



# Linn Energy Skelly #301

## REMEDIATION WORK PLAN

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API No. 30-015-29496

Release Date: June 20, 2012

Unit Letter E, Section 28, Township 17 South, Range 31 East

RP# 2RP-1214

BLM Event# NU12154TG

**January 27, 2016**

**Prepared by:**

Lance Crenshaw, Project Manager  
Environmental Department  
Diversified Field Service, Inc.  
206 W. Snyder  
Hobbs, NM 88240  
Phone: (575)964-8394  
Fax: (575)393-8396

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

**RE: Linn Energy Skelly #301 – Remediation Work Plan**  
UL/E, Section 28, T17S, R31E  
API No. 30-015-29496

Mr. Bratcher,

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

The site is located east of Loco Hills NM, in Eddy County. The leak site resulted from a hydrocarbon release. The source of the leak was due to the poly line busting located in the pasture area. A C-141 was submitted to the NMOCD on July 2, 2012 (2RP-1214) and BLM Event Number NU12154TG.

### **Site Assessment and Delineation**

On April 11, 2014, DFSI personnel obtained surface and delineation samples of the leak area, which included SP1-SP10. The field samples were tested for chloride levels as well as BTEX. The BTEX samples were performed using a Mini Rae Photoionization Detector (PID). All clean field samples found under the BLM/NMOCD standards were taken to Cardinal Lab of Hobbs to obtain confirmation samples.

An ARCH survey was conducted on June 25, 2014, and no cultural resources were recorded or updated during the survey. The results of the ARCH survey are attached.

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

### **Conclusion**

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

Because all of the samples, except for SP3, tested clean down to 2' BGS, DFSI proposes to till and blend the entire spill except in the area of SP3, which will be excavated to 4' BGS. The area of SP3 will require a 20-mil liner or river rocks before backfill, and sidewall samples at this sample point will be taken before backfill. Haul the contaminated soil to an approved disposal site, then reseed the entire area with a BLM/NMOCD approved seed mixture.

Following the approval of the above plan, and after the remediation has taken place, DFSI will submit all proper closure documentation to the NMOCD and BLM in accordance to the State and Federal Guidelines set forth.

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

Sincerely,



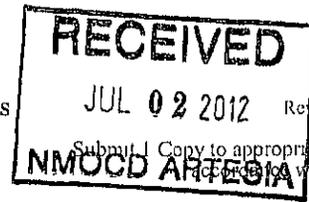
Michael Burton  
Environmental Operations Director  
Diversified Field Service, Inc.  
206 West Snyder  
Hobbs, NM 88240  
Office: (575)964-8394  
Mobile: (575)390-5454  
Fax: (575)964-8396  
Email: mburton@diversifiedfsi.com

cc Shelly Tucker  
NM Bureau of Land Management

Attachments: Initial Form C-141  
Site/Sample Map  
Sample Data  
Lab Analytical Data

District I  
1625 N. French Dr., Hobbs, NM 88240  
District II  
1301 W. Grand Avenue, Artesa, 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 Copy to appropriate District Office in accordance with 19.15.29 NMAC

**Release Notification and Corrective Action**

*nJMW 1219436244* OPERATOR  Initial Report  Final Report

Name of Company: Linn Operating <i>269324</i>	Contact: Joe Hernandez
Address: 2130 W. Bender Hobbs, NM 88240	Telephone No.: 575-738-1739
Facility Name: Skelly Unit # 301	Facility Type: Injection
Surface Owner: Federal	Mineral Owner: Federal
API No : 3001529496	

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the 1980	North/South Line	Feet from the 560	East/West Line	County
E	28	17S	31E	1980	North	560	West	Eddy

Latitude: 32.8073765024948 Longitude: -103.88144231194

**NATURE OF RELEASE**

Type of Release: Oil	Volume of Release: 3	Volume Recovered: 0
Source of Release: Polyline	Date and Hour of Occurrence: 06-20-2012 9am	Date and Hour of Discovery: 06-20-2012 9:30am
Was Immediate Notice Given? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? M. Bratcher - NM OCD / Terry Gregston-BLM	
By Whom? Joe Hernandez	Date and Hour 06-22-2012 3pm	
Was a Watercourse Reached? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse	
If a Watercourse was Impacted, Describe Fully.*:		
Describe Cause of Problem and Remedial Action Taken.*: Fuse on polyline developed hole. Further remedial action pending...		
Describe Area Affected and Cleanup Action Taken.* : Sprayed oil and water on to open field nearest location skelly sat#4.		

