

REVIEWED

By Kellie Jones at 7:37 am, Jan 25, 2016



INFORMATION ONLY

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

January 08, 2016

ZACK THOMAS

MEWBOURNE OIL COMPANY

P. O. BOX 5270

HOBBS, NM 88240

RE: BONE SPRINGS WATERFLOOD CENTRAL FACILITY

Enclosed are the results of analyses for samples received by the laboratory on 01/04/16 16:30.

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,

A handwritten signature in dark ink that reads "Celey D. Keene". The signature is fluid and cursive, with the first name "Celey" being more prominent.

Celey D. Keene

Lab Director/Quality Manager

Analytical Results For:

MEWBOURNE OIL COMPANY
ZACK THOMAS
P. O. BOX 5270
HOBBS NM, 88240
Fax To: (575) 937-6252

Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #1 (H600015-01)

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	01/06/2016	ND	1.98	99.2	2.00	12.0	
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6	
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3	
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7	
Total BTX	<0.300	0.300	01/06/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 101 % 73.6-140

Chloride, SM4500Cl-B			mg/kg		Analyzed By: AP				
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	<16.0	16.0	01/05/2016	ND	400	100	400	3.92	

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	01/08/2016	ND	194	96.9	200	1.41	
DRO >C10-C28	90.5	10.0	01/08/2016	ND	185	92.5	200	2.06	

Surrogate: 1-Chlorooctane 71.6 % 35-147

Surrogate: 1-Chlorooctadecane 77.7 % 28-171

Cardinal Laboratories

*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

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Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #2 (H600015-02)

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	01/06/2016	ND	1.98	99.2	2.00	12.0		
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6		
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3		
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7		
Total BTX	<0.300	0.300	01/06/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 96.8 % 73.6-140

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	01/05/2016	ND	400	100	400	3.92	

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	01/08/2016	ND	194	96.9	200	1.41	
DRO >C10-C28	<10.0	10.0	01/08/2016	ND	185	92.5	200	2.06	

Surrogate: 1-Chlorooctane 69.5 % 35-147

Surrogate: 1-Chlorooctadecane 66.4 % 28-171

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Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #3 (H600015-03)

BTEx 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	01/06/2016	ND	1.98	99.2	2.00	12.0		
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6		
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3		
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7		
Total BTEx	<0.300	0.300	01/06/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 96.7 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1140	16.0	01/05/2016	ND	400	100	400	3.92	

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	01/08/2016	ND	194	96.9	200	1.41	
DRO >C10-C28	<10.0	10.0	01/08/2016	ND	185	92.5	200	2.06	

Surrogate: 1-Chlorooctane 72.8 % 35-147

Surrogate: 1-Chlorooctadecane 72.3 % 28-171

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Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #4 (H600015-04)

BTEx 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	01/06/2016	ND	1.98	99.2	2.00	12.0		
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6		
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3		
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7		
Total BTEX	<0.300	0.300	01/06/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 95.8 % 73.6-140

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	01/05/2016	ND	400	100	400	3.92		

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	01/08/2016	ND	194	96.9	200	1.41		
DRO >C10-C28	<10.0	10.0	01/08/2016	ND	185	92.5	200	2.06		

Surrogate: 1-Chlorooctane 77.7 % 35-147

Surrogate: 1-Chlorooctadecane 73.5 % 28-171

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Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #5 (H600015-05)

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	01/06/2016	ND	1.98	99.2	2.00	12.0		
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6		
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3		
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7		
Total BTX	<0.300	0.300	01/06/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 96.6 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	1060	16.0	01/05/2016	ND	400	100	400	3.92	

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	01/08/2016	ND	194	96.9	200	1.41	
DRO >C10-C28	<10.0	10.0	01/08/2016	ND	185	92.5	200	2.06	

Surrogate: 1-Chlorooctane 69.0 % 35-147

Surrogate: 1-Chlorooctadecane 71.8 % 28-171

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P. O. BOX 5270
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Fax To: (575) 937-6252

Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #6 (H600015-06)

BTEx 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	01/06/2016	ND	1.98	99.2	2.00	12.0		
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6		
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3		
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7		
Total BTEx	<0.300	0.300	01/06/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 95.8 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	64.0	16.0	01/05/2016	ND	400	100	400	3.92	

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	01/08/2016	ND	194	96.9	200	1.41	
DRO >C10-C28	<10.0	10.0	01/08/2016	ND	185	92.5	200	2.06	

Surrogate: 1-Chlorooctane 60.9 % 35-147

Surrogate: 1-Chlorooctadecane 59.1 % 28-171

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P. O. BOX 5270
HOBBS NM, 88240
Fax To: (575) 937-6252

Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #8 (H600015-07)

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	01/06/2016	ND	1.98	99.2	2.00	12.0		
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6		
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3		
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7		
Total BTX	<0.300	0.300	01/06/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 95.4 % 73.6-140

