1R - 475

REPORTS

DATE:

12-04-2006

Larson & Associates, Inc.
Environmental Consultants

December 4, 2006

VIA EMAIL: wayne.price@state.nm.us
CERTIFIED MAIL

Mr. Wayne Price
Environmental Bureau Chief
State of New Mexico
Department of Natural Resources - Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

Re: 1R0475, Response to Conditions of Approval to Remediate Historic Contamination at the Ollie J. Boyd Tank Battery, Unit Letter C (NE/4, NW/4), Section 23, Township 22 South, Range 37 East, Lea County, New Mexico

Dear Mr. Price:

This letter is written to the State of New Mexico, Oil Conservation Division ("OCD") on behalf of Chesapeake Energy Corporation ("Chesapeake") by Larson and Associates, Inc. ("LA"), its consultant, in response to the conditions imposed by the OCD in its approval of the remediation plan for historic (legacy) contamination at the Ollie J. Boyd Tank Battery ("Site") dated October 27, 2006. This letter addresses the following conditions:

- Condition 4 – Chesapeake must determine the vertical delineation of any contaminant that exceeds the following numerical limits:
  1. TPH > 100 mg/Kg
  2. BTEX > 100 ppm using PID or 50 mg/Kg lab analysis
  3. Chlorides 250 mg/Kg; and

- Condition 6 - Area around BH-3 shall be part of the clean-up activity.

Condition 4

On October 30, 2006, at the request of Chesapeake, LA personnel collected additional soil samples at locations BH-5 and BH-6 (former pit) to delineate the chloride and assess the stratigraphic position of shale that was encountered at location BH-3. The borings were drilled adjacent to the previous borings by Scarborough Drilling, Inc., a State of New Mexico licensed well driller, using a truck-mounted air rotary rig. Soil samples were collected every five (5) feet beginning at approximately 35 feet below ground surface ("bgs") using a jam tube sampler. Boring BH-5 was advanced to approximately 45 feet bgs and boring BH-6 was advanced to approximately 51 feet bgs.

Shale was encountered at 37 and 42 feet bgs, respectively, at locations BH-5 and BH-6 and the borings were advanced into the shale about eight (8) feet. Figure 1 presents a location and topographic map. Figure 2 presents a Site drawing. Figure 3 presents a revised geological cross section. Appendix A presents revised boring logs.

Referring to Figure 3, the shale is laterally continuous across the Site and no groundwater is present between the shale and ground surface.

The laboratory analyzed samples form borings BH-5 and BH-6 for chloride using method 300 since headspace readings of the samples was less than 1 ppm and the previous analysis showed that total petroleum hydrocarbon ("TPH") decreased below 100 milligrams per kilogram ("mg/Kg") below approximately 25 and 15 feet bgs at locations BH-5 and BH-6, respectively. BTEX was also below 50 mg/Kg in all samples from locations BH-5 and BH-6. Table 1 presents a revised summary of the laboratory analysis. Appendix B presents the current laboratory reports.

Referring to Table 1, chloride decreased to 1,900 mg/Kg at location BH-5 in the sample from 44 to 45 feet bgs. Chloride decreased to 525 mg/Kg at location BH-6 in the sample from 50 to 51 feet bgs. In conclusion, Chesapeake believes it has fulfilled the requirements of Condition 4, since it has delineated the extent of TPH, BTEX and chloride in soil to levels imposed by the OCD, except chloride at locations BH-5 and BH-6. However, it has been demonstrated that the shale observed at locations BH-3, BH-5 and BH-6 is an adequate barrier for migration due to the observed decrease in chloride concentration.

Condition 6

The BTEX impact at location BH-3 is not associated with the former tank battery or pits. The soil samples that were previously collected at location BH-2, located immediately beneath the tank battery, reported the highest TPH concentration in the surface sample from 0 to 1.8 feet (1,119 mg/Kg). The TPH decreased below the method detection limit (<10 mg/Kg) in the sample from 7 to 8.8 feet. No BTEX was reported in the samples. In contrast, the TPH at location BH-3 was low in the surface and near-surface samples and increased to 7,360 mg/Kg in the sample from 7 to 8.5 feet bgs. The BTEX was 87.101 mg/Kg in the sample from 7 to 8.5 feet bgs and increased to 210.490 mg/Kg in the sample from 35 to 37.0 feet bgs. The samples from location BH-3 demonstrate that the impact is not the result of a surface spill from the former tank battery, but a very recent or on-going release of light hydrocarbons (i.e., natural gas condensate) from a pipeline. In conclusion, Chesapeake does not feel that it should be responsible for a release that is not associated with the former tank battery or pit and requests the OCD to contact the pipeline company(s) to verify if their pipeline(s) is the source for the release.

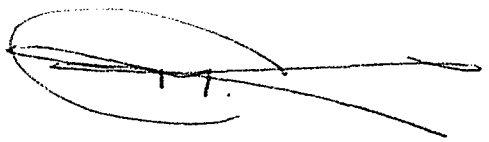
Chesapeake wishes to proceed with remediation at the Site, including:

- Providing notification to landowners before starting work;
- Excavating soil in the area of locations AH-1, BH-1, BH-2 and BH-4 (former tank battery) to approximately 2 feet bgs;
- Excavating soil in the area of locations BH-5 and BH-6 (former pit) to approximately 15 feet bgs;
- Installing a synthetic liner (20 mill) or 2 feet of compacted clay (95% proctor density) in the bottom of the excavation at location BH-5 and BH-6;
- Obtaining OCD approval before filling the excavations with clean soil, contouring and seeding to prevent erosion;
- Disposing of contaminated soil at a commercial facility permitted by OCD to accept chloride contaminated soil; and
- Submitting an interim report by January 30, 2007.

Chesapeake requests OCD approval of this remediation plan and authorization to proceed. Please call Mr. Harlan Brown at (405) 767-4446 or email hbrown@chkenergy.com, if you have questions. I may be reached with questions at (432) 687-0901 or email mark@laenvironmental.com.

Sincerely,

Larson and Associates, Inc.



