David Garrett & Associates
Engineering and Geology

Received
JUN 2007
Solid Waste Section

June 6, 2007

Mr. Ed Mussler
Permitting Branch Head
Solid Waste Section
NCDENR – Division of Waste Management
401 Oberlin Road, Suite 150
Raleigh, NC 27605

RE: Rock Blasting Observation Report for BFI Waste Systems of North America, Inc. Charlotte Motor Speedway MSW Landfill Cells 2F and 2G

Dear Mr. Mussler:

This letter presents a report of observations made during blasting of an estimated 16,000 cubic yards of rock exposed in separate areas within the southwest corner of proposed Cell 2F and the northwest corner of proposed Cell 2G at the landfill site referenced above. The blasting was conducted during February 2007. A site map depicting relevant site features is attached as **Figure 1**. Excavation activities at the site exposed pinnacles of weathered syenite within cells 2F and 2G that extended above the proposed subgrade elevations and therefore required removal. Light blasting was proposed as the most economically viable and expedient method for removing the rock in a rock blasting plan dated January 16, 2007 that was sent to the NC DENR, Division of Waste Management (DWM), Solid Waste Section (SWS). Approval of the blasting plan was received via e-mail from Brian Wooton and Bobby Lufty of the SWS on January 19, 2007.

A preliminary exploratory drilling program was conducted by a drilling contractor (Carolina Drilling, Inc.) in the area of the syenite pinnacles to provide the data necessary to estimate the volume of rock present within the cells extending above a level of four feet below the proposed subgrade elevations. The drilling was conducted in a grid pattern on 50-foot centers within the immediate area of the rock exposures and extended southeast into proposed Cell 2G. A map supplied by the surveying contractor that depicts bedrock elecvations prior to blasting is attached as **Figure 2**. The map was developed based on the results of the preliminary drilling program and shows the drilling locations where weathered syenite was encountered at levels above four feet below the proposed subgrade levels.

The rock blasting was conducted by Austin Powder Company, of Biwabik, Minnesota, during the period from February 6, 2007 to February 23, 2007 in accordance with the current SWS guidelines for rock blasting at lined landfill units. Prior to blasting at each location, a series of shot holes was drilled in the rock on approximately 7-foot centers in an orthogonal grid pattern to hold the blast charges. None of the drill holes encountered water. The blasting shots were loaded light and consisted of ammonium nitrate-fuel oil charges. Delays were used to control and direct the blast energy up and out, so as to limit subgrade damage. Minimal rock-fly was observed during blasting and no ground vibration was detected at the observation site.

A letter from the blasting contractor certifying that the drill-hole patterns, charge weights and delays were selected in such a manner as to minimize the amount of energy impacting the underlying rock is attached. All blasting was monitored with surface vibration monitors by Sauls Seismic, Inc. Seismic monitoring was conducted at two locations along the closest edge of the toe of the currently active landfill cell to the north of the blast locations, as well as at existing monitoring wells MW-17 and MW-17A located northwest of the blast area. Monitoring locations are depicted in **Figure 1**. Seismograph reports of surface vibrations recorded during blasting are attached. Peak particle velocities did not reach 1 inch per second at any of the monitoring locations during blasting. Approximately 16,000 cubic yards of rock were removed by light blasting from cells 2F and 2G.

A map supplied by the surveying contractor that depicts bedrock elecvations as well as planned subgrade elevations in Cells 2F and 2G following blasting is attached as **Figure 3**. The data depicted on the map indicates that the bedrock surface was lowered to elevations at or below four feet beneath the subgrade elevations across Cells 2F and 2G. A cross-section through the long axis of the largest rock pinnacle is attached as **Figure 4**. The cross section depicts the bedrock surface elevations before and after blasting, as well as the planned subgrade elevations, along the line of section. The cross-section indicates that the bedrock surface was lowered to elevations at or below four feet beneath the planned subgrade elevation.

A visual inspection of the bedrock surface following blasting revealed no obvious veins, dikes or distinct linear features in the Cell 2F or 2G subgrade. Inasmuch as the shots were light and timed with delays and that the blast energy was directed upward and outward, it is anticipated that no deep cracking of the bedrock below subgrade occurred. Therefore, the condition of the bedrock following blasting is not anticipated to affect groundwater flow or the groundwater monitoring system. Further evaluation and delineation of the rock body is anticipated through additional exploratory drilling to assess the presence of any additional bedrock pinnacles that

may exist in the remainder of proposed Cell 2G and within proposed Cell 2H which may require removal to complete construction of the cells. Long-term observation of water quality and the depth to groundwater will be conducted during the routine monitoring program of Cell 2F, but no changes in the groundwater monitoring program are presently warranted.

If you have any questions or require further assistance regarding this matter, please do not hesitate to call.

Sincerely,

Brian S. Boutin, P.G.

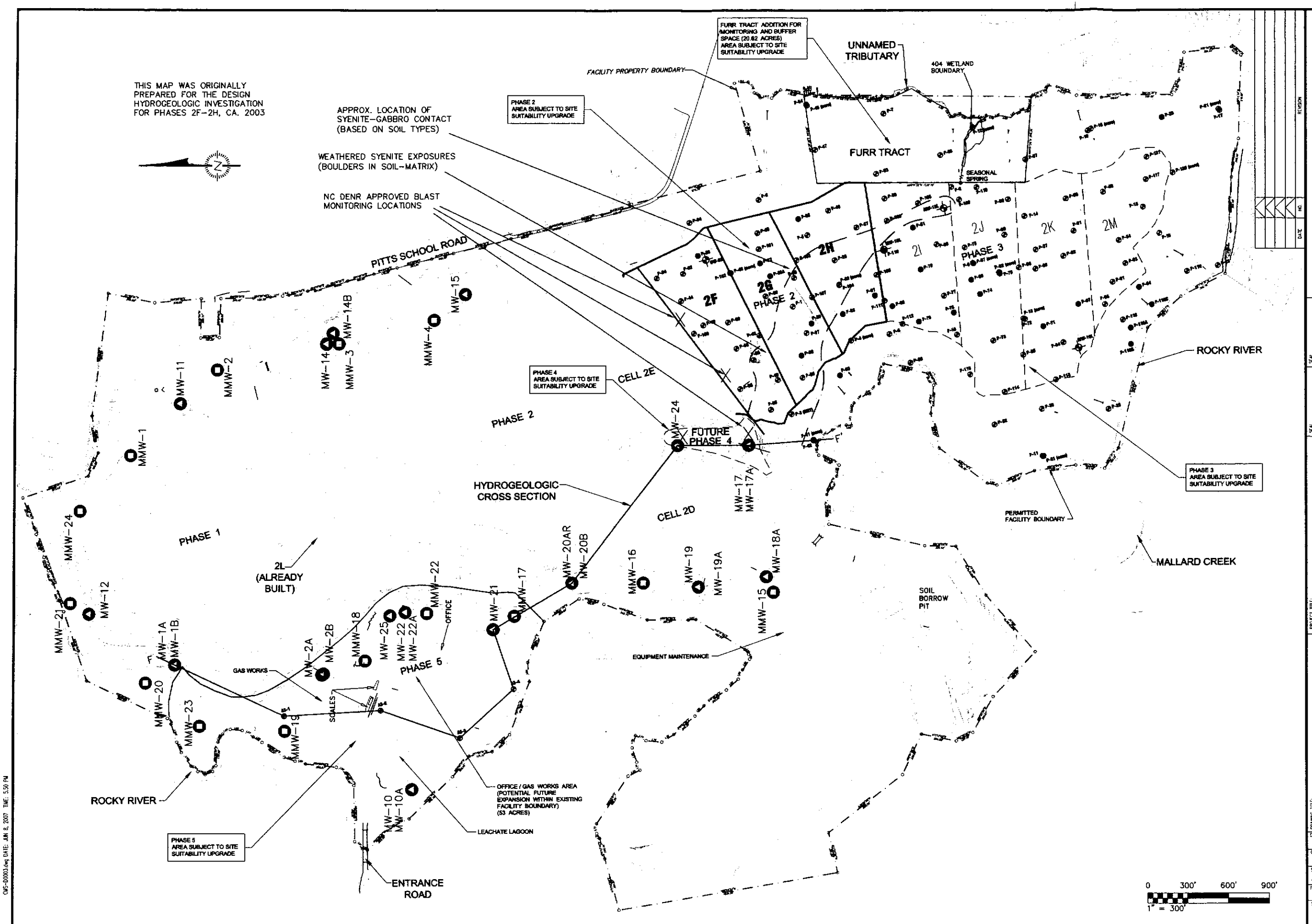
G. David Garrett, P.G., P.E.

NORTH CAROLINA LICENSED SEAL 983 GEOLOGIST G. DAVID GARRETT

6/13/07

Cc: Mike Gurley, Allied Waste Systems

5105 Harbour Towne Drive • Raleigh • North Carolina • 27604
919-231-1818 (Office and Fax) • 919-418-4375 (Mobile) • E-mail: david@davidgarrettpe.com



David Garrett & Associates
Engineering and Geology
5105 Harbour Towne Drive, Raleigh, North Carolina 27604
Email: david_garrett_pg@mindspring.com 919-231-1818 (Office and Fax) 919-418-4375 (mobile)

NORTH CAROLINA LICENSED GEOLOGIST SEAL 1268 BRIAN S. BOUTIN

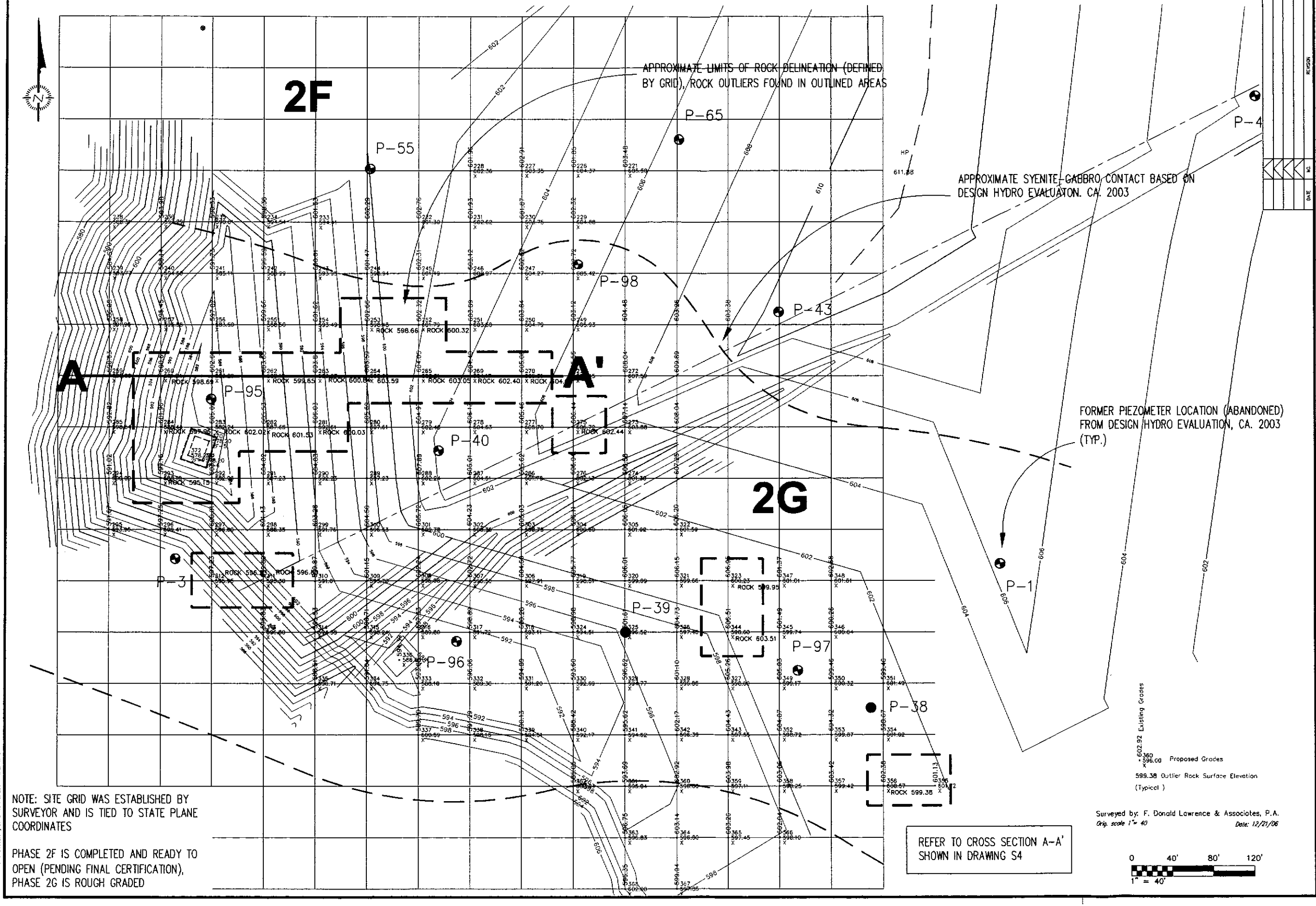
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25462 C. DAVID GARRETT

PROJECT TITLE: BFI/ALLIED WASTE INDUSTRIES
CMS LANDFILL V
CABARRUS COUNTY, NC
NC DENR PERMIT #13-04

DRAWING TITLE: PHASE 2, CELL 2F
ROCK DELINEATION/REMOVAL
SITE OVERVIEW

DESIGNED BY: G.D.G.	DRAWN BY: G.D.G.
CHECKED BY: B.S.B.	PROJECT NO.: CMS-D003
SCALE: AS SHOWN	DATE: JUNE 2007
FILE NAME: CMS-D0001	
SHEET NO.: 1	DRAWING NO.: S1

CMS-D0003.dwg DATE: JUN 8, 2007 TIME: 5:50 PM



NOTE: SITE GRID WAS ESTABLISHED BY SURVEYOR AND IS TIED TO STATE PLANE COORDINATES

PHASE 2F IS COMPLETED AND READY TO OPEN (PENDING FINAL CERTIFICATION), PHASE 2G IS ROUGH GRADED

REFER TO CROSS SECTION A-A' SHOWN IN DRAWING S4

Surveyed by: F. Donald Lawrence & Associates, P.A.
Orig. scale 1" = 40 Date: 12/21/06

NO.	DATE	REVISION

David Garrett & Associates
Engineering and Geology
5105 Harbour Pointe Drive, Raleigh, North Carolina 27604
Email: david_garrett_pg@mindspring.com 919-231-1818 (Office and Fax) 919-410-4375 (mobile)

