RECR – 4

North Lea Joint Venture

Site Assessment 3/28/12

March 28, 2012
File No.: 122078.2-ALB12RP001

Mr. Jim Griswold
New Mexico Oil Conservation Division
1200 South St. Francis Drive
Santa Fe, New Mexico 87505

Subject: Limited Phase II Environmental Site Assessment
North Lea Joint Venture Pit Site
Northeast of Crossroads, New Mexico

Dear Mr. Griswold:

Kleinfelder West, Inc. (Kleinfelder) is pleased to submit this letter report to the New Mexico Oil Conservation Division (NMOCD). This letter report describes the scope of work, results, and conclusions of the limited Phase II Site Assessment (limited Phase II) performed at the above referenced property (Subject Site).

The Subject Site is located approximately 2 miles northeast of Crossroads, New Mexico (see Figure 1, Site Location Map). It consists of an abandoned crude oil pit that is surrounded by an earthen berm. The pit is approximately 80 feet (ft) long by 80 ft wide (see Figure 2, Boring Location Map). The earthen berm varies in height from approximately 3 to 6 ft high. It is approximately 20 ft wide at the base and 8 to 10 ft wide at the top. The pit is currently surrounded by a 4-wire barbed-wire fence. A gate is located along the western side of the pit. It appears that a portion of the western berm was pushed into the pit and may have been moved to provide access for a piece of equipment, possibly a drill rig. Photographs of the site can be found in Attachment 1.

A groundwater monitoring well is located outside of the fenced area adjacent to the southeastern corner of the pit. Depth to groundwater was observed at 121.19 ft below the top of casing (approximately 118 ft below ground surface (bgs)). Groundwater samples were collected from this well and analyzed for the following contaminants of concern (COCs):

- Benzene, toluene, ethylbenzene, and xylene (BTEX) by EPA Method 8260;
- Gasoline- and diesel-range organic total petroleum hydrocarbons (TPH DRO/GRO) by EPA Method 8015B; and
- Chloride by EPA Method 300.0.

The results of the groundwater analyses were below the laboratory reporting limit (LRL) for BTEX and TPH and chlorides was reported at 2500 milligrams per liter.

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LIMITED PHASE II SUBSURFACE ASSESSMENT

It is the intent of the NMOCD to close out this pit. The purpose of this limited Phase II ESA was to:

- Assess the horizontal and vertical extent of COCs associated with the pit; and
- Provide recommendations to complete the closure of the pit.

Three borings were advanced at the Subject Site to assess the horizontal and vertical profile of TPH and chloride concentrations. The first boring was drilled within the pit, immediately adjacent to the pit material, in an area where the berm was removed. Two additional borings were drilled northeast and southeast of the corners of the pit (see Figure 2, Boring Location Map).

Project Preparation

Prior to site mobilization, Kleinfelder prepared a project-specific Health and Safety Plan (HASP). New Mexico One-Call was notified approximately 4 days prior to drilling services to facilitate the location of underground utilities and pipelines. NMOCD staff was notified several days in advance of field activities to arrange for site access.

Field Program

A Kleinfelder field engineer observed the advancement of the borings at the site. Drilling services were provided by EnviroDrill, Inc. of Albuquerque, New Mexico. Borings were drilled using a CME-75 hollow stem auger (HSA) drill rig and 8-inch outside diameter hollow stem augers. Each boring was advanced to a depth of 75 ft below bgs.

Samples were collected at approximately 10 ft bgs, every 10 ft thereafter, and the bottom of each boring using a split spoon sampler. Cuttings and samples were logged according to the Unified Soil Classification System. Selected soil samples (collected at 20, 40, 50, 60, and 70 ft bgs) were field-screened using the Petroflag Hydrocarbon Analyzer (Petroflag). The PetroFlag uses extractant chemistry and a colorimetric analyzer to provide a numeric estimate of the concentration of organics present in the sample.

Soil samples were submitted under chain of custody to Hall Environmental Analytical Laboratory (HEAL) in Albuquerque, New Mexico. The samples were analyzed for chloride by EPA Method 300. The chloride samples collected from boring B-1 were also analyzed for TPH GRO/DRO by EPA method 8015B modified. Additional TPH samples were submitted from borings B-2 (20 and 70 ft bgs) and B-3 (20 and 75 ft bgs).

Kleinfelder also collected a sample of the pit material for potential future disposal at a landfill or landfarm. The pit sample was analyzed for TPH-GRO and DRO, volatile organic compounds by EPA Method 8260; reactivity, corrosivity, and ignitability; and RCRA metals (eight metals) by EPA Methods 6010B and 7470 using the Toxicity Characteristic Leach Procedure.

Investigation Derived Waste (IDW) Management

Cuttings from borings were placed in labeled DOT-approved fifty-five gallon drums. Drums were left on site for future disposal.

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RESULTS

Soils at the site consisted predominately of fine to medium grained, dense to very dense, moist to dry, light brown to reddish-brown, silty sand from ground surface to the total depth of most of the borings (75 ft bgs). See Attachment 2 for the boring logs.

The following table presents the results of the soil analytical data (See Attachment 3 for the laboratory analytical report):

Sample Location	Depth (Ft BGS)	Field Screening (PPM)	TPH (Mg/Kg)	Chloride (Mg/Kg)
B-1	20	478	Not Sampled	Not Sampled
	30	Not Sampled	Not Sampled	Not Sampled
	40	1125	4920	4600
	50	169	3510	4600
	60	2191	3210	2800
	70	Over Range	Not Sampled	Not Sampled
	75	Not Sampled	2580	2300
B-2	20	99	<65.7	350
	50	0	Not Sampled	Not Sampled
	40	96	Not Sampled	Not Sampled
	60	10	Not Sampled	Not Sampled
	70	37	<63.7	1600
B-3	20	107	<64.7	95
	30	Not Sampled	Not Sampled	Not Sampled
	40	68	Not Sampled	Not Sampled
	50	64	Not Sampled	Not Sampled
	60	61	Not Sampled	Not Sampled
	75	139	<64.9	4500

The results of the boring laboratory data indicate the following:

- Concentrations of TPH were found above regulatory levels (100 mg/kg) in boring B-1, located within the pit. However, concentrations of TPH in borings adjacent to the pit (B-2 and B-3) were not observed above the laboratory reporting limit.
- Chloride concentrations appear to decrease with depth in boring B-1, located within the pit. However, chloride concentrations were above the NMOCD guideline concentration of 1000 mg/kg through the total depth of the boring (75 ft). Chloride concentrations in samples collected from the borings located adjacent to the pit (B-2 and B-3) were generally less than the NMOCD guideline concentration above a depth of 40 ft bgs. However, chloride concentrations in these borings increased with depth, exceeding the NMOCD guideline concentration.

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The analytical results of the pit samples did not indicate the presence of any volatile organic compounds (see Attachment 2). The results of the TPH analyses were:

TPH Range	Result
Gasoline Range Organics (GRO)	**<4.9 Mg/Kg**
Diesel Range Organics (DRO)	**2,200 Mg/Kg**
Motor Oil Range Organics (MRO)	**3,500 Mg/Kg**

The results of the metals analyses are:

Analyte	Result
Arsenic	**<2.5 Mg/Kg**
Barium	**130 Mg/Kg**
Cadmium	**<0.10 Mg/Kg**
Chromium	**8.3 Mg/Kg**
Lead	**15 Mg/Kg**
Mercury	**<0.033 Mg/Kg**
Selenium	**<2.5 Mg/Kg**
Silver	**<0.25 Mg/Kg**

The sample was also analyzed for reactivity, corrosivity, ignitability, moisture content, and pH for potential disposal at a landfill or landfarm. The results of these analyses are:

Analyte	Result
Cyanide (reactive)	**<10 Mg/kg**
Ignitability	**Negative**
pH	**7.48**
Reactive Sulfide	**<40 Mg/kg**
Moisture Content	**32.8 percent**

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An area of stained soil was also observed on the property (see Figure 2). Historical aerial photographs of the site indicate that an above ground storage tank (AST) was located in this area. Due to the relatively minor size of the staining that was observed (see photographs in Attachment 1), this area was not assessed. This area will be addressed during remediation of the main pit.

