

# *Basin Environmental Service Technologies, LLC*

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## **REMEDIATION SUMMARY AND SITE CLOSURE REQUEST**

**BOPCO, LP  
POKER LAKE UNIT #145 FLOW LINE  
Eddy County, New Mexico  
Unit Letter "E" (SW/NW), Section 32, Township 23 South, Range 30 East  
Latitude 32.261914° North, Longitude 103.912095° West  
NMOCD Reference #2RP-832**

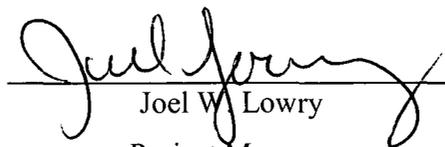
Prepared For:

BOPCO, LP  
522 W. Mermod, Suite 704  
Carlsbad, New Mexico 88220

Prepared By:

Basin Environmental Service Technologies, LLC  
3100 Plains Highway  
Lovington, New Mexico 88260

**November 2013**

  
Joel W. Lowry  
Project Manager

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## **1.0 INTRODUCTION & BACKGROUND INFORMATION**

Basin Environmental Service Technologies, LLC (Basin), on behalf of BOPCO, LP (BOPCO), has prepared this *Remediation Summary & Site Closure Request* for the release site known as Poker Lake Unit #145 Flow Line. The legal description of the release site is Unit Letter "E" (SW/NW), Section 32, Township 23 South, Range 30 East, in Eddy County, New Mexico. The geographic coordinates of the release site are 32.261914° North latitude and 103.912095° West longitude. The properties affected by the release are owned by the New Mexico State Land Office (NMSLO) and the United States Department of the Interior - Bureau of Land Management (BLM). A "Site Location Map" is provided as Figure 1.

On June 7, 2011, BOPCO discovered a release had occurred on the Poker Lake Unit #145 Flow Line. Failure of a two and seven-eighths-inch (2 7/8") flow line resulted in a release of produced water and crude oil. The failure was attributed to external corrosion. During initial response activities, a repair clamp was placed on the affected area of the pipe to mitigate the release. The release was reported to the New Mexico Oil Conservation Division (NMOCD) Artesia District Office on June 7, 2011. The "Release Notification and Corrective Action" (Form C-141) indicated approximately ten barrels (10 bbls) of produced water and less than one barrel (1 bbl) of crude oil were released, with no recovery. The Form C-141 is provided as Appendix A.

The release occurred adjacent to a lease road on land owned by the NMSLO and impacted an area of pasture land measuring approximately two hundred feet (200') in length and two feet (2') in width. The flow path of the release terminated in an area of land owned by the BLM that had been impacted by several historic produced water releases. Since the area affected by the June 7, 2011, release is indistinguishable from that affected by the historic releases, the releases were remediated simultaneously. The total impacted area measures approximately twelve hundred square feet (1,200 ft<sup>2</sup>). General photographs of the release site are provided as Appendix B.

On July 28, 2013, Boone Archaeological Services of New Mexico (Boone) conducted a cultural survey of the affected area. Boone determined that remediation activities associated with the PLU #145 Flow Line release could be conducted without disturbing any cultural resources. A copy of the New Mexico Cultural Resources Information System (NMCRIS) Investigation Abstract Form is provided as Appendix D.

## **2.0 NMOCD SITE CLASSIFICATION**

A search of the New Mexico Water Rights Reporting System (NMWRRS) database maintained by the New Mexico Office of the State Engineer (NMOSE) indicated information was unavailable for Section 32, Township 23 South, Range 30 East. A depth to groundwater reference map utilized by the NMOCD indicates groundwater should be encountered at approximately two hundred feet (200') below ground surface (bgs). Based on the NMOCD ranking system, zero (0) points will be assigned to the site as a result of this criterion.

A search of the NMWRRS database indicated there are no water wells within 1,000 feet of the release. Based on the NMOCD ranking system, zero (0) points will be assigned to the site as a result of this criterion.

There are no surface water bodies within 1,000 feet of the release. Based on the NMOCD ranking system, zero (0) points will be assigned to the site as a result of this criterion.

NMOCD guidelines indicate the PLU #145 Flow Line release site has an initial ranking score of zero (0) points. The soil remediation levels for a site with a ranking score of zero (0) points are as follows:

- Benzene – 10 mg/Kg (ppm)
- BTEX – 50 mg/Kg (ppm)
- TPH – 5,000 mg/Kg (ppm)

The New Mexico Administrative Code (NMAC) does not currently specify a remediation level for chloride concentrations in soil. Chloride remediation levels are set by the NMOCD on a site-specific basis.

### **3.0 SUMMARY OF SOIL REMEDIATION ACTIVITIES**

On November 6, 2013, Basin began delineation activities at the release site. A series of delineation trenches were advanced in an effort to determine the vertical extent of soil impact. Delineation trench RP #1 Floor was advanced adjacent to the western most release point. During the advancement of the delineation trench, three (3) soil samples (RP #1 Floor @ 3', RP #1 Floor @ 4' and RP #1 Floor @ 5') were collected and submitted to Cardinal Laboratories, of Hobbs, New Mexico, for analysis of chloride concentrations by EPA Method 4500 Cl-B. Laboratory analytical results indicated chloride concentrations ranged from 1,120 ppm for soil sample RP #1 Floor @ 3' to 144 ppm for soil sample RP #1 Floor @ 5'. Soil sample RP #1 Floor @ 5' was also analyzed for concentrations of benzene, ethylbenzene, toluene, and xylene (BTEX) using EPA SW-846-8021b and total petroleum hydrocarbon (TPH) using EPA SW-846 8015M. Laboratory analytical results indicate BTEX and TPH concentrations were less than the appropriate laboratory method detection limit (MDL). A summary of "Concentrations of Benzene, BTEX, TPH and Chloride in Soil" is provided in Table 1. Laboratory analytical reports are provided as Appendix C.

Delineation trench RP #2 Floor was advanced adjacent to the eastern-most release point. During the advancement of the delineation trench, two (2) soil samples (RP #2 Floor @ 3' and RP #2 Floor @ 5') were collected and submitted to the laboratory for analysis of chloride concentrations. Laboratory analytical results indicate chloride concentrations ranged from 944 ppm for soil sample RP #2 Floor @ 3' to 912 ppm for soil sample RP #2 Floor @ 5'. Soil sample RP #2 Floor @ 5' was also analyzed for concentrations of BTEX and TPH. Laboratory analytical results indicated BTEX and TPH concentrations were less than the appropriate laboratory MDL. A "Site and Sample Location Map" is provided as Figure 2.

On November 7, 2013, excavation of impacted soil commenced at the release site. The floor of the excavation was advanced to approximately threefeet (3') bgs, and sidewalls of the excavation were advanced until field tests suggested concentrations of BTEX, TPH and chloride were less than NMOCD Regulatory Standards. Excavated soil was stockpiled on-site atop an impermeable liner, pending final disposition.