SEAL: NORTH CAROLINA LICENSED SEAL 1268 GEOLOGIST BRIAN S. BUTTIN

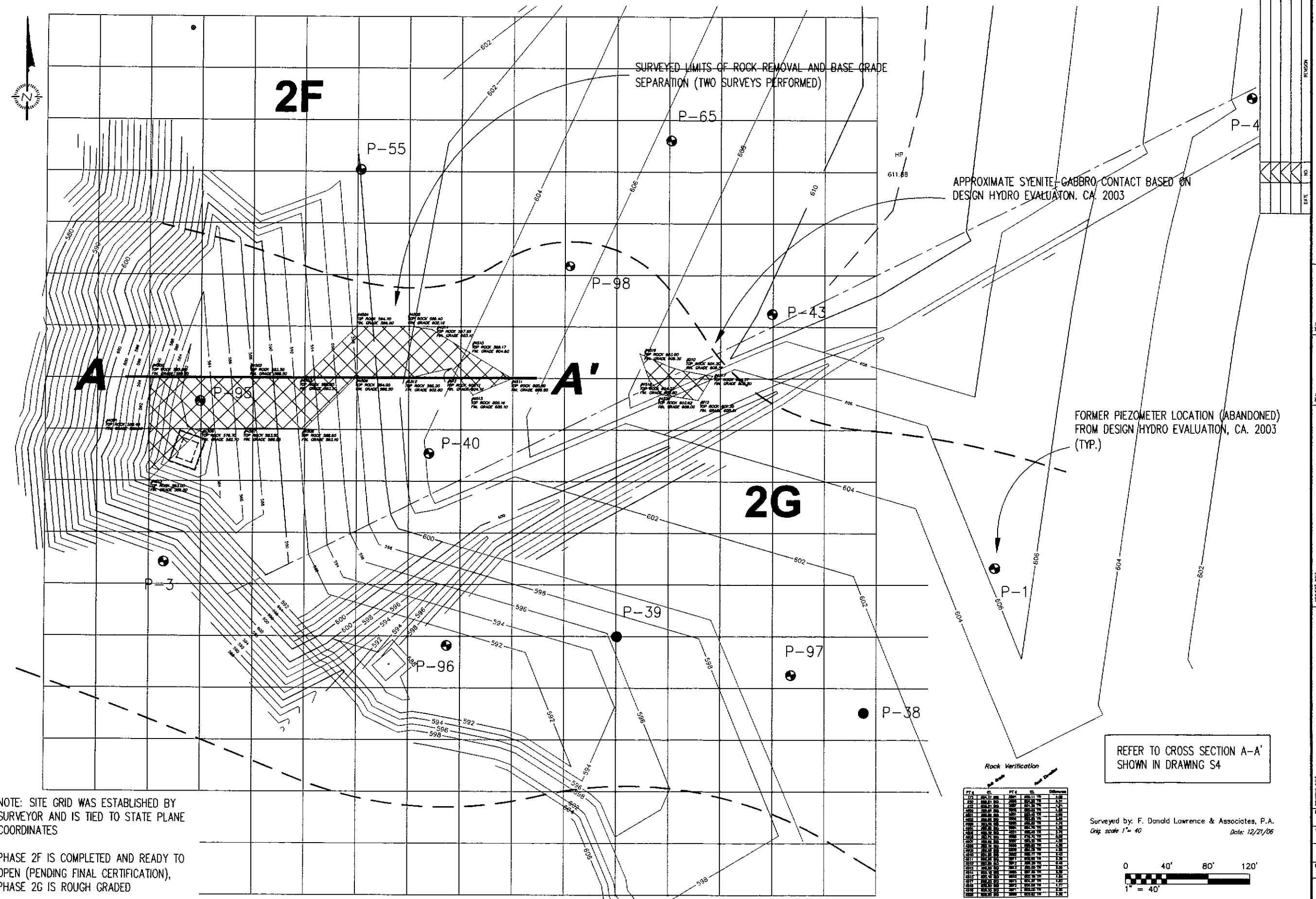
SEAL: NORTH CAROLINA PROFESSIONAL SEAL 25462 ENGINEER C. DAVID CHANG

PROJECT TITLE: BFI/ALLIED WASTE INDUSTRIES
CMS LANDFILL V
CABARRUS COUNTY, NC
NC DENR PERMIT #13-04

DRAWING TITLE: PHASE 2, CELL 2F
ROCK DELINEATION/REMOVAL
PREBLAST TOPO SURVEY

DESIGNED BY: G.D.G.	DRAWN BY: G.D.G.
CHECKED BY: B.S.B.	PROJECT NO.: CMS-D001
SCALE: AS SHOWN	DATE: JUNE 2007
FILE NAME: CMS-D0001	
SHEET NO. 2	DRAWING NO. S2

CMS-D0002.dwg DATE: JUN 8, 2007 TIME: 4:45 PM



NOTE: SITE GRID WAS ESTABLISHED BY SURVEYOR AND IS TIED TO STATE PLANE COORDINATES

PHASE 2F IS COMPLETED AND READY TO OPEN (PENDING FINAL CERTIFICATION), PHASE 2G IS ROUGH GRADED

Rock Verification

PT #	Sub Grade El.	PT #	Rock Elevation El.	Difference
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

REFER TO CROSS SECTION A-A' SHOWN IN DRAWING S4

Surveyed by: F. Donald Lawrence & Associates, P.A.
Orig. scale 1" = 40 Date: 12/21/06

0 40' 80' 120'
1" = 40'

CMS-D0002.dwg DATE: JUN 8, 2007 TIME: 4:45 PM

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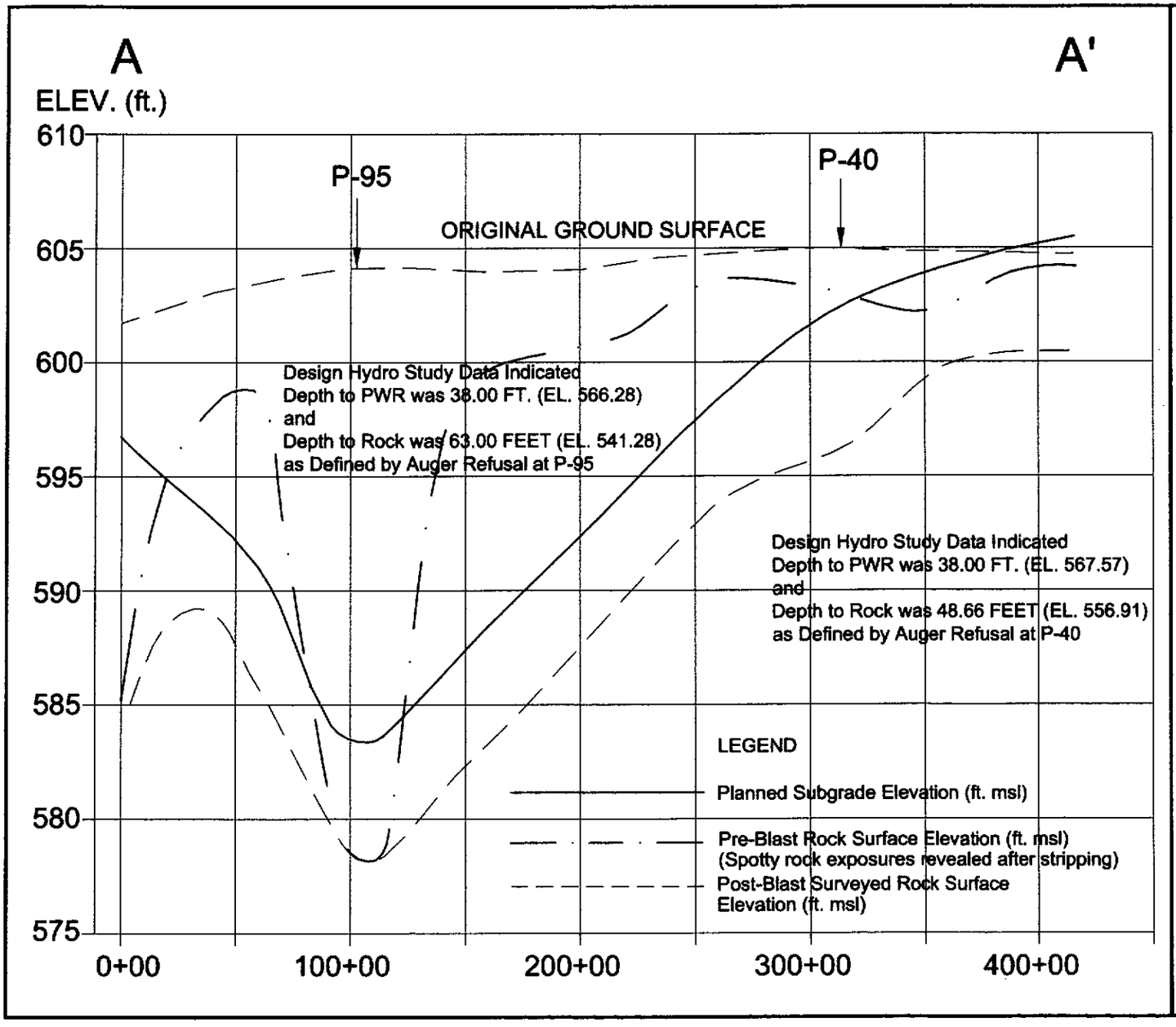
SEAL: NORTH CAROLINA LICENSED GEOLOGIST SEAL 1268 BRIAN S. BOUTIN

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 25482 G. DAVID GARRETT

PROJECT TITLE: BFI/ALLIED WASTE INDUSTRIES
CMS LANDFILL V
CABARRUS COUNTY, NC
NC DENR PERMIT #13-04

DRAWING TITLE: PHASE 2, CELL 2F
ROCK DELINEATION/REMOVAL
POSTBLAST/GRADING SURVEY

DESIGNED BY: G.D.G.	DRAWN BY: G.D.G.
CHECKED BY: B.S.B.	PROJECT NO: CMS-D001
SCALE: AS SHOWN	DATE: JUNE 2007
FILE NAME: CMS-D0001	
SHEET NO: 3	DRAWING NO: S3



BFI/ALLIED WASTE INDUSTRIES
CMS LANDFILL V – PHASE 2
ROCK DELINEATION/REMOVAL
FIGURE 4

FILE NAME A-A'FXSEC.DWG | SCALE AS_SHOWN | DATE 06/13/2007

David Garrett & Associates
Engineering and Geology
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CDB

CAROLINA DRILLING INC.
326 Railroad St. ~ Mocksville, NC 27028
Phone (336) 751-2961~ Fax (336) 751-0774 Carolinadrillinginc@yadtel.com

March 6, 2007

To: Brian Boutin, P.G
11112 Branding Iron Pl.
Wendell, N.C. 27591.

Re: BFI Charlotte Motor Speedway

Brian,

I hereby certify that the drill hole patterns, pounds per cubic yard and delay periods minimized impact to any underlying rock.

If you have any further questions please call me, James Larry Tutterow at 336-345-4595.

Thanks again for the opportunity to work for you and looking forward to working with you in the future.,

Yours Truly,

James Larry Tutterow,
Pres. Carolina Drilling Inc.

