

March 24, 2014

Mr. Brian Wootton, Hydrogeologist
NC DENR Division of Waste Management
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

**RE: Davidson County Phase 2 MSW Landfill
Area 2 Cell 1 Rock Blasting Summary**

Dear Mr. Wootton:

On behalf of Davidson County and based on our earlier correspondence, Smith Gardner, Inc. (S+G) presents this letter to document rock blasting performed during construction of Phase 2 Area 2 Cell 1 of the County's municipal solid waste (MSW) landfill. A rock blasting plan was submitted November 6, 2013 and was approved by North Carolina Department of Environment and Natural Resources (NCDENR) that same day. This report documents the blasting events and provides vibration monitoring results as requested by the NCDENR.

Blasting Events

The blasting was performed by JT Russell and Sons, Inc. (JTR), who is the general contractor for the project. Personnel from S+G and Davidson County were also present during blasting procedures. Blasting was conducted during daylight hours on November 12, 15, and 22, 2013 and December 6, 13, and 18, 2013. The drill hole pattern, charge weights, and delays were selected to minimize the amount of energy which may impact the underlying rock. The planned peak particle velocities at blast monitoring locations were designed to be <1 inch/sec. **Figure 1** presents the blast locations.

Blasting procedures were executed in general accordance with the approved November 6, 2013 blasting plan and the blasting plan from JTR.

Blast Monitoring

During blasting, seismographs were used to monitor three locations (two adjacent to Area 1 and one adjacent to the leachate tanks) for each blast. Locations were selected based on closest proximity to the area that may be affected by the blasting. Measurements were collected for peak particle velocity, frequency, and sound level. **Table 1** presents the data retrieved from each seismograph during each blast event. In general, the peak velocities recorded were well below the generally accepted criterion of 1 in/sec. Only BML-2 on Blast 2B recorded velocities above 1in/sec. These velocities are attributed to the monitoring location residing only 71 feet from the blast. This area was near the edge of Phase 2 Area 1. Blast monitoring records are included in **Attachment 1** and **Figure 1** illustrates the blasting locations with their respective monitoring points.

It should be noted that after blasting, the anchor trench along the edge of Phase 2 Area 1 was uncovered to facilitate extending the liner system from Area 1 across Area 2 Cell 1. During construction, the liner system of Area 1 in the anchor trench was inspected for any indication of damage due to elevated blast velocities in this area. No abnormalities were noted, and the liner system for Phase 2 Area 2 Cell 1 was constructed.

Rock Removal Quantities

As you know, initial estimates projected removal of up to approximately 10,000 CY of rock to install Area 2 Cell 2. Calculations after blasting indicate approximately 18,309 CY of rock were removed during the 6 blasting events. Rock quantities removed from individual blast areas are summarized below:

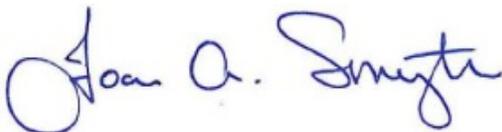
- Blast area 1, 3 and 4 = ~8,422 CY removed;
- Blast area 2a = ~400 CY removed;
- Blast area 2B = ~98 CY removed; and
- Blast area 5 and 6 = ~9,389 CY removed.

Conclusion

The blasting that occurred in Area 2 Cell 1 generally met the rules and requirements of NCDENR. In the instances where a peak velocity of 1-inch/second was exceeded (at approximately 71 feet from the blast), no evidence of damage to the Area 1 liner system was noted. Based on the generally low velocities generated, no changes to the groundwater flow regime are expected and no modifications to the water quality monitoring plan are proposed at this time.

A copy of this blasting summary letter will also be included in the construction quality assurance (CQA) report for the project. Please contact us with any questions or concerns at (919) 828- 0577 or by email below.

Sincerely,
SMITH GARDNER, INC.