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: <i>Joe Hernandez</i>	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Joe Hernandez	Approved by District Supervisor.	Signed By <i>Mike Bratcher</i>
Title: Production Foreman	Approval Date: <b>JUL 12 2012</b>	Expiration Date:
E-mail Address: jhernandez@linenergy.com	Conditions of Approval:	Attached <input type="checkbox"/>
Date: 07-02-2012 Phone: 575-942-9492		

\* Attach Additional Sheets If Necessary

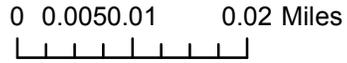
Remediation per OCD Rules & Guidelines. **SUBMIT REMEDIATION PROPOSAL NOT LATER THAN:**

8/12/12

*2RP-1214*

# Site Diagram

Linn, Skelly 301 Poly Line  
 UL/E, Sec. 28 T17S R31E  
 Eddy County, NM  
 Drafted By: Lance Crenshaw, 4-8-14



Spill Area:  
 14,646 sq. ft.

**Legend**

**Misc\_points**

**Types**

- Electrical Box
- Power Pole
- Headers
- Injection
- Pumpjacks
- Tanks
- Valves
- Other
- sample\_pts
- Source

**Pipeline**

**Type**

- Above Ground Line
- Buried Line

**Spill**

- <all other values>

**Spill\_Media**

- Oil and Produced H2O
- Oil
- Other
- Produced Water

Lance Crenshaw  
 GIS Technician

Soil Remediation and Ground Water Remediation  
 Environmental Assessments  
 Regulatory Compliance

**Environmental DFSI Services**

Office: 575-964-8394      Cell: 575-441-2359  
 Fax: 575-964-8396      Email: lcrenshaw@diversifiedfsi.com

Source: Esri, DigitalGlobe, GeoEye, I-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



# Skelly Unit #301

## PHOTO PAGE



Lease sign marking location



Spill area with sample points



Spill area with sample points



Spill area with sample points



Spill area with sample points







May 19, 2014

BRIAN WALL

LINN OPERATING-HOBBS

2130 W. BENDER

HOBBS, NM 88240

RE: SKELLY UNIT #301

Enclosed are the results of analyses for samples received by the laboratory on 05/12/14 16:05.

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 cursive script that reads "Celey D. Keene".

Celey D. Keene

Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	05/12/2014	Sampling Date:	05/12/2014
Reported:	05/19/2014	Sampling Type:	Soil
Project Name:	SKELLY UNIT #301	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SP. 1 @ 2' (H401439-01)**

BTEX 8260B		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	2.32	116	2.00	0.769		
Toluene*	<0.050	0.050	05/15/2014	ND	2.20	110	2.00	0.0923		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	2.05	103	2.00	0.259		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	6.27	105	6.00	0.427		
Total BTEX	<0.300	0.300	05/15/2014	ND						

Surrogate: Dibromofluoromethane 97.0 % 61.3-142

Surrogate: Toluene-d8 100 % 71.3-129

Surrogate: 4-Bromofluorobenzene 113 % 65.7-141

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>112</b>	16.0	05/14/2014	ND	400	100	400	14.8		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	05/15/2014	ND	201	100	200	1.88		
<b>DRO &gt;C10-C28</b>	<b>422</b>	10.0	05/15/2014	ND	212	106	200	1.74		

Surrogate: 1-Chlorooctane 140 % 65.2-140

Surrogate: 1-Chlorooctadecane 153 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

 Received: 05/12/2014  
 Reported: 05/19/2014  
 Project Name: SKELLY UNIT #301  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 05/12/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SP. 2 @ 2' (H401439-02)**

<b>BTEX 8260B</b>		<b>mg/kg</b>		<b>Analyzed By: ms</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	2.32	116	2.00	0.769		
Toluene*	<0.050	0.050	05/15/2014	ND	2.20	110	2.00	0.0923		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	2.05	103	2.00	0.259		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	6.27	105	6.00	0.427		
Total BTEX	<0.300	0.300	05/15/2014	ND						

*Surrogate: Dibromofluoromethane* 96.1 % 61.3-142

*Surrogate: Toluene-d8* 103 % 71.3-129

*Surrogate: 4-Bromofluorobenzene* 103 % 65.7-141

<b>Chloride, SM4500Cl-B</b>		<b>mg/kg</b>		<b>Analyzed By: AP</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>64.0</b>	16.0	05/14/2014	ND	400	100	400	14.8		

<b>TPH 8015M</b>		<b>mg/kg</b>		<b>Analyzed By: MS</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	05/15/2014	ND	201	100	200	1.88		
DRO >C10-C28	<10.0	10.0	05/15/2014	ND	212	106	200	1.74		

*Surrogate: 1-Chlorooctane* 103 % 65.2-140

*Surrogate: 1-Chlorooctadecane* 104 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

