



Linn Energy JL Keel B #30

REMEDIATION WORK PLAN

API No. 30-015-28098

Release Date: 03/26/2014

Unit Letter O, Section 6 , Township 17 South, Range 31E East

RP#2RP-2234

June 6, 2014

Prepared by:

Environmental Department
Diversified Field Service, Inc.

3412 N. Dal Paso
Hobbs, NM 88240
Phone: (575)964-8394
Fax: (575)393-8396

Mike Bratcher
Environmental Specialist
NM Oil Conservation District – Division 2
811 S. First St.
Artesia, NM 88210

RE: Linn Energy JL Keel B #30 – Remediation Work Plan
UL/O, Section 06, T17S, R31E
API No. 30-015-21460

Mr. Bratcher,

Linn Energy (Linn) has retained Diversified Field Service, Inc. (DFSI) to address environmental issues for the site detailed herein.

The site is located south west of Maljamar NM, in Eddy County. The leak site resulted from a hydrocarbon and produced water leak. The source of the leak was due to corrosion on a nipple located on the wellhead. A C-141 was submitted to the NMOCD on March 27, 2014 (2RP-2234).

Site Assessment and Delineation

On April 11, 2014 DFSI personnel obtained surface and delineation samples of the leak area, which included SP1-SP12. All but SP7 cleaned up below the required levels, SP1-SP6 and SP8-12 were sampled to 16' and found that contamination was still present. Then on 04/21/14 SP13-SP16 were sampled whereby indicating that contamination was present and we received augur refusal. At this time John Scarborough Drilling, Inc., was contracted to drill four bore holes at the JL Keel B #30 site. On May 23, 2014 the boreholes were drilled and was successful with finding the bottom of contamination.

Field samples were taken on sixteen sample points, along with four boreholes, each sample was tested for chlorides levels as well as TPH. The TPH samples were performed using a Mini Rae Photoionization Detector (PID). All clean field samples found under the BLM/NMOCD standards, were taken to Cardinal Lab of Hobbs to obtain confirmation samples. And the results confirmed that bottom samples of each sample point were as follows:

SP7: 9'bgs – 608 mg/kg chlorides, <30 mg/kg BTEX and <10 mg/kg GRO/DRO
SB1: 35'bgs – 352 mg/kg chlorides, <30 mg/kg BTEX and <10 mg/kg GRO/DRO
SB2: 35'bgs – 96 mg/kg chlorides, <30 mg/kg BTEX and <10 mg/kg GRO/DRO
SB3: 50'bgs – 368 mg/kg chlorides, <30 mg/kg BTEX and <10 mg/kg GRO/DRO
SB4: 60'bgs – 160 mg/kg chlorides, <30 mg/kg BTEX and <10 mg/kg GRO/DRO

DFSI has conducted a groundwater study of the area and has determined that according to the New Mexico Office of the State Engineer the average depth to groundwater for this area is 236 foot below ground surface. Therefore, no eminent danger of groundwater impact or threat to life is anticipated.

Conclusion

After careful review DFSI on behalf of Linn Energy would like to propose the following:

Option 1

Excavate the entire 11,905 sq. ft. area of compacted soil to 4'bgs, haul the contaminated soil to an approved disposal site, line with a 20 mil liner and backfill with fresh imported topsoil. Then reseed the entire area with a native vegetation mixture as per the BLM's guidelines for returning the site to its natural state.

Option 2

Excavate the entire 11,905 sq. ft. area of compacted soil to 4'bgs. Excavate an 85' x 85' x 8' deep hole, line the bottom and sides with a 20 mil liner, bury the contaminated soil, install a cap at 4' by using a 20 mil liner and backfill with the clean excavated soil and reseed area. The contaminated area will also be lined at 4' with a 20mil liner and the remainder of the soil that was excavated for the deep bury area will be used as well as pushing in the native sand for surface reseeded procedures to return this site to its natural state. Some imported topsoil maybe needed to finalize this procedure to ensure proper growth. This option illuminates having to haul the contaminated soil to an approved facility and the disposal costs.

Side wall samples will be taking during the excavation procedure to ensure that all contaminants have been remediated. These samples will also be taken to an approved lab for confirmation before backfilling will take place.

Following the approval of one of the above plans, either Option 1 or Option 2 above and after the remediation has taken place, DFSI will submit all proper closure documentation to the NMOCD and BLM in accordance to the State and Federal Guidelines set forth.