Joan A. Smyth, P.G.
Senior Hydrogeologist
joan@smithgardnerinc.com

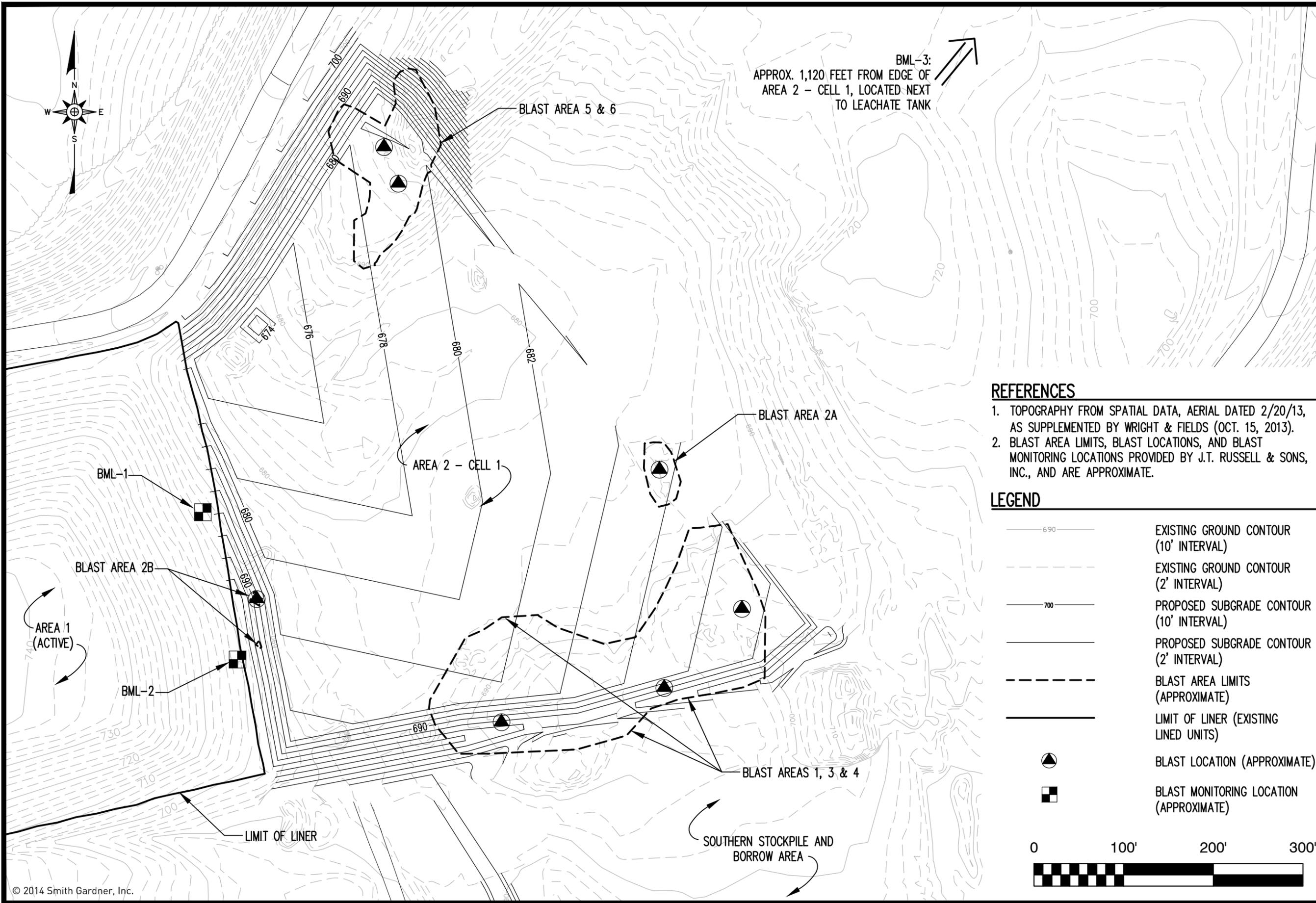


Pieter K. Scheer, P.E.
Vice President, Senior Engineer
pieter@smithgardnerinc.com

Attachments: Figure1- Site Map with Blast Locations
Table 1 - Seismograph Data
Attachment 1- Blast Reports

cc: Charlie Brushwood - Davidson County

G:\CAD\Davidson\Davidco 12-3\sheets\DAVDCO-B0774.dwg - 3/17/2014 2:14 PM



REFERENCES

1. TOPOGRAPHY FROM SPATIAL DATA, AERIAL DATED 2/20/13, AS SUPPLEMENTED BY WRIGHT & FIELDS (OCT. 15, 2013).
2. BLAST AREA LIMITS, BLAST LOCATIONS, AND BLAST MONITORING LOCATIONS PROVIDED BY J.T. RUSSELL & SONS, INC., AND ARE APPROXIMATE.