CONCLUSIONS AND RECOMMENDATIONS

The results of the boring laboratory data indicated the following:

- Concentrations of TPH appear to have migrated vertically, but not horizontally since they do not appear to extend laterally beyond the boundaries of the pit; and
- Concentrations of chlorides appear to have migrated vertically as well as horizontally at depth.

Migration of the TPH and chloride concentrations is most likely caused by the migration of meteoric waters through the pit material and into the subsurface.

The analytical results from the pit sample do not indicate the presence of volatile organic compounds or the presence of gasoline-range TPH. This may be due to the degradation and volatilization of these compounds due to the age of the pit.

A volumetric estimate of the berm materials indicates that there are approximately 2400 cubic yards (yd3) of available backfill soil on site (see Attachment 4, Volumetric Calculations). The berm is currently stabilized with native vegetation, a good indication that the material is suitable for use as a top soil. Kleinfelder assumes that all of the berm material came from the pit since this was a typical pit construction method at the time. If this is correct, then a back-calculation of the pit dimensions with the berm volume indicates a depth of approximately 10 ft bgs. This also indicates that there may be as much as 2400 cubic yards (in-situ) of pit material.

Based on this information, Kleinfelder proposes the following scope of work to remediate the site:

- The pit contents should be excavated to a depth of approximately 5 ft below the top of the existing material. Removal of this amount will allow for some mixing of berm soil into the pit material to increase stability and workability. Kleinfelder would mix enough berm soil into the pit material to allow for an increase in volume of about 1 foot. This would allow for 4 ft of backfill depth. This volume has been estimated at approximately 1800 yd3 (including a swell factor of 50%). These materials should be disposed of in a nearby landfarm or landfill (depending on acceptability criteria and proximity to the site). Due to the age of the material and the proposed addition of a liner (see below), Kleinfelder is recommending that not all of the material be removed, in order to reduce project costs. The presence of the liners will mimimize further infiltration of meteoric waters into the pit material and further the downward migration of TPH and chlorides.
- The stained soil area would be excavated for disposal at a landfarm or landfill. This area would be excavated to a maximum extent of 20 ft by 20 ft by 20 ft deep (or maximum extent of excavator). The maximum amount to be excavated would be approximately 450 yd3, including a swell factor of 50%. Soils would be field

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screened during excavation. If field screening samples indicate that soils are below regulatory levels, excavation would halt to minimize the amount of soil to be excavated. Final excavation depths will be confirmed with laboratory analytical data.

- An impermeable liner would be placed in the bottom of both excavations.
- The existing berm material would be used for backfill. The backfill material would be wheel-roll compacted using the on-site equipment.
- Each area would be reseeded with a native seed mix.
- The fence would be removed from the Subject Site and properly disposed of.

With NMOCD approval, Kleinfelder will prepare a workplan in accordance with this proposed scope of work. The workplan will be an addendum to this report.

LIMITATIONS

Kleinfelder offers various levels of investigative and engineering services to suit the varying needs of different clients. It should be recognized that definition and evaluation of geologic and environmental conditions are a difficult and inexact science. Judgments leading to conclusions and recommendations are generally made with incomplete knowledge of the subsurface conditions present due to the limitations of data from field studies. Although risk can never be eliminated, more detailed and extensive studies yield more information, which may help understand and manage the level of risk. Since detailed study and analysis involves greater expense, our clients participate in determining levels of service that provide adequate information for their purposes at acceptable levels of risk. More extensive studies, including subsurface studies or field tests, should be performed to reduce uncertainties. Acceptance of this report will indicate that NMOCD has reviewed the document and determined that it does not need or want a greater level of service than provided.

During the course of the performance of Kleinfelder's services, hazardous materials may have been discovered. Kleinfelder assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury that results from pre-existing hazardous materials being encountered or present on the project site, or from the discovery of such hazardous materials. Nothing contained in this report should be construed or interpreted as requiring Kleinfelder to assume the status of an owner, operator, or generator, or person who arranges for disposal, transport, storage, or treatment of hazardous materials within the meaning of any governmental statute, regulation, or order. The NMOCD is solely responsible for directing notification of all governmental agencies, and the public at large, of the existence, release, treatment, or disposal of any hazardous materials observed at the project site, either before or during performance of Kleinfelder's services. The NMOCD is responsible for directing all arrangements to lawfully store, treat, recycle, dispose, or otherwise handle hazardous materials, including cuttings and samples resulting from Kleinfelder's services.

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We appreciate the opportunity to provide these services to NMOCD. Should any questions arise concerning this work plan; we will be pleased to discuss them with you.

Respectfully submitted,

KLEINFELDER WEST, INC.

Bernard Bockisch, PMP
Senior Project Manager

Reviewed by:

Eileen Shannon, PG
Project Professional

Attachments:

Figure 1 – Site Location Map
Figure 2 – Boring Location Map
Attachment A – Site Photographs
Attachment B – Soil Boring Logs
Attachment C - Laboratory Analytical Data
Attachment D – Volume Calculations

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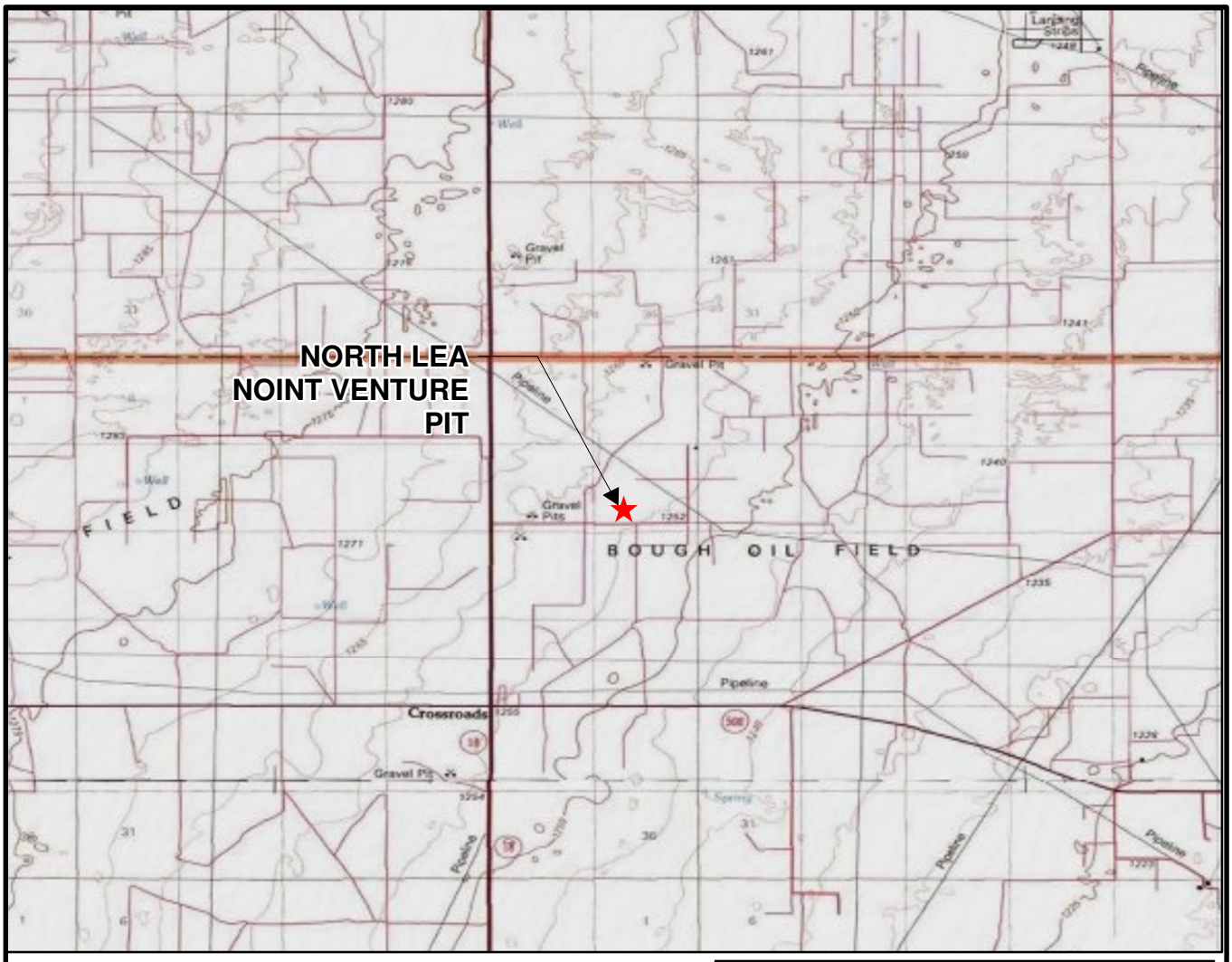
FIGURES



