Bratcher, Mike, EMNRD

From: Amy Ruth <aruth@diversifiedfsi.com>
Sent: Tuesday, November 05, 2013 10:35 AM
To: Bratcher, Mike, EMNRD
Cc: Wall, Fred; Michael Patterson
Subject: 2RP-1873 Linn Energy Turner A #45
Attachments: Linn Energy Turner A #45 - Site Diagram w Sample Data.pdf; Linn Energy Turner A #45 Photo Page.pdf; H302385 LINN.pdf; H302539 LINN.pdf; Linn Energy Turner A #45 Groundwater Search TR.pdf

Hi Mike,

I had previously submitted a work plan for this site with an initial photo of the leak. We have completed delineating the leak area, and I have enclosed a site diagram, photos, 2 lab reports, and our groundwater search for your reference. I have provided some detail below and would like to propose an excavation to address this leak and backfill with compacted caliche if that is acceptable to you via email.

The site was excavated to 1' bgs to keep the source from percolating. The diagram shows an older view of the caliche pad that was available from Google Earth. The site looks very different now. Apache Corporation has expanded the caliche pad and installed a well immediately south of the Turner A #45, and in fact, shares the new caliche pad with that well. This is more apparent in the included photos. The leak occurred on top of and well within the boundaries of this new caliche pad.

For SP2 and SP4, the delineation field data shows that the numbers are reasonably low at 2'. Chloride at SP1 remains near 1000 mg/kg at 3' though it does show a downward trend with depth. SP3 fluctuates some before showing the same downward trend to complete at 8' bgs, though the field data does not exceed 1049 mg/kg within the lower profile. Our groundwater study for the surrounding township/ranges averages 236 ft for qualifying wells. The NMOCD groundwater trend map extrapolates depth to groundwater at 325 to 350 ft bgs.

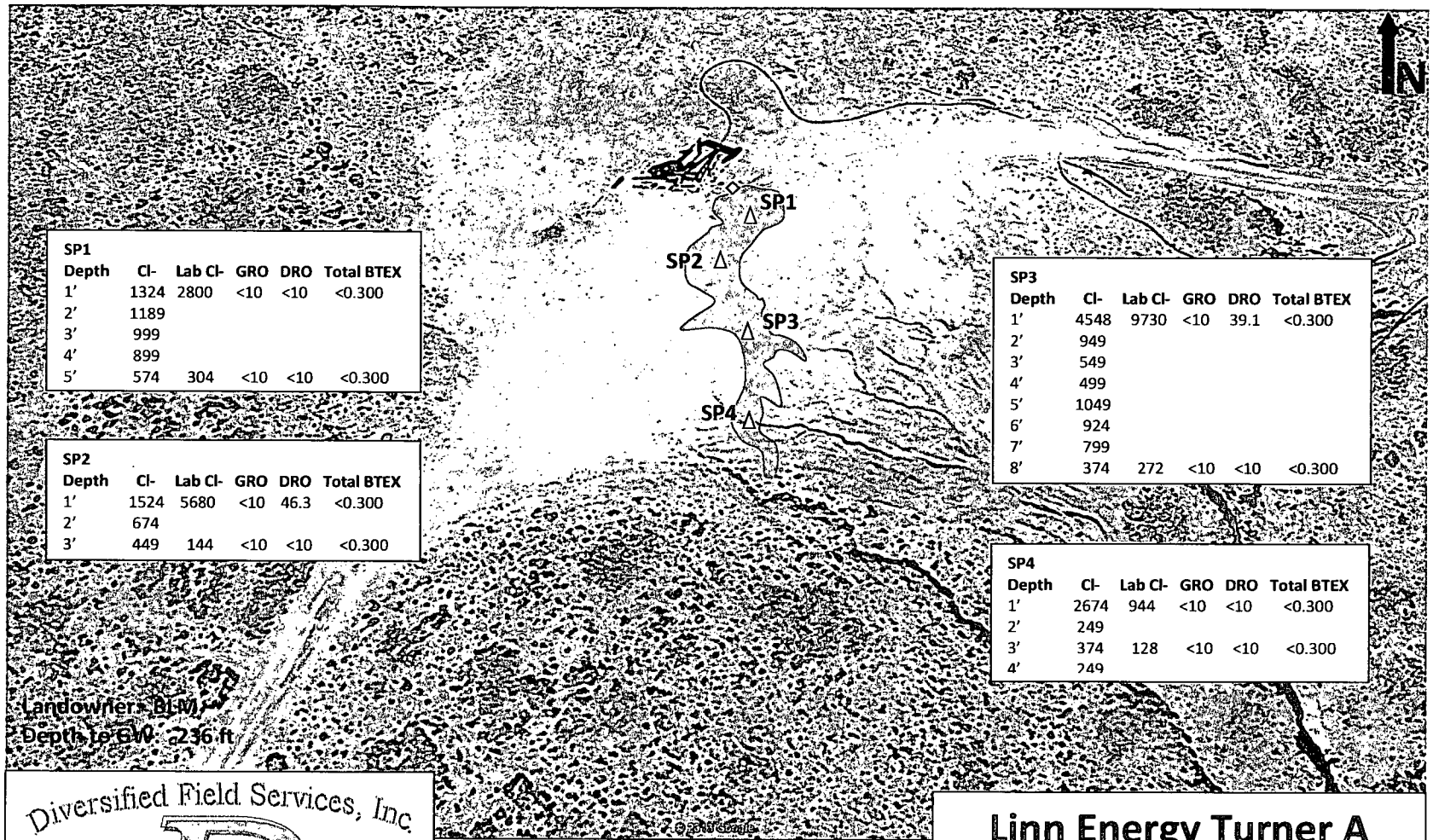
Due to depth of groundwater and the depth of impact at the site, I would like to propose a 3' excavation in the vicinity of SP1 and a 2' excavation across the remaining leak area. Please call me with any questions and suggestions at your convenience.