Mark J. Larson, P.G., C.P.G., C.G.W.P.
Senior Project Manager/President

Enclosures

cc: Harlan Brown/Chesapeake
Paul Hagemeier/Chesapeake
Chris Williams/OCD – District 1

Tables

Table 1
1R0475
Summary of Investigation Soil Samples
Chesapeake Energy, Inc., Ollie J. Boyd Tank Battery Historic Contamination
Unit C (NE/4, NW/4), Section 23, Township 22 South, Range 37 East
Lea County, New Mexico

Location	Date	Depth (Feet BGS)	PID (ppm)	GRO C6 - C12 (mg/Kg)	DRO C12 - C28 (mg/Kg)	DRO C28 - C35 (mg/Kg)	TPH C6 - C35 (mg/Kg)	Benzene (mg/Kg)	BTEX (mg/Kg)	Chloride (mg/Kg)
BH-1	05/17/2006	0 - 1.5	0.8	<10	<10	<10	<30	--	---	13.4
	05/17/2006	3 - 4.5	0.2	<10	<10	<10	<30	---	---	13.1
	05/17/2006	7 - 8.5	0.5	<10	<10	<10	<30	---	---	26.4
	05/17/2006	11 - 12.5	1.3	---	---	---	---	---	---	---
	05/17/2006	15 - 16.5	1.3	---	---	---	---	---	---	---
	05/17/2006	20 - 21.5	1.1	---	---	---	---	---	---	---
	05/17/2006	25 - 26.7	0.7	---	---	---	---	---	---	---
	05/17/2006	30 - 31.6	2.7	---	---	---	---	---	---	---
BH-2	05/17/2006	0 - 1.8	4.0	<10	884	235	1,119	---	---	12
	05/17/2006	3 - 4.4	804	91.7	706	66.3	864	<0.025	<0.025	13.2
	05/17/2006	7 - 8.8	76.3	<10	<10	<10	<30	<0.025	<0.025	15.2
	05/17/2006	11 - 12.7	26.1	<10	<10	<10	<30	---	---	25.8
	05/17/2006	15 - 17.0	17.2	<10	<10	<10	<30	---	---	16.5
	05/17/2006	20 - 21.5	1.2	<10	<10	<10	<30	---	---	38.3
	05/17/2006	25 - 26.2	8.3	<10	<10	<10	<30	---	---	121
	05/17/2006	30 - 31.4	25	<10	<10	<10	<30	---	---	194
BH-3	05/17/2006	0 - 1.9	1.9	<20	232	95.1	327.1	--	--	11.4
	05/17/2006	3 - 4.8	2.7	<10	246	84	330	--	--	11.4
	05/17/2006	7 - 8.5	2,353	2,330	4,630	400	7,360	0.341	87.181	12
	05/17/2006	11 - 12.8	2,408	902	1,350	108	2,360	0.175	35.585	12.2
	05/17/2006	15 - 16.7	2,398	2,180	3,530	309	6,019	0.348	95.878	15.9
	05/17/2006	20 - 21.6	2,100	580	685	36.9	1,301.9	0.0886	52.8286	14.6
	05/17/2006	25 - 27.0	2,161	810	1,110	62	1,982	0.289	53.609	15.3
	05/17/2006	30 - 31.7	2,253	1,730	2,320	164	4,214	0.611	103.891	14.7
	05/17/2006	35 - 37.0	2,402	3,130	4,590	374	8,094	1.39	210.490	55.5
	05/17/2006	45 - 47.0	4.3	5.64	37	<10	42.64	<0.025	0.0489	31.6
BH-4	05/18/2006	0 - 1.6	1.1	<10	<10	<10	<30	---	---	150
	05/18/2006	3 - 4.3	0.1	<10	<10	<10	<30	---	---	473

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1R0475
Summary of Investigation Soil Samples
Chesapeake Energy, Inc., Ollie J. Boyd Tank Battery Historic Contamination
Unit C (NE/4, NW/4), Section 23, Township 22 South, Range 37 East
Lea County, New Mexico