SOURCES: http://services.arcgisonline.com/ArcGIS/rest/services/NGS_Topo_US_2D/MapServer

N

0 1 2 4 Miles

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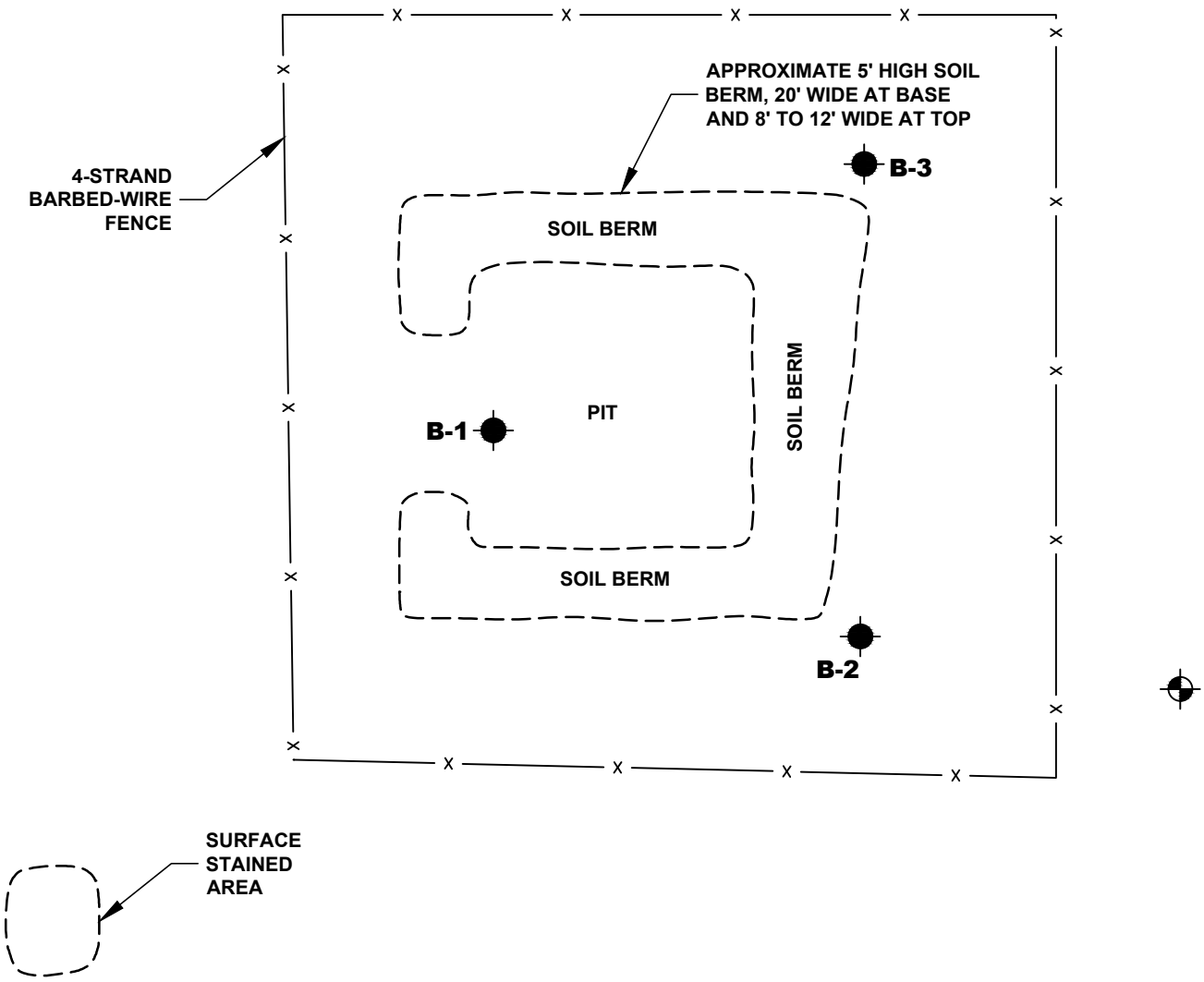
PROJECT NO.	1220708
DRAWN:	02/06/2012
DRAWN BY:	PD
CHECKED BY:	BB
FILE NAME:	122078_SL.mxd

SITE LOCATION MAP

NORTH LEA JOINT VENTURE PIT
2.6 MILES NW OF CROSSROADS, NM
LEA COUNTY, NEW MEXICO

FIGURE

1



LEGEND

- APPROXIMATE MONITORING WELL LOCATION
- B-3 PROPOSED BORING LOCATION

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PROJECT NO.	122078
DRAWN:	9/2011
DRAWN BY:	DMF
CHECKED BY:	BB
FILE NAME:	122078-F1.dwg

BORING LOCATION MAP

NORTH LEA SITE
NMOCD - NEW MEXICO OIL CONSERVATION DIVISION
CROSS ROADS, NEW MEXICO

FIGURE
2

PLOTTED: 25 Oct 2011, 8:56am, dfahrney
CAD FILE: L:\2011\CADD\122078\ LAYOUT: Layout1
ATTACHED IMAGES:
ATTACHED XREFS:
RIVERSIDE, CA

ATTACHMENT A

No.1 View of Subject Property looking northeast. Note stained area in the foreground.

No.2 View of pit looking east.

No.3 View of pit looking southeast

No.4 View of interior of pit looking east

No.5 View of stained soil area noted in Figure 1.

No.6 View of monitoring well located at southeastern corner of the pit.

ATTACHMENT B

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Soil Boring Log

Date		Project	Borehole No.
Started: 1/18/2012	Rig Type: EDI/Dave Tanner	North Lea Joint Venture	B-1
Completed: 1/18/2012	Driller: EDI/Dave Tanner		
Backfilled: 1/18/2012	Drilling Co: EDI/Dave Tanner	Drill Method: CME 75	Project Number: 122078
Latitude: 33.54504	Longitude: -103.31726	Ground Elevation: NA	Logged By: C. Vallejo

Sample Type: G - Grab Sample; CS - 3.5" I.D. Continuous Sampler; SPT - 2" O.D. 1.38" I.D. Tube Sample; CUT - Cuttings; NR - No Recovery; DP - Macropore sampler 1.5" I.D. 4' long

Groundwater

Depth (ft)	Hour	Date
Not observed		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample Type	Pen.Resistance (Blows per foot)	Field Screening (ppm)	TPH (mg/kg)	Chloride (mg/kg)	Visual Classification
	0								SILTY SAND (SM)- fine to medium, dense to very dense, subrounded to subangular, with calcareous gravel, brown, dry to moist
									Soil description from 0 to 10 ft bgs based on drill cuttings
	5								
	10		☒	SPT	50/3"	NS			Calcareous rock fragment in sampler shoe at 10 ft bgs Increased drilling resistance from 10 to 12 ft bgs, possibly due to presence of cobbles or boulders
	15								Gray color, hydrocarbon odor from 15 to 40 ft bgs Increased drilling resistance from 16 to 18 ft bgs
	20		☒	SPT	50/5"	478			
	25								
	30		☒	SPT	50/5"	NS			
	35								
	40		☒	SPT	41	1125	4920	4600	Light tan color, hydrocarbon odor at 40 ft bgs
	45								

Soil Boring Log

Date				
Started: 1/18/2012	Rig Type: EDI/Dave Tanner	Project: North Lea Joint Venture		Borehole No. B-1
Completed: 1/18/2012	Driller: EDI/Dave Tanner			
Backfilled: 1/18/2012	Drilling Co: EDI/Dave Tanner	Drill Method: CME 75	Project Number: 122078	
Latitude: 33.54504	Longitude: -103.31726	Ground Elevation: NA	Logged By: C. Vallejo	

