AMARILLO
921 North Bivins
Amarillo, Texas 79107
Phone 806.467.0607
Fax 806.467.0622

ARTESIA
408 West Texas Ave.
Artesia, New Mexico 88210
Phone 575.746.8768
Fax 575.746.8905

AUSTIN
911 West Anderson Lane
Suite 202
Austin, Texas 78757
Phone 512.989.3428
Fax 512.989.3487

HOBBS
318 East Taylor Street
Hobbs, New Mexico 88240
Phone 575.393.4261
Fax 575.393.4658

MIDLAND
2901 State Hwy 349
Midland, Texas 79706
Phone 432.522.2133
Fax 432.522.2180

SAN ANTONIO
11 Commercial Place
Schertz, Texas 78154
Phone 210.265.8025
Fax 210.568.2191

TULSA
525 South Main Street
Suite 535
Tulsa, Oklahoma 74103
Phone 918.742.0871
Fax 918.382.0232

ENVIRONMENTAL CONSULTING
ENGINEERING
DRILLING
CONSTRUCTION
SPILL MANAGEMENT
GENERAL CONTRACTING

Toll Free: 866.742.0742
www.talonlpe.com

June 2, 2011

Mr. Mike Bratcher
NMOCD District 2
1301 West Grand Avenue
Artesia, NM 88210

Subject: **Soil Assessment and Remediation Work Plan**
Quantum Resources Management, LLC
Artesia State Unit No. 46 release
API # 30-015-02541 -- 2RP-495

Dear Mr. Bratcher,

Quantum Resources Management, LLC has contracted Talon/LPE (Talon) to perform soil assessment and remediation services at the referenced Artesia State Unit No. 46 release. Talon's proposed work plan to perform soil assessment and remediation activities consists of the following:

Incident Date

November 26, 2010

Background Information

The Artesia State Unit No. 46 is located approximately sixteen (16) miles southeast of Artesia, New Mexico. The legal location for the site is Section 3, Township 18 South and Range 28 East in Eddy County, New Mexico. More Specifically the latitude and longitude for the release are 32.7777 North and -104.1649 West.

This site lies on undulating plains and low hills consisting of wind worked sandy deposits. Drainage courses in this area are normally dry. The local surface and shallow geology includes silty soils under lain by sand stone and hard caliches, providing an impermeable barrier to the migration of fluids in the area of the release. The New Mexico State Engineer web site indicates the nearest ground water data to be in S34-T17S-R28E. The ground water in Section 34 is reported to be at an average depth of 53' below ground surface (bgs).

The ranking for this site is 10 based on the as following:

Depth to ground water	50'-100'
Wellhead Protection Area	>1000'
Distance to surface water body	>1000'

Incident Description

On November 26, 2010 the flow line located at the Artesia State Unit No. 46 ruptured. The flow line was taken out of service, repaired and placed back into service. Less than twenty-five (25) barrels of produced water were released. A vacuum truck was brought to the location and fifteen (15) barrels of produced water were recovered. The impacted area was on the flow line right of way due north of the Artesia State Unit No. 46 Water Injection well (WIW). The impacted area on the right of way is estimated to be eighty-nine feet (89') long by forty-eight feet (48') wide. The surface of the impacted area was excavated to a depth of one foot (1') below ground surface (bgs). The excavated soil was transported to an NMOCD approved solid waste disposal facility for disposal (Lea Land, LLC).

Actions Taken

On January 10-11, 2011 Talon/LPE mobilized personnel were on the site to begin the assessment and soil sampling for the construction of a work plan. Grab soil samples were collected utilizing a split spoon auger rig. Grab soil samples were collected from the surface of the excavated area to a depth of forty feet (40') bgs.

The grab soil samples were collected by Talon personnel wearing clean nitrile gloves. The soil samples were placed in laboratory provided sample containers, stored on ice or otherwise refrigerated, and transported to Cardinal Laboratories in Hobbs, New Mexico for analysis of chlorides using method SM4500CL-B. All analytical testing was performed on a standard turn-around basis. The complete laboratory report is attached as Appendix II.

Analytical Results

Analytical results received from Cardinal Laboratories are summarized below:

Sample, Depth	Chlorides	Sample, Depth	Chlorides (mg/kg)
S-1, 0'	11000	S-1, 10'	6560 mg/kg
S-1, 2'	9800	S-1, 20'	7360
S-1, 4'	4960	S-1, 36'	272
S-1, 6'	4400	S-1, 38'	240
S-1, 8'	7440	S-1, 40'	256

Summary and Conclusion

- Groundwater in the project vicinity is greater than 50-feet below land surface per the New Mexico State Engineer Database.
- A dense hard rock formation was encountered at 8' feet below land surface.
- The chlorides have been documented to be 11000 mg/kg at one 1-foot bgs in the excavated area, the chlorides declined to 272 mg/kg in the soil sample S-1 at 36-feet bgs.