Thank you!

Amy C. Ruth
Environmental Director
Diversified Field Services, Inc.
3412 N. Dal Paso
Hobbs, NM 88240
Office: (575)964-8394
Mobile: (575)390-5454
Fax: (575)964-8396

"Nothing will work unless you do." -Maya Angelou

Site Diagram with Sample Data



SP1

Depth	Cl-	Lab Cl-	GRO	DRO	Total BTEX
1'	1324	2800	<10	<10	<0.300
2'	1189				
3'	999				
4'	899				
5'	574	304	<10	<10	<0.300

SP2

Depth	Cl-	Lab Cl-	GRO	DRO	Total BTEX
1'	1524	5680	<10	46.3	<0.300
2'	674				
3'	449	144	<10	<10	<0.300

SP3

Depth	Cl-	Lab Cl-	GRO	DRO	Total BTEX
1'	4548	9730	<10	39.1	<0.300
2'	949				
3'	549				
4'	499				
5'	1049				
6'	924				
7'	799				
8'	374	272	<10	<10	<0.300

SP4

Depth	Cl-	Lab Cl-	GRO	DRO	Total BTEX
1'	2674	944	<10	<10	<0.300
2'	249				
3'	374	128	<10	<10	<0.300
4'	249				

Diversified Field Services, Inc

C.C. & Co, LLC

J & M Welding and Fabrication, Inc.

