrate was less than the associated QC limits. The original results from the associated sample should be considered estimated values and flagged J.

V. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the associated QC limits. No qualification of the data was required.

VI. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicates collected as part of this sample group.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
LMW-8-5-08	Mercury	0.191 JB	0.200 U
LMW-3S-5-08	Nitrate	0.546	0.546 J

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.

CVAA Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in any of the laboratory blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VI. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicate (LMW-DUP2-5-08) collected as part of this sample group. The field duplicate results were all within the accepted QC limits. No qualification of the data was required.

ICP-MS Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. ICP Serial Dilution

The serial dilution of samples quantitated by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) determines whether or not significant physical or chemical interferences exist due to sample matrix. The serial dilution results were all within the associated QC limits. No qualification of the data was required.

IX. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicate (LMW-DUP2-5-08) collected as part of this sample group. The field duplicate results were all within the accepted QC limits. No qualification of the data was required.

Wet Chemistry Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. The samples were all prepared and analyzed within the accepted holding time limits with the following exceptions. Samples LMW-9S-5-08 and LMW-DUP2-5-08 were analyzed after the 48 hour holding time limit for nitrates. The results for these samples should be considered estimated J or UJ. No other qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the method blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

V. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the associated QC limits. No qualification of the data was required.

X. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicate (LMW-DUP2-5-08) collected as part of this sample group. The field duplicate results were all within the accepted QC limits. No qualification of the data was required.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
LMW-9S-5-08	Nitrate	0.113 U	0.113 UJ
LMW-DUP2-5-08	Nitrate	0.364	0.364 J

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.

CVAA Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in any of the laboratory blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VI. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was no field duplicate collected as part of this sample group. No qualification of the data was required.

ICP-MS Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits with the following exceptions. The recoveries for Thallium were less than the associated QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ. No further qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. ICP Serial Dilution

The serial dilution of samples quantitated by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) determines whether or not significant physical or chemical interferences exist due to sample matrix. The serial dilution results were all within the associated QC limits. No qualification of the data was required

IX. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

Wet Chemistry Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the method blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibration results for were all within the required QC limits. No qualification of the data was required.

IV. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

V. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the associated QC limits. No qualification of the data was required.

VI. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

GC/MS Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibration results for were all within the required QC limits. No qualification of the data was required.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that instrument sensitivity and response are stable during each analysis. The IS were all within the required QC limits. No qualification of the data was required.

V. Surrogate Compounds

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits. No qualification of the results was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were within the associated QC limits with the following exception. The results for Benzene, Toluene, trans-1,3-Dichloropropene, Ethylbenzene, Naphthalene 1,2,4-Trimethylbenzene, m-Xylene/p-Xylene and o-Xylene all exceeded the associated QC limits. This may indicate a high bias to the results and any positive results should be considered estimated J.

VII. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the required QC limits. No qualification of the results was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicate (LMW-DUP2-5-08) collected as part of this sample group. The field duplicate results were all within the accepted QC limits. No qualification of the data was required.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
GW-LMW-BLANK	Thallium	1.00 U	1.00 UJ
LMW-3S-5-08	Naphthalene	0.530 J	0.530 J

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.

CVAA Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There was no positive result in the method blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibration results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VI. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results for Mercury exceeded the associated QC limits. This may indicate a matrix effect in the results but since there were no positive results in the associated field samples, no qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicates collected as part of this sample group.

ICP-MS Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. ICP Serial Dilution

The serial dilution of samples quantitated by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) determines whether or not significant physical or chemical interferences exist due to sample matrix. The serial dilution results were all within the associated QC limits. No qualification of the data was required

IX. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicates collected as part of this sample group.

Wet Chemistry Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the method blank(s) associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

V. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the associated QC limits. No qualification of the data was required.

VI. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicates collected as part of this sample group.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
None	None	--	--

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.