Sample Type: G - Grab Sample; CS - 3.5" I.D. Continuous Sampler; SPT - 2" O.D. 1.38" I.D. Tube Sample; CUT - Cuttings; NR - No Recovery; DP - Macropore sampler 1.5" I.D. 4' long

Groundwater

Depth (ft)	Hour	Date
Not observed		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample Type	Pen.Resistance (Blows per foot)	Field Screening (ppm)	TPH (mg/kg)	Chloride (mg/kg)	Visual Classification
	45								SILTY SAND (SM)- fine to medium, dense to very dense, subrounded to subangular, with calcareous gravel, brown, dry to moist
	50		X	SPT	50/5.5"	169	3570	4600	Light reddish brown color, hydrocarbon odor from 50 to 75 ft bgs
	55								
	60		X	SPT	72	2191	3210	2800	Black staining at 60 ft bgs
	65								Increased drilling resistance at 65 ft bgs
	70		X	SPT	50/4"	OR	NS	NS	Broken gravel observed in sampler at 75 ft bgs Field screening levels too high for equipment to read at 75 ft bgs
	75		X	SPT	50/4"		2580	2300	75.8'

Total Depth 75.8'

Boring backfilled with hydrated bentonite chips. Boring coordinates obtained with hand-held GPS device.
OR = over instrument range NS = not sampled

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Soil Boring Log

Date		Project	Borehole No.
Started: 1/18/2012	Rig Type: EDI/Dave Tanner	North Lea Joint Venture	B-2
Completed: 1/18/2012	Driller: EDI/Dave Tanner		
Backfilled: 1/18/2012	Drilling Co: EDI/Dave Tanner	Drill Method: CME 75	Project Number: 122078
Latitude: 33.54479	Longitude: -103.31696	Ground Elevation: NA	Logged By: C. Vallejo

Sample Type: G - Grab Sample; CS - 3.5" I.D. Continuous Sampler; SPT - 2" O.D. 1.38" I.D. Tube Sample; CUT - Cuttings; NR - No Recovery; DP - Macropore sampler 1.5" I.D. 4' long

Groundwater

Depth (ft)	Hour	Date
Not observed		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample Type	Pen.Resistance (Blows per foot)	Field Screening (ppm)	TPH (mg/kg)	Chloride (mg/kg)	Visual Classification
	0								SILTY SAND (SM)- fine to medium, very dense, subrounded to subangular, with calcareous gravel, light brown, dry
									Soil description from 0 to 10 ft bgs based on drill cuttings
	5								
	10		X	SPT	67/9"	NS	NS	NS	Reddish-brown from 10 to 15 ft bgs
	15								
	20		X	SPT	50/2"	99	NS	NS	Light tan to white, calcareous from 20 to 50 ft bgs Very hard drilling from 21 to 23 ft bg; possible boulders or cobbles
	25								
	30		X	SPT	50/3"	NS	NS	NS	Broken gravel in sampler at 30 ft bgs
	35								
	40		X	SPT	50/3"	96	<65.7	350	Broken gravel in sampler at 40 ft bgs
	45								

Soil Boring Log

Date				
Started: 1/18/2012	Rig Type: EDI/Dave Tanner	Project: North Lea Joint Venture		Borehole No. B-2
Completed: 1/18/2012	Driller: EDI/Dave Tanner			
Backfilled: 1/18/2012	Drilling Co: EDI/Dave Tanner	Drill Method: CME 75	Project Number: 122078	
Latitude: 33.54479	Longitude: -103.31696	Ground Elevation: NA	Logged By: C. Vallejo	

Sample Type: G - Grab Sample; CS - 3.5" I.D. Continuous Sampler; SPT - 2" O.D. 1.38" I.D. Tube Sample; CUT - Cuttings; NR - No Recovery; DP - Macropore sampler 1.5" I.D. 4' long

Groundwater

Depth (ft)	Hour	Date
Not observed		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample Type	Pen.Resistance (Blows per foot)	Field Screening (ppm)	TPH (mg/kg)	Chloride (mg/kg)	Visual Classification
	45								SILTY SAND (SM)- fine to medium, very dense, subrounded to subangular, with calcareous gravel, light brown, dry
	50		☒	SPT	50/5"	0	NS	NS	Brown to reddish brown, fine, with calcareous material from 50 to 75 ft bgs
	55								Very hard drilling from 55 to 57 ft bgs; possible boulders or cobbles
	60		☒	SPT	50/5"	10	NS	NS	Tight drilling, augers not moving freely. Driller adds 5 gal. of water down hole to free up auger at 61 ft bgs
	65								
	70		☒	SPT	50/5.5"	37	<63.7	1600	
	75		☒	SPT	50/4"				75.8'

Total Depth 75.8'

Boring backfilled with hydrated bentonite chips. Boring coordinates obtained with hand-held GPS device.
NS = not sampled

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Soil Boring Log

Date		Rig Type: EDI/Dave Tanner	Project: North Lea Joint Venture	Borehole No. B-3
	Started: 1/19/2012			
	Completed: 1/19/2012	Driller: EDI/Dave Tanner		
	Backfilled: 1/19/2012	Drilling Co: EDI/Dave Tanner	Drill Method: CME 75	Project Number: 122078
	Latitude: 33.54528	Longitude: -103.31685	Ground Elevation: NA	Logged By: C. Vallejo

Sample Type: G - Grab Sample; CS - 3.5" I.D. Continuous Sampler; SPT - 2" O.D. 1.38" I.D. Tube Sample; CUT - Cuttings; NR - No Recovery; DP - Macropore sampler 1.5" I.D. 4' long

Groundwater

Depth (ft)	Hour	Date
Not observed		

Groundwater Depth (ft.)	Depth (ft.)	Graphical Log	Sample Taken	Sample Type	Pen.Resistance (Blows per foot)	Field Screening (ppm)	TPH (mg/kg)	Chloride (mg/kg)	Visual Classification
	0								SILTY SAND (SM)- fine to medium, dense to very dense, subrounded to subangular, reddish brown, dry to moist
									Soil description from 0 to 10 ft bgs based on drill cuttings
	5								Tan, calcareous from 6 ft bgs
									Increased drilling resistance at 7 ft bgs
	10		X	SPT	42	NS	NS	NS	
	15								
	20		X	SPT	50/4"	107	<64.7	95	Broken gravel in sampler at 20 ft bgs
									With calcareous gravel from 20 to 45 ft bgs.
	25								
	30		X	SPT	50/5"	NS	NS	NS	
	35								
	40		X	SPT	50/5"	68	NS	NS	
	45								

Soil Boring Log

Date				
Started: 1/19/2012	Rig Type: EDI/Dave Tanner	Project: North Lea Joint Venture		Borehole No. B-3
Completed: 1/19/2012	Driller: EDI/Dave Tanner			
Backfilled: 1/19/2012	Drilling Co: EDI/Dave Tanner	Drill Method: CME 75	Project Number: 122078	
Latitude: 33.54528	Longitude: -103.31685	Ground Elevation: NA	Logged By: C. Vallejo	

Sample Type: G - Grab Sample; CS - 3.5" I.D. Continuous Sampler; SPT - 2" O.D. 1.38" I.D. Tube Sample; CUT - Cuttings; NR - No Recovery; DP - Macropore sampler 1.5" I.D. 4' long

Groundwater

Depth (ft)	Hour	Date
Not observed		

Groundwater Depth (ft.) / Depth (ft.)	Graphical Log	Sample Taken	Sample Type	Pen.Resistance (Blows per foot)	Field Screening (ppm)	TPH (mg/kg)	Chloride (mg/kg)	Visual Classification
45								SILTY SAND (SM)- fine to medium, dense to very dense, subrounded to subangular, reddish brown, dry to moist Reddish brown, fine, some calcareous material and gravel from 45 ft bgs
50		☒	SPT	50/5.5"	64	NS	NS	
55								
60		☒	SPT	50/5.5"	61	NS	NS	Broken gravel in sampler shoe at 60 ft bgs Increased drilling resistance at 61 ft bgs. Driller adds 5 gal. of water down hole
65								Increased drilling resistance from 65 to 75 ft bgs
70								
75		☒	SPT	50/3"	139	<64.9	4500	75.8'

Total Depth 75.8'

Boring backfilled with hydrated bentonite chips. Boring coordinates obtained with hand-held GPS device.
NS = not sampled

ATTACHMENT C

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

February 13, 2012

Bernie Bockisch
Kleinfelder
9019 Washington NE Building A
Albuquerque, NM 87113
TEL: (505) 344-7373
FAX (505) 344-1711

RE: North Lea Pit OrderNo.: 1201641

Dear Bernie Bockisch:

Hall Environmental Analysis Laboratory received 9 sample(s) on 1/23/2012 for the analyses presented in the following report.