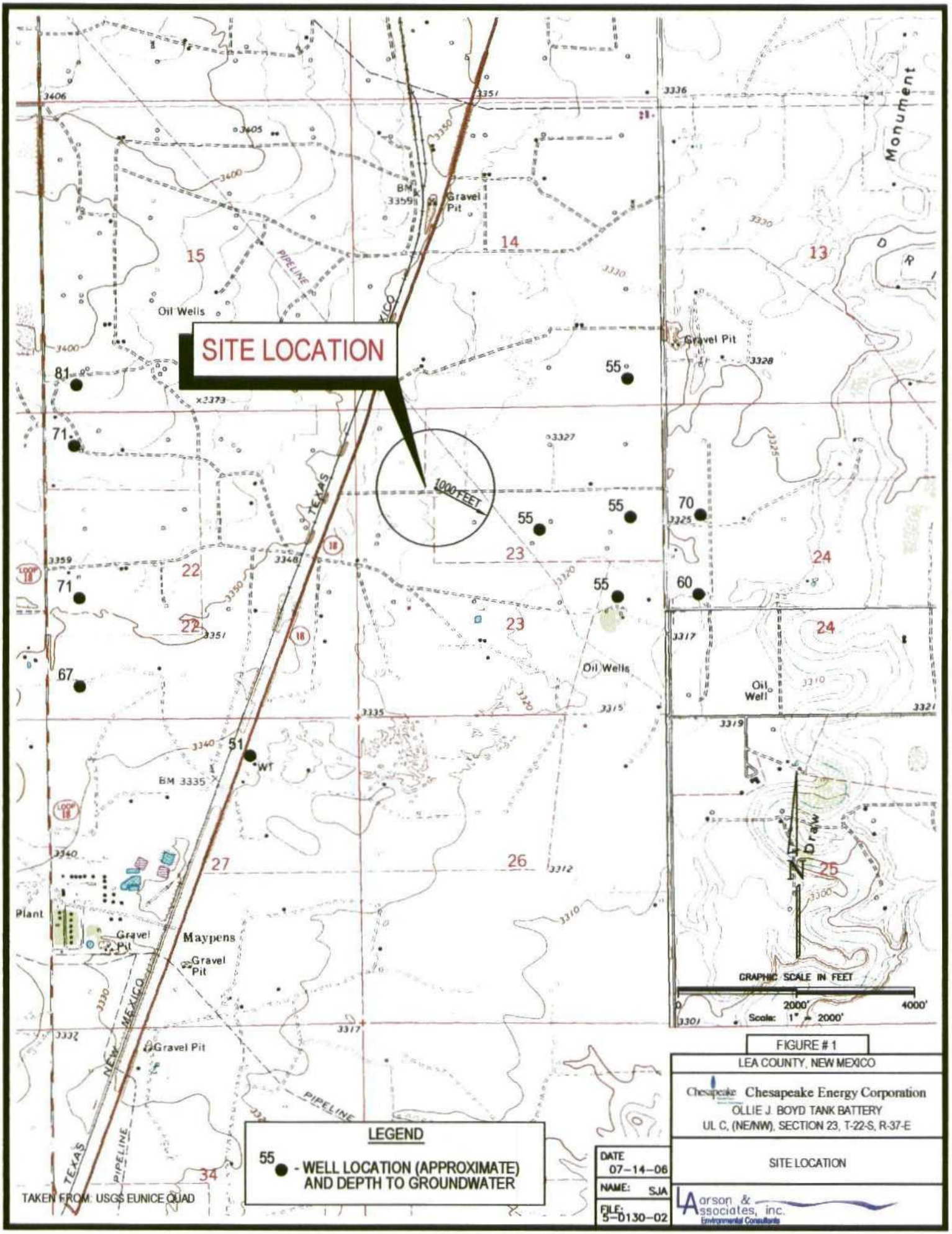
Location	Date	Depth (Feet BGS)	PID (ppm)	GRO C6 - C12 (mg/Kg)	DRO C12 - C28 (mg/Kg)	DRO C28 - C35 (mg/Kg)	TPH C6 - C35 (mg/Kg)	Benzene (mg/Kg)	BTEX (mg/Kg)	Chloride (mg/Kg)
BH-4	05/18/2006	7 - 8.3	0.3	<10	<10	<10	<30	---	---	253
	05/18/2006	11 - 11.8	0.1	---	---	---	---	---	---	---
	05/18/2006	15 - 16.5	0.9	---	---	---	---	---	---	---
	05/18/2006	20 - 21.5	0.1	---	---	---	---	---	---	---
	05/18/2006	25 - 26.6	0.1	---	---	---	---	---	---	---
	05/18/2006	30 - 31.2	2.0	---	---	---	---	---	---	---
BH-5	05/18/2006	0 - 2.0	1.3	<10	413	159	572	--	--	78.7
	05/18/2006	3 - 4.7	1.9	10.1	788	292	1,090.1	--	--	472
	05/18/2006	7 - 8.8	1,999	4,220	17,700	1,740	23,660	2.02	46.84	1,450
	05/18/2006	11 - 12.8	878	3,680	25,700	2,820	32,200	1.44	45.98	3,370
	05/18/2006	15 - 16.8	633	3,580	27,700	2,870	33,450	0.557	37.127	4,100
	05/18/2006	20 - 21.8	372	874	10,500	1,200	12,574	0.0136	1.4646	6,560
	05/18/2006	25 - 26.5	12.6	<10	<10	<10	<30	--	--	12,800
	05/18/2006	30 - 31.4	13.8	<10	<10	<10	<30	--	--	17,400
	10/30/2006	35 - 36	0.2	--	--	--	--	--	--	4,560
	10/30/2006	40 - 41	0.1	--	--	--	--	--	--	3,410
	10/30/2006	44 - 45	0.1	--	--	--	--	--	--	1,900
BH-6	05/18/2006	0 - 0.8	303	209	6,120	1,520	7,849	1.01	10.46	237
	05/18/2006	3 - 4.7	664	584	8,090	1,460	10,134	2.23	24.024	1,290
	05/18/2006	7 - 8.6	564	393	4,380	762	5,540	0.769	9.331	1,600
	05/18/2006	11 - 12.7	594	770	5,800	920	7,490	0.137	5.437	972
	05/18/2006	15 - 16.5	290	7.97	68.9	<10	76.87	<0.025	0.0463	2,380
	05/18/2006	20 - 21.5	24.5	<10	<10	<10	<30	--	--	3,880
BH-6	05/18/2006	25 - 26.8	14.9	<10	<10	<10	<30	--	--	5,040
	05/18/2006	30 - 31.6	5.2	<10	<10	<10	<30	--	--	6,210
	10/30/2006	35 - 36	0.1	--	--	--	--	--	--	4,780
	10/30/2006	40 - 41	0.1	--	--	--	--	--	--	2,270
	10/30/2006	44 - 45	0.1	--	--	--	--	--	--	1,870
	10/30/2006	50 - 51	0.1	--	--	--	--	--	--	525

Table 1
1R0475
Summary of Investigation Soil Samples
Chesapeake Energy, Inc., Ollie J. Boyd Tank Battery Historic Contamination
Unit C (NE/4, NW/4), Section 23, Township 22 South, Range 37 East
Lea County, New Mexico

Location	Date	Depth (Feet BGS)	PID (ppm)	GRO C6 - C12 (mg/Kg)	DRO C12 - C28 (mg/Kg)	DRO C28 - C35 (mg/Kg)	TPH C6 - C35 (mg/Kg)	Benzene (mg/Kg)	BTEX (mg/Kg)	Chloride (mg/Kg)
AH-1	05/18/2006	0 - 1	1.8	<10	896	482	1,378	--	--	15.3
	05/18/2006	1 - 2	0.9	<10	<10	<10	<30	--	--	14.4

Notes: All analyses performed by Environmental Lab of Texas, Inc., Midland, Texas
1. BGS: Depth in feet below ground surface
2. PID: Photoionization detector
3. ppm: Parts per million
4. GRO: Gasoline-range organics
5. DRO: Diesel-range organics
6. TPH: Total petroleum hydrocarbons (Sum of GRO + DRO)
7. mg/Kg Milligrams per kilogram
8. ---: No data available
9. <: Below method detection limit
10. AH: Hand auger samples
11. BH: Air-rotary drilled boring

Figures


SITE LOCATION
1000 FEET
Oil Wells
Gravel Pit
Plant
Maypens
Gravel Pit
Gravel Pit
Gravel Pit
Oil Wells
Oil Well
Gravel Pit
BM 3359
BM 3335
WT
PIPELINE
TEXAS
NEW MEXICO
PIPELINE
TEXAS
PIPELINE
Monument
Draw
GRAPHIC SCALE IN FEET
0
2000'
4000'
Scale: 1" = 2000'
LEGEND
55 - WELL LOCATION (APPROXIMATE) AND DEPTH TO GROUNDWATER
TAKEN FROM: USGS EUNICE QUAD
DATE 07-14-06
NAME: SJA
FILE: 5-D130-02
FIGURE # 1
LEA COUNTY, NEW MEXICO
Chesapeake Energy Corporation
OLLIE J. BOYD TANK BATTERY
UL C, (NE/NW), SECTION 23, T-22-S, R-37-E
SITE LOCATION
Larson & Associates, inc.
Environmental Consultants

ANADARKO
PETROL LMPSU
WELL # 2

IRVIN BOYD
PROPERTY

S & D RANCH PROPERTY

TARGA MIDSTREAM
SERVICES, L.P.
(NATURAL GAS P/L)

RICE OPERATING
(SALT WATER P/L)

TARGA MIDSTREAM SERVICES, L.P.
(NATURAL GAS P/L)

HISTORIC HYDROCABONS

VISUAL
IDENTIFIED
RELEASE
AREA

HA-1

FENCE

SOUTHERN UNION
(NATURAL GAS P/L)

BH-6

A'