 Received: 05/12/2014  
 Reported: 05/19/2014  
 Project Name: SKELLY UNIT #301  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 05/12/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SP. 3 @ 5' (H401439-03)**

<b>BTEX 8260B</b>		<b>mg/kg</b>		<b>Analyzed By: ms</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	2.32	116	2.00	0.769		
Toluene*	<0.050	0.050	05/15/2014	ND	2.20	110	2.00	0.0923		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	2.05	103	2.00	0.259		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	6.27	105	6.00	0.427		
Total BTEX	<0.300	0.300	05/15/2014	ND						

*Surrogate: Dibromofluoromethane* 98.0 % 61.3-142

*Surrogate: Toluene-d8* 99.9 % 71.3-129

*Surrogate: 4-Bromofluorobenzene* 106 % 65.7-141

<b>Chloride, SM4500Cl-B</b>		<b>mg/kg</b>		<b>Analyzed By: AP</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>448</b>	16.0	05/14/2014	ND	400	100	400	14.8		

<b>TPH 8015M</b>		<b>mg/kg</b>		<b>Analyzed By: MS</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	05/15/2014	ND	201	100	200	1.88		
<b>DRO &gt;C10-C28</b>	<b>39.3</b>	10.0	05/15/2014	ND	212	106	200	1.74		

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

*Surrogate: 1-Chlorooctadecane* 140 % 63.6-154

Cardinal Laboratories

\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	05/12/2014	Sampling Date:	05/12/2014
Reported:	05/19/2014	Sampling Type:	Soil
Project Name:	SKELLY UNIT #301	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SP. 4 @ 2' (H401439-04)**

<b>BTEX 8260B</b>		<b>mg/kg</b>		<b>Analyzed By: ms</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	2.32	116	2.00	0.769		
Toluene*	<0.050	0.050	05/15/2014	ND	2.20	110	2.00	0.0923		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	2.05	103	2.00	0.259		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	6.27	105	6.00	0.427		
Total BTEX	<0.300	0.300	05/15/2014	ND						

Surrogate: Dibromofluoromethane 96.8 % 61.3-142

Surrogate: Toluene-d8 99.0 % 71.3-129

Surrogate: 4-Bromofluorobenzene 103 % 65.7-141

<b>Chloride, SM4500Cl-B</b>		<b>mg/kg</b>		<b>Analyzed By: AP</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>192</b>	16.0	05/14/2014	ND	400	100	400	14.8		

<b>TPH 8015M</b>		<b>mg/kg</b>		<b>Analyzed By: MS</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	05/15/2014	ND	201	100	200	1.88		
DRO >C10-C28	<10.0	10.0	05/15/2014	ND	212	106	200	1.74		

Surrogate: 1-Chlorooctane 130 % 65.2-140

Surrogate: 1-Chlorooctadecane 134 % 63.6-154

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	05/12/2014	Sampling Date:	05/12/2014
Reported:	05/19/2014	Sampling Type:	Soil
Project Name:	SKELLY UNIT #301	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SP. 5 @ 2' (H401439-05)**

<b>BTEX 8260B</b>		<b>mg/kg</b>		<b>Analyzed By: ms</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	1.85	92.4	2.00	5.18		
Toluene*	<0.050	0.050	05/15/2014	ND	1.73	86.5	2.00	7.75		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	1.61	80.7	2.00	8.03		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	4.93	82.2	6.00	6.38		
Total BTEX	<0.300	0.300	05/15/2014	ND						

Surrogate: Dibromofluoromethane 95.5 % 61.3-142

Surrogate: Toluene-d8 103 % 71.3-129

Surrogate: 4-Bromofluorobenzene 105 % 65.7-141

<b>Chloride, SM4500Cl-B</b>		<b>mg/kg</b>		<b>Analyzed By: AP</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
<b>Chloride</b>	<b>48.0</b>	16.0	05/14/2014	ND	400	100	400	14.8		

<b>TPH 8015M</b>		<b>mg/kg</b>		<b>Analyzed By: MS</b>							<b>S-06</b>
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier		
GRO C6-C10	<50.0	50.0	05/15/2014	ND	201	100	200	1.88			
<b>DRO &gt;C10-C28</b>	<b>193</b>	50.0	05/15/2014	ND	212	106	200	1.74			

Surrogate: 1-Chlorooctane 108 % 65.2-140

Surrogate: 1-Chlorooctadecane 170 % 63.6-154

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

 Received: 05/12/2014  
 Reported: 05/19/2014  
 Project Name: SKELLY UNIT #301  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 05/12/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SP. 6 @ 2' (H401439-06)**

BTEX 8260B		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	1.85	92.4	2.00	5.18		
Toluene*	<0.050	0.050	05/15/2014	ND	1.73	86.5	2.00	7.75		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	1.61	80.7	2.00	8.03		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	4.93	82.2	6.00	6.38		
Total BTEX	<0.300	0.300	05/15/2014	ND						