There were no problems with the analytical events associated with this report unless noted in the Case Narrative. Analytical results designated with a "J" qualifier are estimated and represent a detection above the Method Detection Limit (MDL) and less than the Reporting Limit (PQL). These analytes are not reviewed nor narrated as to whether they are laboratory artifacts.

Quality control data is within laboratory defined or method specified acceptance limits except if noted.

If you have any questions regarding these tests results, please feel free to call.

Sincerely,

Andy Freeman
Laboratory Manager
4901 Hawkins NE
Albuquerque, NM 87109

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: B-1, 40' bgs
Project: North Lea Pit
Collection Date: 1/18/2012 9:48:00 AM
Lab ID: 1201641-001
Matrix: SOIL
Received Date: 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	4,100	510		mg/Kg	50	1/25/2012 8:48:32 PM
Motor Oil Range Organics (MRO)	ND	2,600		mg/Kg	50	1/25/2012 8:48:32 PM
Surr: DNOP	0	77.4-131	S	%REC	50	1/25/2012 8:48:32 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	820	25		mg/Kg	5	1/25/2012 1:48:15 PM
Surr: BFB	699	69.7-121	S	%REC	5	1/25/2012 1:48:15 PM
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Chloride	4,600	150		mg/Kg	100	1/27/2012 7:02:13 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: B-1, 50' bgs
Project: North Lea Pit
Collection Date: 1/18/2012 10:06:00 AM
Lab ID: 1201641-002
Matrix: SOIL
Received Date: 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	2,900	500		mg/Kg	50	1/25/2012 9:10:21 PM
Motor Oil Range Organics (MRO)	ND	2,500		mg/Kg	50	1/25/2012 9:10:21 PM
Surr: DNOP	0	77.4-131	S	%REC	50	1/25/2012 9:10:21 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	670	240		mg/Kg	50	1/26/2012 1:01:49 PM
Surr: BFB	148	69.7-121	S	%REC	50	1/26/2012 1:01:49 PM
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Chloride	4,600	150		mg/Kg	100	1/27/2012 7:19:38 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: B-1, 60' bgs
Project: North Lea Pit
Collection Date: 1/18/2012 10:27:00 AM
Lab ID: 1201641-003
Matrix: SOIL
Received Date: 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	2,600	500		mg/Kg	50	1/25/2012 9:32:09 PM
Motor Oil Range Organics (MRO)	ND	2,500		mg/Kg	50	1/25/2012 9:32:09 PM
Surr: DNOP	0	77.4-131	S	%REC	50	1/25/2012 9:32:09 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	610	250		mg/Kg	50	1/26/2012 1:30:35 PM
Surr: BFB	151	69.7-121	S	%REC	50	1/26/2012 1:30:35 PM
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Chloride	2,800	75		mg/Kg	50	2/1/2012 10:32:08 AM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: B-1, 75' bgs
Project: North Lea Pit
Collection Date: 1/18/2012 11:06:00 AM
Lab ID: 1201641-004 **Matrix:** SOIL **Received Date:** 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	2,100	490		mg/Kg	50	1/25/2012 9:54:06 PM
Motor Oil Range Organics (MRO)	ND	2,400		mg/Kg	50	1/25/2012 9:54:06 PM
Surr: DNOP	0	77.4-131	S	%REC	50	1/25/2012 9:54:06 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	480	250		mg/Kg	50	1/26/2012 1:59:19 PM
Surr: BFB	140	69.7-121	S	%REC	50	1/26/2012 1:59:19 PM
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Chloride	2,300	75		mg/Kg	50	1/27/2012 7:54:27 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: B-2, 40' bgs
Project: North Lea Pit
Collection Date: 1/18/2012 2:50:00 PM
Lab ID: 1201641-005 **Matrix:** SOIL **Received Date:** 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	1/25/2012 6:16:46 PM
Motor Oil Range Organics (MRO)	ND	51		mg/Kg	1	1/25/2012 6:16:46 PM
Surr: DNOP	89.3	77.4-131		%REC	1	1/25/2012 6:16:46 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.7		mg/Kg	1	1/25/2012 5:09:58 PM
Surr: BFB	98.7	69.7-121		%REC	1	1/25/2012 5:09:58 PM
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Chloride	350	30		mg/Kg	20	1/26/2012 11:18:26 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: B-2, 70' bgs
Project: North Lea Pit
Collection Date: 1/18/2012 3:55:00 PM
Lab ID: 1201641-006
Matrix: SOIL
Received Date: 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	ND	9.8		mg/Kg	1	1/25/2012 6:38:27 PM
Motor Oil Range Organics (MRO)	ND	49		mg/Kg	1	1/25/2012 6:38:27 PM
Surr: DNOP	87.9	77.4-131		%REC	1	1/25/2012 6:38:27 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	1/25/2012 5:38:44 PM
Surr: BFB	97.9	69.7-121		%REC	1	1/25/2012 5:38:44 PM
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Chloride	1,600	75		mg/Kg	50	1/27/2012 8:11:52 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: B-3, 20' bgs
Project: North Lea Pit
Collection Date: 1/19/2012 10:00:00 AM
Lab ID: 1201641-007
Matrix: SOIL
Received Date: 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	ND	9.9		mg/Kg	1	1/25/2012 7:00:11 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	1/25/2012 7:00:11 PM
Surr: DNOP	94.7	77.4-131		%REC	1	1/25/2012 7:00:11 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.8		mg/Kg	1	1/25/2012 6:07:35 PM
Surr: BFB	98.4	69.7-121		%REC	1	1/25/2012 6:07:35 PM
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Chloride	95	30		mg/Kg	20	1/27/2012 12:28:04 AM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: B-3, 75' bgs
Project: North Lea Pit
Collection Date: 1/19/2012 11:40:00 AM
Lab ID: 1201641-008 **Matrix:** SOIL **Received Date:** 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	ND	10		mg/Kg	1	1/25/2012 7:21:47 PM
Motor Oil Range Organics (MRO)	ND	50		mg/Kg	1	1/25/2012 7:21:47 PM
Surr: DNOP	89.1	77.4-131		%REC	1	1/25/2012 7:21:47 PM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	1/25/2012 6:36:28 PM
Surr: BFB	96.8	69.7-121		%REC	1	1/25/2012 6:36:28 PM
EPA METHOD 300.0: ANIONS						Analyst: **BRM**
Chloride	4,500	150		mg/Kg	100	1/27/2012 8:29:17 PM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: Pit Sample
Project: North Lea Pit
Collection Date: 1/18/2012 1:30:00 PM
Lab ID: 1201641-009
Matrix: SOIL
Received Date: 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8015B: DIESEL RANGE ORGANICS						Analyst: **JMP**
Diesel Range Organics (DRO)	2,200	96		mg/Kg	10	1/26/2012 8:08:09 AM
Motor Oil Range Organics (MRO)	3,500	480		mg/Kg	10	1/26/2012 8:08:09 AM
Surr: DNOP	0	77.4-131	S	%REC	10	1/26/2012 8:08:09 AM
EPA METHOD 8015B: GASOLINE RANGE						Analyst: **RAA**
Gasoline Range Organics (GRO)	ND	4.9		mg/Kg	1	1/25/2012 7:05:16 PM
Surr: BFB	97.0	69.7-121		%REC	1	1/25/2012 7:05:16 PM
EPA METHOD 7471: MERCURY						Analyst: **JLF**
Mercury	ND	0.033		mg/Kg	1	1/30/2012 2:38:09 PM
EPA METHOD 6010B: SOIL METALS						Analyst: **ELS**
Arsenic	ND	2.5		mg/kg	1	1/27/2012 6:58:13 AM
Barium	130	0.50		mg/kg	5	1/27/2012 7:13:01 AM
Cadmium	ND	0.10		mg/kg	1	1/27/2012 6:58:13 AM
Chromium	8.3	0.30		mg/kg	1	1/27/2012 6:58:13 AM
Lead	15	0.25		mg/kg	1	1/27/2012 6:58:13 AM
Selenium	ND	2.5		mg/kg	1	1/27/2012 6:58:13 AM
Silver	ND	0.25		mg/kg	1	1/27/2012 6:58:13 AM
EPA METHOD 8260B: VOLATILES						Analyst: **NSB**
Benzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Toluene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Ethylbenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Methyl tert-butyl ether (MTBE)	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,2,4-Trimethylbenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,3,5-Trimethylbenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,2-Dichloroethane (EDC)	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,2-Dibromoethane (EDB)	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Naphthalene	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
1-Methylnaphthalene	ND	0.20		mg/Kg	1	1/28/2012 7:21:27 AM
2-Methylnaphthalene	ND	0.20		mg/Kg	1	1/28/2012 7:21:27 AM
Acetone	ND	0.74		mg/Kg	1	1/28/2012 7:21:27 AM
Bromobenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Bromodichloromethane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Bromoform	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Bromomethane	ND	0.64		mg/Kg	1	1/28/2012 7:21:27 AM
2-Butanone	ND	0.49		mg/Kg	1	1/28/2012 7:21:27 AM
Carbon disulfide	ND	0.49		mg/Kg	1	1/28/2012 7:21:27 AM
Carbon tetrachloride	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
Chlorobenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Chloroethane	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
Chloroform	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Chloromethane	ND	0.15		mg/Kg	1	1/28/2012 7:21:27 AM