LEGEND

	EXISTING GROUND CONTOUR (10' INTERVAL)
	EXISTING GROUND CONTOUR (2' INTERVAL)
	PROPOSED SUBGRADE CONTOUR (10' INTERVAL)
	PROPOSED SUBGRADE CONTOUR (2' INTERVAL)
	BLAST AREA LIMITS (APPROXIMATE)
	LIMIT OF LINER (EXISTING LINED UNITS)
	BLAST LOCATION (APPROXIMATE)
	BLAST MONITORING LOCATION (APPROXIMATE)

0 100' 200' 300'

PREPARED FOR: **DAVIDSON COUNTY MSW LANDFILL**
PHASE 2 - AREA 2 - CELL 1
BLASTING LOCATIONS

FIGURE NO:	FIG. 1
SCALE:	AS SHOWN
APPROVED:	M.M.G.
DRAWN:	K.C.B.
PROJECT NO:	DAVDCO-12-3
DATE:	Mar 2014
FILENAME:	DAVDCO-B0774

PREPARED BY: **SMITH+GARDNER**
 NC LIC. NO. C-0828 (ENGINEERING)
 14 N. Boylan Avenue, Raleigh NC 27603 | 919.828.0577

Table 1
Seismograph Data
Davidson County MSW Landfill
Phase 2 Area 1 Cell 1

		Distance (ft)	Transverse	Vertical	Longitudinal	Acoustic (dbl)
Blast 1 11/12/13	BML1	411	0.093 in/s @ 26.3 Hz	0.123 in/s @ 27.8 Hz	0.075 in/s @ 25 Hz	122
	BML2	312	0.185 in/s @ 11.4 Hz	0.173 in/s @ 35.7 Hz	0.128 in/s @ 13.9 Hz	125
	BML3	1,415	N/T	N/T	N/T	N/A
Blast 2A 11/15/13	BML1	521	0.033 in/s @ 38.5 Hz	0.043 in/s @ 38.5 Hz	0.028 in/s @ 31.3 Hz	115
	BML2	561	0.33 in/s @ 41.7 Hz	0.045 in/s @ 38.5 Hz	0.028 in/s @ 35.7 Hz	113
	BML3	1,085	N/T	N/T	N/T	N/A
Blast 2B 11/15/13	BML1	154	0.328 in/s @ 14.7 Hz	0.518 in/s @ 25 Hz	0.233 in/s @ 16.7 Hz	131
	BML2	71	2.183 in/s @ 17.2 Hz	2.753 in/s @ 26.3 Hz	1.340 in/s @ 9.1 Hz	135
	BML3	1,578	N/T	N/T	N/T	N/A
Blast 3 11/22/13	BML1	556	0.033 in/s @ 16.7 Hz	0.060 in/s @ 33.3 Hz	0.048 in/s @ 29.4 Hz	123
	BML2	494	0.070 in/s @ 15.6 Hz	0.128 in/s @ 31.3 Hz	0.070 in/s @ 31.3 Hz	127
	BML3	1,280	N/T	N/T	N/T	N/A
Blast 4 12/6/13	BML1	618	N/T	N/T	N/T	N/A
	BML2	592	N/T	N/T	N/T	N/A
	BML3	1,160	0.025 in/s @ 31.3 Hz	0.020 in/s @ 45.5 Hz	0.023 in/s @ 35.7 Hz	114
Blast 5 12/13/13	BML1	457	0.073 in/s @ 8.8 Hz	0.055 in/s @ 16.1 Hz	0.098 in/s @ 5.7 Hz	124
	BML2	649	0.048 in/s @ 18.5 Hz	0.040 in/s @ 25 Hz	0.053 in/s @ 17.9 Hz	121
	BML3	1,091	0.020 in/s @ 10.4 Hz	0.013 in/s @ 25 Hz	0.008 in/s @ 7.5 Hz	111
Blast 6 12/18/13	BML1	485	0.035 in/s @ 16.1 Hz	0.038 in/s @ 13.2 Hz	0.053 in/s @ 5.5 Hz	140
	BML2	683	0.035 in/s @ 38.5 Hz	0.038 in/s @ 38.5 Hz	0.033 in/s @ 15.2 Hz	137
	BML3	1,087	N/T	N/T	N/T	N/A

Note:
 BML = Blast Monitoring Location
 N/T = No Movement Detected
 N/A = Data Not Available
 shading indicates velocity above 1in/s

Joan Smyth

From: John Fearington
Sent: Thursday, February 20, 2014 8:12 PM
To: Joan Smyth
Subject: Fwd: FW: Activity Report for 1 - 11/12/2013 2:34 pm

John R. Fearington
Staff Engineer

SMITH + GARDNER

14 N. Boylan Avenue
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F (919) 828.3899

C (919) 980.0515

www.smithgardnerinc.com

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From: Pieter Scheer <pieter@smithgardnerinc.com>
Date: Mon, Jan 13, 2014 at 4:39 PM
Subject: FW: Activity Report for 1 - 11/12/2013 2:34 pm
To: John Fearington <johnf@smithgardnerinc.com>

