



**Whole Earth Environmental, Inc.**

2103 Arbor Cove  
Katy, Tx. 77494  
281.394.2050  
whearth@msn.com

HOBBS OGD

JAN 11 2012

RECEIVED

January 7, 2012

NMOCD  
1625 No. French Dr.  
Hobbs, NM 88241

Attn: Geoffrey Leking

**Reference: 1RP-2751**

Dear Mr. Leking:

Enclosed, please find a copy of our remediation protocol for the Chaparral Energy WDQSU-12 spill located in Unit Letter F, Section 30, Township 24S, Range 38E.

The attached laboratory analytical report from Cardinal indicates that the affected area meets NMOCD clean-up standards at a distance sufficient to protect against groundwater impact. Our protocol describes the excavation and commercial disposal of the highly contaminated soils to a depth of 5' followed by the installation of a geo-synthetic liner and backfill with fresh topsoils.

Thank you for your guidance and personal attention to this project.

Warmest personal regards,

Mike Griffin  
President  
Whole Earth Environmental, Inc.

BOTH DOX  
NEED DATE  
STAMP



## **Executive Summary**

### **1RP-2751**

#### **Location**

The site is located approximately seven miles northeast of the City of Jal, Lea County, New Mexico on fee lands. The primary land use is grazing of cattle however extensive oil and gas operations are prevalent in the area. The area is semi-arid with a net precipitation / evaporation amount of  $-73''$  per year.

#### **Spill Event**

The seep of approximately 200 barrels of saltwater from was discovered on August 31, 2011. The breach occurred due to a buried failed coupling seal. The line has been subsequently replaced. Approximately 160 barrels of fluid were recovered by vacuum truck & removed to disposal.

#### **Investigation Activities**

The area was initially investigated with a Geonics EM-38 electromagnetic survey device and it was determined that the spill area encompassed an area 5,300 square feet. The site was initially bored by Atkins Engineering to a total depth of 75' below ground surface at which point the chloride concentrations matched background.

#### **Remediation Activities**

We propose to excavate and commercially dispose of all soils within the deeply affected area to a minimum depth of 5' below ground surface and installing a geotextile liner. Any superficially impacted soils will be tested and either commercially disposed of or will be mixed and blended with fresh soils to achieve the NMOCD closure standards.



## **Exhibit Index**

### **WDSQU-#12 1RP-2751**

1. Initial C-141
2. Depth to Ground Water Info
3. NMOCD Assessment Ranking
4. Satellite Zoom In
5. EM38 Site Survey
6. Bore Sites Sat. View
7. Bore Logs
8. Excavation Dimensions
9. Broken Sleeve
10. Split Spoon @ 60'

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**

Initial Report  Final Report

Name of Company: CHAPARRAL ENERGY LLC	Contact: Derek E. Presley
Address: 701 CEDAR LAKE BLVD. OKLAHOMA CITY, OKLAHOMA 73114-7806	Telephone No.: (405) 426-4091 X 1491
Facility Name: WDQSU #12 @ SAT. #1	Facility Type: INJECTION HEADER
Surface Owner: BILL GROBE	Mineral Owner
Lease No.:	

**LOCATION OF RELEASE** APL # 30-025-12271-00-00

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
F	30	24S	38E	2352	NORTH	1488	WEST	LEA

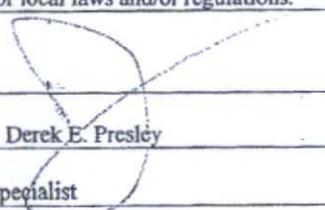
Latitude: 32.18916

Longitude: -103.10335

**NATURE OF RELEASE**

Type of Release: PRODUCE WATER	Volume of Release: 200BBS	Volume Recovered: 160
Source of Release: 2" VICTAULIC F/G > TO STEEL LINE	Date and Hour of Occurrence: 8-31-11	Date and Hour of Discovery: 8-31-11
Was Immediate Notice Given? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom? WEE Inc. was contacted for initial investigation of site, Roy R. Rascon called Geoffery Leking for notification of leak	
By Whom? Roy R. Rascon WEE INC.	Date and Hour: unknown	
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.* High pressure Victaulic connection rusted over period of time, rubber seal blew out. Located source isolated and vacuumed water up and dispose of properly		
Describe Area Affected and Cleanup Action Taken.* CLEAN UP ACTION: Whole Earth Environmental Inc. has been contracted to delineate and sample site. Various samples will be sent to Cardinal Labs in Hobbs. Site will be closed in accordance to NMOCD regulations.		
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.		