Proposed Remedial Actions

- The chloride impacted soil will be excavated to 4-feet bgs. The excavated soil will be transported to an NMOCD approved solid waste disposal facility for disposal.
- Soil samples will be collected for analytical testing from the side walls of the excavated area. The soil samples collected will be submitted to Cardinal Laboratories for analysis of chlorides using method SM4500CL-B. The chlorides will be corrected as agreed upon.
- A 20 Mil liner will then be installed into the bottom of the excavated area.
- The excavated area will be backfilled back to grade using new material transported from a local borrow pit.
- A final report will be provided to the NMOCD Artesia Office utilizing Form C-141.

IF we can be of further assistance please contact us at 575-746-8768 or mstubblefield@talonlpe.com.

Respectfully submitted,

TALON/LPE

Mike Stubblefield
Project Manager

David J. Adkins
District Manager

APPENDIX I

Groundwater Information

Initial C-141 form

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

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

POD Number	Sub basin	Use	County	Q 64	Q 16	Q 4	Sec	Tws	Rng	X	Y	Distance	Depth Well	Depth Water	Water Column
L 07643		DOM	LE	4	4	2	34	17S	28E	578979	3628574*	1696	120	53	67
RA 04561		PRO	ED		4	2	26	17S	27E	570871	3630142*	7476	250		
RA 09588		DOM	ED		1	2	33	18S	28E	576976	3619384*	8007	300		
RA 04048		OBS	LE	1	4	4	14	18S	27E	570841	3623030*	8194	2096		
RA 03917		PRO	LE	4	1	2	10	18S	27E	569019	3625660*	8947	130	50	80
RA 04554		PRO	ED			1	23	17S	27E	569859	3631947*	9181	220	40	180
L 01370 REPAR-1		DOM	LE		2	4	15	18S	27E	569328	3623355*	9371	96	58	38
L 03348 APPRO		DOM	LE	4	3	4	35	18S	28E	580236	3618135*	9528	105	65	40
RA 01493		IRR	ED		2	1	27	17S	27E	568468	3630529*	9864	876		

Average Depth to Water: **53 feet**

Minimum Depth: **40 feet**

Maximum Depth: **65 feet**

Record Count: 9

UTMNAD83 Radius Search (in meters):

Easting (X): 577806 Northing (Y): 3627348 Radius: 10000

Usage Filter:

Use: All Usages

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

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

Release Notification and Corrective Action

OPERATOR

X Initial Report ☐ Final Report

Name of Company Melrose Oil & Gas	Contact Garrett Newton
Address 1905 West Sears Ave., Artesia, New Mexico 88210	Telephone No. 575-513-0230
Facility Name Artesia State Unit #46	Facility Type WIW

Surface Owner	Mineral Owner	Lease No.

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	3	18S	28E	2310'	East	2267'	West	EDDY

Latitude 32.7777 Longitude 104.1649

NATURE OF RELEASE

Type of Release Produced Waters	Volume of Release <25 bbls	Volume Recovered 15 bbls
Source of Release Flow line	Date and Hour of Occurrence 11/26/2010 1:00AM	Date and Hour of Discovery 11/26/2010 1:00AM
Was Immediate Notice Given? X Yes ☐ No Not Required	If YES, To Whom? NMOCD after hours answering system.	
By Whom? Garrett Newton	Date and Hour 11/26/2010 am.	
Was a Watercourse Reached? ☐ Yes ☐ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*
The flow line located north of the Artesia Unit #46 ruptured. The flow line was taken out of service and then repaired.

Describe Area Affected and Cleanup Action Taken.*
The affected area was located on the north side of the well near the flow line. The affected area was measured to be eighty-nine (89') feet long by forty-eight (48') wide. The saturated soil from the impacted area was excavated and transported to and NMOCD approved Solid Waste disposal facility. Talon/LPE has been contracted to construct a work plan for the correction of the release.

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

Signature:	OIL CONSERVATION DIVISION	
Printed Name: Garrett Newton	Approved by District Supervisor:	
Title: Field Supervisor	Approval Date;	Expiration Date:
E-mail Address: gnewton@pvtnetworks.net	Conditions of Approval:	Attached ☐
Date: 12/8/2010 Phone: 575-513-0230		

* Attach Additional Sheets If Necessary

APPENDIX II

Laboratory Data

CARDINAL Laboratories

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

January 25, 2011

MIKE STUBBLEFIELD

TALON LPE

408 W. TEXAS AVE.

ARTESIA, NM 88210

RE: ARTESIA UNIT #46

Enclosed are the results of analyses for samples received by the laboratory on 01/21/11 11:05.

Cardinal Laboratories is accredited through Texas NELAP for:

Method SW-846 8021	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method SW-846 8260	Benzene, Toluene, Ethyl Benzene, and Total Xylenes
Method TX 1005	Total Petroleum Hydorcarbons

Certificate number T104704398-08-TX. Accreditation applies to solid and chemical materials and non-potable water matrices.

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

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

Accreditation applies to public drinking water matrices.