No. 1

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Vice President, Senior Engineer

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From: vtealerts@vibratechinc.com [mailto:vtealerts@vibratechinc.com]
Sent: Monday, January 13, 2014 4:10 PM

To: pieter@smithgardnerinc.com

Subject: Activity Report for 1 - 11/12/2013 2:34 pm

Blast Date/Time 2013-11-12
14:34:00
Project Davidson Landfill
Shot # 1
Lat **Long**
35° 50' 53.800" -80° 10' 54.900"
Shot Type Construction Shot
Max Lbs/Delay

Shot Cover Mats
Average Water Depth
of Holes
of Rows
Hole Diameter
Hole Depth
Hole Subdrill
Space
Burden
Decks
Stem Height!
Stemming Type Crushed Stone
Holes per Delay 1
Min Delay Period 8
Blaster Name
Blaster License
Blaster Comments
Weather Type Clear

Temperature
Wind Speed
Wind Direction

N/A Shot Diagram

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Date	11/12/2013	Trigger Level	0.030 in/s	Tranverse	0.093 in/s @ 26.3 Hz
Time	2:34 pm	Calibration Date	9/30/2013	Vertical	0.123 in/s @ 27.8 Hz
Distance	411 ft	Direction from Blast	NW	Longitudinal	0.075 in/s @ 25.0 Hz
Location	190' E of EW12 Gas Well	GPS	35° 50' 56.000", -80° 10' 59.100"	Acoustic	122 dBL
Operator	VIBRA-TECH GSM	Serial #	9446	Scaled Distance	N/A ft/(lb ^{.5})

Date	11/12/2013	Trigger Level	0.020 in/s	Tranverse	0.185 in/s @ 11.4 Hz
Time	2:34 pm	Calibration Date	10/1/2013	Vertical	0.173 in/s @ 35.7 Hz
Distance	312 ft	Direction from Blast	W	Longitudinal	0.128 in/s @ 13.9 Hz
Location	200' E of EW13 Gas Well	GPS	35° 50' 53.800", -80° 10' 58.700"	Acoustic	125 dBL
Operator	VIBRA-TECH GSM	Serial #	7262	Scaled Distance	N/A ft/(lb ^{.5})

Date	11/12/2013	Trigger Level	0.020 in/s	Tranverse	N/T
Time	2:47 pm	Calibration Date	3/12/2013	Vertical	N/T
Distance	1,415 ft	Direction from Blast	NE	Longitudinal	N/T
Location	Leachate Tank	GPS	35° 51' 5.000", -80° 10' 44.600"	Acoustic	N/A dBL
Operator	VIBRA-TECH GSM	Serial #	7685	Scaled Distance	N/A ft/(lb ^{.5})

Joan Smyth

From: John Fearington
Sent: Thursday, February 20, 2014 8:13 PM
To: Joan Smyth
Subject: Fwd: FW: Activity Report for 2A - 11/15/2013 3:04 pm

John R. Fearington
Staff Engineer

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From: Pieter Scheer <pieter@smithgardnerinc.com>
Date: Mon, Jan 13, 2014 at 4:34 PM
Subject: FW: Activity Report for 2A - 11/15/2013 3:04 pm
To: John Fearington <johnf@smithgardnerinc.com>

No. 2A

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From: vtealerts@vibratechinc.com [mailto:vtealerts@vibratechinc.com]
Sent: Monday, January 13, 2014 4:05 PM

To: pieter@smithgardnerinc.com

Subject: Activity Report for 2A - 11/15/2013 3:04 pm

Blast Date/Time 2013-11-15
15:04:00
Project Davidson Landfill
Shot # 2A
Lat **Long**
35° 50' 56.600" -80° 10' 52.800"
Shot Type Construction Shot
Max Lbs/Delay

Shot Cover	Mats
Average Water Depth	
# of Holes	69
# of Rows	
Hole Diameter	
Hole Depth	
Hole Subdrill	
Space	
Burden	
Decks	
Stem Height	
Stemming Type	Crushed Stone
Holes per Delay	3
Min Delay Period	8
Blaster Name	D MCGUIRT
Blaster License	

Blaster Comments**Weather Type**

Clear

Temperature**Wind Speed****Wind Direction**

N/A Shot Diagram

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Date	11/15/2013	Trigger Level	0.020 in/s	Tranverse	0.033 in/s @ 41.7 Hz
Time	3:04 pm	Calibration Date	10/1/2013	Vertical	0.045 in/s @ 38.5 Hz
Distance	561 ft	Direction from Blast	SW	Longitudinal	0.028 in/s @ 35.7 Hz
Location	200' E of EW13 Gas Well	GPS	35° 50' 53.800", -80° 10' 58.700"	Acoustic	113 dBL
Operator	VIBRA-TECH GSM	Serial #	7262	Scaled Distance	N/A ft/(lb^.5)