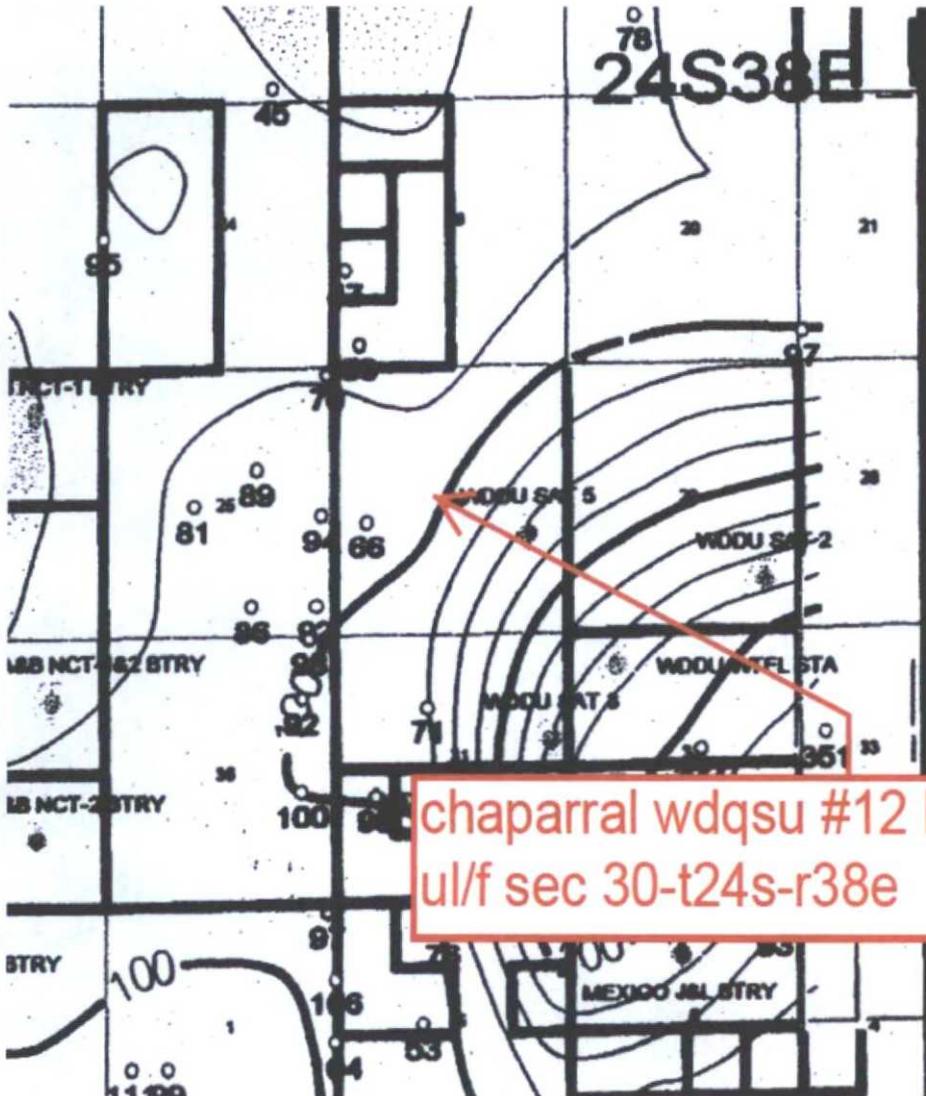
**OIL CONSERVATION DIVISION**

Signature: 	ENV ENGINEER:	
Printed Name: Derek E. Presley	Approved by District Supervisor: 	
Title: Safety Specialist	Approval Date: 11/3/11	Expiration Date: 01/3/12
E-mail Address: derek.presley@chaparralenergy.com	Conditions of Approval: SUBMIT NECESSARY PAPERWORK FOR ALL INVESTIGATION WHEN	
Date: 10/30/11 Phone: (405) 426-4091 X 1491	Attached <input type="checkbox"/> IRP-11-11-2751	

\* Attach Additional Sheets If Necessary

VERIFIED.

CHAPARRAL ENERGY LLC  
WDQSU #12 LEAK @ SATELLITE #1 INJECTION HEADER #1  
UL/F SEC 30 - T24S - R38E  
LEAK SOURCE GPS LAT. & LON WGS84  
N32.18916 / W103.10335  
DEPTH TO GW: +/- 70'bgs  
INFO FROM CHEVRON/TEXACO DEPTH TO GROUNDWATER MAP



chaparral wdqsu #12 leak @ sat. #1  
ul/f sec 30-t24s-r38e

# SITE ASSESSMENT CRITERIA (NMOCD)

CHAPARRAL ENERGY LLC.  
 WDQSU #12 @ SAT. #1  
 UL/F SEC 30 - T24S - R38E  
 GPS LAT & LON WGS84 N32.18916 / W104.1033  
 DTW: +/- 70'BGS according to Cheron Texaco water data map for Lea Co.