Surrogate: Dibromofluoromethane 96.0 % 61.3-142

Surrogate: Toluene-d8 101 % 71.3-129

Surrogate: 4-Bromofluorobenzene 102 % 65.7-141

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>80.0</b>	16.0	05/14/2014	ND	400	100	400	14.8		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	05/15/2014	ND	201	100	200	1.88		
DRO >C10-C28	<10.0	10.0	05/15/2014	ND	212	106	200	1.74		

Surrogate: 1-Chlorooctane 127 % 65.2-140

Surrogate: 1-Chlorooctadecane 129 % 63.6-154

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	05/12/2014	Sampling Date:	05/12/2014
Reported:	05/19/2014	Sampling Type:	Soil
Project Name:	SKELLY UNIT #301	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SP. 7 @ 2' (H401439-07)**

BTEX 8260B		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	1.85	92.4	2.00	5.18		
Toluene*	<0.050	0.050	05/15/2014	ND	1.73	86.5	2.00	7.75		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	1.61	80.7	2.00	8.03		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	4.93	82.2	6.00	6.38		
Total BTEX	<0.300	0.300	05/15/2014	ND						

Surrogate: Dibromofluoromethane 97.4 % 61.3-142

Surrogate: Toluene-d8 101 % 71.3-129

Surrogate: 4-Bromofluorobenzene 102 % 65.7-141

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	05/14/2014	ND	400	100	400	14.8		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	05/15/2014	ND	201	100	200	1.88		
<b>DRO &gt;C10-C28</b>	<b>18.2</b>	10.0	05/15/2014	ND	212	106	200	1.74		

Surrogate: 1-Chlorooctane 131 % 65.2-140

Surrogate: 1-Chlorooctadecane 137 % 63.6-154

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	05/12/2014	Sampling Date:	05/12/2014
Reported:	05/19/2014	Sampling Type:	Soil
Project Name:	SKELLY UNIT #301	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SP. 8 @ 2' (H401439-08)**

<b>BTEX 8260B</b>		<b>mg/kg</b>		<b>Analyzed By: ms</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	1.85	92.4	2.00	5.18		
Toluene*	<0.050	0.050	05/15/2014	ND	1.73	86.5	2.00	7.75		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	1.61	80.7	2.00	8.03		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	4.93	82.2	6.00	6.38		
Total BTEX	<0.300	0.300	05/15/2014	ND						

Surrogate: Dibromofluoromethane 97.9 % 61.3-142

Surrogate: Toluene-d8 101 % 71.3-129

Surrogate: 4-Bromofluorobenzene 104 % 65.7-141

<b>Chloride, SM4500Cl-B</b>		<b>mg/kg</b>		<b>Analyzed By: AP</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	05/14/2014	ND	400	100	400	14.8		

<b>TPH 8015M</b>		<b>mg/kg</b>		<b>Analyzed By: MS</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	05/15/2014	ND	201	100	200	1.88		
<b>DRO &gt;C10-C28</b>	<b>35.9</b>	10.0	05/15/2014	ND	212	106	200	1.74		

Surrogate: 1-Chlorooctane 136 % 65.2-140

Surrogate: 1-Chlorooctadecane 143 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

 Received: 05/12/2014  
 Reported: 05/19/2014  
 Project Name: SKELLY UNIT #301  
 Project Number: NONE GIVEN  
 Project Location: NOT GIVEN

 Sampling Date: 05/12/2014  
 Sampling Type: Soil  
 Sampling Condition: Cool & Intact  
 Sample Received By: Jodi Henson

**Sample ID: SP. 9 @ 2' (H401439-09)**

<b>BTEX 8260B</b>		<b>mg/kg</b>		<b>Analyzed By: ms</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	1.85	92.4	2.00	5.18		
Toluene*	<0.050	0.050	05/15/2014	ND	1.73	86.5	2.00	7.75		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	1.61	80.7	2.00	8.03		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	4.93	82.2	6.00	6.38		
Total BTEX	<0.300	0.300	05/15/2014	ND						

*Surrogate: Dibromofluoromethane* 94.6 % 61.3-142

*Surrogate: Toluene-d8* 101 % 71.3-129

*Surrogate: 4-Bromofluorobenzene* 103 % 65.7-141

<b>Chloride, SM4500Cl-B</b>		<b>mg/kg</b>		<b>Analyzed By: AP</b>						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	<16.0	16.0	05/14/2014	ND	400	100	400	14.8		