Date	11/15/2013	Trigger Level	0.020 in/s	Tranverse	0.033 in/s @ 38.5 Hz
Time	3:04 pm	Calibration Date	9/30/2013	Vertical	0.043 in/s @ 38.5 Hz
Distance	521 ft	Direction from Blast	W	Longitudinal	0.028 in/s @ 31.3 Hz
Location	190' E of EW12 Gas Well	GPS	35° 50' 56.000", -80° 10' 59.100"	Acoustic	115 dBL
Operator	VIBRA-TECH GSM	Serial #	9446	Scaled Distance	N/A ft/(lb^.5)

Date	11/15/2013	Trigger Level	0.020 in/s	Tranverse	N/T
Time	4:18 pm	Calibration Date	3/12/2013	Vertical	N/T
Distance	1,085 ft	Direction from Blast	NE	Longitudinal	N/T
Location	Leachate Tank	GPS	35° 51' 5.000", -80° 10' 44.600"	Acoustic	N/A dBL

Operator VIBRA-TECH
GSM

Serial # 7685

**Scaled
Distance** N/A
ft/(lb^{.5})

Joan Smyth

From: John Fearington
Sent: Thursday, February 20, 2014 8:13 PM
To: Joan Smyth
Subject: Fwd: FW: Activity Report for 2B - 11/15/2013 3:57 pm

John R. Fearington
Staff Engineer

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From: Pieter Scheer <pieter@smithgardnerinc.com>
Date: Mon, Jan 13, 2014 at 4:39 PM
Subject: FW: Activity Report for 2B - 11/15/2013 3:57 pm
To: John Fearington <johnf@smithgardnerinc.com>
Cc: Joan Smyth <joan@smithgardnerinc.com>

No. 2B. Looks like this one was the only shot where readings exceeded 1 in/sec. The one monitor exceeded this significantly but was within very close proximity (71 feet per the provided data).

Pieter

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Vice President, Senior Engineer

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From: vtealerts@vibratechinc.com [mailto:vtealerts@vibratechinc.com]
Sent: Monday, January 13, 2014 4:10 PM
To: pieter@smithgardnerinc.com
Subject: Activity Report for 2B - 11/15/2013 3:57 pm

Blast Date/Time 2013-11-15
15:57:00
Project Davidson Landfill
Shot # 2B
Lat **Long**
35° 50' 54.500" -80° 10' 58.800"
Shot Type Construction Shot
Max Lbs/Delay

Shot Cover None
Average Water Depth
of Holes
of Rows
Hole Diameter
Hole Depth
Hole Subdrill
Space
Burden
Decks
Stem Height!
Stemming Type Crushed Stone
Holes per Delay 1

Min Delay Period 8
Blaster Name
Blaster License
Blaster Comments
Weather Type Clear
Temperature
Wind Speed
Wind Direction

N/A Shot Diagram

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Date	11/15/2013	Trigger Level	0.020 in/s	Tranverse	0.328 in/s @ 14.7 Hz
Time	3:57 pm	Calibration Date	9/30/2013	Vertical	0.518 in/s @ 25.0 Hz
Distance	154 ft	Direction from Blast	N	Longitudinal	0.233 in/s @ 16.7 Hz
Location	190' E of EW12 Gas Well	GPS	35° 50' 56.000", -80° 10' 59.100"	Acoustic	131 dBL
Operator	VIBRA-TECH GSM	Serial #	9446	Scaled Distance	N/A ft/(lb [^] .5)
Date	11/15/2013	Trigger Level	0.020 in/s	Tranverse	2.183 in/s @ 17.2 Hz
Time	3:57 pm	Calibration Date	10/1/2013	Vertical	2.753 in/s @ 26.3 Hz
Distance	71 ft	Direction from Blast	S	Longitudinal	1.340 in/s @ 9.1 Hz
Location	200' E of EW13 Gas Well	GPS	35° 50' 53.800", -80° 10' 58.700"	Acoustic	135 dBL
Operator	VIBRA-TECH GSM	Serial #	7262	Scaled Distance	N/A ft/(lb [^] .5)
Date	11/15/2013	Trigger Level	0.020 in/s	Tranverse	N/T
Time	4:18 pm	Calibration Date	3/12/2013	Vertical	N/T
Distance	1,578 ft	Direction from	NE	Longitudinal	N/T