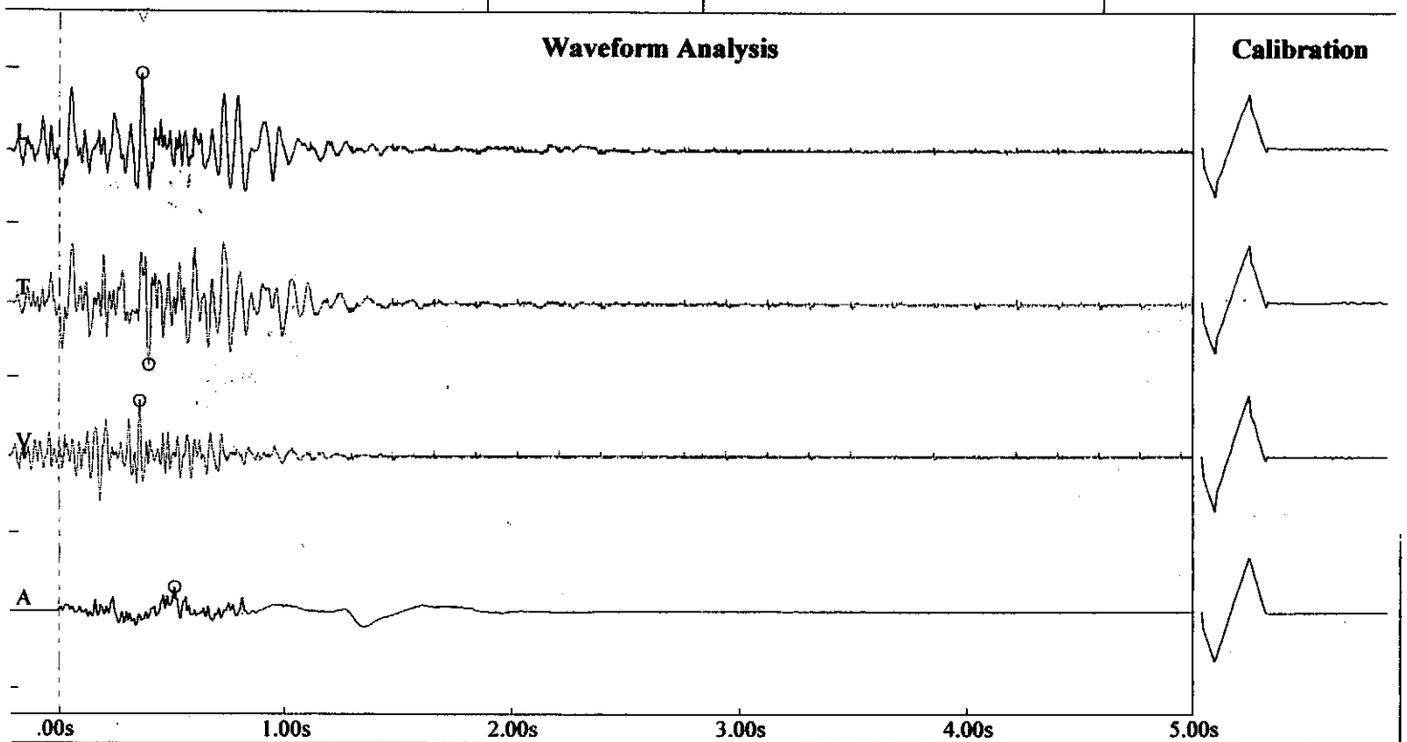
NOMIS Seismographs - Report

Telephone: (205)592-2488 x 22

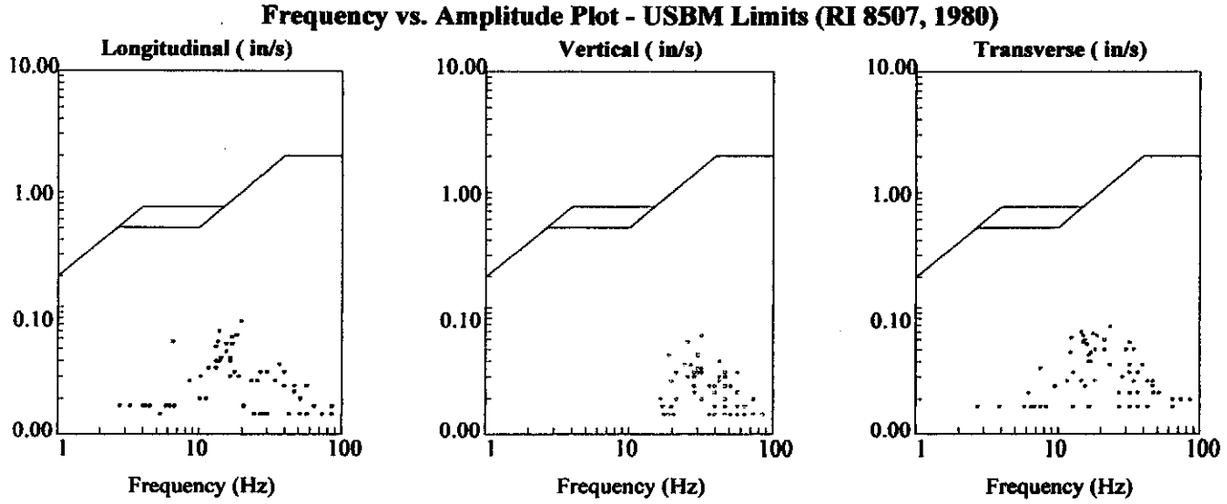
Company: BFI LANDFILL - CONCORD
Location: WELL #1
Operator: ANDREW MCNICHOLS
Notes: SHOT LOC: N OF SEISMOGRAPH

06-FEB-07 at 15:41
Graph: 4072
Last Calibration: 30MAR06
Record Duration: 5 sec
Sample Rate: 1024/sec

Amplitudes / Frequencies	Trigger >>> Peak	Scales / Triggers	Charge / Distance
○ Longitudinal: 0.075 in/s @ 19.6 Hz	368.2 ms	Air Scale: .01843 psi/div.	Wgt. Per Delay: 75.0 lb
○ Transverse: 0.068 in/s @ 23.2 Hz	398.4 ms	Seismic Scale: 0.08 in/s/div.	Distance: 230.0 ft
○ Vertical: 0.055 in/s @ 32 Hz	357.4 ms	Air Trigger (dBL): N	Scaled Distance: 26.56
○ Air: 126 dBL @ 6Hz / .01 psi	512.7 ms	Seismic Trigger: 0.03 in/s	



Frequency vs. Amplitude Plot - USBM Limits (RI 8507, 1980)



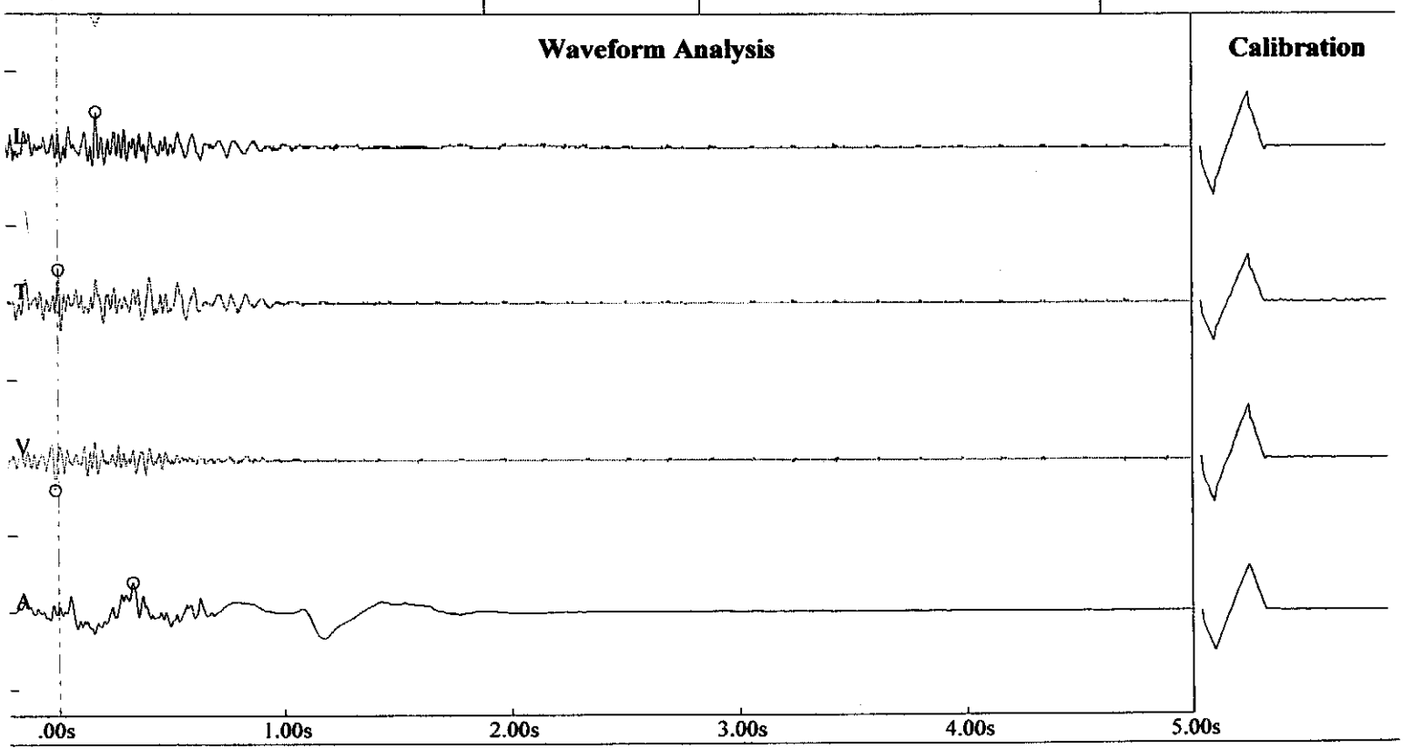
NOMIS Seismographs - Report

Telephone: (205)592-2488 x 22

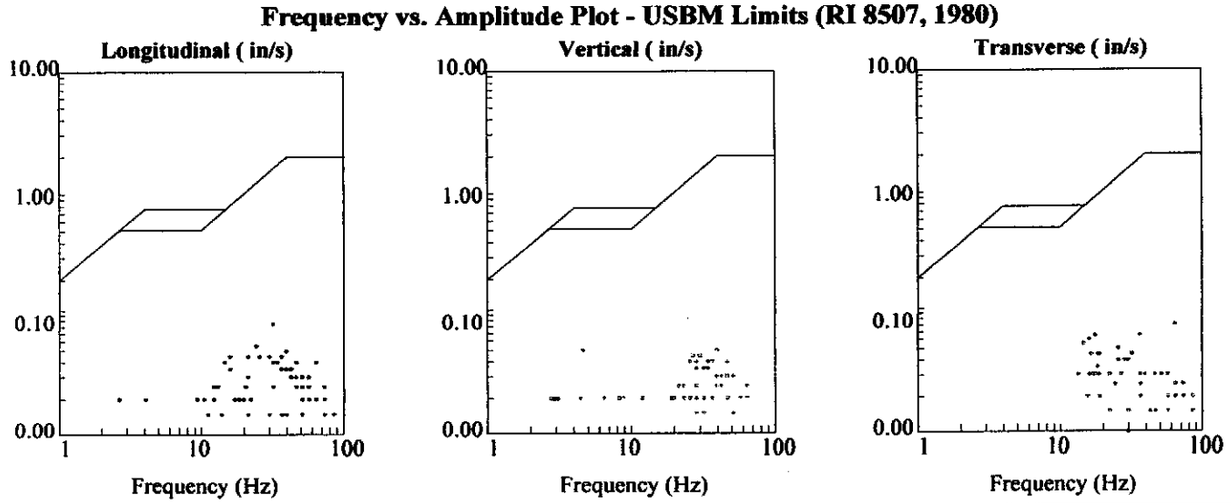
Company: BFI LANDFILL - CONCORD
Location: WELL #2
Operator: ANDREW MCNICHOLS
Notes: SHOT LOC: N OF SEISMOGRAPH

06-FEB-07 at 15:41
Graph: 4015
Last Calibration: 27JUN05
Record Duration: 5 sec
Sample Rate: 1024/sec

Amplitudes / Frequencies	Trigger >>> Peak	Scales / Triggers	Charge / Distance
○ Longitudinal: 0.075 in/s @ 34.1 Hz	170.9 ms	Air Scale: .00922 psi/div.	Wgt. Per Delay: 75.0 lb
○ Transverse: 0.070 in/s @ 34.1 Hz	1.0 ms	Seismic Scale: 0.16 in/s/div.	Distance: 240.0 ft
○ Vertical: 0.040 in/s @ 42.6 Hz	-14.6 ms	Air Trigger (dBL): N	Scaled Distance: 27.71
○ Air: 122 dBL @ 5.6Hz / .00 psi	328.1 ms	Seismic Trigger: 0.06 in/s	



Frequency vs. Amplitude Plot - USBM Limits (RI 8507, 1980)



VIBRATIONS ANALYSIS REPORT

name

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # :NS5400I-2212

Date : 6/2/2007 3:41

Customer : BFI LANDFILL

Location : LINER @ TOE #1

Event # 042

Company : CAROLINA DRILING
Operator : ANDREW MCNICHOLS

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points:5120

Distance (Ft): 325 *Charge per delay (lbs): 75* *Scaled Distance : 37.52*

VIBRATIONS

Amplification: 1 Trigger (T): 0.05 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	**0.2**	**0.2**	**0.23**
Frequency (Hz)	**17.3**	**14.6**	**16.3**
Acceleration (g)	0.062	0.062	0.017
Displacement (in)	0.0018	0.0024	0.0021
*VMax/Trigger (ms) **	*568.4*	*702.1*	*452.1*

ACOUSTIC

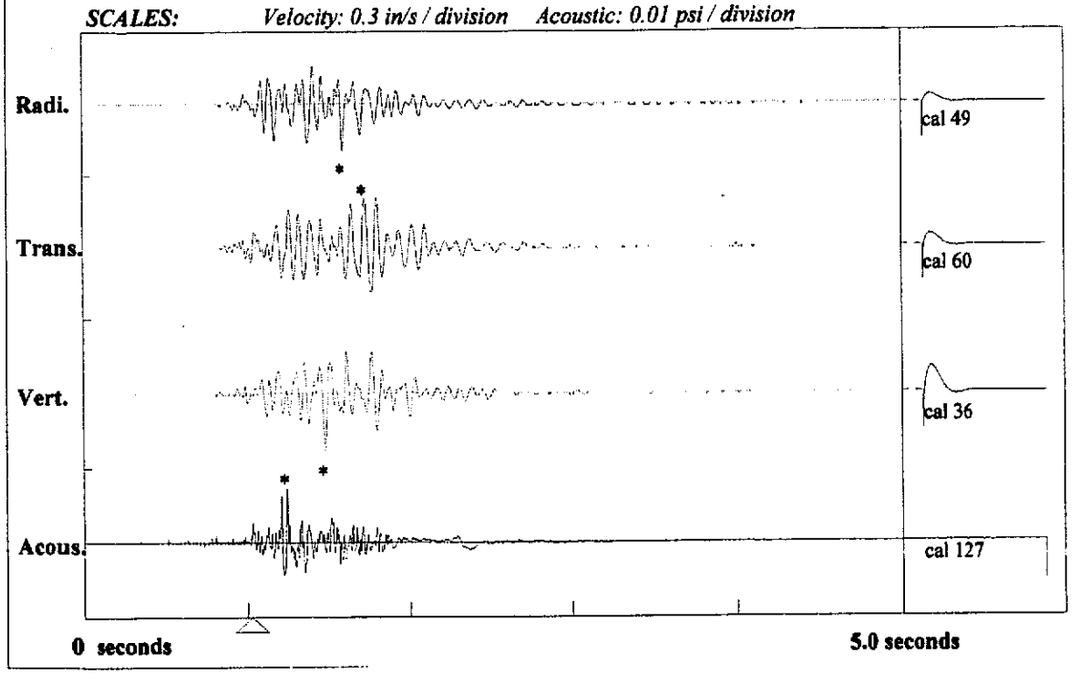
Amplification : 1 Trigger (dB) : N

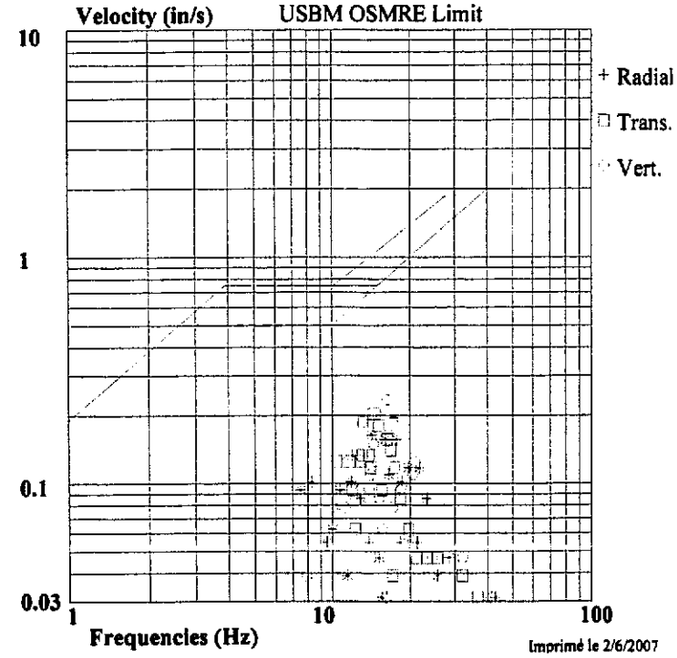
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.0072	214.8 ms
Acoustic in dBF	**127.9**	*41.4 Hz*