On November 8, 2013, six (6) soil samples (RP#1 SSW, RP#1 ESW, RP#1 WSW, RP#2 SSW, RP#2 ESW and RP#2 WSW) were collected from the sidewalls of the excavation and submitted to the laboratory for analysis of chloride concentrations. Laboratory analytical results indicated chloride concentrations ranged from 640 ppm for soil sample RP #1 ESW to 64.0 ppm for soil sample RP #1 WSW. Chloride concentrations were below NMOCD Regulatory Standards in each of the submitted soil samples. The excavation was advanced to the north.

On November 11, 2013, ten (10) soil samples (RP #1 FP 50' WSW, RP #1 FP 50' ESW, RP #1 FP 50' Floor, RP #2 FP 50' WSW, RP #2 FP 50' ESW, RP #2 FP 50' Floor, FP 150' WSW, FP 150' ESW, FP 150' Floor and FP 100' ESW) were collected from the floor and sidewalls of the excavation and submitted to the laboratory for analysis of chloride concentrations. Laboratory analytical results indicated chloride concentrations ranged from 512 ppm for soil sample RP #1 FP 50' ESW to <16.0 ppm for soil sample RP #1 FP 50' WSW. Soil samples RP #1 FP 50' Floor, RP #2 FP 50' Floor and FP 150' Floor were also analyzed for concentrations of BTEX and TPH, which were determined to be less than the appropriate laboratory MDL in each of the submitted soil samples. BTEX, TPH and chloride concentrations were below NMOCD Regulatory Standards in each of the submitted soil samples.

Between November 11 and 14, 2013, approximately two hundred and sixty cubic yards (260 yd<sup>3</sup>) of impacted material was transported to Lea Land, LLC (NMOCD Permit #WM-01-035) for disposal. The final dimensions of the excavation were approximately three (3) to fifteen feet (15') in width, one hundred and fifty feet (150') in length and two (2) to three feet (3') in depth. Upon receiving laboratory analytical data from confirmation soil samples, the excavated area was backfilled with a mixture of river rock and sand in an effort to mitigate erosion. Following backfilling, areas affected by the remediation activities were contoured to fit the surrounding topography. The site will be reseeded at a time conducive to germination.

## **4.0 QA/QC PROCEDURES**

### **4.1 Soil Sampling**

Soil samples were delivered to Cardinal Laboratories, Inc., in Hobbs, New Mexico, for BTEX, TPH and/or chloride analyses using the methods described below:

- BTEX concentrations in accordance with EPA Method SW-846 8021b
- TPH concentrations in accordance with EPA Method SW-846 8015M
- Chloride concentrations in accordance with EPA Method 4500 Cl-B

### **4.2 Decontamination of Equipment**

Cleaning of the sampling equipment was the responsibility of the environmental technician. Prior to use, and between each sample, the sampling equipment was cleaned with Liqui-Nox® detergent and rinsed with distilled water.

### **4.3 Laboratory Protocol**

The laboratory was responsible for proper QA/QC procedures after signing the chain-of-custody form(s). These procedures were either transmitted with the laboratory reports or are on file at the laboratory.

### **5.0 SITE CLOSURE REQUEST**

Soil samples collected from the floor and sidewalls of the PLU #145 excavation were analyzed by an NMOCD-approved laboratory. Laboratory analytical results indicated concentrations of BTEX, TPH and chloride were below NMOCD Regulatory Remediation Action Levels established for the site in each of the submitted soil samples, with the exception of soil sample RP #1 Floor @ 3', which exhibited a chloride concentration of 1,120 ppm. Based on these laboratory analytical results, Basin recommends BOPCO provide the NMOCD Artesia District Office, BML and the NMSLO a copy of this *Remediation Summary and Site Closure Request* and request the NMOCD grant site closure to the PLU #145 release site.

### **6.0 LIMITATIONS**

Basin Environmental Service Technologies, LLC, has prepared this *Remediation Summary and Site Closure Request* to the best of its ability. No other warranty, expressed or implied, is made or intended. Basin has examined and relied upon documents referenced in the report and on oral statements made by certain individuals. Basin has not conducted an independent examination of the facts contained in referenced materials and statements. Basin has presumed the genuineness of these documents and statements and that the information provided therein is true and accurate. Basin has prepared this report in a professional manner, using the degree of skill and care exercised by similar environmental consultants. Basin notes that the facts and conditions referenced in this report may change over time, and the conclusions and recommendations set forth herein are applicable only to the facts and conditions as described at the time of this report.

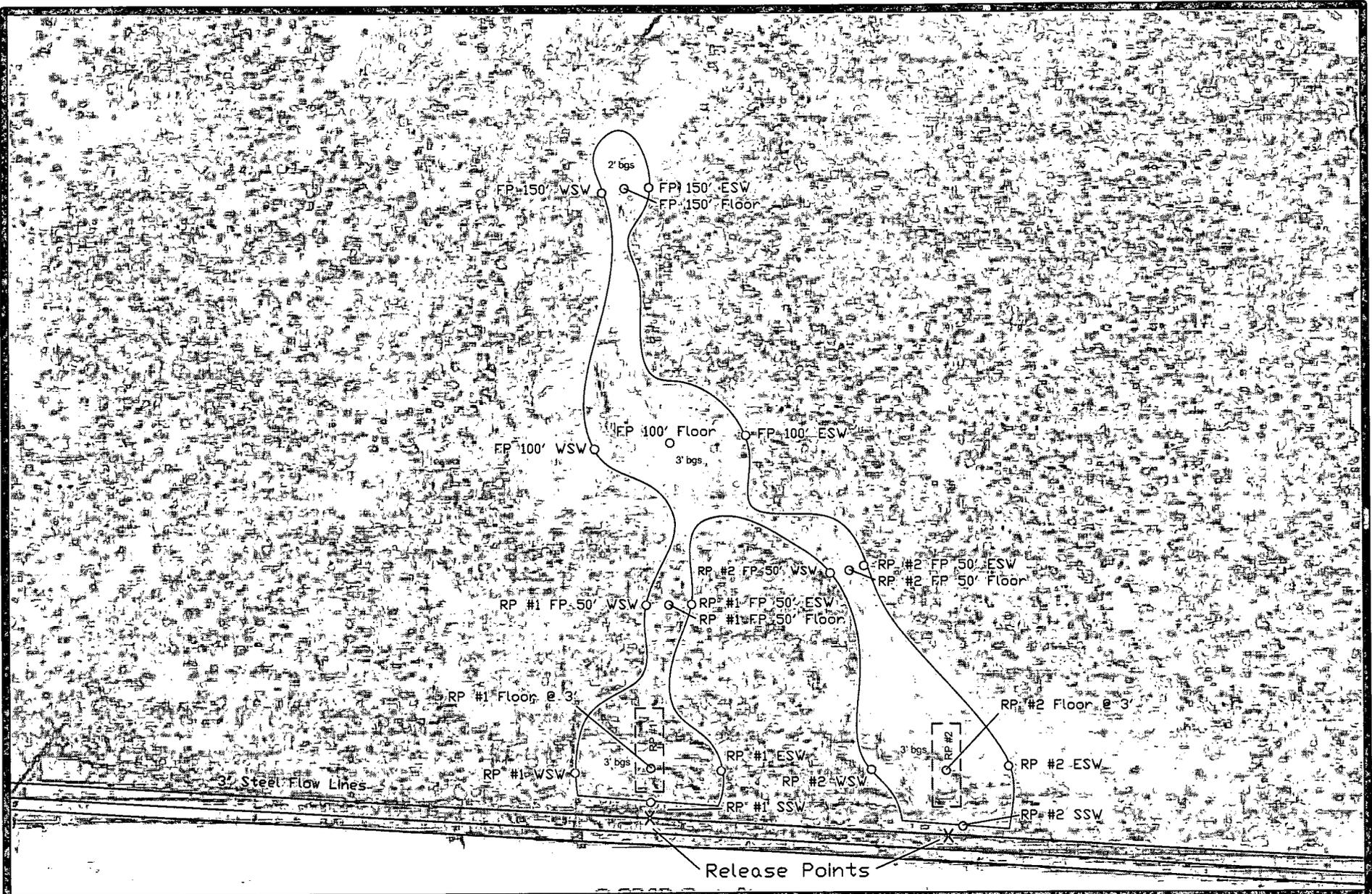
This report has been prepared for the benefit of BOPCO, LP. The information contained in this report, including all exhibits and attachments, may not be used by any other party without the express consent of Basin Environmental Service Technologies, LLC, and/or BOPCO, LP.