Please feel free to contact me with any questions concerning this remediation plan request.

Sincerely,

Natalie Gladden
Environmental Consultant
Diversified Field Service, Inc.
315 S. Leech
Hobbs, NM 88240
Office: (575)964-8394
Mobile: (575)602-1786
Fax: (575)964-8396
Email: ngladden@diversifiedfsi.com

cc Jennifer Van Curen
NM Bureau of Land Management

Attachments: Initial Form C-141
Linn Spill/Release Report
Site/Sample Map
Sample Data
Lab Analytical Data
Drilling Bore Logs

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources
Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

RECEIVED

MAR 27 2014

Form C-141
Revised October 10, 2003

Appropriate District Office in
conformance with 19.15.29 NMAC

NMOCD ARTESIA

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company: Linn Operating	269324	Contact: Brian Wall
Address: 2130 W. Bender Hobbs, NM 88240		Telephone No.: 575-738-1739
Facility Name: Keel J L B #30		Facility Type: Injection
Surface Owner: Federal	Mineral Owner:	API No.: 30-015-21460

LOCATION OF RELEASE

Unit Letter O	Section 06	Township 17S	Range 31E	Feet from the 430	North/South Line South	Feet from the 2250	East/West Line East	County Eddy
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Latitude: 32.85744 Longitude: -103.90692

nHMP1409029298

NATURE OF RELEASE

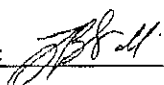

Type of Release: Produced Water	Volume of Release: 88 bbls	Volume Recovered: 60 bbls
Source of Release: Steel Pipeline	Date and Hour of Occurrence: 03/26/2014	Date and Hour of Discovery: 03/26/2014 10:30am
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? Mike Burton-BLM Mike Bratcher- NM OCD	
By Whom? Brian Wall	Date and Hour 03/27/2014 0650	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*:

Describe Cause of Problem and Remedial Action Taken.*: Drove up to keel west water station started getting gauges on control panel noticed that injection pressure was at 1875 # when usually runs 1940-1950# turn pump off went up to header and spotted line #3 dropping down quick s/l master valve turn pump back on pressure went back to normal on header and control panel went out to inj wells to look for leak found leak North side of Keel A #23 location 150'.

Describe Area Affected and Cleanup Action Taken.*: Leak ran west average 10' wide X 450' long end of leak puddle 40' X 50' called vac truck and recover 60 BBLS of P/W from ground hauled to CRI dug out leak found a steel plug at the end of tee with a hole in it, had rain showers early this morning floor was wet was able to recover fluid. Site will be delineated by Diversified and the a CAP will be turned in. I will have estimate and PLA at that time.

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature: 	OIL CONSERVATION DIVISION	
Printed Name: Brian Wall	Approved by District Supervisor: 	
Title: Construction Foreman II	Approval Date: 3-31-14	Expiration Date: NA
E-mail Address: bwall@linenergy.com	Conditions of Approval: Remediation per OCD Rule 8.	Attached <input type="checkbox"/>
Date: 03/27/2014	Phone: 806-367-0645	

Guidelines. SUBMIT REMEDIATION
PROPOSAL NO LATER THAN:

5-1-14

2RP-2234

Spill / Release Report



Incident Date: 3/26/2014

Incident Time: 10:30 AM

Location Information

EH&S Rep: Only By An EH&S Rep.
Date: _____

Completion
or Unit
Lease Code:

Division: <u>Houston Corporate</u>	State: <u>New Mexico</u>
Department: <u>Production</u>	Lease Name & No: <u>Keel B #30</u>
Area: <u>Grayburg</u>	Legal: <u>SEC. 6, T17S, R31E LC-029435-B</u>
Rig Name: _____	County: <u>EDDY</u>

Type and Location

Spill/Release Type: <u>Land</u>	Inside Dike Area: <u>No</u>
Latitude: <u>0 ' " N</u>	Longitude: <u>0 ' " W</u>
Facility: <u>Water Flood</u>	Were There Any Injuries? <u>No</u>
(If yes, must also fill out Injury Report)	

Nearest City: <u>Loco Hills</u>
Directions to Site: <u>From loco hills go E to to CR 221 go N for 1.4 miles go N/E 0.5 go E 0.1 than N 0.5 to lcation Keel A # 23</u>
Source Type: _____
Body of Water Impacted: <u>No</u> Name Body Of Water: _____