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	976	16.0	01/05/2016	ND	400	100	400	3.92	

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	01/08/2016	ND	194	96.9	200	1.41	
DRO >C10-C28	<10.0	10.0	01/08/2016	ND	185	92.5	200	2.06	

Surrogate: 1-Chlorooctane 70.3 % 35-147

Surrogate: 1-Chlorooctadecane 72.2 % 28-171

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Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #9 (H600015-08)

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	01/06/2016	ND	1.98	99.2	2.00	12.0		
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6		
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3		
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7		
Total BTX	<0.300	0.300	01/06/2016	ND						

Surrogate: 4-Bromofluorobenzene (PID) 95.2 % 73.6-140

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	624	16.0	01/05/2016	ND	400	100	400	3.92	

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	01/08/2016	ND	194	96.9	200	1.41	
DRO >C10-C28	<10.0	10.0	01/08/2016	ND	185	92.5	200	2.06	

Surrogate: 1-Chlorooctane 68.1 % 35-147

Surrogate: 1-Chlorooctadecane 63.7 % 28-171

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Received:	01/04/2016	Sampling Date:	01/04/2016
Reported:	01/08/2016	Sampling Type:	Soil
Project Name:	BONE SPRINGS WATERFLOOD CENTRAL	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

Sample ID: SP #10 (H600015-09)

BTEx 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	01/06/2016	ND	1.98	99.2	2.00	12.0	
Toluene*	<0.050	0.050	01/06/2016	ND	2.01	101	2.00	12.6	
Ethylbenzene*	<0.050	0.050	01/06/2016	ND	1.86	93.2	2.00	12.3	
Total Xylenes*	<0.150	0.150	01/06/2016	ND	5.93	98.9	6.00	11.7	
Total BTEx	<0.300	0.300	01/06/2016	ND					

Surrogate: 4-Bromofluorobenzene (PID) 95.1 % 73.6-140

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	592	16.0	01/05/2016	ND	400	100	400	3.92	

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	01/08/2016	ND	194	96.9	200	1.41	
DRO >C10-C28	<10.0	10.0	01/08/2016	ND	185	92.5	200	2.06	

Surrogate: 1-Chlorooctane 62.5 % 35-147

Surrogate: 1-Chlorooctadecane 66.5 % 28-171

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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



CARDINAL Laboratories

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

meubourne

Company Name: <i>Meubourne</i>		P.O. #: <i>5723</i>		BILL TO																															
Project Manager: <i>Zack Thomas</i>		Company: <i>Blade Services</i>		ANALYSIS REQUEST																															
Address:		Attn: <i>Rick</i>																																	
City: <i>Hobbs</i>		Address:																																	
State: <i>N.M.</i>		City: <i>Hobbs, N.M.</i>																																	
Zip: <i>88240</i>		State: <i>N.M.</i>																																	
Phone #:		Fax #:																																	
Project #:		Project Owner:																																	
Project Name: <i>Boone Springs Water Flood</i>		City: <i>Hobbs, N.M.</i>																																	
Project Location: <i>Maljamar</i>		State: <i>N.M.</i>																																	
Sample Name: <i>Rick Neumann</i>		Phone #: <i>575 3405004</i>																																	
FOR LAB USE ONLY		Fax #:																																	
Lab I.D. <i>HL00015</i>		Sample I.D.		(G)RAB OR (C)OMP.		# CONTAINERS		GROUNDWATER		WASTEWATER		SOIL		OIL		SLUDGE		OTHER:		ACID/BASE:		ICE / COOL		OTHER:		DATE		TIME		CL		TPH 8015		BTEX	
1		SP #1																								1-4-16		9:40 AM		✓					
2		SP #2																								1-4		9:20 AM		✓					
3		SP #3																								1-4		9:15 AM		✓					
4		SP #4																								1-4		10:15 AM		✓					
5		SP #5																								1-4		10:40 AM		✓					
6		SP #6																								1-4		11:20 AM		✓					
7		SP #7																								1-4-16		12:10 PM		✓					
8		SP #8																								1-4-16		11:00		✓					
9		SP #9																								1-4-16		11:00		✓					
10		SP #10																								1-4-16		11:00		✓					
Relinquished By: <i>Meubourne</i>		Date: <i>1-4-15</i>		Received By: <i>Blade Services</i>		Date: <i>1-4-15</i>		Time: <i>4:30</i>		Sample Condition		Cool		Intact		Checked By: <i>Zack</i>		Phone Result: <input type="checkbox"/> Yes <input type="checkbox"/> No		Fax Result: <input type="checkbox"/> Yes <input type="checkbox"/> No		Add'l Phone #:		Add'l Fax #:		REMARKS: <i>Bladeservices@netmail.com</i>									
Delivered By: (Circle One)		Sampler - UPS - Bus - Other:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:		Time:	

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