GC/MS Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibration results were all within the required QC limits with the following exceptions. The results for Acrolein, Bromomethane, and Vinyl Acetate were less than the associated QC limits. This may indicate a bias to the data and all results should be considered estimated J or UJ.

IV. Surrogate Compounds

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits. No qualification of the results was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits with the following exceptions. The recoveries for Acetone, 1,2-Dichloroethane, Benzene, Toluene, Ethylbenzene, m-Xylene/p-Xylene, o-Xylene, 1,3,5-Trimethylbenzene, sec-Butylbenzene, 1,3-Dichlorobenzene and Naphthalene were all less than the required QC limits. In addition, the relative percent difference for Bromomethane exceeded the associated QC limits. Since the MS/MSD was run on a sample from another sample group, no qualification of this data was required.

VI. Laboratory Control Samples

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. The recoveries for Vinyl acetate exceeded the associated

QC limits. This may indicate a high bias but since no positive results were reported from the associated field samples, no qualification of the data was required.

VII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicates collected as part of this sample group. All duplicate results were within required QC limits. No qualification of the data was required.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
LMW-6-5-08	Acrolein	10.0 Q1, U	10.0 UJ
LMW-6-5-08	Bromomethane	2.0 U	2.0 UJ
LMW-6-5-08	Vinyl Acetate	2.0 Q1, U	2.0 UJ
LMW-7-5-08	Acrolein	10.0 Q1, U	10.0 UJ
LMW-7-5-08	Bromomethane	2.0 U	2.0 UJ
LMW-7-5-08	Vinyl Acetate	2.0 Q1, U	2.0 UJ

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.

CVAA Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in any of the laboratory blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibration results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VI. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results for Mercury exceeded the associated QC limits. This may indicate a matrix effect in the data but since there were no positive results in the associated field data, no qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was no field duplicate collected as part of this sample group. No qualification of the data was required.

ICP-MS Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. ICP Serial Dilution

The serial dilution of samples quantitated by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) determines whether or not significant physical or chemical interferences exist due to sample matrix. The serial dilution results were all within the associated QC limits. No qualification of the data was required

IX. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

Wet Chemistry Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the method blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

V. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the associated QC limits. No qualification of the data was required.

VI. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

GC/MS Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that instrument sensitivity and response are stable during each analysis. The IS were all within the required QC limits. No qualification of the data was required.

V. Surrogate Compounds

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits. No qualification of the results was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VII. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. The LCS results were within the associated QC limits with the following exceptions. The results for 4-Nitrophenol, Benzoic acid, and Pyrene were all less than the associated QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

GC Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibration results for were all within the required QC limits. No qualification of the data was required.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that GC sensitivity and response are stable during each analysis. The IS results for SLMW-7-5-08 were out of control due to a matrix interference. This may indicate a matrix effect in the data, but since no positive results were reported for this sample, no qualification of the data was required.

V. Surrogate Spikes

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits. No qualification of the results was required.

VI. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the required QC limits with the following exception. The results for delta-delta-BHC were less than the associated QC limits. The results for this compound should be considered estimated J or UJ. No further qualification of the results was required.

VII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
SLMW-7-5-08	delta-BHC	0.0320	0.0320 J
SLMW-7-5-08	4-Nitrophenol	10.2 U	10.2 UJ
SLMW-7-5-08	Benzoic acid	10.2 U	10.2 UJ
SLMW-7-5-08	Pyrene	10.2 U	10.2 UJ

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.

CVAA Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in any of the laboratory blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits with the following exceptions. The recovery for delta-BHC exceeded the associated QC limits. This may indicate a high bias to the data, but since no positive results were reported in the associated field samples, no qualification of the data was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VI. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results for Mercury exceeded the associated QC limits. This may indicate a

matrix effect in the data but since there were no positive results in the associated field data, no qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicated (SLMW-DUP-5-08) collected as part of this sample group. All duplicate results were within required QC limits. No qualification of the data was required.