**7.0 DISTRIBUTION:**

- Copy 1: Mike Bratcher  
New Mexico Energy, Minerals and Natural Resources Department  
Oil Conservation Division (District 2)  
1301 E. Grand Avenue  
Artesia, NM 88210
- Copy 2: James Amos  
Bureau of Land Management  
602 E. Greene Street  
Carlsbad, New Mexico 88220
- Copy 3: Andrew Kraemer  
New Mexico State Land Office  
602 N. Canal, Suite B.  
Carlsbad, New Mexico 88220
- Copy 4: Tony Savoie  
BOPCO, LP  
522 W. Mermod, Suite 704  
Carlsbad, NM 88220
- Copy 5: Basin Environmental Service Technologies, LLC  
P.O. Box 301  
Lovington, NM 88260

## **FIGURES**





Legend:

○	Sample Location	—	Pipeline
---	Excavation Extent	- - -	3' bgs Grade
□	Test Trench		

**Figure 2**  
 Site and Sample Location Map  
 BOPCO, LP  
 Poker Lake Unit #145 Flow Line  
 Eddy County, New Mexico

**Basin Environmental Services**

Prep By: JWJ	Checked By: BJA
November 27, 2013	Scale 1" = 30'

## **TABLES**

TABLE 1

## CONCENTRATIONS OF BENZENE, BTEX, TPH &amp; CHLORIDES IN SOIL

BOPCO, LP  
 PLU #145 FLOW LINE  
 EDDY COUNTY, NEW MEXICO

SAMPLE LOCATION	SAMPLE DEPTH (BGS)	SAMPLE DATE	SOIL STATUS	METHOD: EPA SW 846-8021B, 5030					METHOD: 8015M			TOTAL	4500 Cl-B	
				BENZENE (mg/Kg)	TOLUENE (mg/Kg)	ETHYL-BENZENE (mg/Kg)	TOTAL XYLENES (mg/Kg)	TOTAL BTEX (mg/Kg)	GRO C <sub>6</sub> -C <sub>12</sub> (mg/Kg)	DRO C <sub>12</sub> -C <sub>28</sub> (mg/Kg)	ORO C <sub>28</sub> -C <sub>35</sub> (mg/Kg)	TPH C <sub>6</sub> -C <sub>35</sub> (mg/Kg)	CHLORIDE (mg/Kg)	
RP #1 Floor @ 3'	3'	11/6/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	1,120
RP #1 Floor @ 4'	4'	11/6/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	960
RP #1 Floor @ 5'	5'	11/6/2013	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	144
RP #2 Floor @ 3'	3'	11/6/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	944
RP #2 Floor @ 5'	5'	11/6/2013	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	912
RP #1 SSW	2.5'	11/8/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	256
RP #1 ESW	2.5'	11/8/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	640
RP #1 WSW	2.5'	11/8/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	64.0
RP #2 SSW	2.5'	11/8/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	288
RP #2 ESW	2.5'	11/8/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	576
RP #2 WSW	2.5'	11/8/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	320
RP #1 FP 50' WSW	2.5'	11/11/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	<16.0
RP #1 FP 50' ESW	2.5'	11/11/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	512
RP #1 FP 50' Floor	3'	11/11/2013	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	144
RP #2 FP 50' WSW	2.5'	11/11/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	160
RP #2 FP 50' ESW	2.5'	11/11/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	416
RP #2 FP 50' Floor	2.5'	11/11/2013	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	144
FP 150' WSW	1.5'	11/11/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	32.0
FP 150' ESW	1.5'	11/11/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	32.0
FP 150' Floor	2'	11/11/2013	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	144.0
FP 100' ESW	2.5'	11/11/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	432.0
FP 100' WSW	2.5'	11/12/2013	In-Situ	-	-	-	-	-	-	-	-	-	-	80.0
FP 100' Floor	3'	11/12/2013	In-Situ	<0.050	<0.050	<0.050	<0.150	<0.300	<10.0	<10.0	<10.0	<10.0	<10.0	560
<b>NMOCDCriteria</b>				<b>10</b>				<b>50</b>					<b>5,000</b>	<b>1,000</b>

- = Not analyzed.

# **APPENDICES**

**Appendix A**  
**Release Notification and Corrective Action**  
**(Form C-141)**

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

Form C-141  
Revised October 10, 2003

Submit 2 Copies to appropriate  
District Office in accordance  
with Rule 116 on back  
side of form

30-015-31006

Release Notification and Corrective Action

nMLB1122352326

OPERATOR

Initial Report  Final Report

Name of Company BOPCO, L.P. <u>260737</u>	Contact Tony Savoie
Address 522 W. Mermod, Suite 704 Carlsbad, N.M. 88220	Telephone No. 432-556-8730
Facility Name: Poker Lake Unit well #145	Facility Type E&P

Surface Owner State of N.M. & Federal	Mineral Owner Federal	Lease
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LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
E	32	23S	30E					Eddy

Poker Lake Ut 145 - J-31-23s-30E Latitude N 32.261914 Longitude W 103.912095

NATURE OF RELEASE

Type of Release: Produced water and crude oil	Volume of Release: 10 bbls of produced water, less than 1 bbl crude oil	Volume Recovered: None
Source of Release: 2 7/8 inch flow line from well #145	Date and Hour of Occurrence 6/7/11, hour unknown	Date and Hour of Discovery 6/7/11 10:15 a.m.
Was Immediate Notice Given? <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Not Required	If YES, To Whom?	
By Whom? Tony Savoie	Date and Hour 6/5/11 7:30 p.m.	
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.*	<p><b>RECEIVED</b></p> <p>JUL 11 2011</p> <p>NMOCD ARTESIA</p>	
Describe Cause of Problem and Remedial Action Taken.* A 2 7/8 flow line developed a leak due to external corrosion; a repair clamp was placed on the affected area of the pipe to stop the release.		