BH-3

OLD PIT

GAS METER RUN

VISUAL IDENTIFIED
RELEASE AREA

VISUAL
IDENTIFIED
RELEASE
AREA

OLD
TANK
BATTERY

FENCE

BH-1

A

BH-5

BH-2

BH-4

3' x 10' SEPARATOR

OIL

WATER

210

210

210

CHESAPECKE
OLLIE J. BOYD
TANK BATTERY

COSSATOT "F" TANK BATTERY

4' x 20' HEATER TREATER

FENCE

FENCE

EOTT (LINK ENERGY) CRUDE
OIL PIELINE

LEASE ROAD

CATTLE GAURD

FENCE

IRVIN BOYD
PROPERTY

S & D RANCH PROPERTY

LEGEND

○ – AUGER BORING LOCATION

● – ROTARY BORING LOCATION

A A' – LINE OF GEOLOGICAL CROSS SECTION (REFER TO FIGURE 7)

GRAPHIC SCALE IN FEET

0 60' 120'

Scale: 1" = 60'

FIGURE # 2

LEA COUNTY, NEW MEXICO

Chesapeake Energy Corporation

OLLIE J. BOYD TANK BATTERY

UL C, (NE/NW), SECTION 23, T-22-S, R-37-E

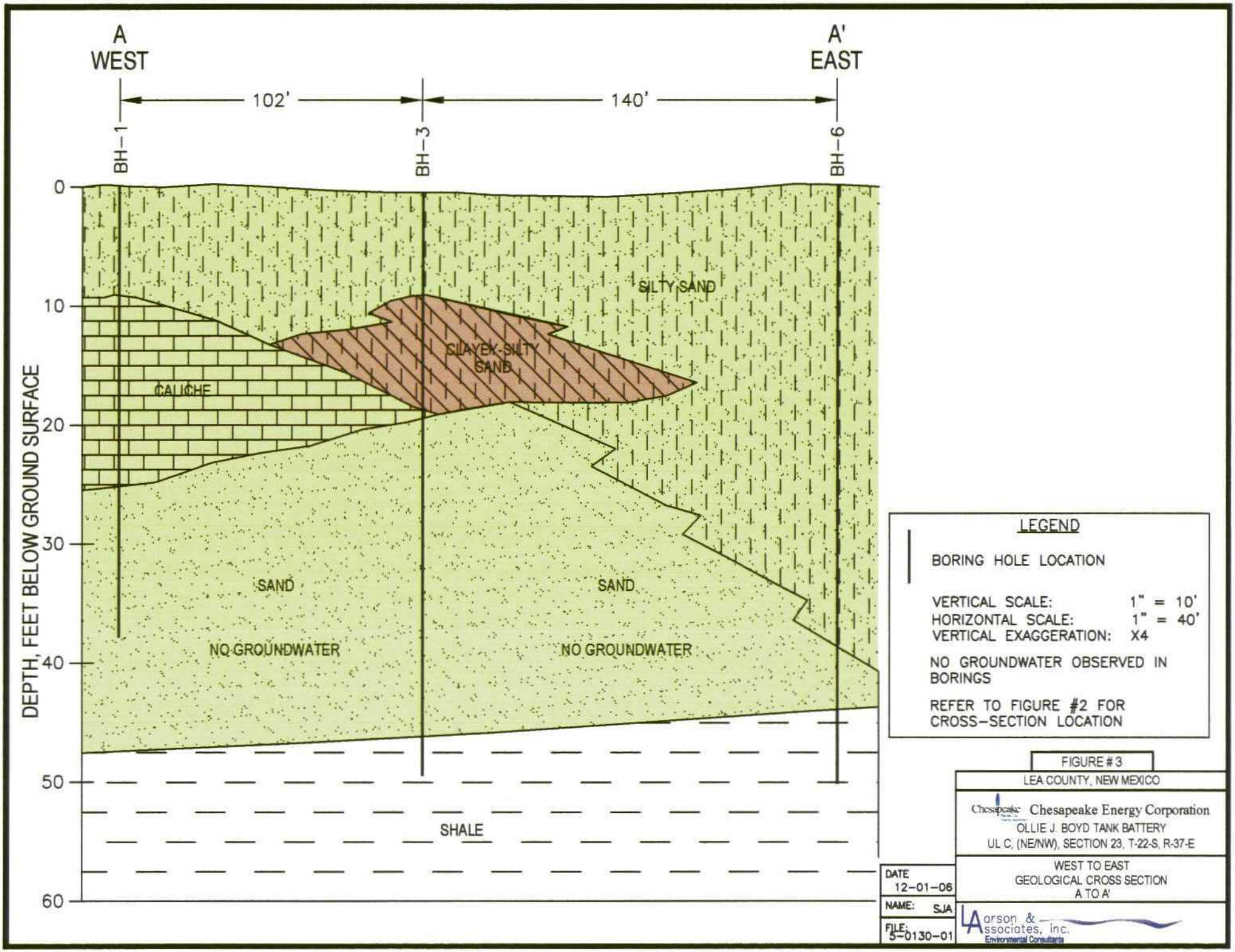
DETAILED DRAWING

DATE 08-23-06

NAME: SJA

FILE: 5-0130-01

Larson & Associates, inc.
Environmental Consultants


A
WEST
A'
EAST
102'
140'
BH-1
BH-3
BH-6
0
10
20
30
40
50
60
DEPTH, FEET BELOW GROUND SURFACE
CALICHE
CLAYEY-SILTY SAND
SILTY SAND
SAND
NO GROUNDWATER
SAND
NO GROUNDWATER
SHALE
LEGEND
BORING HOLE LOCATION
VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 40'
VERTICAL EXAGGERATION: X4
NO GROUNDWATER OBSERVED IN BORINGS
REFER TO FIGURE #2 FOR CROSS-SECTION LOCATION
FIGURE # 3
LEA COUNTY, NEW MEXICO
Chesapeake Energy Corporation
OLLIE J. BOYD TANK BATTERY
UL C, (NE/NW), SECTION 23, T-22-S, R-37-E
WEST TO EAST
GEOLOGICAL CROSS SECTION
A TO A'
DATE 12-01-06
NAME: SJA
FILE: 5-0130-01
Larson & Associates, inc.
Environmental Consultants