Diversified Construction

Legend

- Stained Area (total 2,500 ft²)
- ◇ Leak Source
- Δ Sample Point

Linn Energy Turner A #045

UL/C, Sec 19, T17S R31E

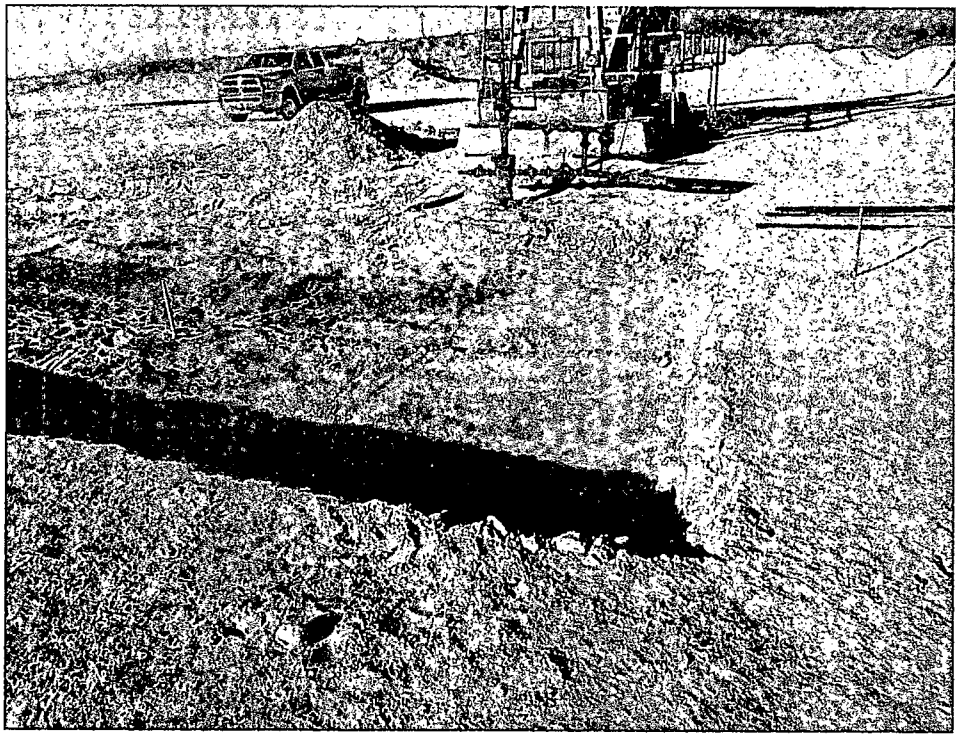
Eddy County, NM

Drafted By: A.C. Ruth, 11/4/13

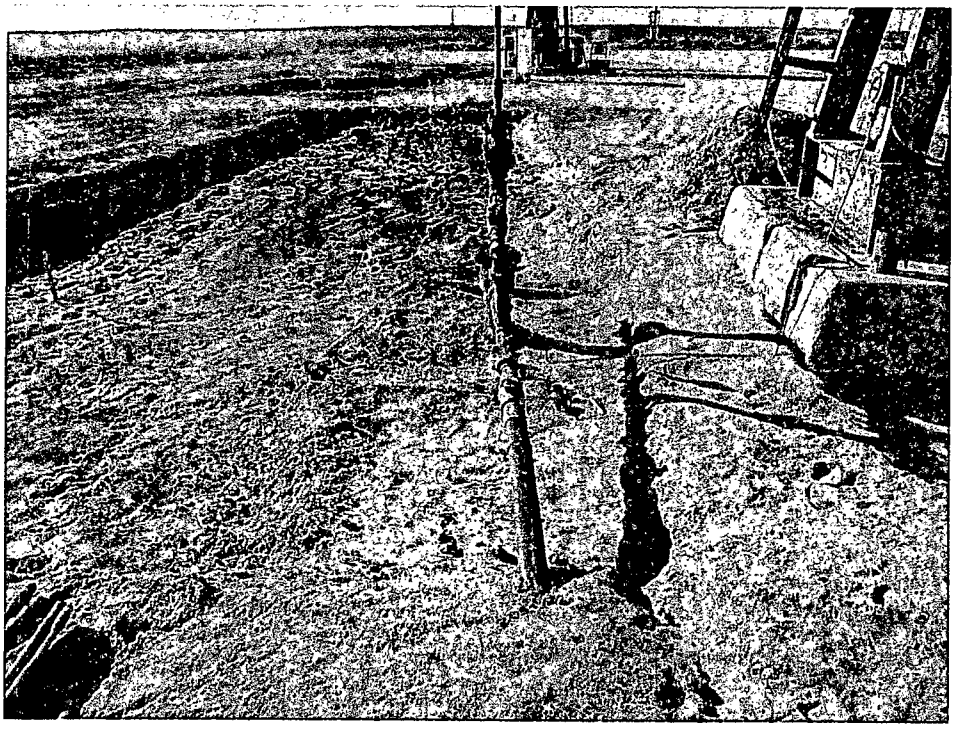
Not to Scale

Linn Energy Turner A #45

Unit Letter C, Section 19, T17S R31E



Excavated to 1 ft., facing west 10/26/13



Excavated to 1 ft., facing south 10/26/13

CARDINAL Laboratories

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

October 03, 2013

BRIAN WALL

LINN ENERGY

RR1, BOX 24 B

KINGFISHER, OK 73750

RE: TURNER A #45

Enclosed are the results of analyses for samples received by the laboratory on 10/01/13 16:25.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. 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 accreditated 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

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

LINN ENERGY
BRIAN WALL
RR1, BOX 24 B
KINGFISHER OK, 73750
Fax To: (405) 375-6693

Received:	10/01/2013	Sampling Date:	10/01/2013
Reported:	10/03/2013	Sampling Type:	Soil
Project Name:	TURNER A #45	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 1 @ 1' SURFACE (H302385-01)

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	10/02/2013	ND	1.97	98.6	2.00	1.41	
Toluene*	<0.050	0.050	10/02/2013	ND	2.03	102	2.00	2.05	
Ethylbenzene*	<0.050	0.050	10/02/2013	ND	2.13	106	2.00	1.11	
Total Xylenes*	<0.150	0.150	10/02/2013	ND	6.56	109	6.00	1.13	
Total BTEX	<0.300	0.300	10/02/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *115 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg **Analyzed By: GR**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**2800**	16.0	10/02/2013	ND	432	108	400	3.64	

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	10/02/2013	ND	206	103	200	0.565	
DRO >C10-C28	<10.0	10.0	10/02/2013	ND	203	102	200	4.45	

Surrogate: 1-Chlorooctane *99.4 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *101 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

LINN ENERGY
BRIAN WALL
RR1, BOX 24 B
KINGFISHER OK, 73750
Fax To: (405) 375-6693

Received:	10/01/2013	Sampling Date:	10/01/2013
Reported:	10/03/2013	Sampling Type:	Soil
Project Name:	TURNER A #45	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 2 @ 1' SURFACE (H302385-02)