<b>TPH 8015M</b>		<b>mg/kg</b>		<b>Analyzed By: MS</b>							<b>S-06</b>
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier		
GRO C6-C10	<100	100	05/15/2014	ND	201	100	200	1.88			
<b>DRO &gt;C10-C28</b>	<b>1850</b>	100	05/15/2014	ND	212	106	200	1.74			

*Surrogate: 1-Chlorooctane* 76.5 % 65.2-140

*Surrogate: 1-Chlorooctadecane* 250 % 63.6-154

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\*=Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

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

Received:	05/12/2014	Sampling Date:	05/12/2014
Reported:	05/19/2014	Sampling Type:	Soil
Project Name:	SKELLY UNIT #301	Sampling Condition:	Cool & Intact
Project Number:	NONE GIVEN	Sample Received By:	Jodi Henson
Project Location:	NOT GIVEN		

**Sample ID: SP. 10 @ 2' (H401439-10)**

BTEX 8260B		mg/kg		Analyzed By: ms						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	05/15/2014	ND	1.85	92.4	2.00	5.18		
Toluene*	<0.050	0.050	05/15/2014	ND	1.73	86.5	2.00	7.75		
Ethylbenzene*	<0.050	0.050	05/15/2014	ND	1.61	80.7	2.00	8.03		
Total Xylenes*	<0.150	0.150	05/15/2014	ND	4.93	82.2	6.00	6.38		
Total BTEX	<0.300	0.300	05/15/2014	ND						

Surrogate: Dibromofluoromethane 97.1 % 61.3-142

Surrogate: Toluene-d8 98.9 % 71.3-129

Surrogate: 4-Bromofluorobenzene 98.5 % 65.7-141

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	05/14/2014	ND	400	100	400	14.8		

TPH 8015M		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
GRO C6-C10	<10.0	10.0	05/16/2014	ND	203	102	200	0.0683		
DRO >C10-C28	<10.0	10.0	05/16/2014	ND	229	114	200	0.184		

Surrogate: 1-Chlorooctane 97.1 % 65.2-140

Surrogate: 1-Chlorooctadecane 106 % 63.6-154

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- S-06 The recovery of this surrogate is outside control limits due to sample dilution required from high analyte concentration and/or matrix interference's.
- 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



---

Celey D. Keene, Lab Director/Quality Manager



**CHAIN-OF-CUSTODY AND ANALYSIS REQUEST**

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

**BILL TO**

**ANALYSIS REQUEST**

Company Name: Linn Energy  
 Project Manager: Brian Wall  
 Address: \_\_\_\_\_  
 City: \_\_\_\_\_ State: \_\_\_\_\_ Zip: \_\_\_\_\_  
 Phone #: \_\_\_\_\_ Fax #: \_\_\_\_\_  
 Project #: \_\_\_\_\_ Project Owner: \_\_\_\_\_  
 Project Name: \_\_\_\_\_  
 Project Location: Skilly 301  
 Sampler Name: Michael Alvey  
 FOR LAB USE ONLY

Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	MATRIX						DATE	TIME	C	PH	BTEX
				GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER :					
H401439	SP.1021	X	1	X						5/12/14	7:30	X	X	X
	SP.2021	X	1	X							8:00	X	X	X
	SP.3021	X	1	X							8:55	X	X	X
	SP.4021	X	1	X							9:30	X	X	X
	SP.5021	X	1	X							10:00	X	X	X
	SP.6021	X	1	X							10:30	X	X	X
	SP.7021	X	1	X							11:00	X	X	X
	SP.8021	X	1	X							11:20	X	X	X
	SP.9021	X	1	X							11:55	X	X	X
	SP.10021	X	1	X							12:15	X	X	X

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Relinquished By: [Signature]  
 Date: 5/12/14  
 Time: 4:05  
 Received By: [Signature]  
 Date: \_\_\_\_\_  
 Time: \_\_\_\_\_

Delivered By: (Circle One)  
 Sampler - UPS - Bus - Other: \_\_\_\_\_  
 Sample Condition:  
 Cool  Intact   
 YES NO YES NO  
 CHECKED BY: [Signature]  
 Initials: [Signature]

REMARKS:  
 E-mail Results To:  
 Ngladden@diversifiedfsi.com  
 Rpons@diversifiedfsi.com  
 Tjennings@diversifiedfsi.com  
 Phone Result:  Yes  No  
 Fax Result:  Yes  No  
 Add'l Phone #: \_\_\_\_\_  
 Add'l Fax #: \_\_\_\_\_

NMCRIS No.: 130990

## NMCRIS INVESTIGATION ABSTRACT FORM (NIAF)

<b>1. NMCRIS Activity No.:</b>  130990	<b>2a. Lead Agency:</b> US Bureau of Land Management Carlsbad Field Office	<b>2b. Other Agency(ies):</b>	<b>3. Lead Agency Report No.:</b>
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<b>4. Title of Report:</b> A Class III Archaeological Survey for Diversified Field Services' clean-up of Linn Energy's Skelly #301 Spill  <b>Author(s)</b> Hill, Rebecca L. and M. Jones	<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?):**

A pedestrian cultural resources survey was conducted on 25 Jun 2014 for Diversified Field Services' clean-up of Linn Energy's Skelly #301 spill. The spill area lies in Eddy County, NM on federal lands managed by the Bureau of Land Management/Carlsbad Field Office (BLM/CFO) in S28 (SE ¼ NW ¼ ) of T17S R31E.