Qualifiers:

- */X Value exceeds Maximum Contaminant Level.
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: Pit Sample
Project: North Lea Pit
Collection Date: 1/18/2012 1:30:00 PM
Lab ID: 1201641-009
Matrix: SOIL
Received Date: 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **NSB**
2-Chlorotoluene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
4-Chlorotoluene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
cis-1,2-DCE	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
cis-1,3-Dichloropropene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,2-Dibromo-3-chloropropane	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
Dibromochloromethane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Dibromomethane	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
1,2-Dichlorobenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,3-Dichlorobenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,4-Dichlorobenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Dichlorodifluoromethane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,1-Dichloroethane	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
1,1-Dichloroethene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,2-Dichloropropane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,3-Dichloropropane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
2,2-Dichloropropane	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
1,1-Dichloropropene	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
Hexachlorobutadiene	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
2-Hexanone	ND	0.49		mg/Kg	1	1/28/2012 7:21:27 AM
Isopropylbenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
4-Isopropyltoluene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
4-Methyl-2-pentanone	ND	0.49		mg/Kg	1	1/28/2012 7:21:27 AM
Methylene chloride	ND	0.15		mg/Kg	1	1/28/2012 7:21:27 AM
n-Butylbenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
n-Propylbenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
sec-Butylbenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Styrene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
tert-Butylbenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,1,1,2-Tetrachloroethane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,1,2,2-Tetrachloroethane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Tetrachloroethene (PCE)	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
trans-1,2-DCE	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
trans-1,3-Dichloropropene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,2,3-Trichlorobenzene	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
1,2,4-Trichlorobenzene	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,1,1-Trichloroethane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,1,2-Trichloroethane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Trichloroethene (TCE)	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Trichlorofluoromethane	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
1,2,3-Trichloropropane	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM
Vinyl chloride	ND	0.049		mg/Kg	1	1/28/2012 7:21:27 AM
Xylenes, Total	ND	0.099		mg/Kg	1	1/28/2012 7:21:27 AM

Qualifiers:
- */X Value exceeds Maximum Contaminant Level.
- B Analyte detected in the associated Method Blank
- E Value above quantitation range
- H Holding times for preparation or analysis exceeded
- J Analyte detected below quantitation limits
- ND Not Detected at the Reporting Limit
- R RPD outside accepted recovery limits
- RL Reporting Detection Limit
- S Spike Recovery outside accepted recovery limits

Hall Environmental Analysis Laboratory, Inc.

CLIENT: Kleinfelder
Client Sample ID: Pit Sample
Project: North Lea Pit
Collection Date: 1/18/2012 1:30:00 PM
Lab ID: 1201641-009
Matrix: SOIL
Received Date: 1/23/2012 11:10:00 AM

Analyses	Result	RL	Qual	Units	DF	Date Analyzed
EPA METHOD 8260B: VOLATILES						Analyst: **NSB**
Surr: 1,2-Dichloroethane-d4	91.8	70-130		%REC	1	1/28/2012 7:21:27 AM
Surr: 4-Bromofluorobenzene	86.8	70-130		%REC	1	1/28/2012 7:21:27 AM
Surr: Dibromofluoromethane	110	71.7-132		%REC	1	1/28/2012 7:21:27 AM
Surr: Toluene-d8	94.7	70-130		%REC	1	1/28/2012 7:21:27 AM

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit
S	Spike Recovery outside accepted recovery limits		

Anatek Labs, Inc.

1282 Alturas Drive • Moscow, ID 83843 • (208) 883-2839 • Fax (208) 882-9246 • email moscow@anateklabs.com
504 E Sprague Ste. D • Spokane WA 99202 • (509) 838-3999 • Fax (509) 838-4433 • email spokane@anateklabs.com

Client:	HALL ENVIRONMENTAL ANALYSIS LAB	**Batch #:**	120126025
Address:	4901 HAWKINS NE SUITE D ALBUQUERQUE, NM 87109	**Project Name:**	1201641
Attn:	ANDY FREEMAN		

Analytical Results Report

Sample Number	120126025-001	**Sampling Date**	1/18/2012	**Date/Time Received**	1/26/2012	11:40 AM
Client Sample ID	1201641-009A / PIT SAMPLE	**Sampling Time**	1:30 PM			
Matrix	Soil	**Sample Location**				
Comments						

Parameter	Result	Units	PQL	Analysis Date	Analyst	Method	Qualifier
Cyanide (reactive)	ND	mg/Kg	10	2/7/2012	CRW	SW846 CH7	
Ignitability	Negative			1/26/2012	JWC	EPA 1030	
pH	7.48	ph Units		2/8/2012	KFG	EPA 9045	
Reactive sulfide	ND	mg/kg	40	2/10/2012	JTT	SW846 CH7	
%moisture	32.8	Percent		2/6/2012	KFG	%moisture	

Authorized Signature

John Coddington, Lab Manager

MCL EPA's Maximum Contaminant Level
ND Not Detected
PQL Practical Quantitation Limit

The results reported relate only to the samples indicated.
Soil/solid results are reported on a dry-weight basis unless otherwise noted.

Certifications held by Anatek Labs ID: EPA:ID00013; AZ:0701; CO:ID00013; FL(NELAP):E87893; ID:ID00013; IN:C-ID-01; KY:90142; MT:CERT0028; NM: ID00013; OR:ID200001-002; WA:C595
Certifications held by Anatek Labs WA: EPA:WA00169; CA:Cert2832; ID:WA00169; WA:C585; MT:Cert0095

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1201641**

13-Feb-12

Client: Kleinfelder

Project: North Lea Pit

Sample ID	**MB-451**	SampType:	**MBLK**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**PBS**	Batch ID:	**451**	RunNo:	**608**					
Prep Date:	**1/26/2012**	Analysis Date:	**1/26/2012**	SeqNo:	**17273**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	ND	1.5								

Sample ID	**LCS-451**	SampType:	**LCS**	TestCode:	**EPA Method 300.0: Anions**					
Client ID:	**LCSS**	Batch ID:	**451**	RunNo:	**608**					
Prep Date:	**1/26/2012**	Analysis Date:	**1/26/2012**	SeqNo:	**17274**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Chloride	14	1.5	15.00	0	93.7	90	110			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1201641**