Description of Incident and Cause Analysis

Drove up to keel west water station started getting gauges on control panel noticed that injection pressure was at 1875 # when usually runs 1940-1950# turn pump off went up to header and spotted line #3 dropping down quick s/l master valve turn pump back on pressure went back to normal on header and control panel went out to inj wells to look for leak found leak North side of Keel A #23 location 150'. leak ran west average 10' wide X 450' long end of leak puddle 40' X 50' called vac truck and recover 60 BBLs of P/W from ground hauled to CRI dug out leak found a steel plug at the end of tee with a hole in it, had rain showers early this morning floor was wet was able to recover fluid

Company Name: if caused by contractor - contractor information	
Address: _____	City, State, Zip: _____
Phone: _____	Contact Person: _____

Personnel Information

Lease Operator: <u>Mario Hernandez</u>	Phone: <u>575-602-8598</u>
Remarks: _____	
Supervisor: <u>Joe Hernandez</u>	Phone: <u>575-942-9492</u>
Remarks: _____	

Containment/Clean Up

Cleaned Date: _____	Time: _____	By: LaminaTrucking
Containment/Cleanup Description: picked up fluid off ground, Lamina trucking hauled to CR		
Waste Handling Description: Site will be delineated by Diversified and the a CAP will be turned in. I will have estimate and PLA at that time.		
Containment/Cleanup Costs: <u>\$80,000.00</u> Oil Loss Cost: <u>\$0.00</u>		

Weather

Wind Direction: <u>S/W</u>	Wind Speed: <u>15</u>	Wind Speed UOM: _____
Temperature: <u>75</u>	<u>Fahrenheit</u>	Temperature UOM: _____
Weather Conditions: <u>Rain</u>		

Substance

Number Substances Were Released? <u>1</u>			
SUBSTANCE 1			
Substance Released: <u>Produced Water</u>	Volume Released: <u>88</u>	Volume Recovered: <u>60</u>	
Volume Type: <u>Barrels</u>		Amount Lost: <u>28</u>	
SUBSTANCE 2			
Substance Released: <u>Select One</u>	Volume Released: <u>0</u>	Volume Recovered: <u>0</u>	
Volume Type: <u>Select One</u>		Amount Lost: <u>0</u>	
SUBSTANCE 3			
Substance Released: <u>Select One</u>	Volume Released: <u>0</u>	Volume Recovered: <u>0</u>	
Volume Type: <u>Select One</u>		Amount Lost: <u>0</u>	

Slick Present: <u>No</u>	Was a CERCLA Hazardous substance Released? <u>No</u>
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External Agency Name	Reported to	Reported By	Verbal / Written	Date / Time
1 BLM	Mike Burton	Brian Wall	Verbal/Written	3-27-14 0650
2 OCD	Mike Bratcher	Brian Wall	Verbal/Written	3-27-14 0700
3				

Equipment Type: <u>Pipeline-Steel</u>	Specific Cause: <u>Normal Degradation</u>
If not listed enter on line below:	If not listed enter on line below:
<u>4" bull plug at end of fiber glass injection line</u>	

For EH&S Department Only	
Contributing Factors	
Contributing Factors: <u>SELECT ONE</u>	Weather Conditions: <u>SELECT ONE</u>