### DEPTH TO GROUND WATER

(Vertical distance from contaminants to seasonal high water elevation of ground water.)

Less than 50' BGS	(20 points)	
50' to 99' BGS	(10 points)	
Greater than 100' BGS	(0 points)	10

### WELLHEAD PROTECTION AREA

(Less than 200' from a private domestic water source, or; less than 1000' from all other water sources)

YES	(20 points)	
NO	(0 points)	0

### DISTANCE TO SURFACE WATER BODY

(Horizontal distance to perennial lakes, ponds, rivers, streams, creeks, irrigation canals, and ditches)

Less than 200'	(20 points)	
200' to 1000'	(10 points)	
Greater than 1000'	(0 points)	0

RANKING SCORE TOTAL POINTS		0
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### CLEAN - UP TARGET CONCENTRATIONS FOR "SITE CLOSURE"

IF RANKING SCORE IS:	> 19	10 - 19	0 - 9
BENZENE (ppm)*	10	10	10
BTEX (ppm)*	50	50	50
TPH (ppm)**	100	1000	5000

\*A field vapor headspace measurement of 100 ppm may be substituted for a laboratory analysis.

\*\* The contaminant concentration for TPH is the concentration above background levels.

CHAPARRAL  
WDQSU #12 @ SAT #2 LEAK  
1RP-2751

WDQSU #12 @ Sat #1

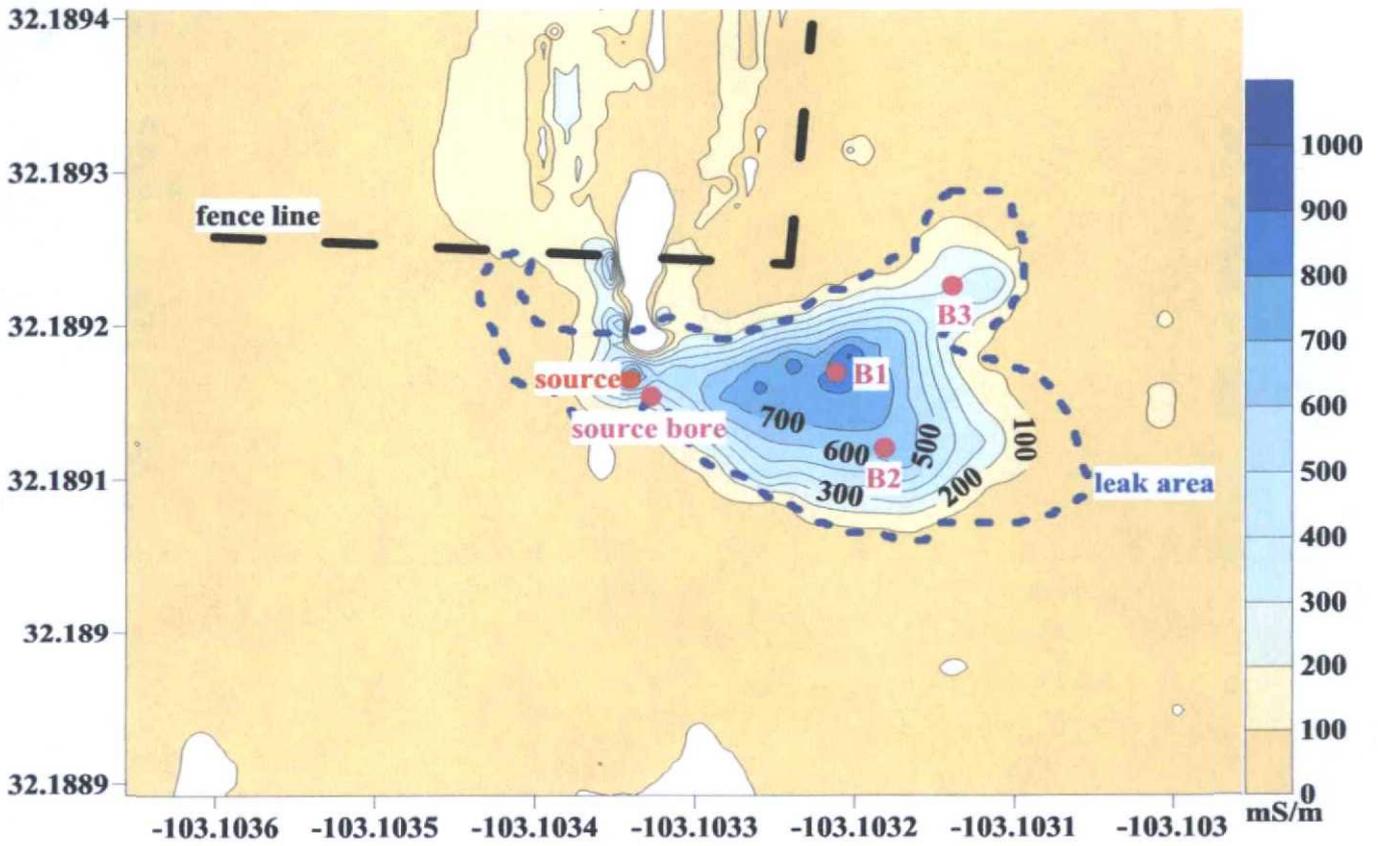
1RP-2751 Chaparral WDQSU #12 Leak PR-158