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

Sincerely,

Celey D. Keene

Celey D. Keene
Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TALON LPE
MIKE STUBBLEFIELD
408 W. TEXAS AVE.
ARTESIA NM, 88210
Fax To: (575) 745-8905

Received:	01/21/2011	Sampling Date:	01/10/2011
Reported:	01/25/2011	Sampling Type:	Soil
Project Name:	ARTESIA UNIT #46	Sampling Condition:	Cool & Intact
Project Number:	701395.001.01	Sample Received By:	Jodi Henson
Project Location:	SEC 3. 18S-28E		

Sample ID: S.1 0' (H100152-01)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**11000**	16.0	01/24/2011	ND	432	108	400	0.00	

Sample ID: S.1 2' (H100152-02)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**9800**	16.0	01/24/2011	ND	432	108	400	0.00	

Sample ID: S.1 4' (H100152-03)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**4960**	16.0	01/24/2011	ND	432	108	400	0.00	

Sample ID: S.1 6' (H100152-04)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**4400**	16.0	01/24/2011	ND	432	108	400	0.00	

Sample ID: S.1 8' (H100152-05)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**7440**	16.0	01/24/2011	ND	432	108	400	0.00	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Analytical Results For:

TALON LPE
MIKE STUBBLEFIELD
408 W. TEXAS AVE.
ARTESIA NM, 88210
Fax To: (575) 745-8905

Received:	01/21/2011	Sampling Date:	01/10/2011
Reported:	01/25/2011	Sampling Type:	Soil
Project Name:	ARTESIA UNIT #46	Sampling Condition:	Cool & Intact
Project Number:	701395.001.01	Sample Received By:	Jodi Henson
Project Location:	SEC 3. 18S-28E		

Sample ID: S.1 10' (H100152-06)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**6560**	16.0	01/24/2011	ND	432	108	400	0.00	

Sample ID: S.1 20' (H100152-07)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**7360**	16.0	01/24/2011	ND	432	108	400	0.00	

Sample ID: S.1 36' (H100152-08)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**272**	16.0	01/24/2011	ND	432	108	400	0.00	

Sample ID: S.1 38' (H100152-09)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**240**	16.0	01/24/2011	ND	432	108	400	0.00	

Sample ID: S.1 40' (H100152-10)

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

Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	**256**	16.0	01/24/2011	ND	432	108	400	0.00	

Cardinal Laboratories

*=Accredited Analyte

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL Laboratories

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

Notes and Definitions

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

Celey D. Keene

Celey D. Keene, Lab Director/Quality Manager

CARDINAL LABORATORIES

101 East Marland, Hobbs, NM 88240
(505) 393-2326 FAX (505) 393-2476

CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

2-2

Company Name:	Talon / LPE	BILL TO	
Project Manager:	Mike Stubblefield	P.O. #:	
Address:	408 W. Texas Ave.	Company:	Talon / LPE
City:	Artesia State: NM. Zip: 88210	Attn:	
Phone #:	575-441-7254 Fax #: 575-746-8905	Address:	
Project #:	701395.001.01 Project Owner: Quantum Res.	City:	
Project Name:	Artesia Unit #46	State: Zip:	
Project Location:	Sec. 3 - 18S - 28E	Phone #:	
Sampler Name:	Mike Stubblefield	Fax #:	

FOR LAB USE ONLY				MATRIX						PRESERV.			SAMPLING		ANALYSIS REQUEST
Lab I.D.	Sample I.D.	(G)RAB OR (C)OMP.	# CONTAINERS	GROUNDWATER	WASTEWATER	SOIL	OIL	SLUDGE	OTHER:	ACID/BASE:	ICE / COOL	OTHER:	DATE	TIME	Total Chlorides
H10052-1	S-1 0'	G				✓							1/10/2011	12:50 P	✓
2	S-1 2'	G				✓							1/10/2011	12:54 P	✓
3	S-1 4'	G				✓							1/10/2011	1:10 P	✓
4	S-1 6'	G				✓							1/10/2011	1:20 P	✓
5	S-1 8'	G				✓							1/10/2011	1:29 P	✓
6	S-1 10'	G				✓							1/10/2011	1:34 P	✓
7	S-1 20'	G				✓							1/10/2011	2:19 P	✓
8	S-1 36'	G				✓							1/11/2011	9:41 A	✓
9	S-1 38'	G				✓							1/11/2011	10:05 A	✓
10	S-1 40'	G				✓							1/11/2011	10:22 A	✓

Relinquished By:	Date: 1/30/2011	Received By:	Phone Result: ☐ Yes ☐ No	Add'l Phone #:	
Mike Stubblefield	Time: 4:00 Pm		Fax Result: ☐ Yes ☐ No	Add'l Fax #:	
Relinquished By:	Date:	Received By:	REMARKS:		
	Time:				

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

6°C

Sample Condition		CHECKED BY: (Initials)
Cool	Intact	
☑ Yes ☐ No	☑ Yes ☐ No	

† Cardinal cannot accept verbal changes. Please fax written changes to 505-393-2476

#20