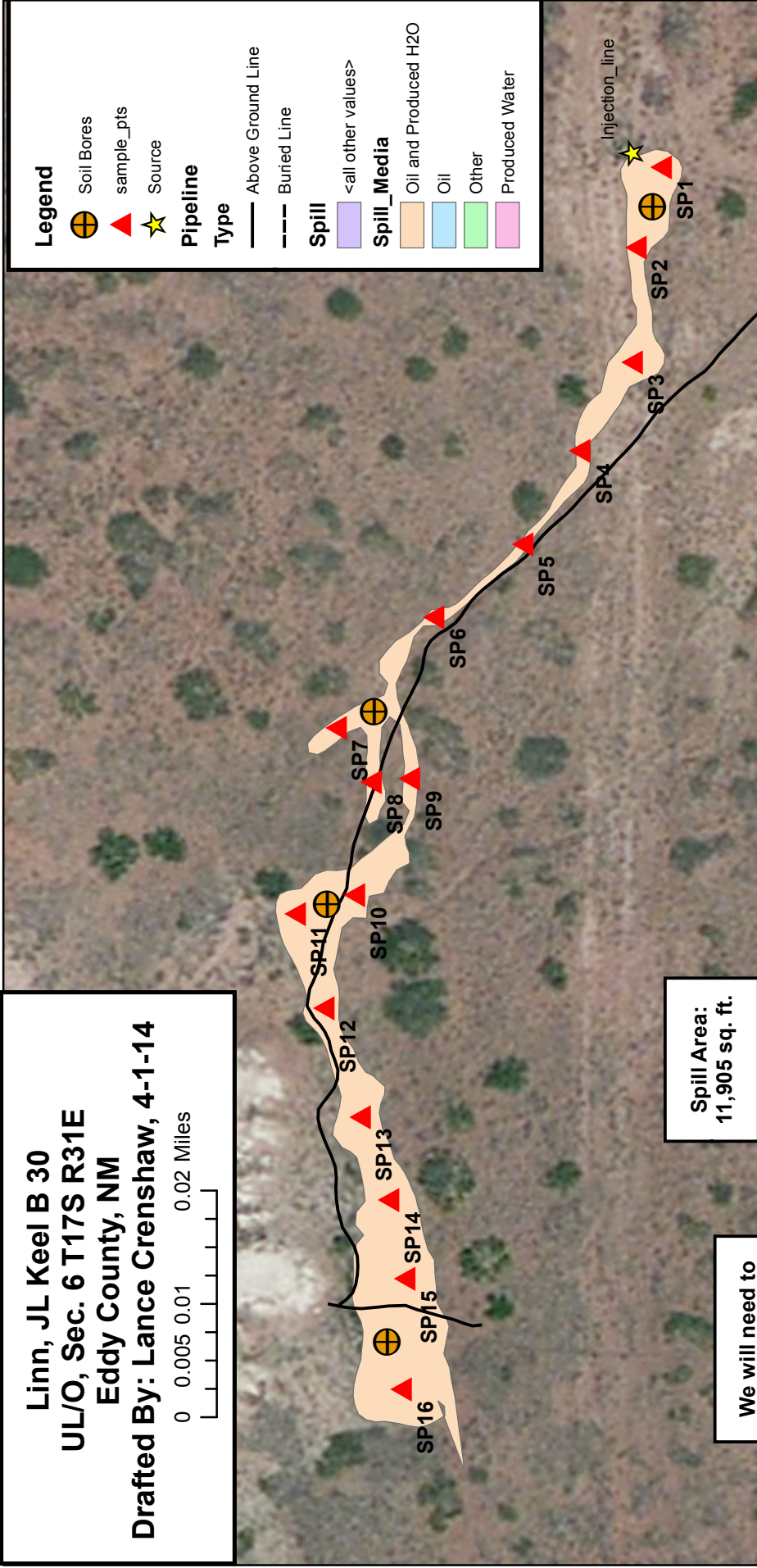
Site Diagram

Linn, JL Keel B 30
UL/O, Sec. 6 T17S R31E
Eddy County, NM
Drafted By: Lance Crenshaw, 4-1-14

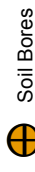
0 0.005 0.01 0.02 Miles

Spill Area:
11,905 sq. ft.

We will need to
prepare a road
for the drilling rig
for each of the
four soil bores.



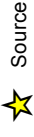
Legend



Soil Bores



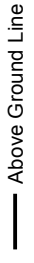
sample_pts



Source

Pipeline

Type



Above Ground Line



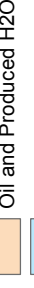
Buried Line

Spill



<all other values>

Spill_Media



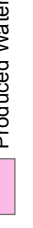
Oil and Produced H2O



Oil



Other



Produced Water

Lance Crenshaw
GIS Technician

Soil Remediation and Ground Water Remediation
Environmental Assessments
Regulatory Compliance



DFS

Environmental

Services

Office: 575-964-8394
Fax: 575-964-8396

Cell: 575-441-2359
Email: lcrenshaw@diversifiedfsi.com

Source: Esri, DigitalGlobe, GeoEye, Earthstar (United States), Swisstopo, and the GIS User