Appendix A

Boring Logs

Client: Chesapeake Energy Corporation

Project: Ollie J. Boyd Tank Battery

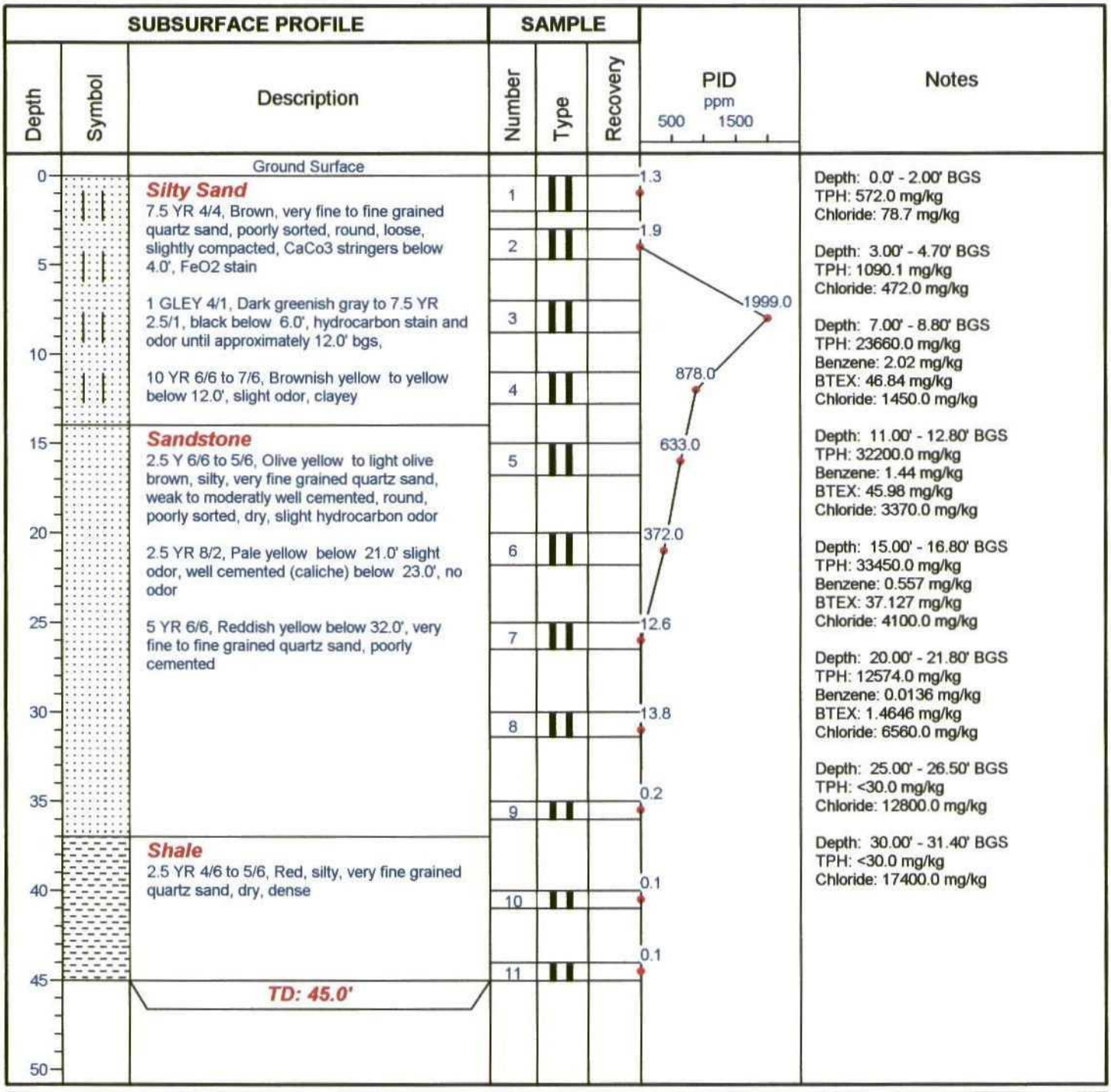
Project No: 5-0130

Location: Lea County, New Mexico

Log: BH-5

Page: 1 of 1

Geologist: M.Larson



Drill Method: Air Rotary

Drill Date: 5-18-06, 10-30-06

Hole Size: 6"

Larson and Associates, Inc
507 N. Marienfeld, Suite 202
Midland, Texas 79701
(432) 687-0901