Location	Leachate Tank	Blast			
		GPS	35° 51' 5.000", -80° 10' 44.600"	Acoustic	N/A dBL
Operator	VIBRA-TECH GSM	Serial #	7685	Scaled Distance	N/A ft/(lb^.5)

Joan Smyth

From: John Fearington
Sent: Thursday, February 20, 2014 8:13 PM
To: Joan Smyth
Subject: Fwd: FW: Activity Report for 3 - 11/22/2013 4:58 pm

John R. Fearington
Staff Engineer

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From: Pieter Scheer <pieter@smithgardnerinc.com>
Date: Mon, Jan 13, 2014 at 4:33 PM
Subject: FW: Activity Report for 3 - 11/22/2013 4:58 pm
To: John Fearington <johnf@smithgardnerinc.com>

No. 3

Pieter K. Scheer, P.E.
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From: vtealerts@vibratechinc.com [mailto:vtealerts@vibratechinc.com]
Sent: Monday, January 13, 2014 4:05 PM

To: pieter@smithgardnerinc.com

Subject: Activity Report for 3 - 11/22/2013 4:58 pm

Blast Date/Time 2013-11-22
16:58:00
Project Davidson Landfill
Shot # 3
Lat **Long**
35° 50' 54.200" -80° 10' 52.700"
Shot Type Construction Shot
Max Lbs/Delay

Shot Cover Mats
Average Water Depth
of Holes 277
of Rows
Hole Diameter
Hole Depth
Hole Subdrill
Space
Burden
Decks
Stem Height
Stemming Type Crushed Stone
Holes per Delay 1
Min Delay Period 8
Blaster Name
Blaster License
Blaster Comments
Weather Type Clear

Temperature
Wind Speed
Wind Direction

N/A Shot Diagram

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Date	11/22/2013	Trigger Level	0.020 in/s	Tranverse	0.033 in/s @ 16.7 Hz
Time	4:58 pm	Calibration Date	9/30/2013	Vertical	0.060 in/s @ 33.3 Hz
Distance	556 ft	Direction from Blast	W	Longitudinal	0.048 in/s @ 29.4 Hz
Location	190' E of EW12 Gas Well	GPS	35° 50' 56.000", -80° 10' 59.100"	Acoustic	123 dBL
Operator	VIBRA-TECH GSM	Serial #	9446	Scaled Distance	N/A ft/(lb ^{.5})

Date	11/22/2013	Trigger Level	0.020 in/s	Tranverse	0.070 in/s @ 15.6 Hz
Time	4:58 pm	Calibration Date	10/1/2013	Vertical	0.128 in/s @ 31.3 Hz
Distance	494 ft	Direction from Blast	W	Longitudinal	0.070 in/s @ 31.3 Hz
Location	200' E of EW13 Gas Well	GPS	35° 50' 53.800", -80° 10' 58.700"	Acoustic	127 dBL
Operator	VIBRA-TECH GSM	Serial #	7262	Scaled Distance	N/A ft/(lb ^{.5})

Date	11/22/2013	Trigger Level	0.020 in/s	Tranverse	N/T
Time	5:12 pm	Calibration Date	3/12/2013	Vertical	N/T
Distance	1,280 ft	Direction from Blast	NE	Longitudinal	N/T
Location	Leachate Tank	GPS	35° 51' 5.000", -80° 10' 44.600"	Acoustic	N/A dBL
Operator	VIBRA-TECH GSM	Serial #	7685	Scaled Distance	N/A ft/(lb ^{.5})

Joan Smyth

From: John Fearington
Sent: Thursday, February 20, 2014 8:13 PM
To: Joan Smyth
Subject: Fwd: FW: Activity Report for 4 - 12/06/2013 2:06 pm

John R. Fearington
Staff Engineer

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From: Pieter Scheer <pieter@smithgardnerinc.com>
Date: Mon, Jan 13, 2014 at 3:59 PM
Subject: FW: Activity Report for 4 - 12/06/2013 2:06 pm
To: John Fearington <johnf@smithgardnerinc.com>

No. 4

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From: vtealerts@vibratechinc.com [mailto:vtealerts@vibratechinc.com]
Sent: Monday, January 13, 2014 4:00 PM

To: pieter@smithgardnerinc.com

Subject: Activity Report for 4 - 12/06/2013 2:06 pm

Blast Date/Time 2013-12-06
14:06:00
Project Davidson Landfill
Shot # 4
Lat **Long**
35° 50' 55.080" -80° 10' 51.660"
Shot Type Construction
Max Lbs/Delay