Comments :
» SHOT LOC: E OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.3 in/s / division* *Acoustic: 0.01 psi / division*





Imprimé le 2/6/2007

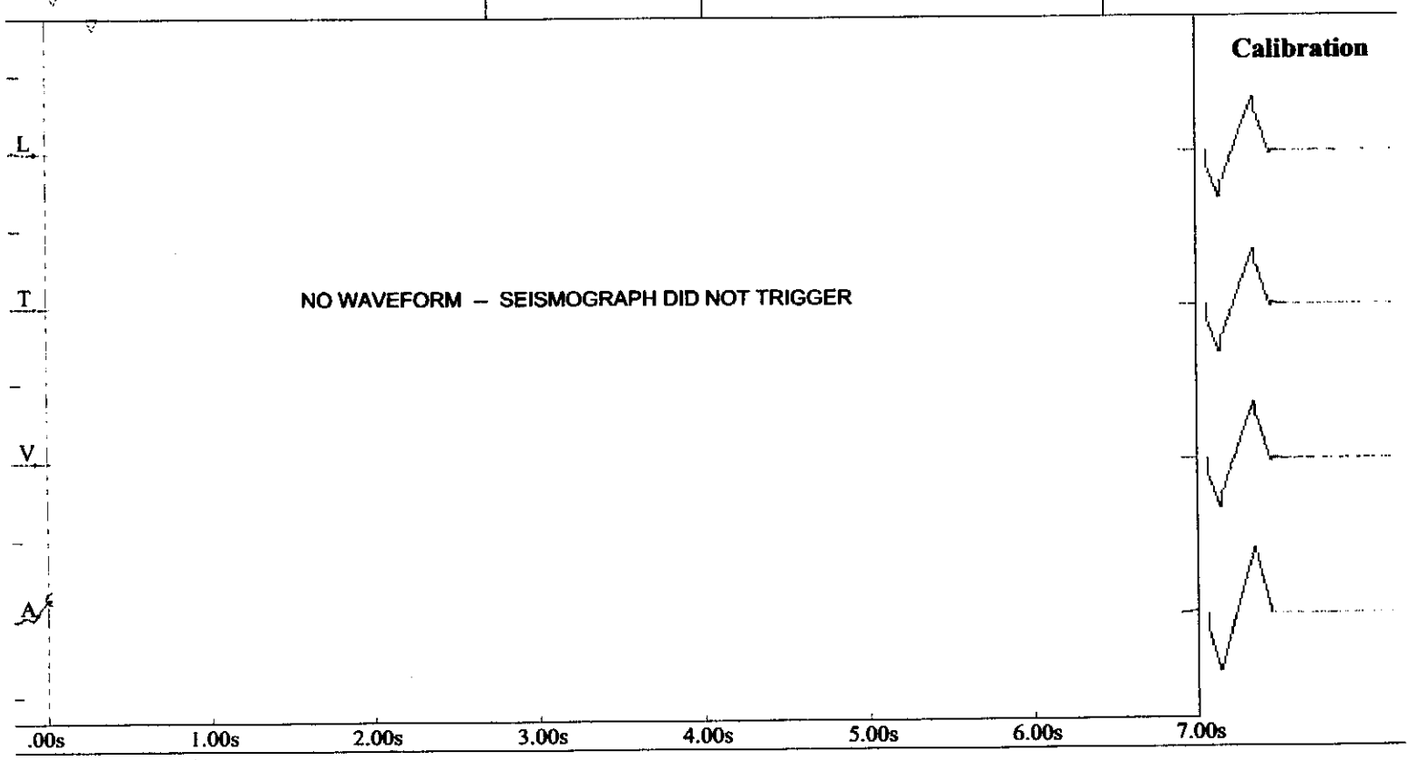
Sauls Seismic, Inc. - Report

Telephone: 800-351-8566

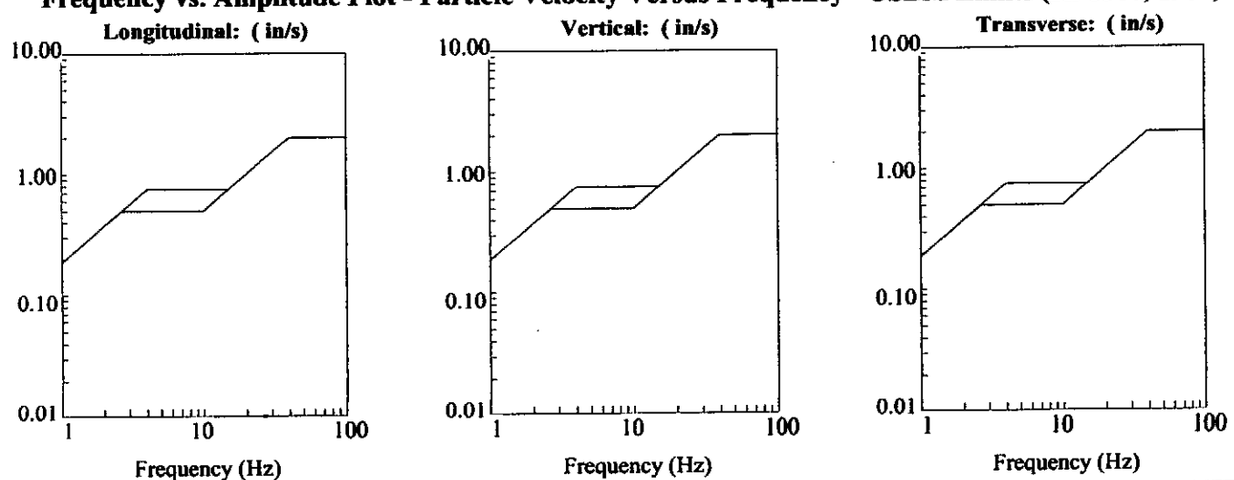
Company: BFI LANDFILL
Location: LINER @ TOE #2
Operator: ANDREW MCNICHOLS
Shot Loc: E OF SEISMOGRAPH
Shot #1 SEISMIC TRIGGER .05

FEB 06, 2007 15:41
Graph SuperGraph - Serial # 4021
Last Calibration: APRIL 20, 2006
Record Duration: 7 sec
Sample Rate: 1024/sec

Amplitudes / Frequencies	Trigger >>> Peak	Scales / Triggers	Charge / Distance
○ Longitudinal: <0.03 in/s @ --.- Hz	302.7 ms	Air Scale: .0023 psi/division	Wgt. Per Delay: 75 LB
○ Transverse: <0.03 in/s @ --.- Hz	118.2 ms	Seismic Scale: 0.20 in/s/division	Distance:570 FT.
○ Vertical: <0.03 in/s @ --.- Hz	111.3 ms	Air Trigger: N/A dBL	Scaled Distance:
○ Air: --- dBL @ --.- Hz / 0.000 psi	21.5 ms	Seismic Trigger: 0.03 in/s	



Frequency vs. Amplitude Plot - Particle Velocity Versus Frequency - USBM Limits (RI 8507, 1980)



VIBRATIONS ANALYSIS REPORT

File name: No-Trigger

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # 2212

Date: 02/08/07 14:03

Customer : BFI LANDFILL

Location : WELL #1

Event #

Company : CAROLINA
Operator : ANDREW MCNICHOLS

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points:5120

Distance (Ft): 395 Charge per delay (lbs):15
Scaled Distance :

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	<0.03	<0.03	<0.03
Frequency (Hz)	---	---	---
Acceleration (g)			
Displacement (in)			
*VMax/Trigger (ms) **	-	-	-

ACOUSTIC

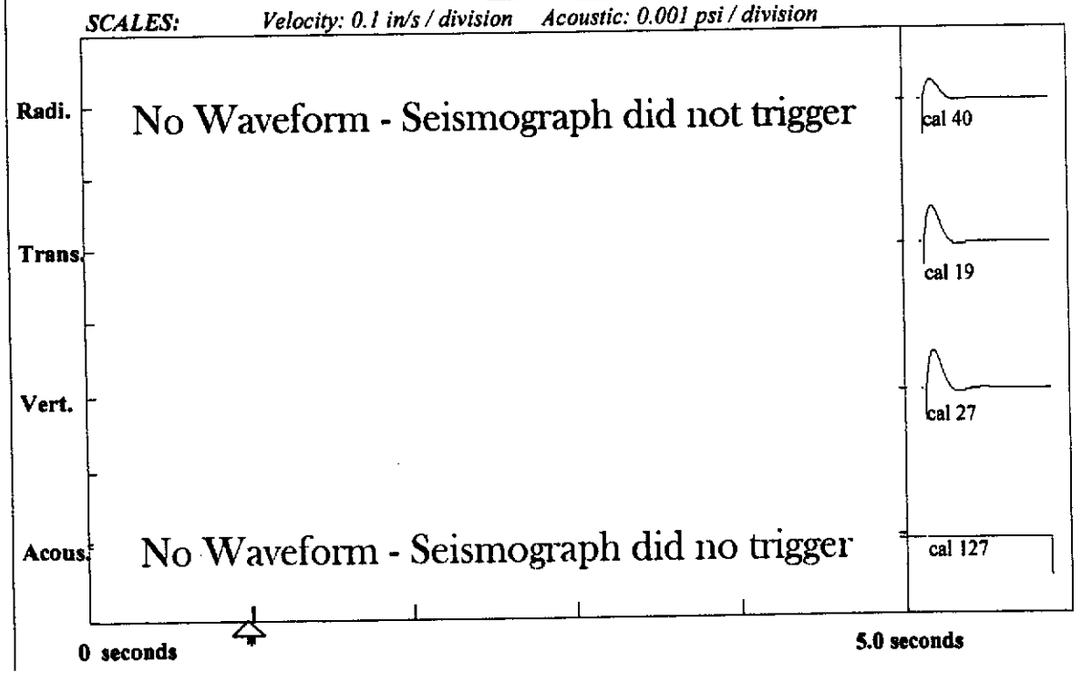
Amplification : 1 Trigger (dB) : 115

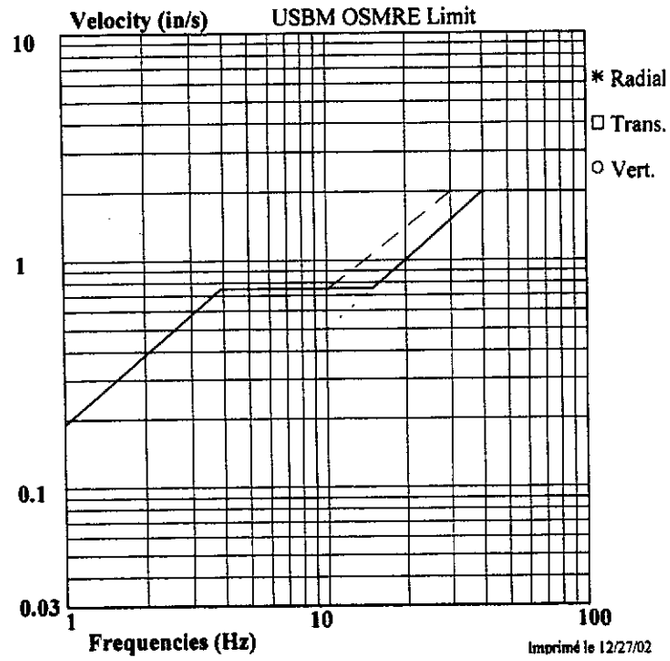
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.00	31.3 ms
Acoustic in dBF	<115	--- *Hz*

Comments: SHOT LOC: N OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.001 psi / division*





Imprimé le 12/27/02

NOMIS SEISMOGRAPHS,USA - Tel: 205-592-2466

VIBRATIONS ANALYSIS REPORT

File name: No-Trigger

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # 2610

Date: 02/08/07 14:03

Customer : BFI LANDFILL

Location : WELL #2

Event #

Company : CAROLINA
Operator : ANDREW MCNICHOLS

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points: 5120

Distance (Ft): 405 Charge per delay (lbs): 15
Scaled Distance :

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	<0.03	<0.03	<0.03
Frequency (Hz)	---	---	---
Acceleration (g)			
Displacement (in)			
*VMax/Trigger (ms) **	-	-	-

ACOUSTIC

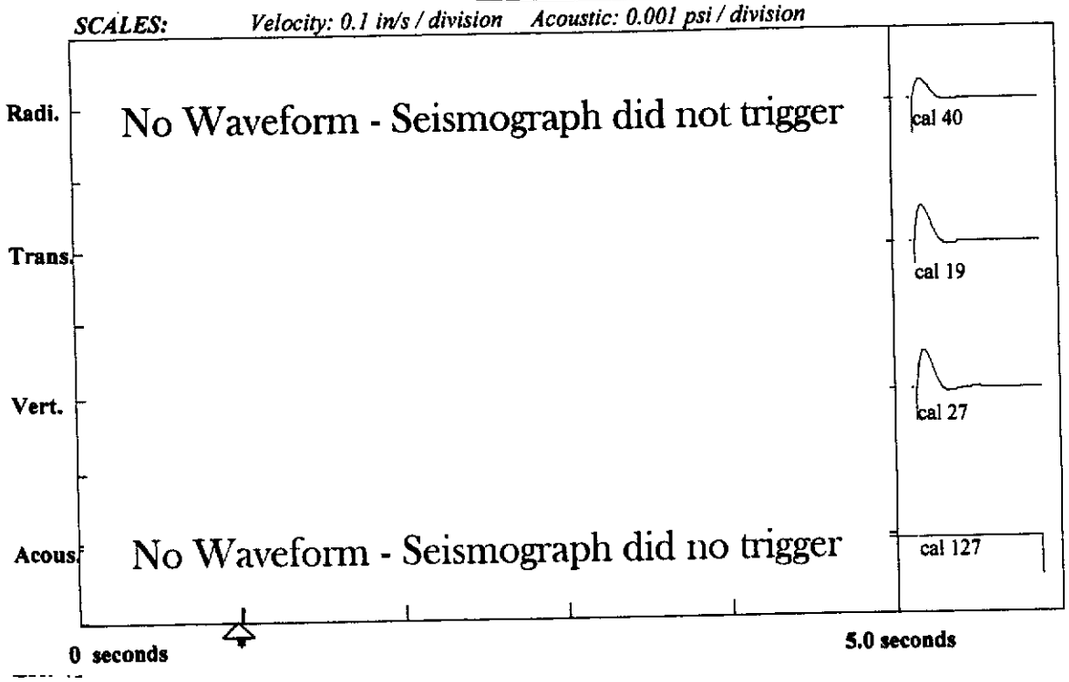
Amplification : 1 Trigger (dB) : 115

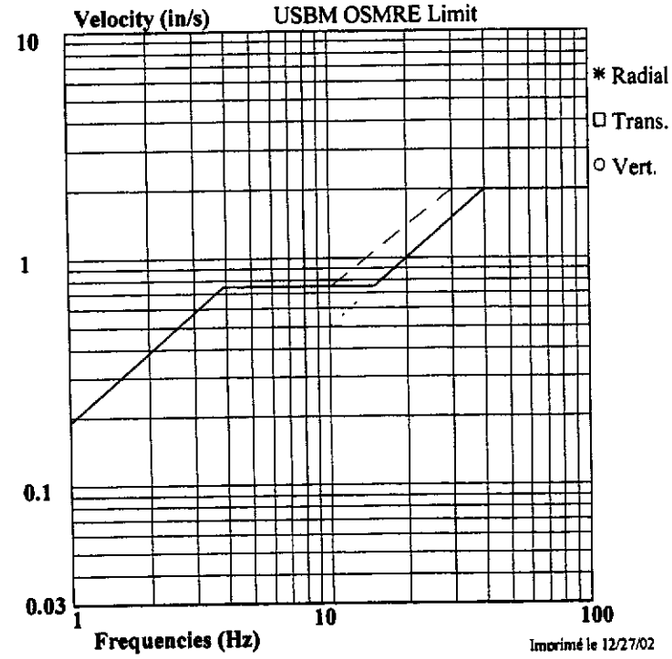
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.00	31.3 ms
Acoustic in dBF	<115	--- *Hz*