ICP-MS Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. ICP Serial Dilution

The serial dilution of samples quantitated by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) determines whether or not significant physical or chemical interferences exist due to sample matrix. The serial dilution results were all within the associated QC limits. No qualification of the data was required.

IX. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicated (SLMW-DUP-5-08) collected as part of this sample group. All duplicate results were within required QC limits. No qualification of the data was required.

Wet Chemistry Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits with the following exceptions. The Cyanide analyses were analyzed outside of the recommended holding time limits. All Cyanide results for the associated samples should be considered estimated J or UJ. No further qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the method blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits with the following exceptions. The recovery for Sulfide exceeded the associated QC limits. This may indicate a high bias to the data so all positive results should be considered estimated J. No further qualification of the data was required.

V. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the associated QC limits. No qualification of the data was required.

VI. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicated (SLMW-DUP-5-08) collected as part of this sample group. All duplicate results were within required QC limits. No qualification of the data was required.

GC/MS Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits with the following exceptions. Sample SLMW-DUP-5-08 was reanalyzed for semi-volatiles outside the holding time limits. All results from this sample should be considered estimated J or UJ. No further qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits with the following exceptions. The results for 2,4-Dinitrophenol were less than the associated QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that instrument sensitivity and response are stable during each analysis. The IS were all within the required QC limits. No qualification of the data was required.

V. Surrogate Compounds

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits with the following exceptions. The base/neutral surrogate recoveries for sample SLMW-DUP-5-08 were less than the required QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ. No qualification of the results was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits with the following exceptions. The recoveries for 1,2-Dichloroethane (VOC) exceeded the associated QC limits and Acetone, Benzene, Toluene, Ethylbenzene, m-Xylene/p-Xylene, o-Xylene, 1,3,5-Trimethylbenzene, 1,2,4-Trimethylbenzene, sec-Butylbenzene, and

Naphthalene (VOC) were less than the associated QC limits. The relative percent difference for Bromomethane exceeded the associated QC limits. This may indicate a high bias to the VOC data but since no positive results were reported for this compound, no qualification of the data was required. The SVOC results may indicate a low bias and all associated results should be considered estimated J or UJ. No further qualification of the data was required.

VII. Laboratory Control Samples

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits with the following exceptions. The recoveries for Vinyl acetate (VOC) exceeded the associated QC limits, and 2-Chloronaphthalene, 4-Nitrophenol, Benzoic acid, and Phenol (SVOC) were less than the associated QC limits. This may indicate a high bias to the VOC data but since no positive results were reported for this compound, no qualification of the data was required. The SVOC results may indicate a low bias and all associated results should be considered estimated J or UJ. No further qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicated (SLMW-DUP-5-08) collected as part of this sample group. All duplicate results were within required QC limits. No qualification of the data was required.

GC Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that GC sensitivity and response are stable during each analysis. The IS results for 0806029-06 were out of control due to a matrix interference. This may indicate a matrix effect in the data, but since no positive results were reported for this sample, no qualification of the data was required.

V. Surrogate Spikes

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits. No qualification of the results was required.

VI. Laboratory Control Samples

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits with the following exceptions. The recoveries for delta-BHC were less than the associated QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ. No further qualification of the data was required.