Diversified Environmental Services

Company Name: Linn Energy
Location Name: JL Keel B #30

SP Date: 4/11/2014 4/21/2014 5/23/2014
Rel Date: 3/26/2014

SP1	CHL	TPH	SP2	CHL	TPH	SP3	CHL	TPH	SP4	CHL	TPH	SP5	CHL	TPH
Surface	9022	3.6	Surface	12221	0.5	Surface	12471	5.7	Surface	14045	0.4	Surface	30790	9.8
1'	7022	3.7	1'	7022	0.6	1'	4373	2.6	1'	6098	0.4	1'	2499	2.9
2'	7772	3.8	2'	7122	0.6	2'	6472	3.8	2'	5523	0.2	2'	5473	2.4
3'	4223	0.9	3'	10021	0.4	3'	6472	3.2	3'	4448	0.3	3'	5448	0.9
4'	3873	0.7	4'	4862	0.5	4'	4473	0.4	4'	3199	0.2	4'	4123	0.9
5'	6472	0.7	5'	4273	0.3	5'	6048	0.3	5'	3448	0.2	5'	4523	0.7
6'	6223	0.9	7'	4248	0.2	7'	5698	0.2	7'	4973	0.4	7'	4423	0.3
7'	6448	0.6	9'	4573	0.3	9'	3948	0.3	9'	4973	0.3	9'	5048	0.3
8'	7472	0.5	11'	4623	0.2	11'	3698	0.2	11'	4373	0.2	11'	4273	0.3
9'	7947	0.4	13'	4973	0.2	13'	3723	0.2	13'	3523	0.4	13'	4723	0.1
11'	4973	0.2	15'	4048	0.2	15'	3673	0.1	15'	3473	0.3	15'	4598	0.2
13'	3873	0.3	16'	4048	0.1	16'	3698	0.2	16'	3498	0.2	16'	4773	0.3
15'	3773	0.2												
16'	3448	0.2												

	Lab Confirmation Sample
	Field Sampling
	Needs Delineation and confirmation samples

Diversified Environmental Services

[illegible]

	Lab Confirmation Sample
	Field Sampling
	Needs Delineation and confirmation samples

Diversified Environmental Services

[illegible]

	Lab Confirmation Sample
	Field Sampling
	Needs Delineation and confirmation samples

Diversified Environmental Services

[illegible]

	Lab Confirmation Sample
	Field Sampling
	Needs Delineation and confirmation samples

April 28, 2014

BRIAN WALL

LINN OPERATING-HOBBS

2130 W. BENDER

HOBBS, NM 88240

RE: J. L. KEEL B #30

Enclosed are the results of analyses for samples received by the laboratory on 04/22/14 15:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

Cardinal Laboratories is accredited through the State of Colorado Department of Public Health and Environment for:

Method EPA 552.2	Haloacetic Acids (HAA-5)
Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

LINN OPERATING-HOBBS
 BRIAN WALL
 2130 W. BENDER
 HOBBS NM, 88240
 Fax To: (575) 738-1740

Received:	04/22/2014	Sampling Date:	04/22/2014
Reported:	04/28/2014	Sampling Type:	Soil
Project Name:	J. L. KEEL B #30	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 7 @ 9' (H401210-01)

BTX 8021B			mg/kg		Analyzed By: CK				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	04/25/2014	ND	1.89	94.5	2.00	8.49	
Toluene*	<0.050	0.050	04/25/2014	ND	1.88	94.2	2.00	8.41	
Ethylbenzene*	<0.050	0.050	04/25/2014	ND	1.88	94.0	2.00	8.50	
Total Xylenes*	<0.150	0.150	04/25/2014	ND	5.61	93.4	6.00	8.54	
Total BTX	<0.300	0.300	04/25/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 101 % 89.4-126

Chloride, SM4500Cl-B			mg/kg		Analyzed By: AP				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	608	16.0	04/24/2014	ND	400	100	400	0.00	

TPH 8015M			mg/kg		Analyzed By: CK				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	04/24/2014	ND	193	96.7	200	6.41	
DRO >C10-C28	<10.0	10.0	04/24/2014	ND	215	107	200	1.79	

Surrogate: 1-Chlorooctane 104 % 65.2-140

Surrogate: 1-Chlorooctadecane 97.4 % 63.6-154

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

Cardinal Laboratories

*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and client's exclusive remedy for any claim arising, whether based in contract or tort, shall be limited to the amount paid by client for analyses. All claims, including those for negligence and any other cause whatsoever shall be deemed waived unless made in writing and received by Cardinal within thirty (30) days after completion of the applicable service. In no event shall Cardinal be liable for incidental or consequential damages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its subsidiaries, affiliates or successors arising out of or related to the performance of the services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise. Results relate only to the samples identified above. This report shall not be reproduced except in full with written approval of Cardinal Laboratories.