Describe Area Affected and Cleanup Action Taken.\* The release happened next to a lease road and traveled across the pasture and affected an area approximately 2 ft. wide by 200 ft. long where it connected to and area that had been affected by several produced water spills prior to this event. The spill occurred on State land and traveled onto Federal land where it mixed with the prior releases. The total area affected by all of the releases measures approximately 1200 sq. ft. On 7/6/11 a total of 17 soil samples were collected at depths ranging from surface to 4 ft below surface with a hand auger and field tested for chlorides; total vertical extent was not achieved, we plan on going back to the area and collect samples with a backhoe. A remediation plan will be developed and submitted to the NMOCD and BLM for approval.

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: <u>Tony Savoie</u>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Tony Savoie	Approved by District Supervisor: <u>Miki Beaudoin</u>	
Title: Waste Mgmt. & Remediation Specialist	Approval Date: <u>AUG 11 2011</u>	Expiration Date:
E-mail Address: TAsavoie@BassPet.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 7/11/11 Phone: 432-556-8730	Remediation per OCD Rules & Guidelines. <b>SUBMIT REMEDIATION PROPOSAL NOT LATER THAN:</b>	

\* Attach Additional Sheets If Necessary

9/11/2011  
**2RP-832**

**Appendix B**  
**Photographs**



Photograph of the initial release at the PLU #145 Release Site. (Looking Northwest)



Photograph of the initial release and narrow flowpath at the PLU #145 Release Site. (Looking Northwest)



Photograph of excavation and sample locations at release point RP #1. (Looking Northwest)



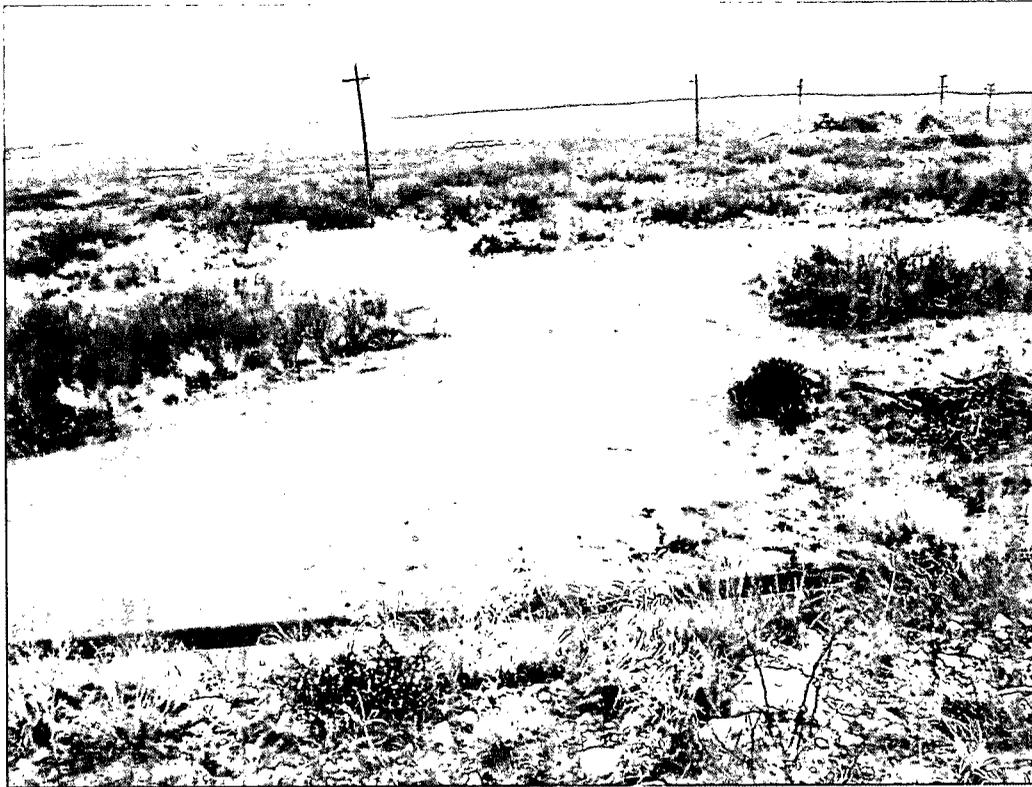
Photograph of excavation and sample at Release Point RP #2. (Looking Northeast)



Photograph of sample locations and excavated RP#2 Flowpath area. (Looking North)



Photograph of excavation and sample locations at convergence of RP#1 and RP#2 Flow Paths.



Photograph of western portion of the release site after remediation activities.



Photograph of eastern portion of the release site after remediation activities.

**Appendix C**  
**Laboratory Analytical Reports**

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 11/08/2013  
 Reported: 11/21/2013  
 Project Name: PLU #145  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY, NM

 Sampling Date: 11/06/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: RP #1 FLOOR @ 3' (H302729-01)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	1120	16.0	11/13/2013	ND	400	100	400	3.92		

**Sample ID: RP #1 FLOOR @ 4' (H302729-02)**

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	960	16.0	11/13/2013	ND	400	100	400	3.92		

**Sample ID: RP #1 FLOOR @ 5' (H302729-03)**

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	11/20/2013	ND	2.13	107	2.00	4.28		
Toluene*	<0.050	0.050	11/20/2013	ND	2.14	107	2.00	5.97		
Ethylbenzene*	<0.050	0.050	11/20/2013	ND	2.15	107	2.00	5.77		
Total Xylenes*	<0.150	0.150	11/20/2013	ND	6.50	108	6.00	8.38		
Total BTEX	<0.300	0.300	11/20/2013	ND						

Surrogate: 4-Bromofluorobenzene (PIE) 110 % 89.4-126

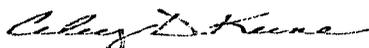
Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	144	16.0	11/13/2013	ND	400	100	400	3.92		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	

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

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 11/08/2013  
 Reported: 11/21/2013  
 Project Name: PLU #145  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY, NM