VII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There was one field duplicated (SLMW-DUP-5-08) collected as part of this sample group. All duplicate results were within required QC limits. No qualification of the data was required.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
SLMW-7-5-08	Cyanide	0.0250 U	0.0250 UJ
SLMW-8-5-08	2,4-Dinitrophenol	10.1 U	10.1 UJ
SLMW-8-5-08	2-Chloronaphthalene	10.1 U	10.1 UJ
SLMW-8-5-08	4-Nitrophenol	10.1 U	10.1 UJ
SLMW-8-5-08	Benzoic acid	10.1 U	10.1 UJ
SLMW-8-5-08	Bromoethane	10.1 U	10.1 UJ
SLMW-8-5-08	Cyanide	0.0250 U	0.0250 UJ
SLMW-8-5-08	delta-BHC	0.0250 U	0.0250 UJ
SLMW-8-5-08	Phenol	10.1 U	10.1 UJ
SLMW-8-5-08	Sulfide	0.400 J	0.400 J
SLMW-9-5-08	2,4-Dinitrophenol	10.0 U	10.0 UJ
SLMW-9-5-08	2-Chloronaphthalene	10.0 U	10.0 UJ
SLMW-9-5-08	4-Nitrophenol	10.0 U	10.0 UJ
SLMW-9-5-08	Benzoic acid	10.0 U	10.0 UJ
SLMW-9-5-08	Bromoethane	10.0 U	10.0 UJ
SLMW-9-5-08	Cyanide	0.0250 U	0.0250 UJ
SLMW-9-5-08	delta-BHC	0.0250 U	0.0250 UJ
SLMW-9-5-08	Phenol	10.0 U	10.0 UJ
SLMW-9-5-08	Sulfide	0.153 J	0.153 J
SLMW-DUP-5-08	2,4-Dinitrophenol	10.1 U	10.1 UJ
SLMW-DUP-5-08	2,4-Dinitrophenol	10.1 Q2, U	10.1 UJ
SLMW-DUP-5-08	2-Chloronaphthalene	10.1 U	10.1 UJ
SLMW-DUP-5-08	4-Nitrophenol	10.1 U	10.1 UJ
SLMW-DUP-5-08	All other SVOC	10.1 U	10.1 UJ
		20.2 U	20.2 UJ
SLMW-DUP-5-08	Benzoic acid	10.1 U	10.1 UJ
SLMW-DUP-5-08	Bromoethane	10.1 U	10.1 UJ
SLMW-DUP-5-08	Cyanide	0.0250 U	0.020 UJ
SLMW-DUP-5-08	delta-BHC	0.0250 U	0.0250 UJ
SLMW-DUP-5-08	Phenol	10.0 U	10.0 UJ
SLMW-DUP-5-08	Sulfide	0.0740 J	0.0740 J

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.

CVAA Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in any of the laboratory blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits. No qualification of the data was required.

VI. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology. The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

ICP-MS Analyses

I. Preservation and Holding Times

The objective is to ascertain the validity of the analytical results based on the sample condition, and the holding time of the sample from the date of collection to the date of analysis. All samples were properly preserved and prepared and analyzed within the accepted holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blank associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Laboratory Control Sample (LCS)

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits. No qualification of the data was required.

V. Duplicate Sample Analysis

The objective of duplicate sample analysis is to demonstrate acceptable method precision by the Laboratory at the time of analysis. The duplicate results were all within the associated QC limits. No qualification of the data was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits with the following exceptions. The recoveries for Thallium were less than the required QC limits. This may indicate a low bias to the data and all results in the original sample should be considered estimated J or UJ. No further qualification of the data was required.

VII. Spike Sample Analysis

The spiked sample analysis is designed to provide information about the effect of each sample matrix on the sample preparation procedures and the measurement methodology.

The spike results were all within the associated QC limits. No qualification of the data was required.

VIII. ICP Serial Dilution

The serial dilution of samples quantitated by Inductively Coupled Plasma-Mass Spectrometry (ICP-MS) determines whether or not significant physical or chemical interferences exist due to sample matrix. The serial dilution results were all within the associated QC limits. No qualification of the data was required

IX. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

Wet Chemistry Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the method blank associated with this sample group with the following exceptions. There was Nitrate reported in the method blank. Any results in the associated field samples less than ten times the blank concentration should be considered non-detects U. No further qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits with the following exceptions. The recoveries for Sulfide were greater than the required QC limits. This may indicate high bias to the data but since there were no positive results in the associated field samples, no qualification of the data was required.

V. Laboratory Control Samples

Data for laboratory control samples (LCS) are generated to provide information on the accuracy of the analytical method and on the laboratory performance. All LCS results were within the associated QC limits. No qualification of the data was required.