Celey D. Keene, Lab Director/Quality Manager



ANALYSIS REQUEST

+ Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326



PHONE (575) 393-2326 ° 101 E. MARLAND ° HOBBS, NM 88240

May 30, 2014

BRIAN WALL

LINN OPERATING-HOBBS

2130 W. BENDER

HOBBS, NM 88240

RE: J. L. KEEL B #30

Enclosed are the results of analyses for samples received by the laboratory on 05/23/14 14:55.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-13-5. Accreditation applies to drinking water, non-potable water and solid and chemical materials. All accredited analytes are denoted by an asterisk (*). For a complete list of accredited analytes and matrices visit the TCEQ website at www.tceq.texas.gov/field/qa/lab_accred_certif.html.

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Method EPA 524.2	Total Trihalomethanes (TTHM)
Method EPA 524.4	Regulated VOCs (V1, V2, V3)

Accreditation applies to public drinking water matrices.

This report meets NELAP requirements and is made up of a cover page, analytical results, and a copy of the original chain-of-custody. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

LINN OPERATING-HOBBS
 BRIAN WALL
 2130 W. BENDER
 HOBBS NM, 88240
 Fax To: (575) 738-1740

Received:	05/23/2014	Sampling Date:	05/23/2014
Reported:	05/30/2014	Sampling Type:	Soil
Project Name:	J. L. KEEL B #30	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 1 @ 35' (H401591-01)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	05/29/2014	ND	2.07	103	2.00	3.77	
Toluene*	<0.050	0.050	05/29/2014	ND	2.05	102	2.00	3.01	
Ethylbenzene*	<0.050	0.050	05/29/2014	ND	1.96	98.2	2.00	3.78	
Total Xylenes*	<0.150	0.150	05/29/2014	ND	6.15	102	6.00	3.77	
Total BTX	<0.300	0.300	05/29/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 107 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	352	16.0	05/29/2014	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	05/27/2014	ND	212	106	200	16.2	
DRO >C10-C28	<10.0	10.0	05/27/2014	ND	228	114	200	20.7	

Surrogate: 1-Chlorooctane 112 % 65.2-140

Surrogate: 1-Chlorooctadecane 111 % 63.6-154

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

LINN OPERATING-HOBBS
 BRIAN WALL
 2130 W. BENDER
 HOBBS NM, 88240
 Fax To: (575) 738-1740

Received:	05/23/2014	Sampling Date:	05/23/2014
Reported:	05/30/2014	Sampling Type:	Soil
Project Name:	J. L. KEEL B #30	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 2 @ 35' (H401591-02)

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	05/29/2014	ND	2.07	103	2.00	3.77	
Toluene*	<0.050	0.050	05/29/2014	ND	2.05	102	2.00	3.01	
Ethylbenzene*	<0.050	0.050	05/29/2014	ND	1.96	98.2	2.00	3.78	
Total Xylenes*	<0.150	0.150	05/29/2014	ND	6.15	102	6.00	3.77	
Total BTEx	<0.300	0.300	05/29/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 106 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	96.0	16.0	05/29/2014	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	05/27/2014	ND	212	106	200	16.2	
DRO >C10-C28	<10.0	10.0	05/27/2014	ND	228	114	200	20.7	

Surrogate: 1-Chlorooctane 111 % 65.2-140

Surrogate: 1-Chlorooctadecane 111 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

LINN OPERATING-HOBBS
 BRIAN WALL
 2130 W. BENDER
 HOBBS NM, 88240
 Fax To: (575) 738-1740

Received:	05/23/2014	Sampling Date:	05/23/2014
Reported:	05/30/2014	Sampling Type:	Soil
Project Name:	J. L. KEEL B #30	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SB 3 @ 50' (H401591-03)

BTEx 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	05/29/2014	ND	2.07	103	2.00	3.77	
Toluene*	<0.050	0.050	05/29/2014	ND	2.05	102	2.00	3.01	
Ethylbenzene*	<0.050	0.050	05/29/2014	ND	1.96	98.2	2.00	3.78	
Total Xylenes*	<0.150	0.150	05/29/2014	ND	6.15	102	6.00	3.77	
Total BTEx	<0.300	0.300	05/29/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 107 % 89.4-126