 Sampling Date: 11/06/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: RP #1 FLOOR @ 5' (H302729-03)**

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	11/20/2013	ND	193	96.4	200	5.24	
DRO >C10-C28	<10.0	10.0	11/20/2013	ND	189	94.5	200	5.46	
EXT DRO >C28-C35	<10.0	10.0	11/20/2013	ND					
<hr/>									
Surrogate: 1-Chlorooctane	85.0 %	65.2-140							
Surrogate: 1-Chlorooctadecane	89.3 %	63.6-154							

**Sample ID: RP #2 FLOOR @ 3' (H302729-04)**

Chloride, SM4500Cl-B	mg/kg	Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	944	16.0	11/13/2013	ND	400	100	400	3.92	



Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 11/08/2013  
 Reported: 11/21/2013  
 Project Name: PLU #145  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY, NM

 Sampling Date: 11/06/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: RP #2 FLOOR @ 5' (H302729-05)**

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	11/20/2013	ND	2.13	107	2.00	4.28		
Toluene*	<0.050	0.050	11/20/2013	ND	2.14	107	2.00	5.97		
Ethylbenzene*	<0.050	0.050	11/20/2013	ND	2.15	107	2.00	5.77		
Total Xylenes*	<0.150	0.150	11/20/2013	ND	6.50	108	6.00	8.38		
Total BTEX	<0.300	0.300	11/20/2013	ND						

Surrogate: 4-Bromofluorobenzene (PIC) 111 % 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	912	16.0	11/13/2013	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	11/11/2013	ND	170	84.9	200	11.6		
DRO >C10-C28	<10.0	10.0	11/11/2013	ND	169	84.5	200	6.55		
EXT DRO >C28-C35	<10.0	10.0	11/11/2013	ND						

Surrogate: 1-Chlorooctane 86.6 % 65.2-140

Surrogate: 1-Chlorooctadecane 94.2 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

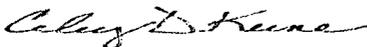
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported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

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager



November 11, 2013

JOEL LOWRY

Basin Environmental Service

P.O. Box 301

Lovington, NM 88260

RE: PLU #145

Enclosed are the results of analyses for samples received by the laboratory on 11/07/13 9:45.

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/ga/lab\\_accred\\_certif.html](http://www.tceq.texas.gov/field/ga/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:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 11/07/2013  
 Reported: 11/11/2013  
 Project Name: PLU #145  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY, NM

 Sampling Date: 11/06/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: RP #1 SSW (H302719-01)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	256	16.0	11/08/2013	ND	416	104	400	0.00		

**Sample ID: RP #1 ESW (H302719-02)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	640	16.0	11/08/2013	ND	416	104	400	0.00		

**Sample ID: RP #1 WSW (H302719-03)**

Chloride, SM4500CI-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	11/08/2013	ND	416	104	400	0.00		

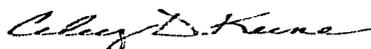
**Sample ID: RP #2 SSW (H302719-04)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	288	16.0	11/08/2013	ND	416	104	400	0.00		

Cardinal Laboratories

\*=Accredited Analyte

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Celestine D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 11/07/2013  
 Reported: 11/11/2013  
 Project Name: PLU #145  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY, NM

 Sampling Date: 11/06/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: RP #2 ESW (H302719-05)**

Chloride, SM4500CI-B	mg/kg	Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	576	16.0	11/08/2013	ND	416	104	400	0.00	

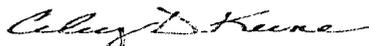
**Sample ID: RP #2 WSW (H302719-06)**

Chloride, SM4500CI-B	mg/kg	Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	320	16.0	11/08/2013	ND	416	104	400	0.00	

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Celestine 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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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager





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

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November 19, 2013

JOEL LOWRY

Basin Environmental Service

P.O. Box 301

Lovington, NM 88260

RE: POKER LAKE UNIT #145

Enclosed are the results of analyses for samples received by the laboratory on 11/12/13 13:00.

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](http://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 black ink that reads "Celey D. Keene". The signature is written in a cursive, flowing style.

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

Received:	11/12/2013	Sampling Date:	11/11/2013
Reported:	11/19/2013	Sampling Type:	Soil
Project Name:	POKER LAKE UNIT #145	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

**Sample ID: RP #1 FP 50' WSW (H302751-01)**

Chloride, SM4500CI-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	11/14/2013	ND	400	100	400	0.00		

**Sample ID: RP #1 FP 50' ESW (H302751-02)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	512	16.0	11/14/2013	ND	400	100	400	0.00		

**Sample ID: RP #1 FP 50' FLOOR (H302751-03)**

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	11/18/2013	ND	1.98	99.2	2.00	5.01		
Toluene*	<0.050	0.050	11/18/2013	ND	1.96	98.2	2.00	5.59		
Ethylbenzene*	<0.050	0.050	11/18/2013	ND	1.95	97.4	2.00	5.81		
Total Xylenes*	<0.150	0.150	11/18/2013	ND	5.71	95.2	6.00	5.49		
Total BTEX	<0.300	0.300	11/18/2013	ND						

Surrogate: 4-Bromofluorobenzene (PIC) 109 % 89.4-126

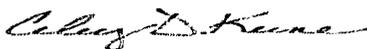
Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	144	16.0	11/14/2013	ND	400	100	400	0.00		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

Received:	11/12/2013	Sampling Date:	11/11/2013
Reported:	11/19/2013	Sampling Type:	Soil
Project Name:	POKER LAKE UNIT #145	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

**Sample ID: RP #1 FP 50' FLOOR (H302751-03)**

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	11/13/2013	ND	217	108	200	4.00	
DRO >C10-C28	<10.0	10.0	11/13/2013	ND	215	107	200	6.89	
EXT DRO >C28-C35	<10.0	10.0	11/13/2013	ND					
<hr/>									
Surrogate: 1-Chlorooctane	118 %	65.2-140							
Surrogate: 1-Chlorooctadecane	126 %	63.6-154							

**Sample ID: RP #2 FP 50' WSW (H302751-04)**

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	11/15/2013	ND	416	104	400	3.92	

**Sample ID: RP #2 FP 50' ESW (H302751-05)**

Chloride, SM4500CI-B	mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	416	16.0	11/15/2013	ND	416	104	400	3.92	

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 11/12/2013  
 Reported: 11/19/2013  
 Project Name: POKER LAKE UNIT #145  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY, NM

 Sampling Date: 11/11/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: RP #2 FP 50' FLOOR (H302751-06)**

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	11/18/2013	ND	1.98	99.2	2.00	5.01		
Toluene*	<0.050	0.050	11/18/2013	ND	1.96	98.2	2.00	5.59		
Ethylbenzene*	<0.050	0.050	11/18/2013	ND	1.95	97.4	2.00	5.81		
Total Xylenes*	<0.150	0.150	11/18/2013	ND	5.71	95.2	6.00	5.49		
Total BTEX	<0.300	0.300	11/18/2013	ND						