Comments: SHOT LOC: N OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.001 psi / division*





NOMIS SEISMOGRAPHS, USA - Tel: 205-592-2466

VIBRATIONS ANALYSIS REPORT

ame C:\DOCUMENTS AND SETTINGS\ANDREW\DESKTOP\SAULS 2007\SAULS DOWNLOADS\2007\WEEK OF 021007\CAROLINA DRILLING - BFI LANDFILL - CONCORD, NC\LINER @ TOE #1\EVENT060.

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # :NS5400I-2727

Date : 02/08/07 14:03

Customer : BFI LANDFILL

Location : LINER @ TOE #1

Event # 060

Company : CAROLINA
Operator : ANDREW MCNICHOLS

Record time: 3.0 sec
Sampling rate: 1024 E/s
Number of points:3072

Distance (Ft): 235 *Charge per delay (lbs): 15* *Scaled Distance : 60.7*

VIBRATIONS

Amplification: 1 Trigger (T): 0.05 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	0.1	0.06	0.1
Frequency (Hz)	14.6	21.3	17.6
Acceleration (g)	0.004	0.004	0.038
Displacement (in)	0.0006	0.0004	0.0006
*VMax/Trigger (ms) **	*344.7*	*10.7*	*201.2*

ACOUSTIC

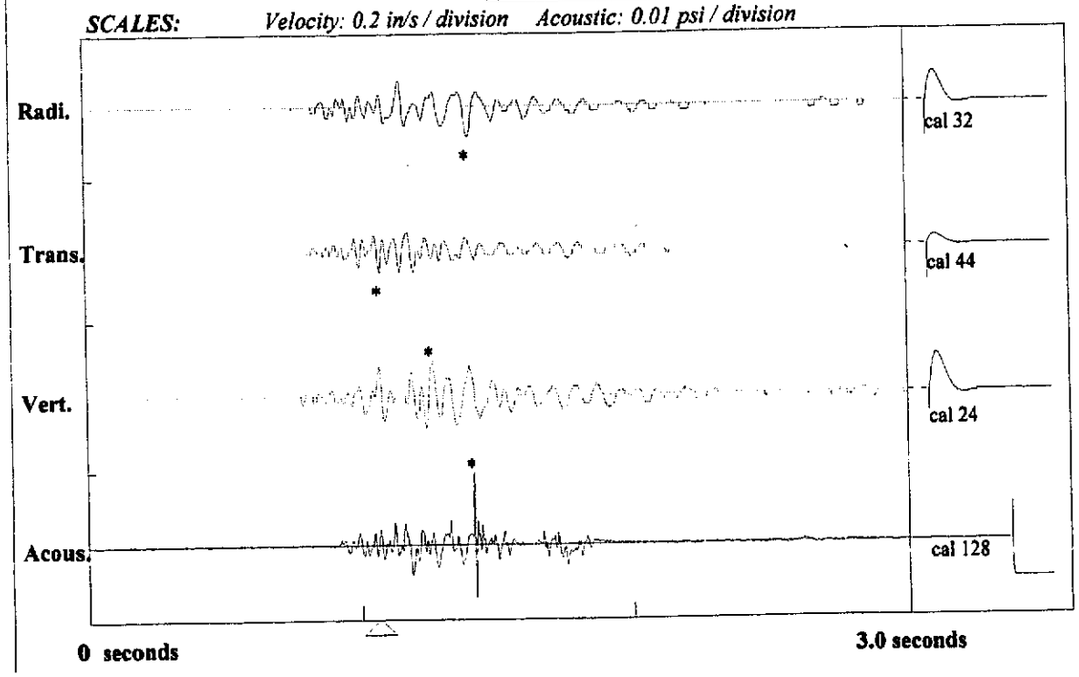
Amplification : 1 Trigger (dB) : N

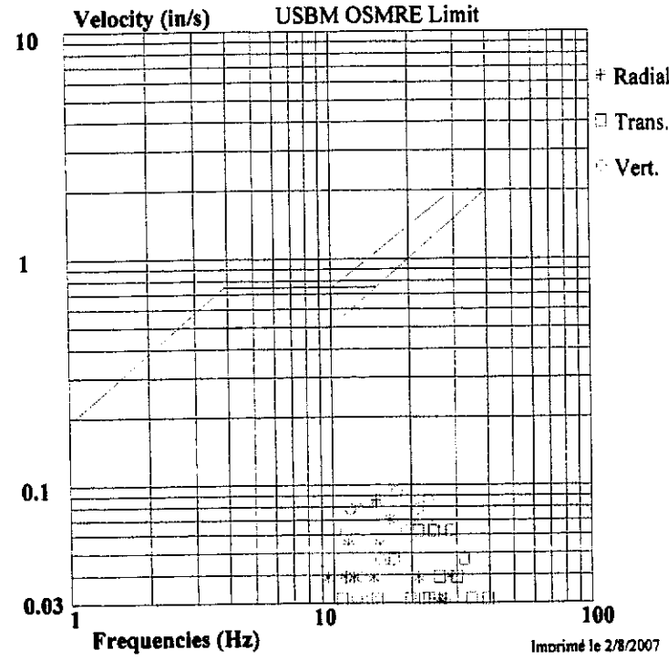
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.0095	355.5 ms
Acoustic in dBF	130.3	*16.0 Hz*

Comments :SHOT LOC: N OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.2 in/s / division* *Acoustic: 0.01 psi / division*





Imprimé le 2/8/2007

Developped by EXPLO-TECH - FRANCE (W-NOMIS Version 4.4.1)

NOMIS SEISMOGRAPHS, USA - Tel: 205-592-2466

VIBRATIONS ANALYSIS REPORT

File name: No-Trigger

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # 2328

Date: 02/08/07 14:03

Customer : BFI LANDFILL

Location : LINER @ TOE #2

Event #

Company : CAROLINA
Operator : ANDREW MCNICHOLS

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points:5120

Distance (Ft): 580 Charge per delay (lbs):15
Scaled Distance :

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	<0.03	<0.03	<0.03
Frequency (Hz)	---	---	---
Acceleration (g)			
Displacement (in)			
*VMax/Trigger (ms) **	-	-	-

ACOUSTIC

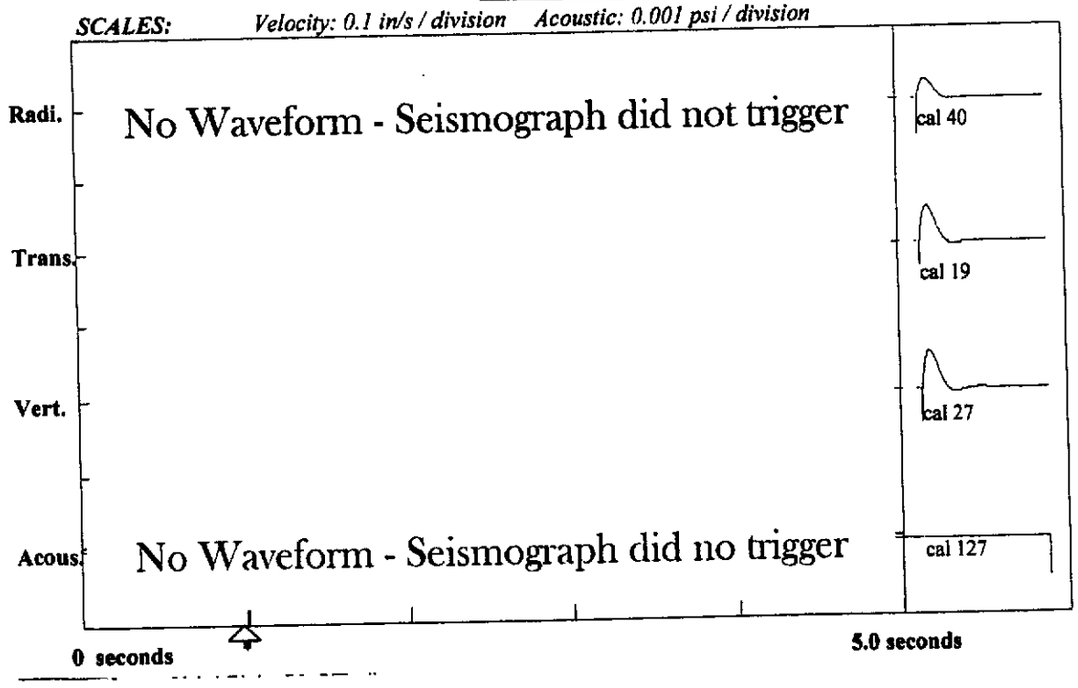
Amplification : 1 Trigger (dB) : 115

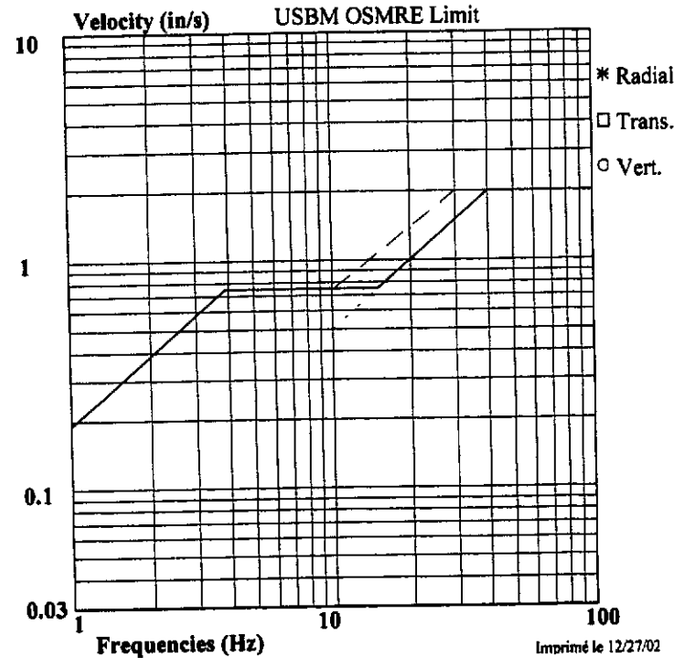
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.00	31.3 ms
Acoustic in dBF	<115	--- *Hz*

Comments: SHOT LOC: N OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.001 psi / division*





Imprimé le 12/27/02

VIBRATIONS ANALYSIS REPORT

File name: No-Trigger

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # 2212

Date: 02/12/07 16:31

Customer : BFI LANDFILL

Location : WELL #1

Event #

Company : CAROLINA
Operator : ANDREW MCNICHOLS

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points:5120

Distance (Ft): 720 Charge per delay (lbs):15
Scaled Distance :

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	<0.03	<0.03	<0.03
Frequency (Hz)	---	---	---
Acceleration (g)			
Displacement (in)			
*VMax/Trigger (ms) **	-	-	-