The spill area's APE (area of potential effect) is an irregularly shaped block measuring 0.55 acres. The spill area was surveyed using 15 m (50 ft.) parallel transects throughout. The survey area is an irregularly shaped block measuring 4.53 acres.

Both the spill area's APE and survey area lie entirely on federal lands and no cultural resources were recorded or updated during the survey.

[ ] Continuation

<b>8. Dates of Investigation:</b> from: 25-Jun-2014 to: 25-Jun-2014	<b>9. Report Date:</b> 03-Jul-2014
---	------------------------------------

**10. Performing Agency/Consultant:** Boone Arch Services of NM

**Principal Investigator:** Hill, Rebecca L.

**Field Supervisor:** Hill, Rebecca L.

**Field Personnel Names:** Hill, Rebecca L.  
Schmid, Hans W. III

**Historian / Other:**

**11. Performing Agency/Consultant Report No.:**  
BASNM 05-14-14

**12. Applicable Cultural Resource Permit No(s):**  
BLM Permit No.: 190-2920-12-S

NMCRIS No.: 130990

13. Client/Customer (project proponent):

Diversified Field Services

Contact: Natalie Gladden

Address: 3412 N. Dal Paso, Hobbs, NM 88240

Phone: 575-964-8394

14. Client/Customer Project No.:

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	4.53	0.55
<b>TOTALS</b>	4.53	0.55

16. Records Search(es):

Date(s) of HPD/ARMS File Review: 18 Jun 2014	Name of Reviewer(s): J. Broxson	
Date(s) of Other Agency File Review: 18 Jun 2014	Name of Reviewer(s): J. Broxson	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

Loco Hills, NM	32103-G8
----------------	----------

c. County(ies): Eddy, NM

d. Nearest City or Town: Loco Hills, NM

e. Legal Description:

Township (N/S) Range (E/W) Section

17S	31E	28
-----	-----	----

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

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

[ ] Continuation

18. Survey Field Methods:

Intensity:  100% coverage  <100% coverage

Configuration:  block survey units  linear survey units (l x w):

NMCRIS No.: 130990

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: 2 Fieldwork Dates: from: 25-Jun-2014 to: 25-Jun-2014

Survey Person Hours: 1.75 Recording Person Hours: Total Hours: 1.75

**Additional Narrative:**

The spill area lies within one-quarter mile of two previously recorded archaeological sites: LAs 113655 and 100741. The spill is at a distance sufficient to avoid impacting these sites. For additional information about these sites, see Table 1 on page 5.

[ ] Continuation

---

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

According to the Natural Resources Conservation Service's online database, the spill area soil is a combination of Kermit-Berino fine sands, a combination deep and loamy sand, 0 to 3 percent slopes and Pajarito loamy fine sand, 0 to 3 percent slopes, eroded. These soils support grassland dominated by black grama, dropseeds, and bluestems. Shrubs, such as sand sage, shinnery oak, and mesquite are dispersed throughout. Winterfat and various forbs were also viewed in the spill area. The spill area sits among rolling sand dunes.

The spill area lies approximately 0.5 miles northwest of Taylor Draw, 10.6 miles east of Bear Grass Draw, 7.8 miles southeast of Mescalero Sands, and 11.5 miles west of Mescalero Ridge. The Pecos River lies approximately 25.6 miles to the west. The elevation of the spill area is 3770 ft. above mean sea level.

[ ] Continuation

---

**20.a. Percent Ground Visibility: 60 % b. Condition of Survey Area (grazed, bladed, undistributed, etc.):**

Heavy grazing is evident in the spill area with several flowlines and a buried pipeline in the southern portion.

[ ] Continuation

---

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

No cultural resources were recorded or updated during the survey. It is uncertain why aboriginal peoples did not inhabit the area.

[ ] 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 [ X ] Other Attachments  
(Describe): BLM Map

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

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

Signature: Rebecca Hill Date: 7 Jul 2014 Title: Principal Investigator

<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): 0
- 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:**

No cultural resources were recorded or updated during the survey; therefore, the project is recommended for approval as staked. If cultural materials are encountered during construction, work should be halted and archaeologists with BLM/CFO should be notified immediately.