VI. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

GC/MS Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group with the following exception. There was Acetone reported in the trip blank. Since there was no Acetone reported in the associated field sample, no qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits with the following exceptions. The percent differences for Bromomethane were less than the required QC limits. This may indicate a low bias to the data and all results for should be considered estimated J or UJ. No qualification of the data was required.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that instrument sensitivity and response are stable during each analysis. The IS were all within the required QC limits. No qualification of the data was required.

V. Surrogate Compounds

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits. No qualification of the results was required.

VI. Matrix Spikes/Matrix Spike Duplicates

Data for matrix spike/matrix spike duplicates (MS/MSD) are generated to determine long-term precision and accuracy of the analytical method on various matrices and to demonstrate acceptable compound recovery by the laboratory at the time of sample analysis. The MS/MSD results were all within the associated QC limits with the following exceptions. The recoveries for Iodomethane, Ethanol, tert-Butyl alcohol were less than the required QC limits. This may indicate a matrix effect and a low bias to the data, however, since the original sample was from another sample group, no qualification of the results is required. In addition, the relative percent difference for Acetone exceeded the required QC limits. This may indicate a matrix effect but since no positive results for

the compound were reported in the associated field samples, no qualification of the data was required.

VII. Laboratory Control Samples

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits with the following exceptions. The recoveries for Hexachlorocyclopentadiene were less than the required QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ. No qualification of the data was required.

VIII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

GC Analyses

I. Holding Times

The objective is to ascertain the validity of the analytical results based on the holding time of the sample from the time of collection to the time of analysis. All samples were properly preserved and then prepared and analyzed within the required holding time limits. No qualification of the data was required.

II. Blanks

The purpose of laboratory (or field) blank analysis is to determine the existence and magnitude of contamination resulting from laboratory (or field) activities. There were no positive results in the blanks associated with this sample group. No qualification of the data was required.

III. Calibrations

Compliance requirements for satisfactory instrument calibration are established to ensure that the instrument is capable of producing acceptable qualitative and quantitative data for compounds on the target list. The calibrations results for were all within the required QC limits. No qualification of the data was required.

IV. Internal Standards

Internal Standard (IS) performance criteria ensures that GC sensitivity and response are stable during each analysis. The IS were all within the required QC limits. No qualification of the data was required.

V. Surrogate Spikes

Laboratory performance on individual samples is established by means of spiking activities. All surrogate results were within the required QC limits. No qualification of the results was required.

VI. Laboratory Control Samples

The Laboratory Control Sample (LCS) serves as a monitor of the overall performance of each step during the analysis, including the sample preparation. The LCS results were all within the associated QC limits with the following exceptions. The recoveries for delta-BHC were less than the required QC limits. This may indicate a low bias to the data and all results should be considered estimated J or UJ. No qualification of the data was required.

VII. Field Duplicates

Field duplicate samples may be collected and analyzed as an indication of overall precision. These analyses measure both field and Laboratory precision. There were no field duplicated collected as part of this sample group. No qualification of the data was required.

Overall Assessment of Data

The overall assessment of a data package is a brief narrative in which the data reviewer expresses concerns and comments on the quality and, if possible, the useability of the data. Below is a table summarizing the necessary data qualification changes, based on the results of this validation.

Sample ID	Analyte	Original Result	Validated Result
SLMW-13-5-08	Bromomethane	2.00 Q2, U	2.00 UJ
SLMW-13-5-08	Thallium	1.00 U	1.00 UJ
SLMW-13-5-08	Nitrate/Nitrite as N	0.179 B	0.040 UJ
SLMW-13-5-08	Hexachlorocyclopentadiene	10.0 U	10.0 UJ
SLMW-13-5-08	Delta-BHC	0.0263 U	0.0263 UJ

Overall the data is acceptable for its intended usage. There was no data rejected based on failed QC requirements and the completeness for this data package is 100 percent.