ACOUSTIC

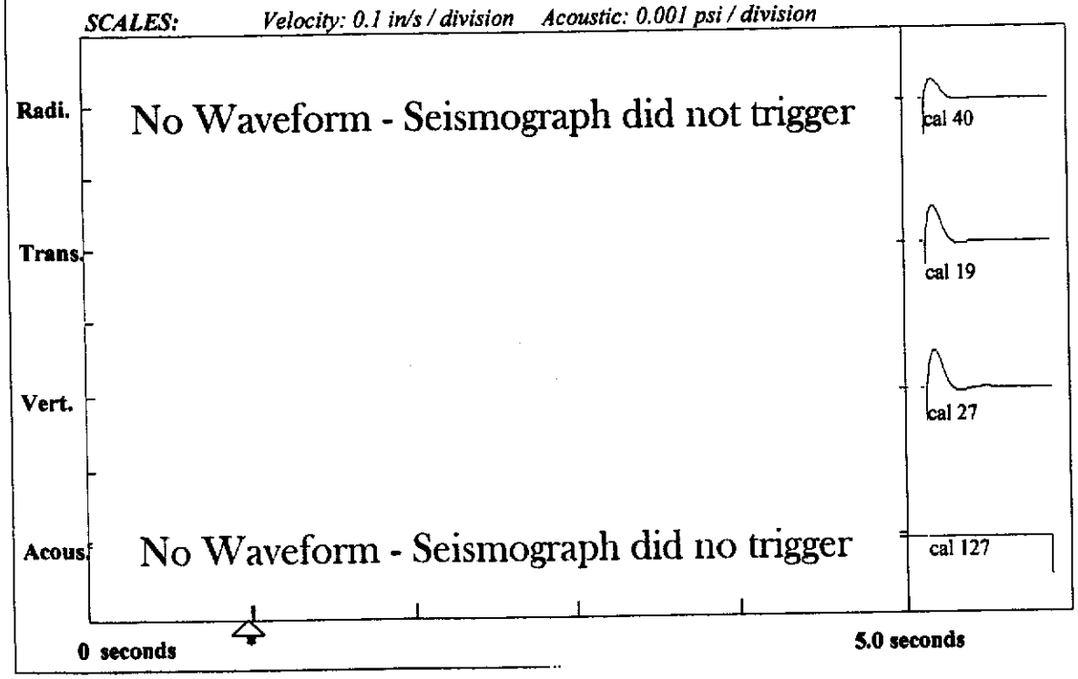
Amplification : 1 Trigger (dB) : 115

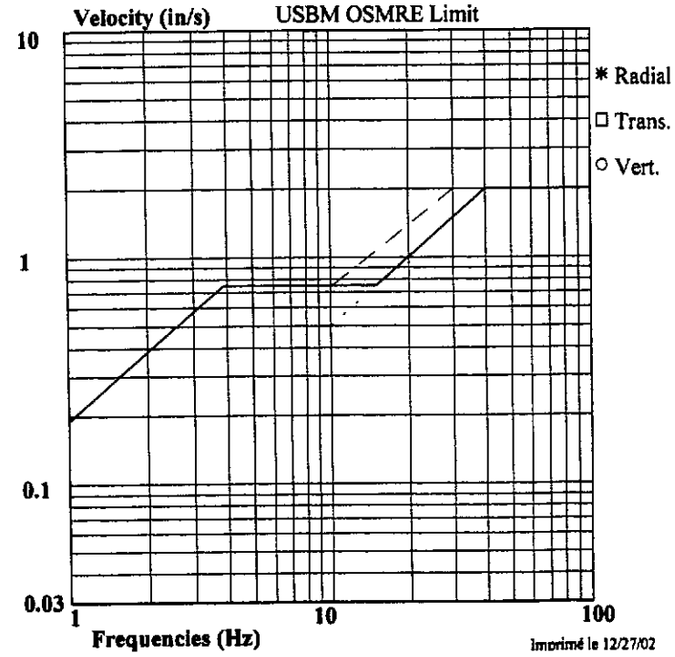
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.00	31.3 ms
Acoustic in dBF	<115	--- *Hz*

Comments: SHOT LOC: N OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.001 psi / division*





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VIBRATIONS ANALYSIS REPORT

File name: No-Trigger

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # 2610

Date: 02/12/07 16:31

Customer : BFI LANDFILL

Location : WELL #2

Event #

Company : CAROLINA
Operator : ANDREW MCNICHOLS

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points: 5120

Distance (Ft): 730 Charge per delay (lbs): 15
Scaled Distance :

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	<0.03	<0.03	<0.03
Frequency (Hz)	----	----	--
Acceleration (g)			
Displacement (in)			
VMax/Trigger (ms) *	-	-	-

ACOUSTIC

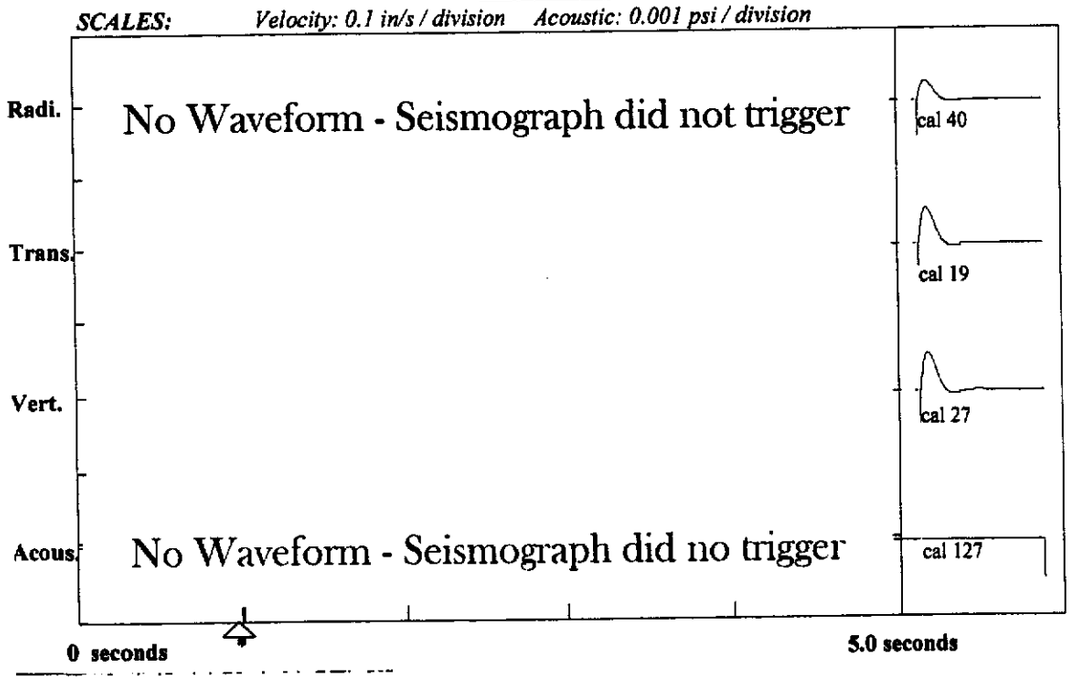
Amplification : 1 Trigger (dB) : 115

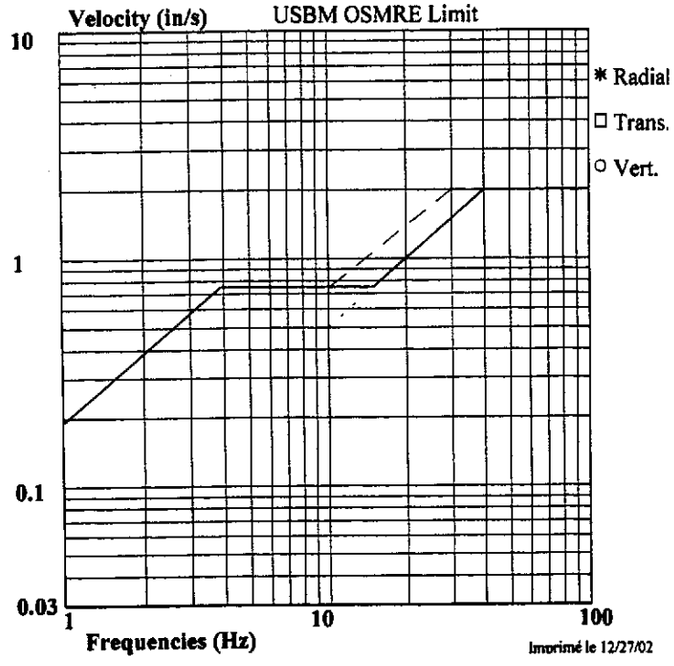
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.00	31.3 ms
Acoustic in dBF	<115	— *Hz*

Comments: SHOT LOC: N OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.001 psi / division*





Imprimé le 12/27/02

VIBRATIONS ANALYSIS REPORT

File name: No-Trigger

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # 2727

Date: 02/12/07 16:31

Customer : BFI LANDFILL

Location : LINER @ TOE #1

Event #

Company : CAROLINA
Operator : ANDREW MCNICHOLS

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points:5120

Distance (Ft): 475 Charge per delay (lbs):15
Scaled Distance :

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	<0.03	<0.03	<0.03
Frequency (Hz)	---	---	---
Acceleration (g)			
Displacement (in)			
*VMax/Trigger (ms) **	-	-	-

ACOUSTIC

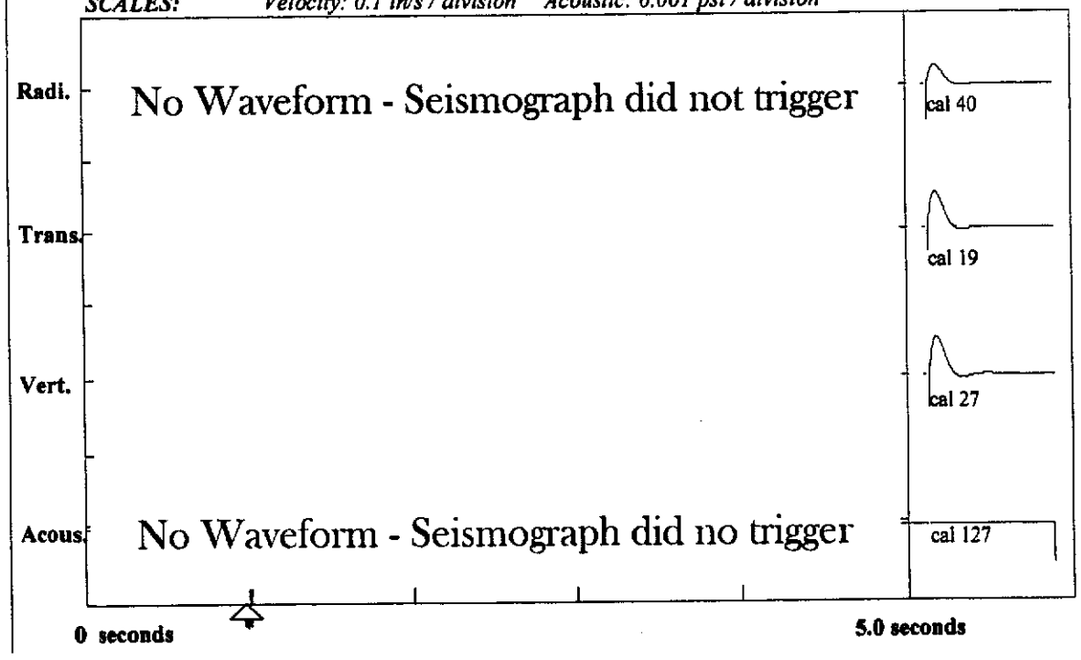
Amplification : 1 Trigger (dB) : 115

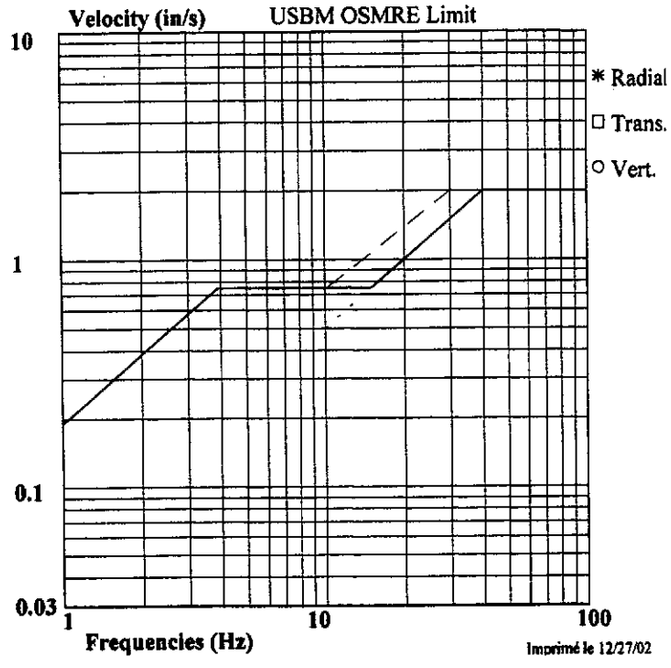
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.00	31.3 ms
Acoustic in dBF	<115	--- *Hz*

Comments: SHOT LOC: N OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.001 psi / division*





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VIBRATIONS ANALYSIS REPORT

File name: No-Trigger

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # 2328

Date: 02/12/07 16:31

Customer : BFI LANDFILL

Location : LINER @ TOE #2

Event #

Company : CAROLINA
Operator : ANDREW MCNICHOLS

Record time: 5.0 sec
Sampling rate: 1024 E/s

Number of points:5120

Distance (Ft): 490 Charge per delay (lbs):15

Scaled Distance :

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	<0.03	<0.03	<0.03
Frequency (Hz)	----	----	---
Acceleration (g)			
Displacement (in)			
*VMax/Trigger (ms) **	-	-	-

ACOUSTIC

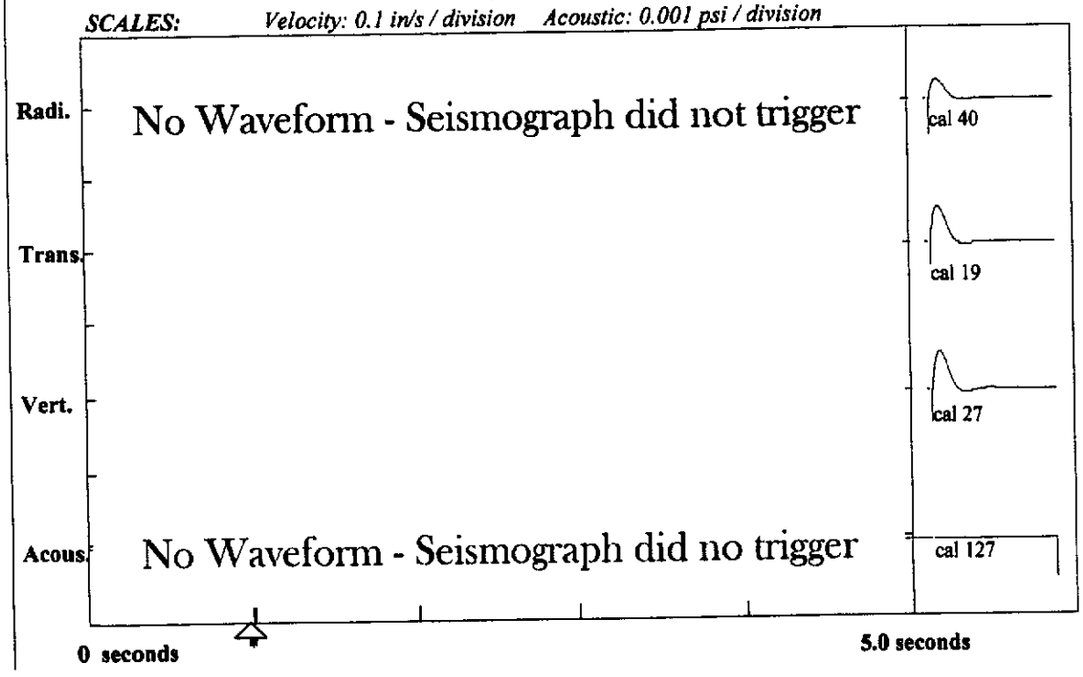
Amplification : 1 Trigger (dB) : 115

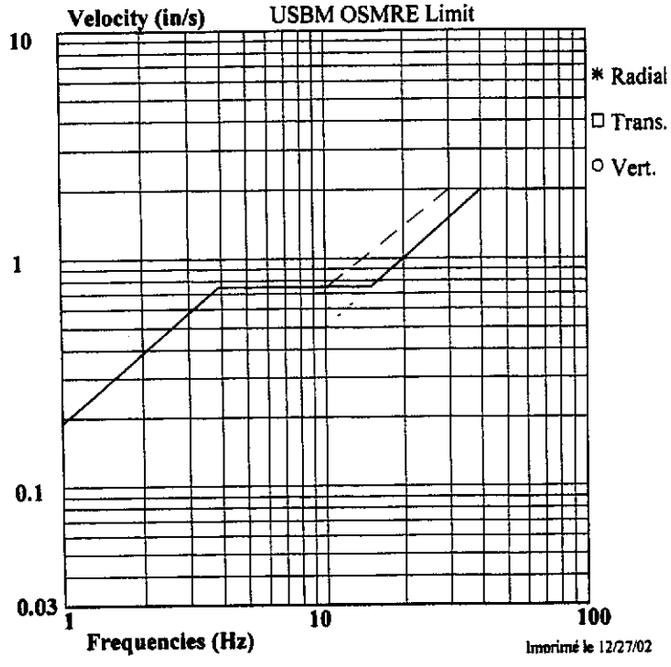
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.00	31.3 ms
Acoustic in dBF	<115	--- *Hz*