Shot Cover Mats
Average Water Depth
of Holes
of Rows
Hole Diameter
Hole Depth
Hole Subdrill
Space
Burden
Decks
Stem Height!
Stemming Type Crushed Stone
Holes per Delay 1
Min Delay Period 8
Blaster Name
Blaster License
Blaster Comments
Weather Type Clear

Temperature
Wind Speed
Wind Direction

N/A Shot Diagram

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Date	12/6/2013	Trigger Level	0.020 in/s	Tranverse	0.025 in/s @ 31.3 Hz
Time	2:06 pm	Calibration Date	3/12/2013	Vertical	0.020 in/s @ 45.5 Hz
Distance	1,160 ft	Direction from Blast	NE	Longitudinal	0.023 in/s @ 35.7 Hz
Location	Leachate Tank	GPS	35° 51' 5.000", -80° 10' 44.600"	Acoustic	114 dBL
Operator	VIBRA-TECH GSM	Serial #	7685	Scaled Distance	N/A ft/(lb ^{.5})

Date	12/6/2013	Trigger Level	0.100 in/s	Tranverse	N/T
Time	4:57 pm	Calibration Date	9/30/2013	Vertical	N/T
Distance	618 ft	Direction from Blast	W	Longitudinal	N/T
Location	190' E of EW12 Gas Well	GPS	35° 50' 56.000", -80° 10' 59.100"	Acoustic	N/A dBL
Operator	VIBRA-TECH GSM	Serial #	9446	Scaled Distance	N/A ft/(lb ^{.5})

Date	12/6/2013	Trigger Level	0.100 in/s	Tranverse	N/T
Time	5:00 pm	Calibration Date	10/1/2013	Vertical	N/T
Distance	592 ft	Direction from Blast	W	Longitudinal	N/T
Location	200' E of EW13 Gas Well	GPS	35° 50' 53.800", -80° 10' 58.700"	Acoustic	N/A dBL
Operator	VIBRA-TECH GSM	Serial #	7262	Scaled Distance	N/A ft/(lb ^{.5})

Joan Smyth

From: John Fearington
Sent: Thursday, February 20, 2014 8:13 PM
To: Joan Smyth
Subject: Fwd: FW: Activity Report for 5 - 12/13/2013 5:27 pm

John R. Fearington
Staff Engineer

SMITH + GARDNER

14 N. Boylan Avenue
Raleigh, NC 27603

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F (919) 828.3899

C (919) 980.0515

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From: Pieter Scheer <pieter@smithgardnerinc.com>
Date: Mon, Jan 13, 2014 at 3:59 PM
Subject: FW: Activity Report for 5 - 12/13/2013 5:27 pm
To: John Fearington <johnf@smithgardnerinc.com>

FYI. Per my other email I'm hoping that we can get pdfs. However, please maintain these until we receive.

Pieter K. Scheer, P.E.
Vice President, Senior Engineer

SMITH + GARDNER

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From: vtealerts@vibratechinc.com [mailto:vtealerts@vibratechinc.com]
Sent: Monday, January 13, 2014 4:00 PM

To: pieter@smithgardnerinc.com

Subject: Activity Report for 5 - 12/13/2013 5:27 pm

Blast Date/Time 2013-12-13
17:27:00
Project Davidson Landfill
Shot # 5
Lat **Long**
35° 50' 59.900" -80° 10' 56.300"
Shot Type Construction Shot
Max Lbs/Delay

Shot Cover Mats
Average Water Depth
of Holes
of Rows
Hole Diameter
Hole Depth
Hole Subdrill
Space
Burden
Decks
Stem Height!
Stemming Type Crushed Stone
Holes per Delay 1
Min Delay Period 8
Blaster Name
Blaster License D MCGUIRT
Blaster Comments
Weather Type Clear

Temperature
Wind Speed
Wind Direction

N/A Shot Diagram

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Date	12/13/2013	Trigger Level	0.020 in/s	Tranverse	0.020 in/s @ 10.4 Hz
Time	5:27 pm	Calibration Date	3/12/2013	Vertical	0.013 in/s @ 25.0 Hz
Distance	1,091 ft	Direction from Blast	NE	Longitudinal	0.008 in/s @ 7.5 Hz
Location	Leachate Tank	GPS	35° 51' 5.000", -80° 10' 44.600"	Acoustic	111 dBL
Operator	VIBRA-TECH GSM	Serial #	7685	Scaled Distance	N/A ft/(lb ^{.5})