[    ] 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.: 130990

Previously recorded revisited sites/HCPI properties:

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

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**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

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

Tested LA number(s)

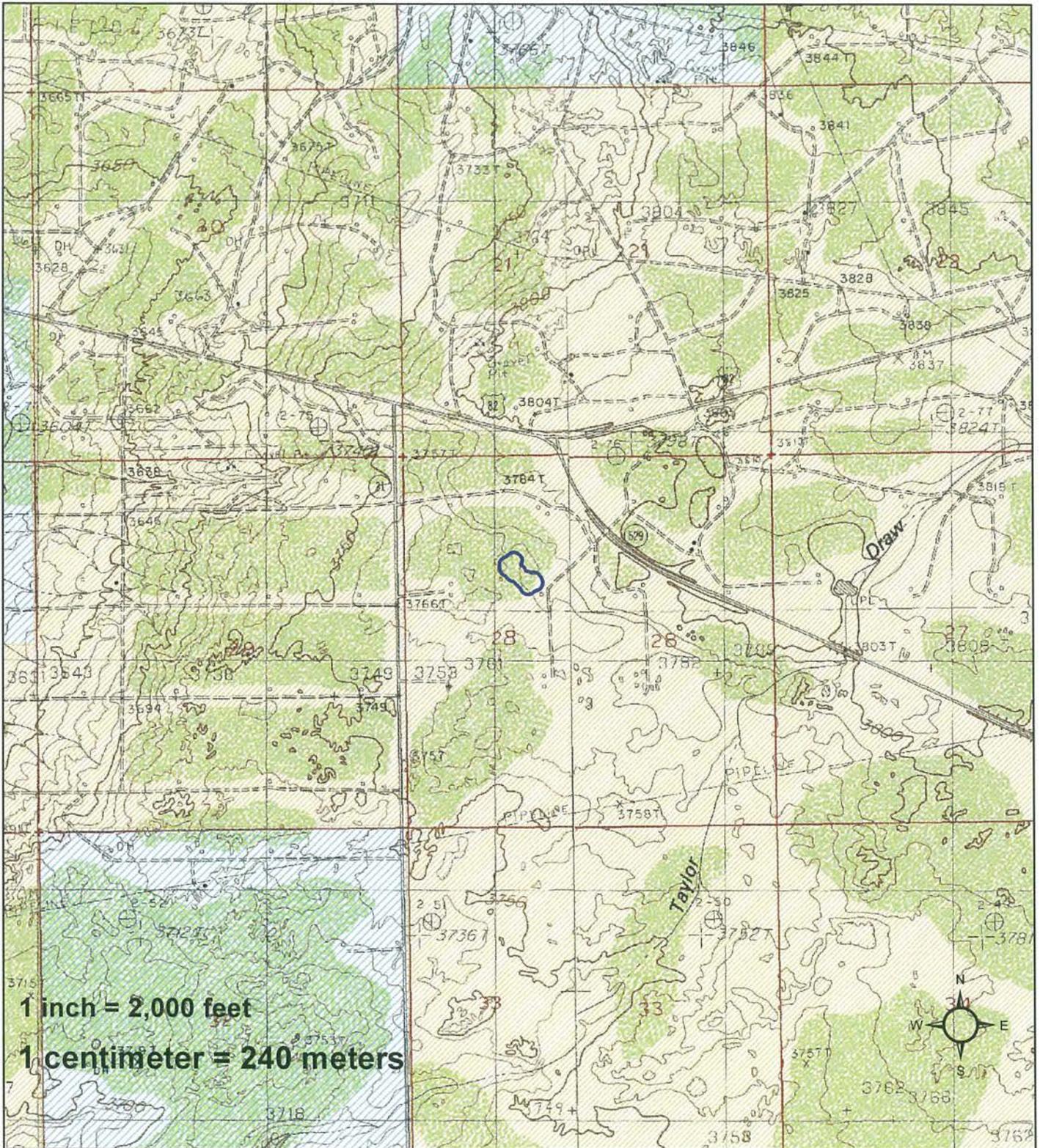
Excavated LA number(s)

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Table 1. Previously Recorded Archaeological Sites Within A One-quarter Mile

LA No.	Cultural/Temporal Affiliation	Eligibility
113655	Jornada Mogollon/Late Pithouse to Late Pueblo (750 – 1400 AD)	Eligible, D
100741	Jornada Mogollon/Late Pithouse to Late Pueblo (750 – 1400 AD)	Eligible, D

# Diversified Field Services Skelly #301 Spill



Legend					
	ArmsSubmittal		Forest Service		NM State Trust Lands
	BLM		BOI		NM State Game & Fish
	BOR		NPS		NM State Park
	DOE		Private		