Surrogate: 4-Bromofluorobenzene (PIE) 109 % 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	<b>144</b>	16.0	11/15/2013	ND	416	104	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	11/13/2013	ND	217	108	200	4.00		
DRO >C10-C28	<10.0	10.0	11/13/2013	ND	215	107	200	6.89		
EXT DRO >C28-C35	<10.0	10.0	11/13/2013	ND						

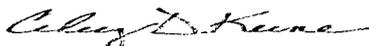
Surrogate: 1-Chlorooctane 126 % 65.2-140

Surrogate: 1-Chlorooctadecane 132 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

Received:	11/12/2013	Sampling Date:	11/11/2013
Reported:	11/19/2013	Sampling Type:	Soil
Project Name:	POKER LAKE UNIT #145	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

**Sample ID: FP 150' WSW (H302751-07)**

Chloride, SM4500Cl-B	mg/kg		Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	11/15/2013	ND	416	104	400	3.92		

**Sample ID: FP 150' ESW (H302751-08)**

Chloride, SM4500Cl-B	mg/kg		Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	32.0	16.0	11/15/2013	ND	416	104	400	3.92		

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

Received:	11/12/2013	Sampling Date:	11/11/2013
Reported:	11/19/2013	Sampling Type:	Soil
Project Name:	POKER LAKE UNIT #145	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

**Sample ID: FP 150' FLOOR (H302751-09)**

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	11/18/2013	ND	1.98	99.2	2.00	5.01		
Toluene*	<0.050	0.050	11/18/2013	ND	1.96	98.2	2.00	5.59		
Ethylbenzene*	<0.050	0.050	11/18/2013	ND	1.95	97.4	2.00	5.81		
Total Xylenes*	<0.150	0.150	11/18/2013	ND	5.71	95.2	6.00	5.49		
Total BTEX	<0.300	0.300	11/18/2013	ND						

Surrogate: 4-Bromofluorobenzene (PIE) 109 % 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	11/15/2013	ND	416	104	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	11/13/2013	ND	217	108	200	4.00		
DRO >C10-C28	<10.0	10.0	11/13/2013	ND	215	107	200	6.89		
EXT DRO >C28-C35	<10.0	10.0	11/13/2013	ND						

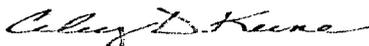
Surrogate: 1-Chlorooctane 118 % 65.2-140

Surrogate: 1-Chlorooctadecane 129 % 63.6-154

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

Received:	11/12/2013	Sampling Date:	11/11/2013
Reported:	11/19/2013	Sampling Type:	Soil
Project Name:	POKER LAKE UNIT #145	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	EDDY COUNTY, NM		

**Sample ID: FP 100' ESW (H302751-10)**

Chloride, SM4500Cl-B	mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>432</b>	16.0	11/15/2013	ND	416	104	400	3.92	

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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





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

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November 21, 2013

JOEL LOWRY

Basin Environmental Service

P.O. Box 301

Lovington, NM 88260

RE: PLU #145

Enclosed are the results of analyses for samples received by the laboratory on 11/14/13 11:55.

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](http://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 black ink that reads "Caley D. Keene". The signature is written in a cursive style with a large, prominent initial "C".

Caley D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 11/14/2013  
 Reported: 11/21/2013  
 Project Name: PLU #145  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY, NM

 Sampling Date: 11/12/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: FP 100' WSW (H302782-01)**

Chloride, SM4500CI-B	mg/kg	Analyzed By: AP							
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
<b>Chloride</b>	<b>80.0</b>	16.0	11/15/2013	ND	432	108	400	0.00	

**Sample ID: FP 100' FLOOR (H302782-02)**

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	11/18/2013	ND	1.98	99.2	2.00	5.01	
Toluene*	<0.050	0.050	11/18/2013	ND	1.96	98.2	2.00	5.59	
Ethylbenzene*	<0.050	0.050	11/18/2013	ND	1.95	97.4	2.00	5.81	
Total Xylenes*	<0.150	0.150	11/18/2013	ND	5.71	95.2	6.00	5.49	
Total BTEX	<0.300	0.300	11/18/2013	ND					

Surrogate: 4-Bromofluorobenzene (PIE) 109 % 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
<b>Chloride</b>	<b>560</b>	16.0	11/18/2013	ND	432	108	400	0.00	

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	11/15/2013	ND	182	91.1	200	5.05	
DRO >C10-C28	<10.0	10.0	11/15/2013	ND	182	90.8	200	6.00	
EXT DRO >C28-C35	<10.0	10.0	11/15/2013	ND					

Surrogate: 1-Chlorooctane 94.8 % 65.2-140

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 Basin Environmental Service  
 JOEL LOWRY  
 P.O. Box 301  
 Lovington NM, 88260  
 Fax To: (575) 396-1429

 Received: 11/14/2013  
 Reported: 11/21/2013  
 Project Name: PLU #145  
 Project Number: NONE GIVEN  
 Project Location: EDDY COUNTY, NM

 Sampling Date: 11/12/2013  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

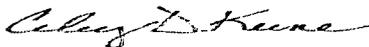
**Sample ID: FP 100' FLOOR (H302782-02)**

TPH 8015M	mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Surrogate: 1-Chlorooctadecane	94.9 %	63.6-154							

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

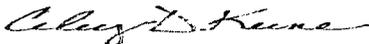
- ND Analyte NOT DETECTED at or above the reporting limit
- RPD Relative Percent Difference
- \*\* Samples not received at proper temperature of 6°C or below.
- \*\*\* Insufficient time to reach temperature.
- Chloride by SM4500Cl-B does not require samples be received at or below 6°C  
Samples reported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

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Celey D. Keene, Lab Director/Quality Manager



## **Appendix D**

### **NMCRIS Investigation Abstract Form**

NMCRIS No.: 121479

### NMCRIS INVESTIGATION ABSTRACT FORM (NIAF)

<b>1. NMCRIS Activity No.:</b>  121479	<b>2a. Lead Agency:</b> US Bureau of Land Management Carlsbad Field Office	<b>2b. Other Agency:</b> State of New Mexico	<b>3. Lead Agency Report No.:</b>
--	---	---	-----------------------------------

<b>4. Title of Report:</b> Class III Archaeological Survey for Basin Environmental's Remediation of a SWD Spill of the BOPCO PLU No. 145 Flowline  <b>Author:</b> Stephen Smith	<b>5. Type of Report</b> <input checked="" type="checkbox"/> Negative <input type="checkbox"/> Positive
---	---

**6. Investigation Type**

Research Design    Archaeological Survey/Inventory    Architectural Survey/Inventory    Test Excavation    Excavation  
 Collections/Non-Field Study    Compliance Decision Based on Previous Inventory    Overview/Lit Review    Monitoring  
 Ethnographic Study    Site/Property Specific Visit    Historic Structures Report    Other