13-Feb-12

Client: Kleinfelder

Project: North Lea Pit

Sample ID **MB-409**	SampType: **MBLK**	TestCode: **EPA Method 8015B: Diesel Range Organics**
Client ID: **PBS**	Batch ID: **409**	RunNo: **517**
Prep Date: **1/24/2012**	Analysis Date: **1/25/2012**	SeqNo: **16212** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	ND	10								
Motor Oil Range Organics (MRO)	ND	50								
Surr: DNOP	11		10.00		114	77.4	131			

Sample ID **LCS-409**	SampType: **LCS**	TestCode: **EPA Method 8015B: Diesel Range Organics**
Client ID: **LCSS**	Batch ID: **409**	RunNo: **517**
Prep Date: **1/24/2012**	Analysis Date: **1/25/2012**	SeqNo: **16213** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Diesel Range Organics (DRO)	43	10	50.00	0	86.4	62.7	139			
Surr: DNOP	8.7		5.000		174	77.4	131			S

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1201641**

13-Feb-12

Client: Kleinfelder

Project: North Lea Pit

Sample ID **MB-416**	SampType: **MBLK**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **PBS**	Batch ID: **416**	RunNo: **587**
Prep Date: **1/24/2012**	Analysis Date: **1/25/2012**	SeqNo: **16706** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	ND	5.0								
Surr: BFB	920		1,000		92.5	69.7	121			

Sample ID **LCS-416**	SampType: **LCS**	TestCode: **EPA Method 8015B: Gasoline Range**
Client ID: **LCSS**	Batch ID: **416**	RunNo: **587**
Prep Date: **1/24/2012**	Analysis Date: **1/25/2012**	SeqNo: **16712** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Gasoline Range Organics (GRO)	30	5.0	25.00	0	120	86.4	132			
Surr: BFB	980		1,000		98.5	69.7	121			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT
Hall Environmental Analysis Laboratory, Inc.

WO#: **1201641**
13-Feb-12

Client: Kleinfelder
Project: North Lea Pit

Sample ID **mb-416**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBS**	Batch ID: **416**	RunNo: **632**
Prep Date: **1/24/2012**	Analysis Date: **1/28/2012**	SeqNo: **17907** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	ND	0.050								
Toluene	ND	0.050								
Ethylbenzene	ND	0.050								
Methyl tert-butyl ether (MTBE)	ND	0.050								
1,2,4-Trimethylbenzene	ND	0.050								
1,3,5-Trimethylbenzene	ND	0.050								
1,2-Dichloroethane (EDC)	ND	0.050								
1,2-Dibromoethane (EDB)	ND	0.050								
Naphthalene	ND	0.10								
1-Methylnaphthalene	ND	0.20								
2-Methylnaphthalene	ND	0.20								
Acetone	ND	0.75								
Bromobenzene	ND	0.050								
Bromodichloromethane	ND	0.050								
Bromoform	ND	0.050								
Bromomethane	ND	0.65								
2-Butanone	ND	0.50								
Carbon disulfide	ND	0.50								
Carbon tetrachloride	ND	0.10								
Chlorobenzene	ND	0.050								
Chloroethane	ND	0.10								
Chloroform	ND	0.050								
Chloromethane	ND	0.15								
2-Chlorotoluene	ND	0.050								
4-Chlorotoluene	ND	0.050								
cis-1,2-DCE	ND	0.050								
cis-1,3-Dichloropropene	ND	0.050								
1,2-Dibromo-3-chloropropane	ND	0.10								
Dibromochloromethane	ND	0.050								
Dibromomethane	ND	0.10								
1,2-Dichlorobenzene	ND	0.050								
1,3-Dichlorobenzene	ND	0.050								
1,4-Dichlorobenzene	ND	0.050								
Dichlorodifluoromethane	ND	0.050								
1,1-Dichloroethane	ND	0.10								
1,1-Dichloroethene	ND	0.050								
1,2-Dichloropropane	ND	0.050								
1,3-Dichloropropane	ND	0.050								
2,2-Dichloropropane	ND	0.10								
1,1-Dichloropropene	ND	0.10								
Hexachlorobutadiene	ND	0.10								

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1201641**

13-Feb-12

Client: Kleinfelder

Project: North Lea Pit

Sample ID **mb-416**	SampType: **MBLK**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **PBS**	Batch ID: **416**	RunNo: **632**
Prep Date: **1/24/2012**	Analysis Date: **1/28/2012**	SeqNo: **17907** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
2-Hexanone	ND	0.50								
Isopropylbenzene	ND	0.050								
4-Isopropyltoluene	ND	0.050								
4-Methyl-2-pentanone	ND	0.50								
Methylene chloride	ND	0.15								
n-Butylbenzene	ND	0.050								
n-Propylbenzene	ND	0.050								
sec-Butylbenzene	ND	0.050								
Styrene	ND	0.050								
tert-Butylbenzene	ND	0.050								
1,1,1,2-Tetrachloroethane	ND	0.050								
1,1,2,2-Tetrachloroethane	ND	0.050								
Tetrachloroethene (PCE)	ND	0.050								
trans-1,2-DCE	ND	0.050								
trans-1,3-Dichloropropene	ND	0.050								
1,2,3-Trichlorobenzene	ND	0.10								
1,2,4-Trichlorobenzene	ND	0.050								
1,1,1-Trichloroethane	ND	0.050								
1,1,2-Trichloroethane	ND	0.050								
Trichloroethene (TCE)	ND	0.050								
Trichlorofluoromethane	ND	0.050								
1,2,3-Trichloropropane	ND	0.10								
Vinyl chloride	ND	0.050								
Xylenes, Total	ND	0.10								
Surr: 1,2-Dichloroethane-d4	0.46		0.5000		92.9	70	130			
Surr: 4-Bromofluorobenzene	0.46		0.5000		92.3	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		105	71.7	132			
Surr: Toluene-d8	0.48		0.5000		96.6	70	130			

Sample ID **lcs-416**	SampType: **LCS**	TestCode: **EPA Method 8260B: VOLATILES**
Client ID: **LCSS**	Batch ID: **416**	RunNo: **632**
Prep Date: **1/24/2012**	Analysis Date: **1/28/2012**	SeqNo: **17908** Units: **mg/Kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Benzene	0.96	0.050	1.000	0	96.1	70.7	123			
Toluene	0.96	0.050	1.000	0	96.2	80	120			
Surr: 1,2-Dichloroethane-d4	0.47		0.5000		93.5	70	130			
Surr: 4-Bromofluorobenzene	0.45		0.5000		89.6	70	130			
Surr: Dibromofluoromethane	0.52		0.5000		103	71.7	132			
Surr: Toluene-d8	0.47		0.5000		93.8	70	130			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1201641**

13-Feb-12

Client: Kleinfelder

Project: North Lea Pit

Sample ID	**MB-486**	SampType:	**MBLK**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**PBS**	Batch ID:	**486**	RunNo:	**652**					
Prep Date:	**1/30/2012**	Analysis Date:	**1/30/2012**	SeqNo:	**18686**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	ND	0.033								

Sample ID	**LCS-486**	SampType:	**LCS**	TestCode:	**EPA Method 7471: Mercury**					
Client ID:	**LCSS**	Batch ID:	**486**	RunNo:	**652**					
Prep Date:	**1/30/2012**	Analysis Date:	**1/30/2012**	SeqNo:	**18687**	Units:	**mg/Kg**			

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Mercury	0.18	0.033	0.1667	0	107	80	120			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

QC SUMMARY REPORT

Hall Environmental Analysis Laboratory, Inc.