Loco Hills 32103-G8  
T17S R31E S28

1:24,000

BASNM 05-14-14  
NMCRIS 130990

Diversified Field Services  
Skelly #301 Spill



**Legend**

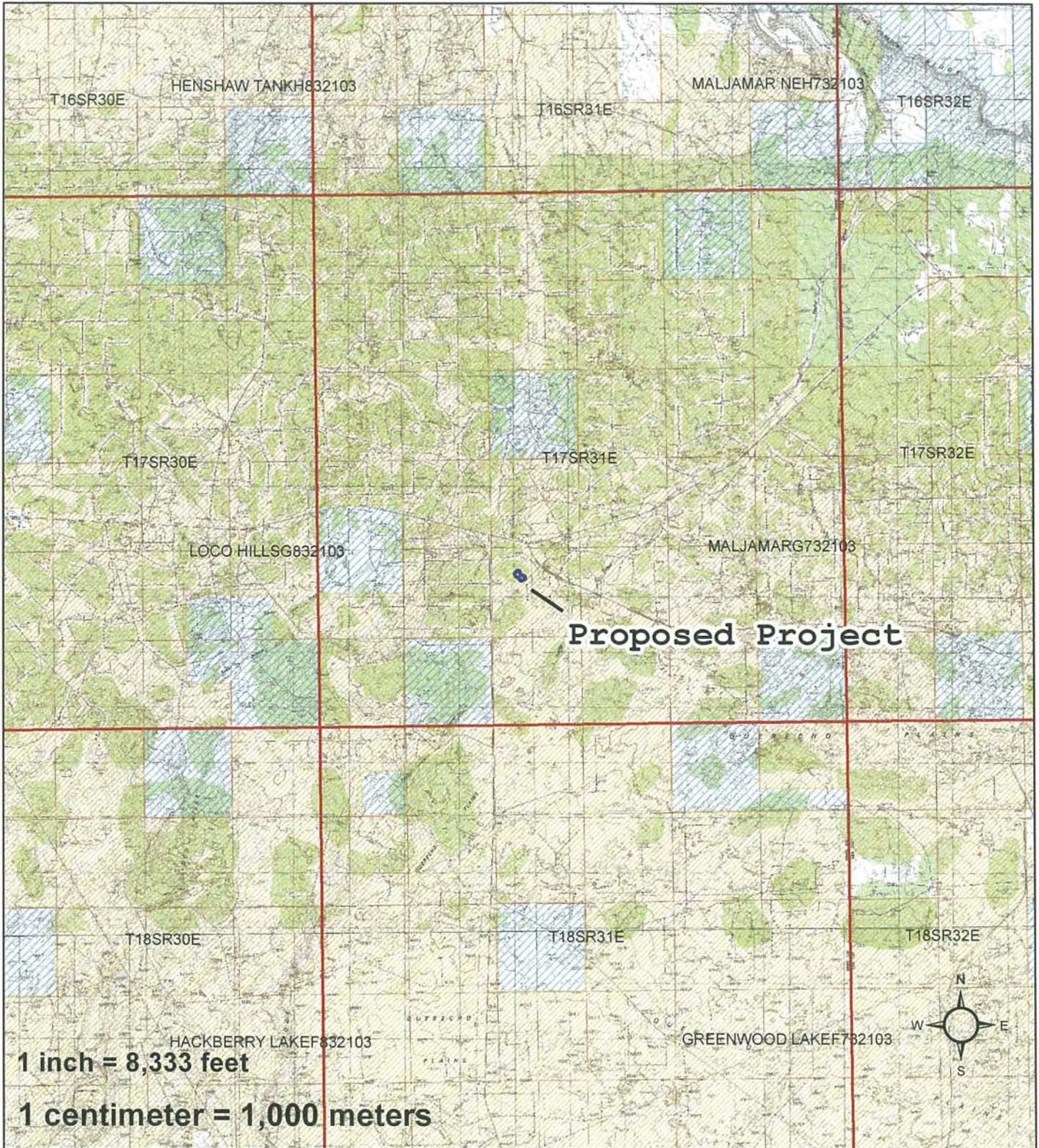
- Spill1
- Spill
- ArmsSubmittal

Loco Hills 32103-G8  
T17S R31E S28

1:2,000

BASNM 05-14-14  
NMCRIS 130990

# Diversified Field Services Skelly #301 Spill



**Legend**

ArmsSubmittal	Forest Service	NM State Trust Lands
BLM	BOI	NM State Game & Fish
BOR	NPS	NM State Park
DOE	Private	

Loco Hills 32103-G8  
T17S R31E S28

1:100,000

BASNM 05-14-14  
NMCRI 130990