Elevation: N/A

Checked by: MJL

Drilled by: Eades, Scarboraugh

Client: Chesapeake Energy Corporation

Project: Ollie J. Boyd Tank Battery

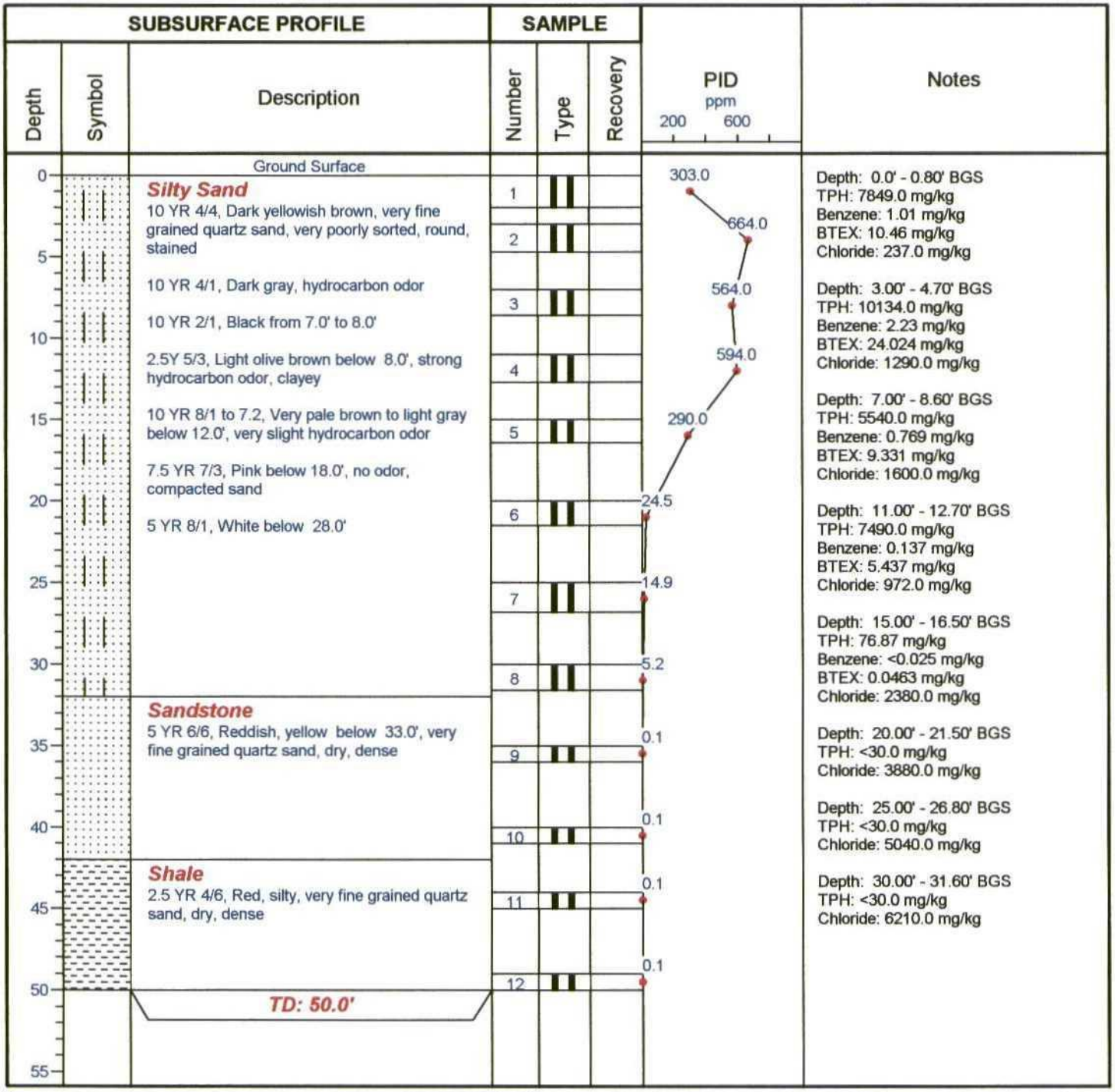
Project No: 5-0130

Location: Lea County, New Mexico

Log: BH-6

Page: 1 of 1

Geologist: M.Larson



Drill Method: Air Rotary

Drill Date: 5-18-06, 10-30-06

Hole Size: 6"

Larson and Associates, Inc
507 N. Marienfeld, Suite 202
Midland, Texas 79701
(432) 687-0901

Elevation: N/A

Checked by: MJL

Drilled by: Eades

Appendix B

Laboratory Report

ENVIRONMENTAL LAB OF

12600 West I-20 East - Odessa, Texas 79765

Analytical Report

Prepared for:

Mark Larson

Larson & Associates, Inc.

P.O. Box 50685

Midland, TX 79710

Project: Chesapeake/ Ollie J. Boyd

Project Number: 5-0130-01

Location: None Given

Lab Order Number: 6J31002

Report Date: 11/06/06

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chesapeake/ Ollie J. Boyd
Project Number: 5-0130-01
Project Manager: Mark Larson

Fax: (432) 687-0456

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH-5, 35'-36'	6J31002-01	Soil	10/30/06 12:24	10-31-2006 08:10
BH-5, 40'-41'	6J31002-02	Soil	10/30/06 12:30	10-31-2006 08:10
BH-6, 35'-36'	6J31002-04	Soil	10/30/06 13:12	10-31-2006 08:10
BH-6, 40'-41'	6J31002-05	Soil	10/30/06 13:20	10-31-2006 08:10
BH-6, 44'-45'	6J31002-06	Soil	10/30/06 13:30	10-31-2006 08:10

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chesapeake/ Ollie J. Boyd
Project Number: 5-0130-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BH-5, 35'-36' (6J31002-01) Soil									
Chloride	**4560**	100	mg/kg	200	EK60102	11/01/06	11/01/06	EPA 300.0	
BH-5, 40'-41' (6J31002-02) Soil									
Chloride	**3410**	50.0	mg/kg	100	EK60102	11/01/06	11/01/06	EPA 300.0	
BH-6, 35'-36' (6J31002-04) Soil									
Chloride	**4780**	50.0	mg/kg	100	EK60102	11/01/06	11/01/06	EPA 300.0	
BH-6, 40'-41' (6J31002-05) Soil									
Chloride	**2270**	50.0	mg/kg	100	EK60103	11/01/06	11/03/06	EPA 300.0	
BH-6, 44'-45' (6J31002-06) Soil									
Chloride	**1870**	25.0	mg/kg	50	EK60103	11/01/06	11/03/06	EPA 300.0	

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chesapeake/ Ollie J. Boyd
Project Number: 5-0130-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK60102 - Water Extraction										
Blank (EK60102-BLK1)				Prepared & Analyzed: 11/01/06						
Chloride	ND	0.500	mg/kg							
LCS (EK60102-BS1)				Prepared & Analyzed: 11/01/06						
Chloride	10.6	0.500	mg/kg	10.0		106	80-120			
Calibration Check (EK60102-CCV1)				Prepared & Analyzed: 11/01/06						
Chloride	11.4		mg/L	10.0		114	80-120			
Duplicate (EK60102-DUP1)		Source: 6J30005-03		Prepared & Analyzed: 11/01/06						
Chloride	637	50.0	mg/kg		649			1.87	20	
Duplicate (EK60102-DUP2)		Source: 6J31001-01		Prepared & Analyzed: 11/01/06						
Chloride	495	10.0	mg/kg		531			7.02	20	
Matrix Spike (EK60102-MS1)		Source: 6J30005-03		Prepared & Analyzed: 11/01/06						
Chloride	1780	50.0	mg/kg	1000	649	113	80-120			
Matrix Spike (EK60102-MS2)		Source: 6J31001-01		Prepared & Analyzed: 11/01/06						
Chloride	757	10.0	mg/kg	200	531	113	80-120			
Batch EK60103 - Water Extraction										
Blank (EK60103-BLK1)				Prepared: 11/01/06 Analyzed: 11/03/06						
Chloride	ND	0.500	mg/kg							
LCS (EK60103-BS1)				Prepared: 11/01/06 Analyzed: 11/03/06						
Chloride	10.9	0.500	mg/kg	10.0		109	80-120			

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chesapeake/ Ollie J. Boyd
Project Number: 5-0130-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control
Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK60103 - Water Extraction										
Calibration Check (EK60103-CCV1)				Prepared: 11/01/06 Analyzed: 11/03/06						
Chloride	11.0		mg/L	10.0		110	80-120			
Duplicate (EK60103-DUP1)		Source: 6J31002-05		Prepared: 11/01/06 Analyzed: 11/03/06						
Chloride	2290	50.0	mg/kg		2270			0.877	20	
Duplicate (EK60103-DUP2)		Source: 6J31010-13		Prepared: 11/01/06 Analyzed: 11/03/06						
Chloride	458	10.0	mg/kg		455			0.657	20	
Matrix Spike (EK60103-MS1)		Source: 6J31002-05		Prepared: 11/01/06 Analyzed: 11/03/06						
Chloride	3390	50.0	mg/kg	1000	2270	112	80-120			
Matrix Spike (EK60103-MS2)		Source: 6J31010-13		Prepared: 11/01/06 Analyzed: 11/03/06						
Chloride	693	10.0	mg/kg	200	455	119	80-120			

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Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chesapeake/ Ollie J. Boyd
Project Number: 5-0130-01
Project Manager: Mark Larson

Fax: (432) 687-0456

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Raland K Tuttle Date: 11-06-06

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
LaTasha Cornish, Chemist
Sandra Sanchez, Lab Tech.