WO#: **1201641**

13-Feb-12

Client: Kleinfelder

Project: North Lea Pit

Sample ID	**MB-450**	SampType:	**MBLK**	TestCode:	**EPA Method 6010B: Soil Metals**
Client ID:	**PBS**	Batch ID:	**450**	RunNo:	**616**
Prep Date:	**1/26/2012**	Analysis Date:	**1/27/2012**	SeqNo:	**17428** Units: **mg/kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	ND	2.5								
Barium	ND	0.10								
Cadmium	ND	0.10								
Chromium	ND	0.30								
Lead	ND	0.25								
Selenium	ND	2.5								
Silver	ND	0.25								

Sample ID	**LCS-450**	SampType:	**LCS**	TestCode:	**EPA Method 6010B: Soil Metals**
Client ID:	**LCSS**	Batch ID:	**450**	RunNo:	**616**
Prep Date:	**1/26/2012**	Analysis Date:	**1/27/2012**	SeqNo:	**17429** Units: **mg/kg**

Analyte	Result	PQL	SPK value	SPK Ref Val	%REC	LowLimit	HighLimit	%RPD	RPDLimit	Qual
Arsenic	26	2.5	25.00	0	105	80	120			
Barium	24	0.10	25.00	0	97.8	80	120			
Cadmium	26	0.10	25.00	0	102	80	120			
Chromium	25	0.30	25.00	0.06600	98.7	80	120			
Lead	25	0.25	25.00	0	98.8	80	120			
Selenium	27	2.5	25.00	0	108	80	120			
Silver	5.1	0.25	5.000	0	102	80	120			

Qualifiers:

*/X	Value exceeds Maximum Contaminant Level.	B	Analyte detected in the associated Method Blank
E	Value above quantitation range	H	Holding times for preparation or analysis exceeded
J	Analyte detected below quantitation limits	ND	Not Detected at the Reporting Limit
R	RPD outside accepted recovery limits	RL	Reporting Detection Limit

HALL ENVIRONMENTAL ANALYSIS LABORATORY

Hall Environmental Analysis Laboratory
4901 Hawkins NE
Albuquerque, NM 87109
TEL: 505-345-3975 FAX: 505-345-4107
Website: www.hallenvironmental.com

Sample Log-In Check List

Client Name:	Klein	Work Order Number:	1201641
Logged by:	**Lindsay Mangin**	1/23/2012 11:10:00 AM	
Completed By:	**Lindsay Mangin**	1/23/2012 11:50:53 AM	
Reviewed By:		1/23/12	

Chain of Custody

1. Were seals intact?	Yes ☐	No ☐	Not Present ☑
2. Is Chain of Custody complete?	Yes ☑	No ☐	Not Present ☐
3. How was the sample delivered?	Client		

Log In

4. Coolers are present? (see 19. for cooler specific information)	Yes ☑	No ☐	NA ☐
5. Was an attempt made to cool the samples?	Yes ☑	No ☐	NA ☐
6. Were all samples received at a temperature of >0° C to 6.0°C	Yes ☑	No ☐	NA ☐
7. Sample(s) in proper container(s)?	Yes ☑	No ☐	
8. Sufficient sample volume for indicated test(s)?	Yes ☑	No ☐	
9. Are samples (except VOA and ONG) properly preserved?	Yes ☑	No ☐	
10. Was preservative added to bottles?	Yes ☐	No ☑	NA ☐
11. Is the headspace in the VOA vials less than 1/4 inch or 6 mm?	Yes ☐	No ☐	No VOA Vials ☑
12. Were any sample containers received broken?	Yes ☐	No ☑	
13. Does paperwork match bottle labels? (Note discrepancies on chain of custody)	Yes ☑	No ☐	
14. Are matrices correctly identified on Chain of Custody?	Yes ☑	No ☐	
15. Is it clear what analyses were requested?	Yes ☑	No ☐	
16. Were all holding times able to be met? (If no, notify customer for authorization.)	Yes ☑	No ☐	

# of preserved bottles checked for pH: _____ (<2 or >12 unless noted)

Adjusted? _____

Checked by: _____

Special Handling (if applicable)

17. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

Person Notified: _____ Date: _____

By Whom: _____ Via: ☐ eMail ☐ Phone ☐ Fax ☐ In Person

Regarding: _____

Client Instructions: _____

18. Additional remarks:

19. **Cooler Information**

Cooler No	Temp °C	Condition	Seal Intact	Seal No	Seal Date	Signed By
1	3.8	Good	Not Present			

Chain-of-Custody Record

Client: Kleinfelder

Mailing Address: 9019 Washington St NE Bldg A
Albuquerque, NM 87113

Phone #: (505) 344-7373

email or Fax#: BBocksch@kleinfelder.com

QA/QC Package:
☑ Standard ☐ Level 4 (Full Validation)

Accreditation:
☐ NELAP ☐ Other_____
☐ EDD (Type) _____

Turn-Around Time:
☑ Standard ☐ Rush_____

Project Name: North Leg Pit

Project #: 122078-2

Project Manager: Bernie Bocksch

Sampler: Courtney Vallejo

On Ice: ☑ Yes ☐ No

Sample Temperature: 3.8

HALL ENVIRONMENTAL ANALYSIS LABORATORY
www.hallenvironmental.com
4901 Hawkins NE - Albuquerque, NM 87109
Tel. 505-345-3975 Fax 505-345-4107

Date	Time	Matrix	Sample Request ID	Container Type and #	Preservative Type	HEAL No. 1201161	BTEX + MTBE + TMB's (8021)	BTEX + MTBE + TPH (Gas only)	TPH Method 8015B (Gas/Diesel)	TPH (Method 418.1)	EDB (Method 504.1)	8310 (PNA or PAH)	RCRA 8 Metals	Anions ($F, Cl, NO_3, NO_2, PO_4, SO_4$)	8081 Pesticides / 8082 PCB's	8260B (VOA)	8270 (Semi-VOA)	Reactivity, corrosivity, ignitability			Air Bubbles (Y or N)
1/18/12	0948	soil	B-1, 40' bgs	4oz glass	ice	-1			✓					✓							
1/18/12	1006	soil	B-1, 50' bgs	4oz glass	ice	-2			✓					✓							
1/18/12	1027	soil	B-1, 60' bgs	4oz glass	ice	-3			✓					✓							
1/18/12	1106	soil	B-1, 75' bgs	4oz glass	ice	-4			✓					✓							
1/18/12	1450	soil	B-2, 40' bgs	4oz glass	ice	-5			✓					✓							
1/18/12	1555	soil	B-2, 70' bgs	4oz glass	ice	-6			✓					✓							
1/19/12	1000	soil	B-3, 20' bgs	4oz glass	ice	-7			✓					✓							
1/19/12	1140	soil	B-3, 75' bgs	4oz glass	ice	-8			✓					✓							
1/18/12	1330	soil	Pit sample	8oz glass	ice	-9			✓				✓			✓		✓			

Analysis Request

Date:	Time:	Relinquished by:	Received by:	Date	Time
1/23/12	1110	C. Vallejo		1/23/12	1110
Date:	Time:	Relinquished by:	Received by:	Date	Time

Remarks: Chlorides by method 300.0.
Reactivity, corrosivity & ignitability by methods SM 4500 and 1010.

If necessary, samples submitted to Hall Environmental may be subcontracted to other accredited laboratories. This serves as notice of this possibility. Any sub-contracted data will be clearly notated on the analytical report.

ATTACHMENT D

KLEINFELDER
Bright People. Right Solutions.

PROJECT NORTH LEA PIT REMEDIATION PROJECT NO. _____

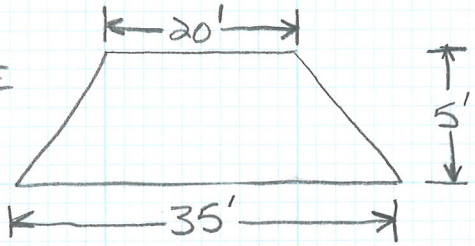
SUBJECT VOLUME ESTIMATES BY B. BOCKISCH DATE 3/7/12

ATTACHMENT 4 REVIEWED BY _____ DATE _____

BERM VOLUME ESTIMATE:

CROSS SECTION POLYGON:

TOP WIDTH AND HEIGHT ESTIMATED DURING SITE VISIT, BASE WIDTH ESTIMATED FROM GOOGLE EARTH.



$(20+35)/2 = 27.5\ Ft \cdot 5FT = 137.5\ FT^2$

LENGTH OF BERM (ESTIMATED FROM GOOGLE EARTH): ≈ 470 FT

TOTAL VOLUME $= 137.5\ FT^2 \cdot 470\ Ft = 64{,}625\ Ft^3 \div 27\ Ft^3/YD^3 = 2393\ YD^3$

$\approx 2400\ YD^3$

PIT DEPTH ESTIMATE:

PIT SIZE $= 80\ Ft \times 80\ Ft = 6400\ Ft^2$

$$\text{DEPTH} = \frac{64{,}625\ Ft^3}{6{,}400\ Ft^2} = 10.09' \approx 10\ Ft$$