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	368	16.0	05/29/2014	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	05/28/2014	ND	212	106	200	16.2	
DRO >C10-C28	<10.0	10.0	05/28/2014	ND	228	114	200	20.7	

Surrogate: 1-Chlorooctane 119 % 65.2-140

Surrogate: 1-Chlorooctadecane 117 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

Analytical Results For:

 LINN OPERATING-HOBBS
 BRIAN WALL
 2130 W. BENDER
 HOBBS NM, 88240
 Fax To: (575) 738-1740

 Received: 05/23/2014
 Reported: 05/30/2014
 Project Name: J. L. KEEL B #30
 Project Number: NONE GIVEN
 Project Location: NOT GIVEN

 Sampling Date: 05/22/2014
 Sampling Type: Soil
 Sampling Condition: Cool & Intact
 Sample Received By: Jodi Henson

Sample ID: SB 4 @ 60' (H401591-04)

BTX 8021B		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Benzene*	<0.050	0.050	05/29/2014	ND	2.30	115	2.00	1.75	
Toluene*	<0.050	0.050	05/29/2014	ND	2.33	116	2.00	2.64	
Ethylbenzene*	<0.050	0.050	05/29/2014	ND	2.23	111	2.00	2.07	
Total Xylenes*	<0.150	0.150	05/29/2014	ND	6.96	116	6.00	2.23	
Total BTX	<0.300	0.300	05/29/2014	ND					

Surrogate: 4-Bromofluorobenzene (PID) 106 % 89.4-126

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	160	16.0	05/29/2014	ND	432	108	400	3.77	

TPH 8015M		mg/kg		Analyzed By: MS					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
GRO C6-C10	<10.0	10.0	05/28/2014	ND	212	106	200	16.2	
DRO >C10-C28	<10.0	10.0	05/28/2014	ND	228	114	200	20.7	

Surrogate: 1-Chlorooctane 114 % 65.2-140

Surrogate: 1-Chlorooctadecane 108 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

Notes and Definitions

ND	Analyte NOT DETECTED at or above the reporting limit
RPD	Relative Percent Difference
**	Samples not received at proper temperature of 6°C or below.
***	Insufficient time to reach temperature.
-	Chloride by SM4500Cl-B does not require samples be received at or below 6°C Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Keene, Lab Director/Quality Manager



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BILL TO

ANALYSIS REQUEST

Lab I.D.		Sample I.D.		(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						PRESERV.	SAMPLING	DATE	TIME	CL	TMT	MEX	
						GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :	ACID/BASE:	ICE / COOL	OTHER :					
H4D1591								X	X				X		5/23/14	11:30	X	X	X
1	sb 10 @ 35'			g	1								X		5/23/14	12:00	X	X	X
2	sb 20 @ 35'			g	1			t					X		5/23/14	10:40	X	X	X
3	sb 30 @ 50'			g	1			t					X		5/23/14	9:00	X	X	X
4	sb 40 @ 60'			g	1			X					X		5/23/14				

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Relinquished By:

Date: 2/9/14

Received By:

11

Reinquished By:

Date:

Received By:

Delivered By: (Circle One)
Sampler - UPS - Bus - Other:

Sample Condition	
Cool	Intact
<input checked="" type="checkbox"/> Yes	<input checked="" type="checkbox"/> Yes
<input type="checkbox"/> No	<input type="checkbox"/> No

CHECKED BY:
(Initials)

Persons or otherwise.		
Phone Result:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Add'l Phone #:
Fax Result:	<input type="checkbox"/> Yes <input type="checkbox"/> No	Add'l Fax #:
REMARKS:		

E-mail Results To:

Ngladden@diversifiedfsi.com

Rpons@diversifiedfsi.com

Tjennings@diversifiedfsi.com

JOHN SCARBOROUGH DRILLING, INC.

2001 S. Hwy 87
P.O. Box 305
Lamesa, Texas 79331

Linn Energy:
5-23-2014

J.L. Keel B # 30

SB1:

0-11	Top soil
11-22	Caliche
22-35	Sand & gravel
35-60	Red clay

SB2:

0-12	Top soil
12-25	Caliche
25-40	Sand & gravel
40-55	Red Clay

SB3:

0-10	Top soil
10-20	Caliche
20-30	Sand & gravel
30-35	Red clay

SB4:

0-11	Top soil
11-22	Caliche
22-29	Sand & gravel
29-35	Red clay