**7. Description of Undertaking (what does the project entail?):**  
Basin Environmental plans remediate a SWD spill for the PLU No. 145 flowline. On September 28, 2009, Stephen Smith with Boone Arch Services of New Mexico conducted an extensive cultural survey for the area surrounding the proposed remediation area. \*Continued on Page 5

[X] Continuation

<b>8. Dates of Investigation:</b> 28-Jul-2011	<b>9. Report Date:</b> 30-Jul-2011
---	------------------------------------

**10. Performing Agency/Consultant:** Boone Arch Svcs of NM  
**Principal Investigator:** Rebecca L. Hill  
**Field Supervisor:** Stephen Smith  
  
**Field Personnel Names:** Stephen Smith

**Historian / Other:**

**11. Performing Agency/Consultant Report No.:**  
BASNM 07-11-27

**12. Applicable Cultural Resource Permit No(s):**  
BLM: 190-2920-11-O  
State: NM-11-157-S

NMCRIS No.: 121479

13. Client/Customer (project proponent):

Basin Environmental

Contact: Ben Arguijo

Address: 3100 Plains Hwy-PO Box 301, Lovington, NM 88260

Phone: (575) 396-2873

14. Client/Customer Project No.: Oil spill of the PLU #145 flowline

15. Land Ownership Status (must be indicated on project map):

Land Owner (By Agency)	Acres Surveyed	Acres in APE
US Bureau of Land Management Carlsbad Field Office	1.39	0.41
State of NM	0.85	0.25
<b>TOTALS</b>	<b>2.24</b>	<b>0.66</b>

16. Records Search:

Date of HPD/ARMS File Review: 7-27-11	Name of Reviewer: Stephen Smith	
Date of Other Agency File Review: 7-27-11	Name of Reviewer: Stephen Smith	Agency: BLM-CFO

17. Survey Data:

a. Source Graphics [ ] NAD 27 [X] NAD 83 Note: NAD 83 is the NMCRIS standard.

USGS 7.5' (1:24,000) topo map  Other topo map, Scale:

GPS Unit Accuracy  <1.0m  1-10m  10-100m  >100m

Aerial Photo(s)

Other Source Graphic(s):

b. USGS 7.5' Topographic Map Name

USGS Quad Code

Remuda Basin, NM (Provisional Edition 1985)

32103-C8

c. County: Eddy

d. Nearest City or Town: Loving, NM

e. Legal Description:

Township (N/S)

Range (E/W)

Section

T 23S

R 30E

31 & 32

Projected legal description? [ ] Yes [ ] No [ ] Unplatted

f. Other Description (e.g. well pad footages, mile markers, plats, land grant name, etc.):

No plats were provided for this undertaking. The work area was located by the use of GPS Coordinates, a USGS map, and written directions provided by the client. The GPS coordinates are as follows (Longitude and Latitude); 32.26199 degrees N, 103.91222 degrees W.

[ ] Continuation

18. Survey Field Methods:

Intensity:  100% coverage  >100% coverage

NMCRIS No.: 121479

Configuration:  block survey units  linear survey units (l x w): 977 ft @ 100 ft width

other survey units (specify):

Scope:  non-selective (all sites/properties recorded)  selective/thematic (selected sites/properties recorded)

Coverage Method:  systematic pedestrian coverage

other method (describe):

Survey Interval (m): 15 Crew Size: 1 Fieldwork Dates: 28-Jul-2011

Survey Person Hours: 1.50 Recording Person Hours: 0.00 Total Hours: 1.50

Additional Narrative:

None

[ ] Continuation

---

**19. Environmental Setting (NRCS soil designation; vegetative community; elevation; etc.):**

Topography: Aeolian, small to moderate size dunes (1.5 meters or less), north slope of a dune ridge, south margin of Remuda Basin

Elevation: 3,230 ft

Vegetation: Shin oak, mesquite, yucca, sage, four-wing salt bush, prickly pear, and various grasses

Visibility: 55-65 percent due to vegetative cover

NRCS: Kermit-Berino association: Sandy, deep soils from wind-worked mixed sand deposits

[ ] Continuation

---

**20.a. Percent Ground Visibility: 55-65 percent b. Condition of Survey Area (grazed, bladed, undistributed, etc.):**

The project area has been impacted by a lease road, a well pad, a number of metal (surface) flow lines, and cattle grazing.

[ ] Continuation

---

**21. CULTURAL RESOURCE FINDINGS**  Yes, see next report section  No, discuss why:

[ ] Continuation

---

**22. Attachments (check all appropriate boxes):**

USGS 7.5 Topographic Map with sites, isolates, and survey area clearly drawn (required)

Copy of NMCRIS Map Check (required)

LA Site Forms - new sites (with sketch map & topographic map) if applicable

LA Site Forms (update) - previously recorded & un-relocated sites (first 2 pages minimum)

Historic Cultural Property Inventory Forms, if applicable

List and Description of Isolates, if applicable

List and Description of Collections, if applicable

---

**23. Other Attachments:**

Photographs and Log

[ ] Other Attachments (Describe):

NMCRIS No.: 121479

24. I certify the information provided above is correct and accurate and meets all applicable agency standards.

Principal Investigator/Qualified Supervisor: Printed Name: Rebecca L. Hill

Signature: Stephen Smith Date: 7-31-11 Title: Field Supervisor

<p>25. Reviewing Agency</p> <p>Reviewer's Name/Date:</p> <p>Accepted [ ] Rejected [ ]</p>	<p>26. SHPO</p> <p>Reviewer's Name/Date:</p> <p>HPD Log #:</p> <p>Date sent to ARMS:</p>
---	--

**CULTURAL RESOURCE FINDINGS**

*[fill in appropriate section(s)]*

**SURVEY RESULTS:**

- Archaeological Sites discovered and registered: 0
- Archaeological Sites discovered and NOT registered: 0
- Previously recorded archaeological sites revisited (site update form required): 0
- Previously recorded archaeological sites not relocated (site update form required): 1
- TOTAL ARCHAEOLOGICAL SITES (visited & recorded): 0
- Total isolates recorded: 0  Non-selective isolate recording?
- HCPI properties discovered and registered: 0
- HCPI properties discovered and NOT registered: 0
- Previously recorded HCPI properties revisited: 0
- Previously recorded HCPI properties not relocated: 0
- TOTAL HCPI PROPERTIES (visited & recorded, including acequias): 0

**MANAGEMENT SUMMARY:**

Because no cultural resources were encountered during the course of this survey, Basin Environmental's proposed tract of land for remediation of a SWD spill is recommended as currently flagged. If cultural resources are encountered during any construction related activity, construction should cease and an archaeologist with the BLM should be immediately notified.