Comments: SHOT LOC: N OF SEISMOGRAPH

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division Acoustic: 0.001 psi / division*





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NOMIS SEISMOGRAPHS,USA - Tel: 205-592-2466

VIBRATIONS ANALYSIS REPORT

File name 2012_001

EXPLO-TECH Minage & vibrations
Tel Assistance:(33) 01.64.93.05.76

Unit # :NS5400I-2465

Date :FEB 14, 2007 13:47

Location : #1 - N35 20'46.7" W080 39'38.3"

Customer :BFI LANDFILL

Event # 012

Record time: 5.0 sec

Company : CAROLINA DRILLING

Sampling rate: 1024 E/s

Number of points:5120

Operator : JOHN MIKESH

Distance (Ft): 419 *Charge per delay (lbs):14* *Scaled Distance : NA*

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	<0.03	<0.03	<0.03
Frequency (Hz)	-----	-----	-----
Acceleration (g)	<0.00	<0.00	<0.00
Displacement (in)	<0.0000	<0.0000	<0.0000
*VMax/Trigger (ms) **	-----	-----	------

ACOUSTIC

Amplification : 1 Trigger (dB) : ---

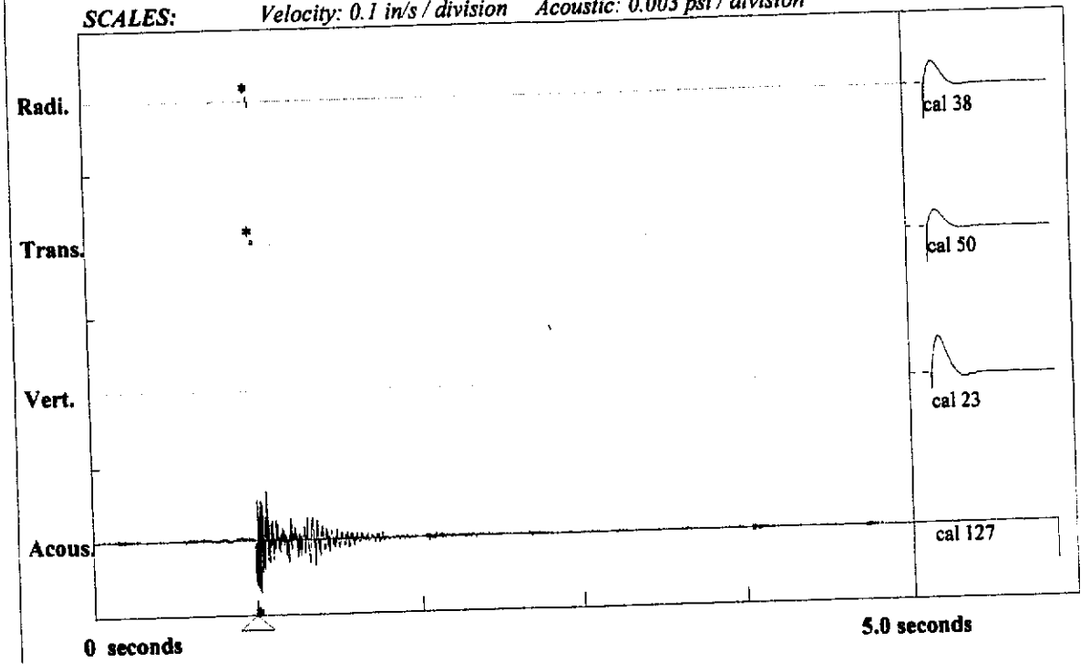
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	<0.000	--.- ms
Acoustic in dBF	----	---- *Hz*

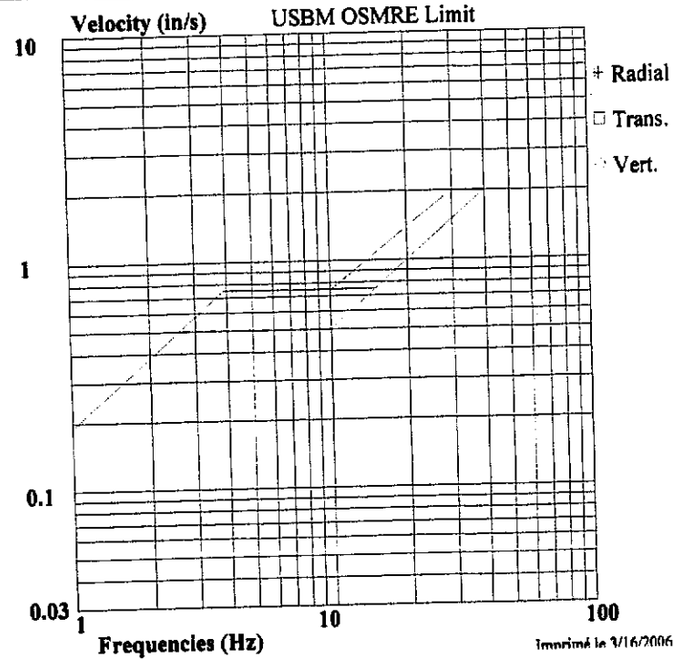
Comments :

»Shot Loc: N35 20'42.8" W080 39'40.1"

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.003 psi / division*





NOMIS SEISMOGRAPHS, USA - Tel: 205-592-2466

VIBRATIONS ANALYSIS REPORT

File name

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # :NS5400I-2431

Date : FEB 14, 2007 13:47

Location : #2 - N35 20'44.6" W080 39'42.1

Customer : BFI LANDFILL

Event # 495

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points:5120

Company : CAROLINA DRILLING
Operator : JOHN MIKESH

Distance (Ft): 239.2 *Charge per delay (lbs): 14.00* *Scaled Distance : 63.92*

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	0.14	0.15	0.16
Frequency (Hz)	23.3	32.0	19.3
Acceleration (g)	0.062	0.017	0.017
Displacement (in)	0.0010	0.0008	0.0010
*VMax/Trigger (ms) **	*822.3*	*435.5*	*436.5*

ACOUSTIC

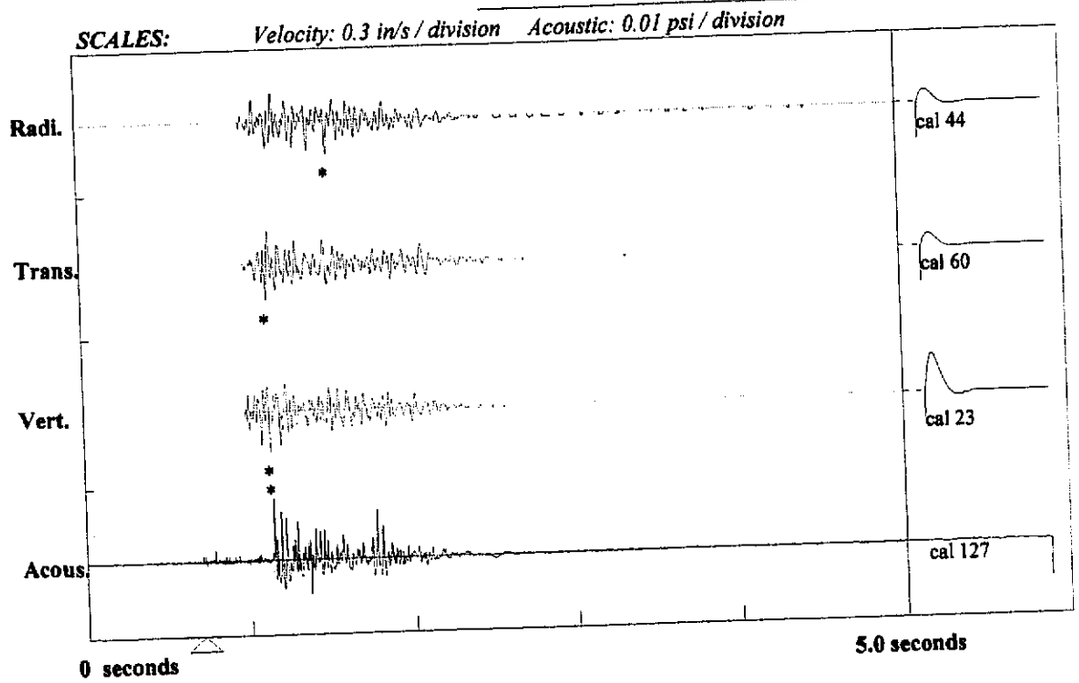
Amplification : 1 Trigger (dB) : 115

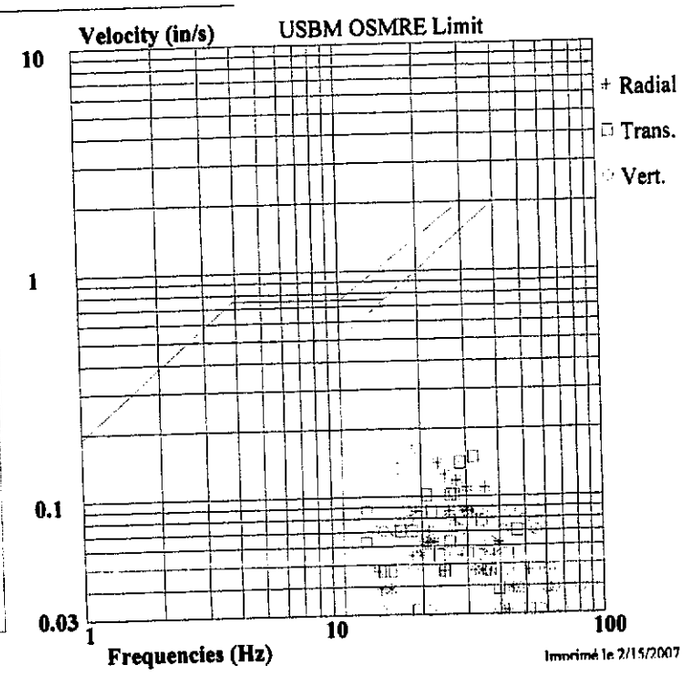
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.0081	444.3 ms
Acoustic in dBF	128.9	*21.8 Hz*

Comments :
» SHOT LOC: N35 20'44.6" W080 39'42.1"

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.3 in/s / division* *Acoustic: 0.01 psi / division*





Imprimé le 2/15/2007

Developped by EXPLO-TECH - FRANCE (W-NOMIS Version 4.4.1)

NOMIS SEISMOGRAPHS, USA - Tel: 205-592-2466

VIBRATIONS ANALYSIS REPORT

File name 021407 seis #3

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # :NS5400I-2720

Date : FEB 14, 2007 13:47

Location : #3 - N35 20'44.0" W080 39'44.7

Customer : BFI LANDFILL

Event # 025

Company : CAROLINA DRILLING
Operator : JOHN MIKESH

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points:5120

Distance (Ft): 398 | *Charge per delay (lbs): 14.00* | *Scaled Distance : 106.36*

VIBRATIONS

Amplification: 1 Trigger (T): 0.03 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	**0.06**	**0.05**	**0.06**
Frequency (Hz)	**22.3**	**34.1**	**28.4**
Acceleration (g)	0.062	0.041	0.062
Displacement (in)	0.0004	0.0004	0.0004
*VMax/Trigger (ms) **	*133.8*	*684.6*	*32.2*