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CHAIN—OF—CUSTODY RECORD

Larson & Associates, Inc. Environmental Consultants
Fax: 432-687-0456
432-687-0901
507 N. Marienfeld, Ste. 202 • Midland, TX 79701

CLIENT NAME: Chesapeake Energy Corporation
SITE MANAGER: M. Larson
PROJECT NO.: 5-0130-01
PROJECT NAME: Ollie Boyd tank Battery
PAGE 1 OF 1
LAB. PO #

DATE	TIME	WATER	SOIL	OTHER	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PARAMETERS/METHOD NUMBER: Chloride	PARAMETERS/METHOD NUMBER: Hold	LAB. I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E., FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE)
10/30/06	1224		X		BH-5, 35' - 36'	1	✓			0531002-01
	1230				BH-5, 40' - 41'	1	✓			-02
	1245				BH-5, 44' - 45'	1		✓		-03
	1312				BH-6, 35' - 36'	1	✓			-04
	1320				BH-6, 40' - 41'	1	✓			-05
	1330				BH-6, 44' - 45'	1	✓			-06
↓	1345		↓		BH-6, 49' - 50'	1		✓		-07

SAMPLED BY: (Signature) DATE: 10/30/06 TIME: 1345
RELINQUISHED BY: (Signature) DATE: TIME:
RECEIVED BY: (Signature) DATE: TIME:

RELINQUISHED BY: (Signature) DATE: 10/31/06 TIME: 8:00
RECEIVED BY: (Signature) DATE: TIME:

SAMPLE SHIPPED BY: (Circle)
FEDEX BUS AIRBILL #:
HAND DELIVERED UPS OTHER:

COMMENTS:

TURNAROUND TIME NEEDED

WHITE – RECEIVING LAB
YELLOW – RECEIVING LAB (TO BE RETURNED TO LA AFTER RECEIPT)
PINK – PROJECT MANAGER
GOLD – QA/QC COORDINATOR

RECEIVING LABORATORY: Env. Lab of Texas
ADDRESS: 12600 W I-20 E.
CITY: Odessa STATE: TX ZIP: 79765
CONTACT: K. Tuttle PHONE: (432) 563-1800
RECEIVED BY: (Signature)
DATE: 10-31-06 TIME: 0810

SAMPLE CONDITION WHEN RECEIVED: Rec 0.0°C
LA CONTACT PERSON: Mark Larson
SAMPLE TYPE: Soil

Environmental Lab of Texas

Variance/ Corrective Action Report- Sample Log-In

Client: Larson

Date/ Time: 10/31/06 8:10

Lab ID # : 610310-02

Initials: CK

Sample Receipt Checklist

					Client Initials
#1	Temperature of container/ cooler?	Yes	No	0.0 °C	
#2	Shipping container in good condition?	~~Yes~~	No		
#3	Custody Seals intact on shipping container/ cooler?	Yes	No	~~Not Present~~	
#4	Custody Seals intact on sample bottles/ container?	Yes	No	~~Not Present~~	
#5	Chain of Custody present?	~~Yes~~	No		
#6	Sample instructions complete of Chain of Custody?	~~Yes~~	No		
#7	Chain of Custody signed when relinquished/ received?	~~Yes~~	No		
#8	Chain of Custody agrees with sample label(s)?	~~Yes~~	No	ID written on Cont./ Lid	
#9	Container label(s) legible and intact?	~~Yes~~	No	Not Applicable	
#10	Sample matrix/ properties agree with Chain of Custody?	~~Yes~~	No		
#11	Containers supplied by ELOT?	~~Yes~~	No		
#12	Samples in proper container/ bottle?	~~Yes~~	No	See Below	
#13	Samples properly preserved?	~~Yes~~	No	See Below	
#14	Sample bottles intact?	~~Yes~~	No		
#15	Preservations documented on Chain of Custody?	~~Yes~~	No		
#16	Containers documented on Chain of Custody?	~~Yes~~	No		
#17	Sufficient sample amount for indicated test(s)?	~~Yes~~	No	See Below	
#18	All samples received within sufficient hold time?	~~Yes~~	No	See Below	
#19	VOC samples have zero headspace?	Yes	No	~~Not Applicable~~	

Variance Documentation

Contact: _____ Contacted by: _____ Date/ Time: _____

Regarding: _____

Corrective Action Taken: _____

Check all that Apply:

- ☐ See attached e-mail/ fax
- ☐ Client understands and would like to proceed with analysis
- ☐ Cooling process had begun shortly after sampling event

ENVIRONMENTAL LAB OF

12600 West I-20 East - Odessa, Texas 79765

Analytical Report

Prepared for:

Mark Larson

Larson & Associates, Inc.

P.O. Box 50685

Midland, TX 79710

Project: Chesapeake/ Ollie J. Boyd

Project Number: 5-0130-01

Location: None Given

Lab Order Number: 6K13009

Report Date: 11/16/06

Larson & Associates, Inc.	Project: Chesapeake/ Ollie J. Boyd	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 5-0130-01	
Midland TX, 79710	Project Manager: Mark Larson	

ANALYTICAL REPORT FOR SAMPLES

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
BH-5 44-45'	6K13009-01	Soil	10/30/06 12:45	10-31-2006 08:10
BH-6 49-50'	6K13009-02	Soil	10/30/06 13:45	10-31-2006 08:10

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Larson & Associates, Inc.	Project: Chesapeake/ Ollie J. Boyd	Fax: (432) 687-0456
P.O. Box 50685	Project Number: 5-0130-01	
Midland TX, 79710	Project Manager: Mark Larson	

General Chemistry Parameters by EPA / Standard Methods

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
BH-5 44-45' (6K13009-01) Soil									
Chloride	**1900**	40.0	mg/kg	80	EK61508	11/15/06	11/15/06	EPA 300.0	
BH-6 49-50' (6K13009-02) Soil									
Chloride	**525**	10.0	mg/kg	20	EK61508	11/15/06	11/15/06	EPA 300.0	

12600 West I-20 East - Odessa, Texas 79705 - (432) 563-1800 - Fax (432) 563-1713

Larson & Associates, Inc.
P.O. Box 50685
Midland TX, 79710

Project: Chesapeake/ Ollie J. Boyd
Project Number: 5-0130-01
Project Manager: Mark Larson