Date	12/13/2013	Trigger Level	0.020 in/s	Tranverse	0.048 in/s @ 18.5 Hz
Time	5:27 pm	Calibration Date	10/1/2013	Vertical	0.040 in/s @ 25.0 Hz
Distance	649 ft	Direction from Blast	S	Longitudinal	0.053 in/s @ 17.9 Hz
Location	200' E of EW13 Gas Well	GPS	35° 50' 53.800", -80° 10' 58.700"	Acoustic	121 dBL
Operator	VIBRA-TECH GSM	Serial #	7262	Scaled Distance	N/A ft/(lb ^{.5})

Date	12/13/2013	Trigger Level	0.020 in/s	Tranverse	0.073 in/s @ 8.8 Hz
Time	5:27 pm	Calibration Date	9/30/2013	Vertical	0.055 in/s @ 16.1 Hz
Distance	457 ft	Direction from Blast	SW	Longitudinal	0.098 in/s @ 5.7 Hz
Location	190' E of EW12 Gas Well	GPS	35° 50' 56.000", -80° 10' 59.100"	Acoustic	124 dBL

Operator VIBRA-TECH GSM

Serial # 9446

**Scaled
Distance**

N/A ft/(lb^{.5})

Joan Smyth

From: John Fearington
Sent: Thursday, February 20, 2014 8:14 PM
To: Joan Smyth
Subject: Fwd: FW: Activity Report for 6 - 12/18/2013 10:54 am

John R. Fearington
Staff Engineer

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From: Pieter Scheer <pieter@smithgardnerinc.com>
Date: Mon, Jan 13, 2014 at 1:36 PM
Subject: FW: Activity Report for 6 - 12/18/2013 10:54 am
To: John Fearington <johnf@smithgardnerinc.com>, Joan Smyth <joan@smithgardnerinc.com>
Cc: pieter@smithgardnerinc.com

John/Joan:

This is the report for the final blast at Davidson. I assume the other reports will be forthcoming.

Pieter

Pieter K. Scheer, P.E.
Vice President, Senior Engineer

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From: vtealerts@vibratechinc.com [mailto:vtealerts@vibratechinc.com]
Sent: Monday, January 13, 2014 1:35 PM
To: pieter@smithgardnerinc.com
Subject: Activity Report for 6 - 12/18/2013 10:54 am

Blast Date/Time 2013-12-18
10:54:00
Project Davidson Landfill
Shot # 6
Lat **Long**
35° 51' 0.300" -80° 10' 56.500"
Shot Type Construction Shot
Max Lbs/Delay

Shot Cover Mats
Average Water Depth
of Holes
of Rows
Hole Diameter
Hole Depth
Hole Subdrill
Space
Burden
Decks
Stem Height!

Stemming Type Crushed Stone
Holes per Delay 1
Min Delay Period 8
Blaster Name
Blaster License
Blaster Comments
Weather Type Clear
Temperature
Wind Speed
Wind Direction

N/A Shot Diagram

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Date	12/18/2013	Trigger Level	0.020 in/s	Tranverse	0.035 in/s @ 38.5 Hz
Time	10:54 am	Calibration Date	10/1/2013	Vertical	0.038 in/s @ 38.5 Hz
Distance	683 ft	Direction from Blast	S	Longitudinal	0.033 in/s @ 15.2 Hz
Location	200' E of EW13 Gas Well	GPS	35° 50' 53.800", -80° 10' 58.700"	Acoustic	137 dBL
Operator	VIBRA-TECH GSM	Serial #	7262	Scaled Distance	N/A ft/(lb ^{.5})

Date	12/18/2013	Trigger Level	0.020 in/s	Tranverse	0.035 in/s @ 16.1 Hz
Time	10:54 am	Calibration Date	9/30/2013	Vertical	0.038 in/s @ 13.2 Hz
Distance	485 ft	Direction from Blast	SW	Longitudinal	0.053 in/s @ 5.5 Hz
Location	190' E of EW12 Gas Well	GPS	35° 50' 56.000", -80° 10' 59.100"	Acoustic	140 dBL
Operator	VIBRA-TECH GSM	Serial #	9446	Scaled Distance	N/A ft/(lb ^{.5})

Date	12/18/2013	Trigger Level	0.020 in/s	Tranverse	N/T
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Time	11:07 am	Calibration Date	3/12/2013	Vertical	N/T
Distance	1,087 ft	Direction from Blast	NE	Longitudinal	N/T
Location	Leachate Tank	GPS	35° 51' 5.000", -80° 10' 44.600"	Acoustic	N/A dBL
Operator	VIBRA-TECH GSM	Serial #	7685	Scaled Distance	N/A ft/(lb ^{.5})