[ ] Continuation

IF REPORT IS NEGATIVE, YOU ARE DONE AT THIS POINT.

**SURVEY LA/HCPI NUMBER LOG**

Sites/Properties Discovered:

LA/HCPI No.	Field/Agency No.	Eligible? (Y/N/U, applicable criteria)
-------------	------------------	--

NMCRIS No.: 121479

Previously recorded revisited sites/HCPI properties:

LA/HCPI No.      Field/Agency No.      Eligible? (Y/N/U, applicable criteria)

---

**MONITORING LA NUMBER LOG (site form required)**

Sites Discovered (site form required):

Previously recorded sites (site update form required):

LA No.      Field/Agency No.

LA No.      Field/Agency No.

Areas outside known nearby site boundaries monitored?      [   ] Yes      [   ] No, Explain why:

---

**TESTING & EXCAVATION LA NUMBER LOG (site form required)**

Tested LA number(s)

Excavated LA number(s)

---

**Description of Undertaking (what does the project entail?):**

Basin Environmental plans remediate a SWD spill for the PLU No. 145 flowline. On September 28, 2009, Stephen Smith with Boone Arch Services of New Mexico conducted an extensive cultural survey for the area surrounding the proposed remediation area. Although the survey for the remediation work encroaches on the site boundary of LA 132349, as currently plotted on BLM-CFO GIS archaeological site maps, the site maps show the site location inaccurately. No artifacts were relocated within 150 ft of the work area. At the request of Bruce Boeke, BLM-CFO archaeologist, a two page site form is attached to this report explaining the site was not relocated as currently plotted on BLM maps. The site is more accurately plotted on the Mesa Field Services and Lone Mountain Archaeological Services site maps (site was originally recorded by the author of this report in 2001). The remediation area was flagged (white flagging tape) by Basin Environmental. A total of 977 ft was surveyed. A 100 ft cultural buffer was surveyed around the entire clean-up area to assure that no cultural resources will be impacted during remediation work. Access for the remediation work will be from an existing lease road and existing well pad. The lease road is the south boundary of the work area. A total of 2.24 acres was surveyed, of which 1.39 acres is on land administered by the BLM-CFO and 0.85 acres is on State of New Mexico land.

**Records Search:**

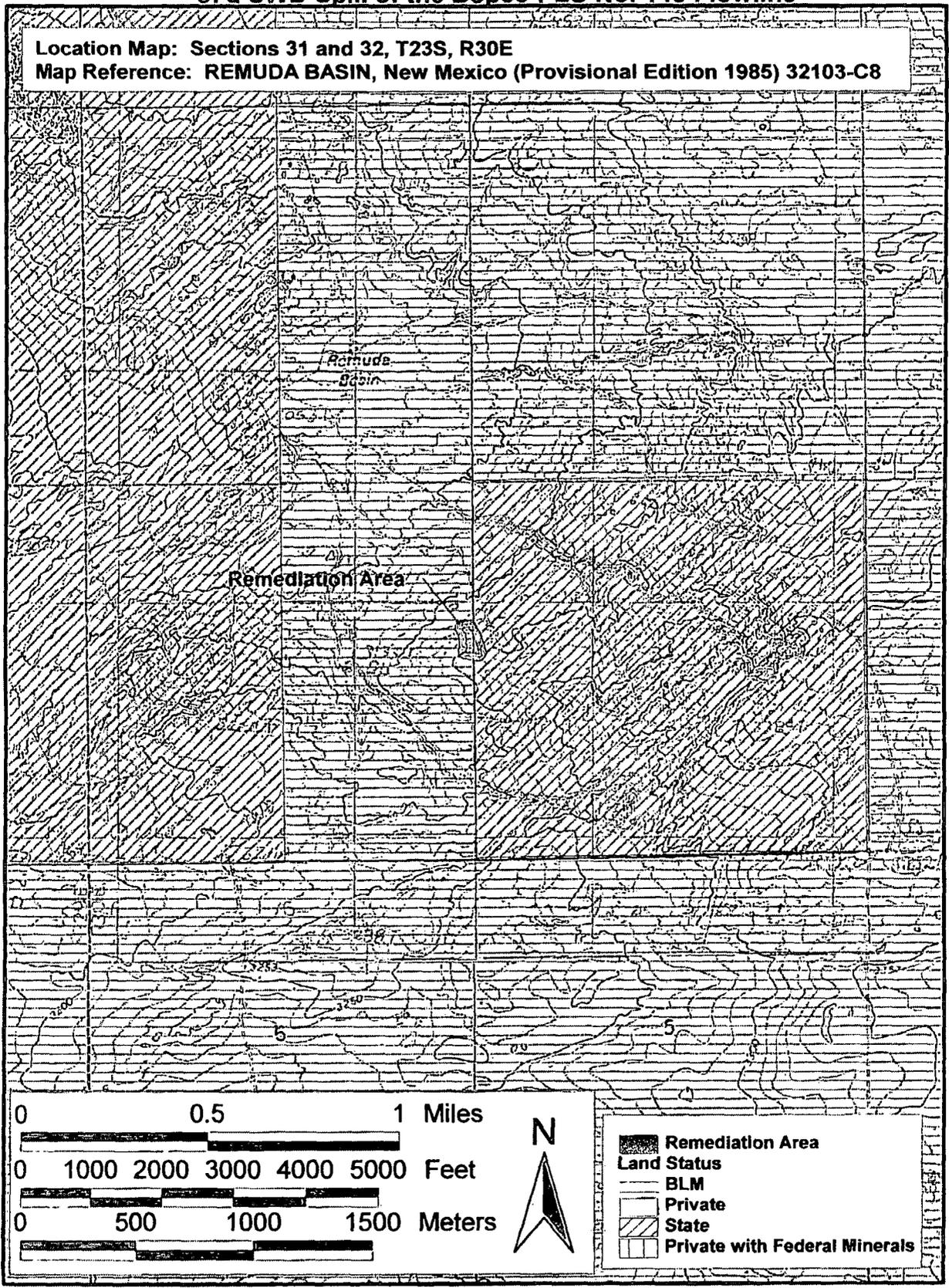
Date of ARMS File Review: 7-27-11	Name of Reviewer: Stephen Smith	ARMS-online
Date of NR/SR File Review:	Name of Reviewer:	
Date of Other Agency File Review : 7-27-11	Name of Reviewer: Stephen Smith	Agency: BLM-CFO

Findings: During the course of the pre-field research for this project it was learned that one previously recorded site is plotted within ¼ mile of the proposed pipeline, LA 132349. The previously recorded site is plotted within 500 ft of the project area.

# Survey for Basin Environmental's Remediation of a SWD Spill of the Bopco PLU No. 145 Flowline

Location Map: Sections 31 and 32, T23S, R30E

Map Reference: REMUDA BASIN, New Mexico (Provisional Edition 1985) 32103-C8



BASNM 07-11-27