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	10/02/2013	ND	1.97	98.6	2.00	1.41	
Toluene*	<0.050	0.050	10/02/2013	ND	2.03	102	2.00	2.05	
Ethylbenzene*	<0.050	0.050	10/02/2013	ND	2.13	106	2.00	1.11	
Total Xylenes*	<0.150	0.150	10/02/2013	ND	6.56	109	6.00	1.13	
Total BTEX	<0.300	0.300	10/02/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *114 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg **Analyzed By: GR**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**5680**	16.0	10/02/2013	ND	432	108	400	3.64	

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	10/02/2013	ND	206	103	200	0.565	
DRO >C10-C28	**46.3**	10.0	10/02/2013	ND	203	102	200	4.45	

Surrogate: 1-Chlorooctane *108 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *112 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

LINN ENERGY
BRIAN WALL
RR1, BOX 24 B
KINGFISHER OK, 73750
Fax To: (405) 375-6693

Received:	10/01/2013	Sampling Date:	10/01/2013
Reported:	10/03/2013	Sampling Type:	Soil
Project Name:	TURNER A #45	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 3 @ 1' SURFACE (H302385-03)

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	10/02/2013	ND	1.97	98.6	2.00	1.41	
Toluene*	<0.050	0.050	10/02/2013	ND	2.03	102	2.00	2.05	
Ethylbenzene*	<0.050	0.050	10/02/2013	ND	2.13	106	2.00	1.11	
Total Xylenes*	<0.150	0.150	10/02/2013	ND	6.56	109	6.00	1.13	
Total BTEX	<0.300	0.300	10/02/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *112 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg **Analyzed By: GR**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**9730**	16.0	10/02/2013	ND	432	108	400	3.64	

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	10/02/2013	ND	206	103	200	0.565	
DRO >C10-C28	**39.1**	10.0	10/02/2013	ND	203	102	200	4.45	

Surrogate: 1-Chlorooctane *115 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *120 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

LINN ENERGY
BRIAN WALL
RR1, BOX 24 B
KINGFISHER OK, 73750
Fax To: (405) 375-6693

Received:	10/01/2013	Sampling Date:	10/01/2013
Reported:	10/03/2013	Sampling Type:	Soil
Project Name:	TURNER A #45	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 4 @ 1' SURFACE (H302385-04)

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	10/02/2013	ND	1.97	98.6	2.00	1.41	
Toluene*	<0.050	0.050	10/02/2013	ND	2.03	102	2.00	2.05	
Ethylbenzene*	<0.050	0.050	10/02/2013	ND	2.13	106	2.00	1.11	
Total Xylenes*	<0.150	0.150	10/02/2013	ND	6.56	109	6.00	1.13	
Total BTEX	<0.300	0.300	10/02/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *113 %* *89.4-126*

Chloride, SM4500Cl-B mg/kg **Analyzed By: GR**

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**944**	16.0	10/02/2013	ND	432	108	400	3.64	

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	10/02/2013	ND	206	103	200	0.565	
DRO >C10-C28	<10.0	10.0	10/02/2013	ND	203	102	200	4.45	

Surrogate: 1-Chlorooctane *109 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *110 %* *63.6-154*

Cardinal Laboratories *=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

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

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name:	Linn energy
Project Manager:	Brian Wall
Address:	
City:	State: Zip:
Phone #:	Fax #:
Project #:	Project Owner:
Project Name:	
Project Location:	Turner A #45
Sampler Name:	Miguel Gómez

BILL TO

P.O. #:	
Company:	
Attn:	
Address:	
City:	Same
State:	Zip:
Phone #:	
Fax #:	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST											
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	chloride	TPH 8015M	BTEX									
H302389																										
1	SP1 @ 1' surface	G	1			✓					✓		10-1-13	1:23	✓	✓	✓									
2	SP2 @ 1' surface	G	1			✓					✓		10-1-13	1:25	✓	✓	✓									
3	SP3 @ 1' surface	G	1			✓					✓		10-1-13	1:27	✓	✓	✓									
4	SP4 @ 1' surface	G	1			✓					✓		10-1-13	1:29	✓	✓	✓									

Relinquished By: Miguel Gómez	Date: 10/1/13 Time: 4:25	Received By: Jodi Henson	
Relinquished By:	Date: Time:	Received By:	

Delivered By: (Circle One)
Sampler - UPS - Bus - Other: 5.8°C

Sample Condition: Cool ☑ Yes ☐ No; Intact ☑ Yes ☐ No

CHECKED BY: (Initials) LM

Phone Result:	☐ Yes	☐ No	Add'l Phone #:
Fax Result:	☐ Yes	☐ No	Add'l Fax #:

REMARKS:
Bwall@linnenergy.com
aruth@diversifiedfsi.com

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

#54

CARDINAL Laboratories

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

October 25, 2013

BRIAN WALL

LINN ENERGY

RR1, BOX 24 B

KINGFISHER, OK 73750

RE: TURNER A #45

Enclosed are the results of analyses for samples received by the laboratory on 10/21/13 16:07.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-11-3. 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 accreditated 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

Celey D. Keene

Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

LINN ENERGY
BRIAN WALL
RR1, BOX 24 B
KINGFISHER OK, 73750
Fax To: (405) 375-6693

Received:	10/21/2013	Sampling Date:	10/21/2013
Reported:	10/25/2013	Sampling Type:	Soil
Project Name:	TURNER A #45	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 1 @ 5' (H302539-01)

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	10/22/2013	ND	2.14	107	2.00	0.577	
Toluene*	<0.050	0.050	10/22/2013	ND	2.14	107	2.00	0.813	
Ethylbenzene*	<0.050	0.050	10/22/2013	ND	2.16	108	2.00	0.211	
Total Xylenes*	<0.150	0.150	10/22/2013	ND	6.37	106	6.00	0.365	
Total BTEX	<0.300	0.300	10/22/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *104 %* *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	**304**	16.0	10/22/2013	ND	432	108	400	7.69	

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	10/22/2013	ND	200	99.9	200	3.36	
DRO >C10-C28	<10.0	10.0	10/22/2013	ND	192	95.9	200	2.97	

Surrogate: 1-Chlorooctane *125 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *130 %* *63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

LINN ENERGY
BRIAN WALL
RR1, BOX 24 B
KINGFISHER OK, 73750
Fax To: (405) 375-6693

Received:	10/21/2013	Sampling Date:	10/21/2013
Reported:	10/25/2013	Sampling Type:	Soil
Project Name:	TURNER A #45	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 2 @ 3' (H302539-02)

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	10/22/2013	ND	2.14	107	2.00	0.577	
Toluene*	<0.050	0.050	10/22/2013	ND	2.14	107	2.00	0.813	
Ethylbenzene*	<0.050	0.050	10/22/2013	ND	2.16	108	2.00	0.211	
Total Xylenes*	<0.150	0.150	10/22/2013	ND	6.37	106	6.00	0.365	
Total BTEX	<0.300	0.300	10/22/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *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	**144**	16.0	10/22/2013	ND	432	108	400	7.69	

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	10/24/2013	ND	180	90.0	200	2.46	
DRO >C10-C28	<10.0	10.0	10/24/2013	ND	175	87.4	200	1.75	

Surrogate: 1-Chlorooctane *89.5 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *97.4 %* *63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

LINN ENERGY
BRIAN WALL
RR1, BOX 24 B
KINGFISHER OK, 73750
Fax To: (405) 375-6693

Received:	10/21/2013	Sampling Date:	10/21/2013
Reported:	10/25/2013	Sampling Type:	Soil
Project Name:	TURNER A #45	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 3 @ 8' (H302539-03)

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	10/22/2013	ND	2.14	107	2.00	0.577	
Toluene*	<0.050	0.050	10/22/2013	ND	2.14	107	2.00	0.813	
Ethylbenzene*	<0.050	0.050	10/22/2013	ND	2.16	108	2.00	0.211	
Total Xylenes*	<0.150	0.150	10/22/2013	ND	6.37	106	6.00	0.365	
Total BTEX	<0.300	0.300	10/22/2013	ND					

Surrogate: 4-Bromofluorobenzene (PID *103 %* *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	**272**	16.0	10/22/2013	ND	432	108	400	7.69	

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	10/24/2013	ND	180	90.0	200	2.46	
DRO >C10-C28	<10.0	10.0	10/24/2013	ND	175	87.4	200	1.75	

Surrogate: 1-Chlorooctane *88.4 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *91.7 %* *63.6-154*

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

LINN ENERGY
BRIAN WALL
RR1, BOX 24 B
KINGFISHER OK, 73750
Fax To: (405) 375-6693

Received:	10/21/2013	Sampling Date:	10/21/2013
Reported:	10/25/2013	Sampling Type:	Soil
Project Name:	TURNER A #45	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP 4 @ 3' (H302539-04)

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	10/22/2013	ND	2.14	107	2.00	0.577	
Toluene*	<0.050	0.050	10/22/2013	ND	2.14	107	2.00	0.813	
Ethylbenzene*	<0.050	0.050	10/22/2013	ND	2.16	108	2.00	0.211	
Total Xylenes*	<0.150	0.150	10/22/2013	ND	6.37	106	6.00	0.365	
Total BTEX	<0.300	0.300	10/22/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIL *103 %* *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	**128**	16.0	10/22/2013	ND	432	108	400	7.69	

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	10/23/2013	ND	180	90.0	200	2.46	
DRO >C10-C28	<10.0	10.0	10/23/2013	ND	175	87.4	200	1.75	