ACOUSTIC

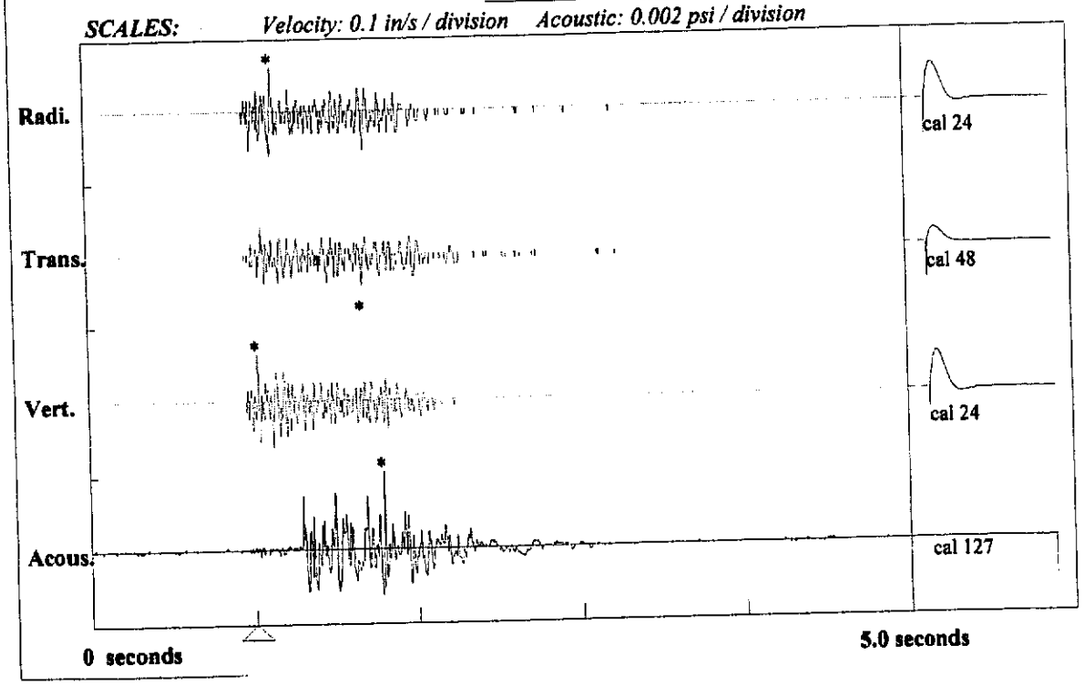
Amplification : 1 Trigger (dB) : N

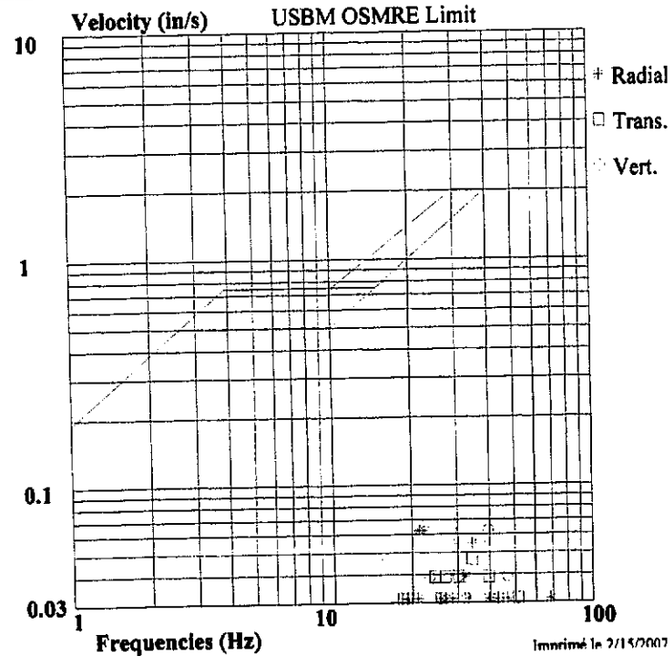
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.002	794.9 ms
Acoustic in dBF	**116.8**	*45.4 Hz*

Comments :
» SHOT LOC: N35 20'42.8" W080 39'40.1"

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.002 psi / division*





Imprimé le 2/15/2007

Developped by EXPLO-TECH - FRANCE (W-NOMIS Version 4.4.1)

VIBRATIONS ANALYSIS REPORT

File name 021407 seis #4

NOMIS SEISMOGRAPHS
Tel :205.592.2466

Unit # :NS5400I/H-2357

Date : FEB 14, 2007 13:47

Customer : BFI LANDFILL

Location : #4 - N35 20'45.1" W080 39'45.5

Event # 012

Company : CAROLINA DRILLING
Operator : JOHN MIKESH

Record time: 5.0 sec
Sampling rate: 1024 E/s
Number of points:5120

Distance (Ft): 535 *Charge per delay (lbs): 14.00* *Scaled Distance : 142.98*

VIBRATIONS

Amplification: 1 Trigger (T): 0.04 in/s Vector Sum (in/s): N

Channel	Radial	Transverse	Vertical
Velocity (in/s)	**0.05**	**0.05**	**0.03**
Frequency (Hz)	**26.9**	**30.1**	**36.6**
Acceleration (g)	0.017	0.017	0.017
Displacement (in)	0.0016	0.0007	0.0017
*VMax/Trigger (ms) **	*-3922.9*	*-4001.0*	*-4029.3*

ACOUSTIC

Amplification : 1 Trigger (dB) : N

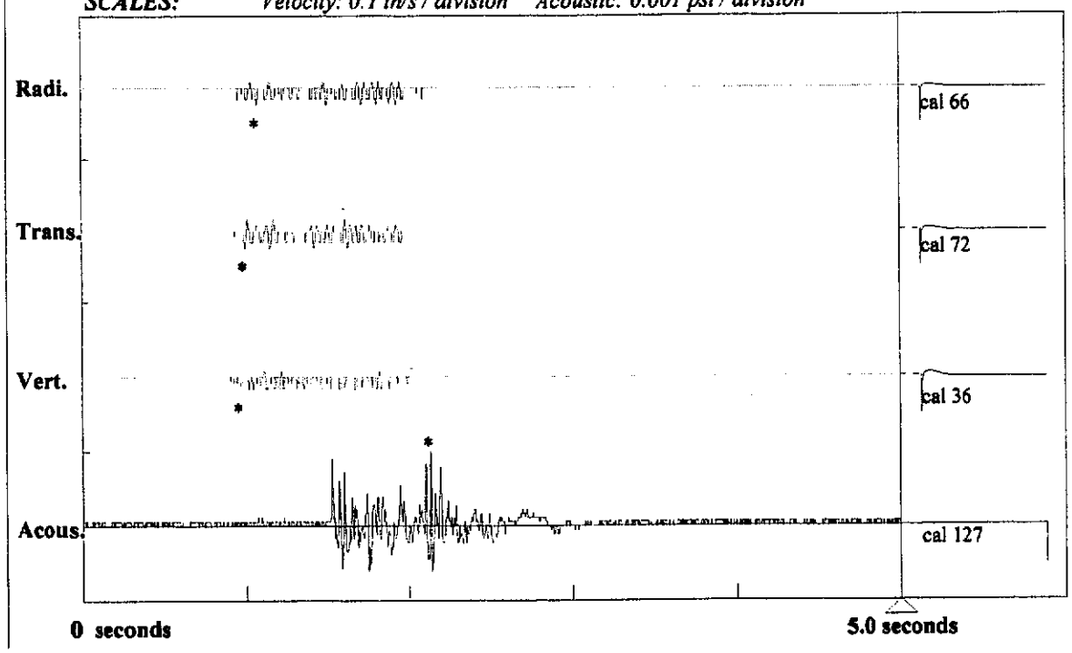
Parameters	Values	SMax/Trigger(*) :
Acoustic in psi	0.001	-2865.2 ms
Acoustic in dBF	**110.8**	*53.9 Hz*

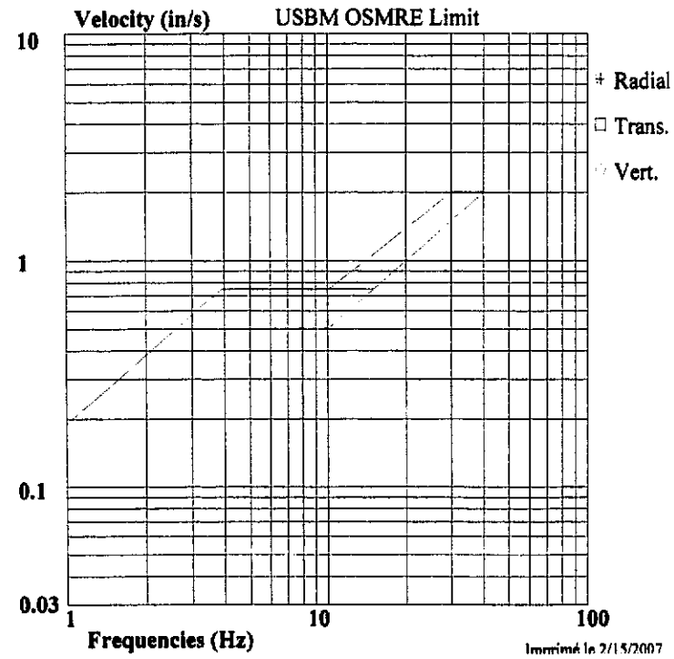
Comments :

» SHOT LOC: N35 20'42.8" W080 39'40.1"

AMPLITUDE GRAPHS & FREQUENCY vs VELOCITY GRAPHIC

SCALES: *Velocity: 0.1 in/s / division* *Acoustic: 0.001 psi / division*





Imprimé le 2/15/2007

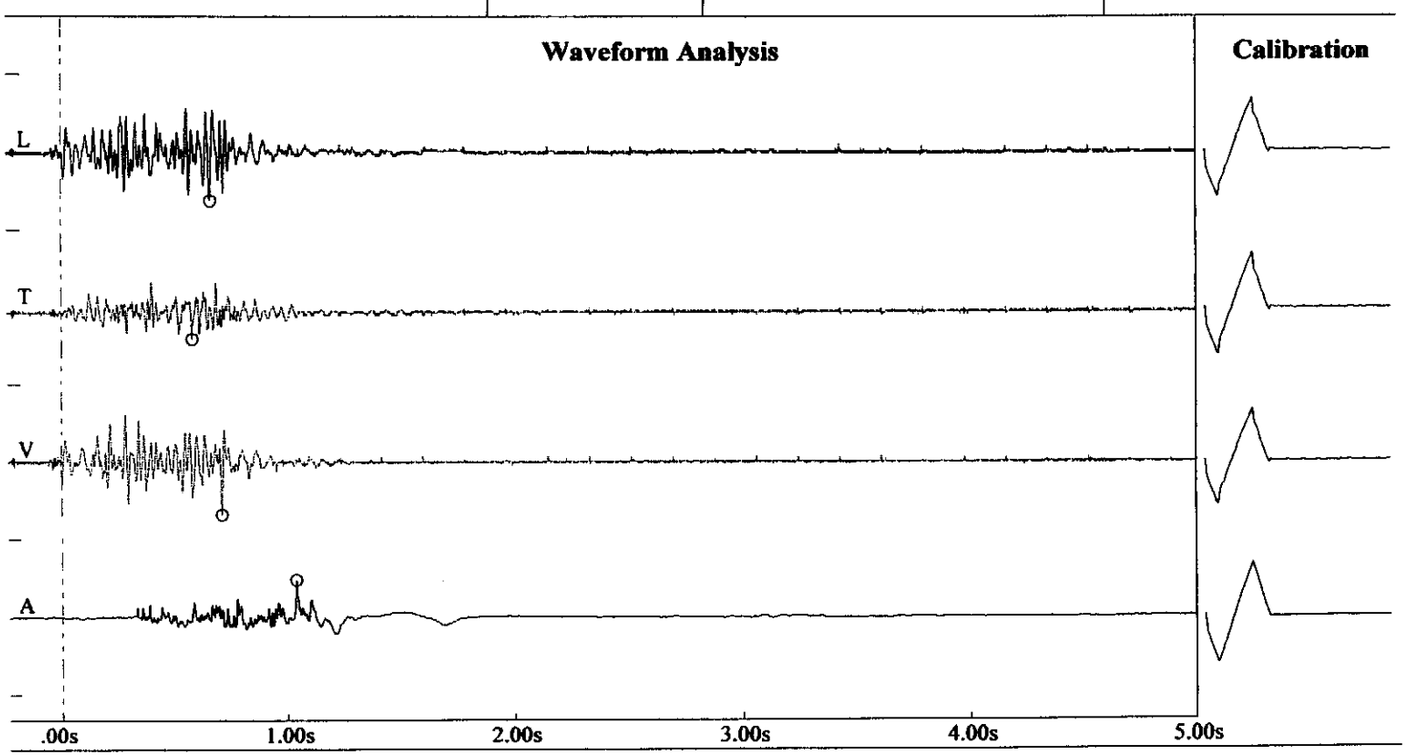
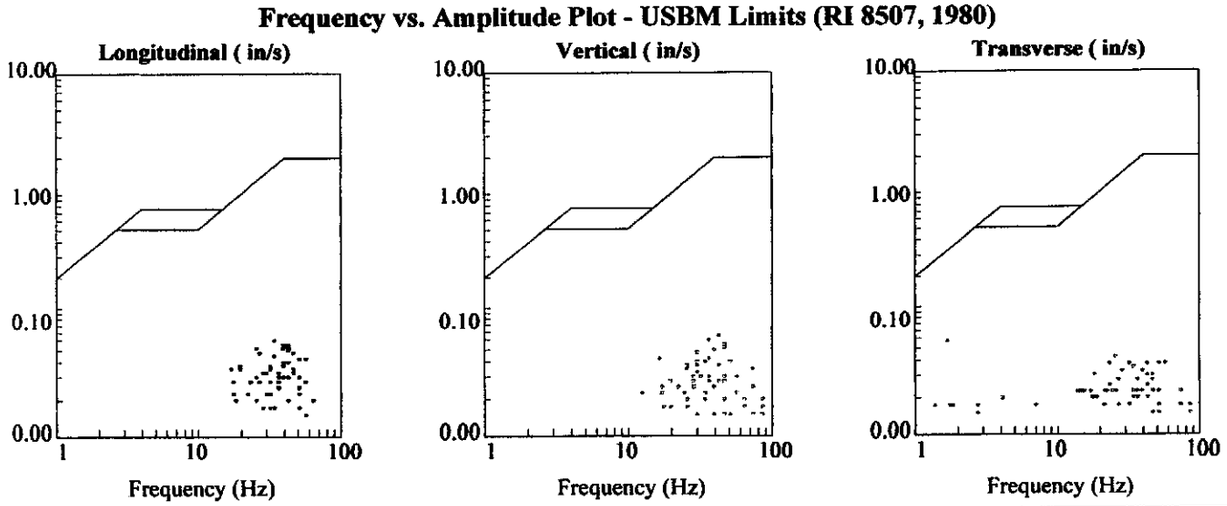
Sauls Seismic, Inc. - Report

Telephone: 800-351-8566

Company: CAROLINA DRILLING/BFI LANDFILL
Location: #1-N35 20'46.7 W080 39'38.3
Operator: BRIAN EARLY
Notes: SHOT IS SOUTH OF SEISMOGRAPH

FEB 23, 2007 at 15:37
Graph: 4030
Record Duration: 5 sec
Sample Rate: 1024/sec

mplitudes / Frequencies	Trigger >>> Peak	Scales / Triggers	Charge / Distance
○ Longitudinal: 0.050 in/s @ 36.5 Hz	661.1 ms	Air Scale: .00922 psi/div.	Wgt. Per Delay: 15.0 lb
○ Transverse: 0.033 in/s @ 26.9 Hz	580.1 ms	Seismic Scale: 0.08 in/s/div.	Distance: 210.0 ft
○ Vertical: 0.055 in/s @ 46.5 Hz	710.0 ms	Air Trigger (dBL): N	Scaled Distance: N/A.
○ Air: 124 dBL @ 8.9Hz / .00 psi	1038.1 ms	Seismic Trigger: 0.02 in/s	



Frequency vs. Amplitude Plot - USBM Limits (RI 8507, 1980)