Fax: (432) 687-0456

General Chemistry Parameters by EPA / Standard Methods - Quality Control

Environmental Lab of Texas

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch EK61508 - Water Extraction										
Blank (EK61508-BLK1)				Prepared & Analyzed: 11/15/06						
Chloride	ND	0.500	mg/kg							
LCS (EK61508-BS1)				Prepared & Analyzed: 11/15/06						
Chloride	10.1	0.500	mg/kg	10.0		101	80-120			
Calibration Check (EK61508-CCV1)				Prepared & Analyzed: 11/15/06						
Chloride	10.5		mg/L	10.0		105	80-120			
Duplicate (EK61508-DUP1)		**Source: 6K13008-01**		Prepared & Analyzed: 11/15/06						
Chloride	561	10.0	mg/kg		553			1.44	20	
Duplicate (EK61508-DUP2)		**Source: 6K14009-01**		Prepared & Analyzed: 11/15/06						
Chloride	1910	40.0	mg/kg		1870			2.12	20	
Matrix Spike (EK61508-MS1)		**Source: 6K13008-01**		Prepared & Analyzed: 11/15/06						
Chloride	769	10.0	mg/kg	200	553	108	80-120			
Matrix Spike (EK61508-MS2)		**Source: 6K14009-01**		Prepared & Analyzed: 11/15/06						
Chloride	2830	40.0	mg/kg	800	1870	120	80-120			

Larson & Associates, Inc. P.O. Box 50685 Midland TX, 79710	Project: Chesapeake/ Ollie J. Boyd Project Number: 5-0130-01 Project Manager: Mark Larson	Fax: (432) 687-0456

Notes and Definitions

DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By: Raland K Tuttle Date: 11/16/2006

Raland K. Tuttle, Lab Manager
Celey D. Keene, Lab Director, Org. Tech Director
Peggy Allen, QA Officer
Jeanne Mc Murrey, Inorg. Tech Director
LaTasha Cornish, Chemist
Sandra Sanchez, Lab Tech.

CHAIN—OF—CUSTODY RECORD

Larson & Associates, Inc. Environmental Consultants
Fax: 432-687-0456
432-687-0901
507 N. Marienfeld, Ste. 202 • Midland, TX 79701

CLIENT NAME: Chesapeake Energy Corporation
SITE MANAGER: M. Larson
PROJECT NO.: 5-0130-01
PROJECT NAME: Ollie Boyd tank Battery
PAGE 1 OF 1
LAB. PO #

DATE	TIME	WATER	SOIL	OTHER	SAMPLE IDENTIFICATION	NUMBER OF CONTAINERS	PARAMETERS/METHOD NUMBER: Chloride	Hold	LAB. I.D. NUMBER (LAB USE ONLY)	REMARKS (I.E., FILTERED, UNFILTERED, PRESERVED, UNPRESERVED, GRAB COMPOSITE)
10/30/06	1224		X		BH-5, 35' - 36'	1	✓			0531002-01 10/30/2006
	1230				BH-5, 40' - 41'	1	✓			-02
	1245				BH-5, 44' - 45'	1	X	✓		-03 -01
	1312				BH-6, 35' - 36'	1	✓			-04
	1320				BH-6, 40' - 41'	1	✓			-05
	1330				BH-6, 44' - 45'	1	✓			-06
↓	1345		↓		BH-6, 49' - 50'	1	X	✓		-07 -02

SAMPLED BY: (Signature) DATE: 10/30/06 TIME: 1345
RELINQUISHED BY: (Signature) DATE: TIME:
RECEIVED BY: (Signature) DATE: TIME:

RELINQUISHED BY: (Signature) DATE: 10/31/06 TIME: 8:00
RECEIVED BY: (Signature) DATE: TIME:

SAMPLE SHIPPED BY: (Circle)
FEDEX BUS AIRBILL #:
HAND DELIVERED UPS OTHER:

COMMENTS:

TURNAROUND TIME NEEDED

WHITE – RECEIVING LAB
YELLOW – RECEIVING LAB (TO BE RETURNED TO LA AFTER RECEIPT)
PINK – PROJECT MANAGER
GOLD – QA/QC COORDINATOR

COPY

RECEIVING LABORATORY: Env. Lab of Texas
ADDRESS: 12600 W I-20 E.
CITY: Odessa STATE: TX ZIP: 79765
CONTACT: R. Luttle PHONE: (432) 563-1800
RECEIVED BY: (Signature) Roland Leija
DATE: 10-31-06 TIME: 0810

SAMPLE CONDITION WHEN RECEIVED: Rec 0.0°C
LA CONTACT PERSON: Mark Larson
SAMPLE TYPE: Soil

Environmental Lab of Texas

Variance/ Corrective Action Report- Sample Log-In

ent: LAWSON

te/ Time: 10/31/06 8:10

b ID #: ~~610310-5~~ WK13009

tials: CK

COPY

Sample Receipt Checklist

					Client Initials
	Temperature of container/ cooler?	Yes	No	0.0 °C	
2	Shipping container in good condition?	~~Yes~~	No		
3	Custody Seals intact on shipping container/ cooler?	Yes	No	~~Not Present~~	
4	Custody Seals intact on sample bottles/ container?	Yes	No	~~Not Present~~	
5	Chain of Custody present?	~~Yes~~	No		
6	Sample instructions complete of Chain of Custody?	~~Yes~~	No		
7	Chain of Custody signed when relinquished/ received?	~~Yes~~	No		
8	Chain of Custody agrees with sample label(s)?	~~Yes~~	No	ID written on Cont./ Lid	
9	Container label(s) legible and intact?	~~Yes~~	No	Not Applicable	
10	Sample matrix/ properties agree with Chain of Custody?	~~Yes~~	No		
11	Containers supplied by ELOT?	~~Yes~~	No		
12	Samples in proper container/ bottle?	~~Yes~~	No	See Below	
13	Samples properly preserved?	~~Yes~~	No	See Below	
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15	Preservations documented on Chain of Custody?	~~Yes~~	No		
16	Containers documented on Chain of Custody?	~~Yes~~	No		
17	Sufficient sample amount for indicated test(s)?	~~Yes~~	No	See Below	
18	All samples received within sufficient hold time?	~~Yes~~	No	See Below	
19	VOC samples have zero headspace?	Yes	No	~~Not Applicable~~	

Variance Documentation

Contact: _____ Contacted by: _____ Date/ Time: _____

Regarding: _____

Corrective Action Taken: _____

Check all that Apply:

- ☐ See attached e-mail/ fax
- ☐ Client understands and would like to proceed with analysis
- ☐ Cooling process had begun shortly after sampling event

Jeanne McMurrey

From: "Mark Larson" <mark@laenvironmental.com>
To: "Jeanne McMurrey" <jeanne@elabtexas.com>
Sent: Monday, November 13, 2006 10:39 AM
Subject: RE: Report #6J31002 Chesapeake/ Ollie J. Boyd

Jeanne - Did you receive my email to analyze the remaining samples from BH-5 (44 - 45') and BH-6 (49 - 50') for chloride? Is there data available?
Mark

--

LARSON & ASSOCIATES, INC.

P.O. Box 50685 ◆ Midland, Texas 79710-0685

Ph. (432) 687-0901