Surrogate: 1-Chlorooctane *82.1 %* *65.2-140*

Surrogate: 1-Chlorooctadecane *89.8 %* *63.6-154*

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Celey D. Keene, Lab Director/Quality Manager

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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

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

101 East Marland, Hobbs, NM 88240
(575) 393-2326 FAX (575) 393-2476

Company Name: Lim energy	BILL TO		
Project Manager: Brian wall	P.O. #:		
Address:	Company:		
City: State: Zip:	Attn: Same		
Phone #: Fax #:	Address:		
Project #: Project Owner:	City:		
Project Name:	State: Zip:		
Project Location: Turner A #45	Phone #:		
Sampler Name: Miguel Gómez	Fax #:		

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST		
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	Chloride	TPH 8015m	BTEX
H302539																	
1	SP1@5'	G	1			/					/		10-21-13	9:18	/	/	/
2	SP2@3'	G	1			/					/		10-21-13	9:33	/	/	/
3	SP3@8	G	1			/					/		10-21-13	2:20	/	/	/
4	SP4@3'	G	1			/					/		10-21-13	10:25	/	/	/

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 the client for the 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 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 services hereunder by Cardinal, regardless of whether such claim is based upon any of the above stated reasons or otherwise.

Relinquished By: Miguel Gómez	Date: 10/21/13 Time: 4:07	Received By: Dai Henson	Phone Result: ☐ Yes ☐ No	Add'l Phone #:
Relinquished By:	Date: Time:	Received By:	Fax Result: ☐ Yes ☐ No	Add'l Fax #:
			REMARKS: Bwall@Linenergy.com Aruth@diversifiedfsi.com	
Delivered By: (Circle One) Sampler - UPS - Bus - Other: 5.6°C	Sample Condition Cool: Yes / Intact: Yes	CHECKED BY: (Initials)		

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

#54

GROUND WATER SEARCH

Linn Energy Turner A #045

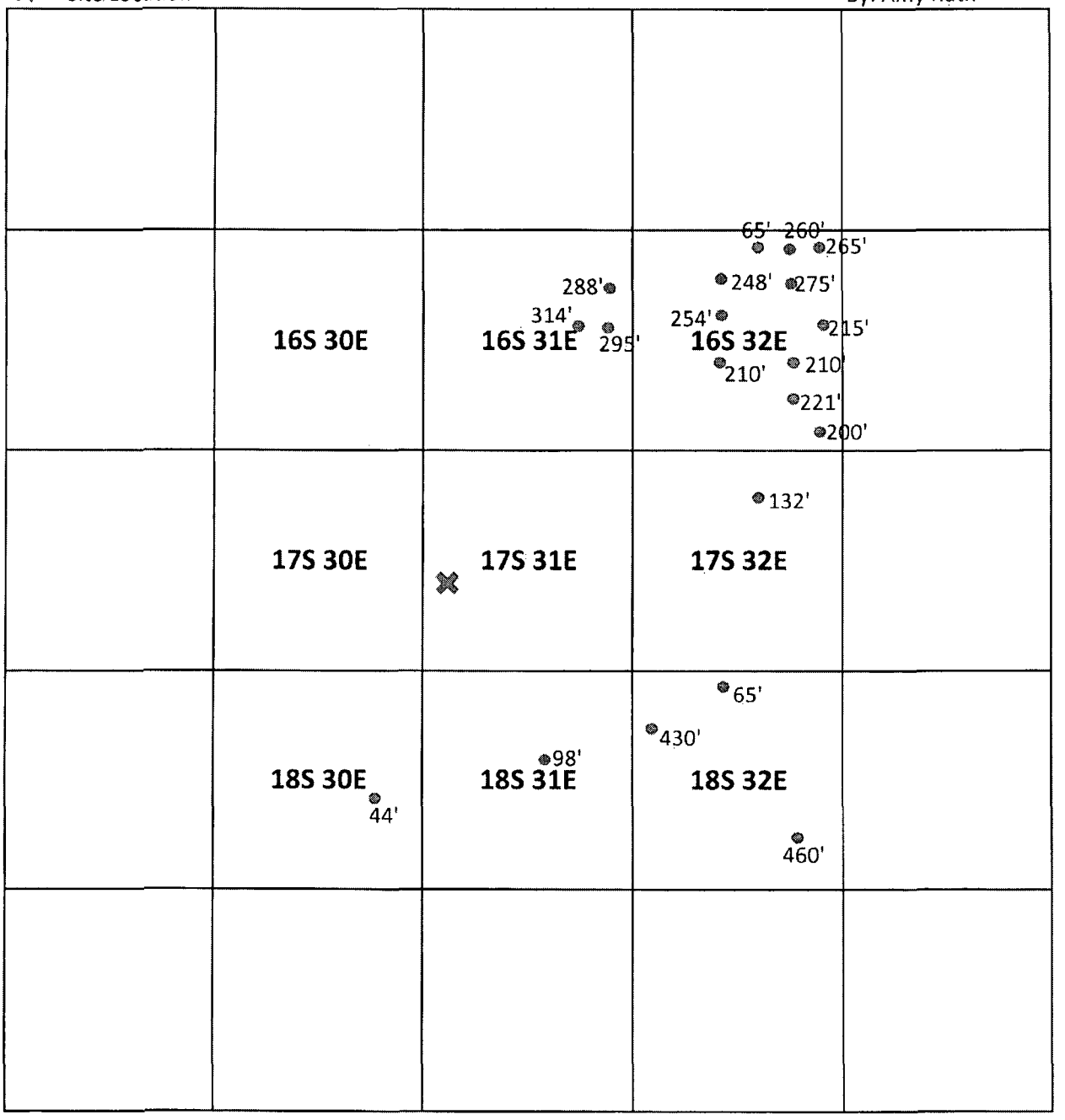
UL: C **Sec:** 19 **T:** 17S **R:** 31E

Groundwater Depth: 236 ft. (averaged)

● = NM Office of the State Engineer
● = U.S. Geological Survey (unknown well)
✖ = Site Location

NMOCD GW Trend Map - 325' to 350'

Date: 10/21/13
By: Amy Ruth



New Mexico Office of the State Engineer
Water Column/Average Depth to Water

No records found.

PLSS Search:

Township: 16S **Range:** 30E

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)
(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Depth Well	Depth Water	Water Column
L 03435		L	LE		1	1	05	16S	31E	602954	3646955*			
L 03852	R	L	LE	2	2	2	14	16S	31E	609126	3643913*	370	314	56
L 03852 POD4		L	LE	3	4	3	13	16S	31E	609744	3642516*	333	299	34
L 03852 POD5		L	LE		3	2	13	16S	31E	610238	3643427*	328	295	33
L 03852 X	R	L	LE	4	4	4	13	16S	31E	610749	3642526*	333	299	34
L 03852 X2		L	LE	3	2	2	13	16S	31E	610535	3643733*	330	287	43
L 04671		L	LE	1	1	2	12	16S	31E	610114	3645538*	340	288	52
L 10203		L	LE	4	4	3	14	16S	31E	608334	3642495*	310		
L 10206		L	LE		2	2	23	16S	31E	609045	3642204*	280		

Average Depth to Water: **297 feet**

Minimum Depth: **287 feet**

Maximum Depth: **314 feet**

Record Count: 9

PLSS Search:

Township: 16S Range: 31E

***UTM location was derived from PLSS - see Help**

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twws	Rng	X	Y	Depth Well	Depth Water	Water Column
L 02381	L	LE		3	1	13	16S	32E	619086	3643515*	308	215	93
L 02434	L	LE				01	16S	32E	619661	3646531*	337		
L 02449	L	LE				01	16S	32E	619661	3646531*	330	265	65
L 02617	L	LE		4	4	02	16S	32E	618656	3645924*	322	270	52
L 02752	L	LE		1	3	26	16S	32E	617521	3639880*	324	280	44
L 02846	L	LE	4	2	1	11	16S	32E	617956	3645413*	328	275	53
L 02954	L	LE		2	4	03	16S	32E	617043	3646310*	120	65	55
L 02993	L	LE	3	3	2	15	16S	32E	616572	3643391*	100		
L 03631	L	LE		1	2	02	16S	32E	618240	3647126*	315	250	65
L 04930	L	LE			1	23	16S	32E	617698	3642092*	307	210	97
L 05494	L	LE				36	16S	32E	619758	3638489*	303	200	103
L 06557	L	LE		1	4	21	16S	32E	615089	3641466*	295	210	85
L 06807	L	LE	1	4	4	09	16S	32E	615356	3644383*	290	248	42
L 07823	L	LE	2	2	2	16	16S	32E	615561	3643981*	269	247	22
L 08084	L	LE	1	1	1	16	16S	32E	614157	3643970*	317	260	57
L 08084 POD4	L	LE			2	26	16S	32E	618522	3640492*	303	233	70
L 08084 POD5	L	LE	4	1	4	26	16S	32E	618425	3639788*	296	165	131
L 08084 S3	L	LE			2	26	16S	32E	618522	3640492*	305	205	100
L 08241	L	LE		4	4	02	16S	32E	618656	3645924*	316		
L 10204	L	LE	4	2	2	04	16S	32E	615524	3646993*	319		
L 10205	L	LE		4	1	08	16S	32E	613038	3645066*	330		
L 11189	L	LE	1	1	4	04	16S	32E	614932	3646391*	350		

*UTM location was derived from PLSS - see Help

Average Depth to Water: **224 feet**

Minimum Depth: **65 feet**

Maximum Depth: **280 feet**

Record Count: 22

PLSS Search:

Township: 16S Range: 32E

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

No records found.

PLSS Search:

Township: 17S **Range:** 30E

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Twp	Rng	X	Y	Depth Well	Depth Water	Water Column
RA 11590 POD1		ED	2	1	3	32	17S	31E	603315	3628545	158		
RA 11590 POD3		ED	3	1	2	32	17S	31E	603932	3629260	60		
RA 11590 POD4		ED	4	1	1	32	17S	31E	603308	3629253	55		

Average Depth to Water: --

Minimum Depth: --

Maximum Depth: --

Record Count: 3

PLSS Search:

Township: 17S Range: 31E

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Code	Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twws	Rng	X	Y	Depth Well	Depth Water	Water Column
L 04019		L	LE	4	3	4	02	17S	32E	618468	3636166*	182		
L 04020		L	LE	3	3	4	02	17S	32E	618268	3636166*	200		
L 04021	R	L	LE	3	4	4	02	17S	32E	618670	3636170*	190		
L 04021 POD3		L	LE		3	4	03	17S	32E	616761	3636252*	247		
L 04021 S		L	LE	2	4	4	03	17S	32E	617262	3636354*	260		
L 13047 POD1		L	LE				11	17S	32E	618187	3635254*	140		
L 13050 POD1		L	LE	2	2	1	10	17S	32E	616463	3635945*	156	132	24
RA 08855			LE	4	1	1	10	17S	32E	616061	3635742*	158		
RA 09505			LE	2	2	1	10	17S	32E	616462	3635944	147		
RA 09505 S			LE	2	2	1	10	17S	32E	616463	3635945*	144		
RA 10175			LE		2	1	28	17S	32E	614814	3631005*	158		
RA 11684 POD1			LE	1	1	4	11	17S	32E	618216	3635124	275		
RA 11684 POD2			LE	1	1	4	11	17S	32E	618313	3635248	275		
RA 11684 POD3			LE	3	3	1	11	17S	32E	618262	3635371	275		
RA 11684 POD4			LE	1	3	2	11	17S	32E	618334	3635521	275		
RA 11684 POD5			LE	3	1	4	11	17S	32E	618353	3635047	275		
RA 11734 POD1			LE	2	2	1	10	17S	32E	616556	3635929	165		

Average Depth to Water: **132 feet**

Minimum Depth: **132 feet**

Maximum Depth: **132 feet**

Record Count: 17

PLSS Search:

Township: 17S Range: 32E

***UTM location was derived from PLSS - see Help**

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest) (NAD83 UTM in meters) (In feet)

POD Number	POD Sub-Code	basin	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Depth Well	Depth Water	Water Column
CP 00818			LE	1	4		26	18S	30E	599289	3620364*	240		
CP 00819			LE	2	4		32	18S	30E	594878	3618720*	150		
L 01978		L	LE	1	3		23	18S	30E	598469	3621964*	65	44	21

Average Depth to Water: **44 feet**

Minimum Depth: **44 feet**

Maximum Depth: **44 feet**

Record Count: 3

PLSS Search:

Township: 18S Range: 30E

***UTM location was derived from PLSS - see Help**

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin	County	Q 64	Q 16	Q 4	Sec	Twp	Rng	X	Y	Depth Well	Depth Water	Water Column
L 11092	L	LE	2	3		15	18S	31E	606849	3623669*	160	98	62

Average Depth to Water: **98 feet**

Minimum Depth: **98 feet**

Maximum Depth: **98 feet**

Record Count: 1

PLSS Search:

Township: 18S Range: 31E

*UTM location was derived from PLSS - see Help

New Mexico Office of the State Engineer
Water Column/Average Depth to Water

(A CLW##### in the POD suffix indicates the POD has been replaced & no longer serves a water right file.)

(R=POD has been replaced, O=orphaned, C=the file is closed)

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

(In feet)

POD Number	POD Sub-basin Code	County	Q 64	Q 16	Q 4	Sec	Twn	Rng	X	Y	Depth Well	Depth Water	Water Column
CP 00566		LE	4	4	1	04	18S	32E	614960	3627280*	133	65	68
CP 00672		LE		4	4	07	18S	32E	612475	3624947*	524	430	94
CP 00672 CLW475398	O	LE		4	4	07	18S	32E	612475	3624947*	540	460	80
CP 00677		LE		1	1	26	18S	32E	617750	3621373*	700		

Average Depth to Water: **318 feet**

Minimum Depth: **65 feet**

Maximum Depth: **460 feet**

Record Count: 4

PLSS Search:

Township: 18S Range: 32E

*UTM location was derived from PLSS - see Help