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Page 7  
Google earth

101  
←  
LEAK  
ON  
SPRAY

9-22-11  
CHAPARRAL ENERGY LLC.  
WDQSU #12 LEAK @ SATELLITE #1  
UL/F SEC 30 - T24S - R38E  
GPS LAT & LON WGS84  
N32.18916 / W103.1033  
DEPTH TO GW: +/- 70'BGS  
EM38 Site Survey Map



CHAPARRAL WQSU #12  
BORE SITES WITHIN LEAK AREA

source

B1

B2

B3



# Log of Boring Chapparral WDQSU # 12 @Sat #1 Source

Whole Earth Environmental, Inc.  
2103 Arbor Cove  
Katy TX 77494

Contact: Mike Griffin

Job#: WEWD121.MWD.11

Date : 10/27/11  
Boring Location : 32°11.350, 103°06.199  
Site Location : NE Jal, NM  
Auger Type : 3/4 Hollow  
Logged By : M. Bates

Depth in Feet	GRAPHIC	USCS	Sample	DESCRIPTION
0		SP		Silty sand, brown, loose, damp
5				
10				
15				
20	GW			Sandy and gravel, tan, loose, damp
25				
30				
35				
40				Total Depth 40' (AEA TH-4)
45				

Bentonite Seal

01-09-2012 C:\Users\Paddy\Documents\Whole Earth\Chapparral WDQSU # 12 @Sat #1\Source.bor



# Log of Boring Chapparral WDQSU # 12 @Sat #1 B1

Whole Earth Environmental, Inc.  
2103 Arbor Cove  
Katy TX 77494

Contact: Mike Griffin

Job#: WEWD121.MWD.11

Date : 10/27/11  
Boring Location : 32°11.350, 103°06.191  
Site Location : NE Jal, NM  
Auger Type : 3¼ Hollow  
Logged By : M. Bates

Depth in Feet	GRAPHIC	USCS	Sample	DESCRIPTION
0		SP		Silty sand, brown, loose, damp
				Sand and caliche, tan, loose, damp
5		SP		
10	Total Depth 10' (AEA TH-2)			
15				

Bentonite Seal

01-09-2012 C:\Users\Paddy\Documents\Whole Earth\Chapparral WDQSU # 12 @Sat #1b1.bor

Whole Earth Environmental, Inc.  
2103 Arbor Cove  
Katy TX 77494

Contact: Mike Griffin

Job#: WEWD121.MWD.11

Date : 10/27/11  
Boring Location : 32°11.347, 103°06.139  
Site Location : NE Jal, NM  
Auger Type : 3/4 Hollow  
Logged By : M. Bates

Depth in Feet	GRAPHIC	USCS	Sample	DESCRIPTION
0		SP		Silty sand, brown, loose, damp
5				Sand and caliche, tan, loose, damp
10		SP		
15				
20				
25		CL		Sandy clay, tan, loose, dry
30				
35		CL		Sandy clay, tan, loose, moist
40				
45				
50				
55		CL		
60				
65		SP		
70				Sand, reddish tan, loose, wet
75	Total Depth 75' (AEA TH-1)			
80				

Bentonite Seal

01-09-2012 C:\Users\Paddy\Documents\Whole Earth\Chapparral WDQSU # 12 @Sat #1\B2.bor



Log of Boring Chapparral WDQSU # 12 @Sat #1 B3

Whole Earth Environmental, Inc.  
2103 Arbor Cove  
Katy TX 77494

Contact: Mike Griffin

Job#: WEWD121.MWD.11

Date : 10/27/11  
Boring Location : 32°11.355, 103°06.186  
Site Location : NE Jal, NM  
Auger Type : 3/4 Hollow  
Logged By : M. Bates

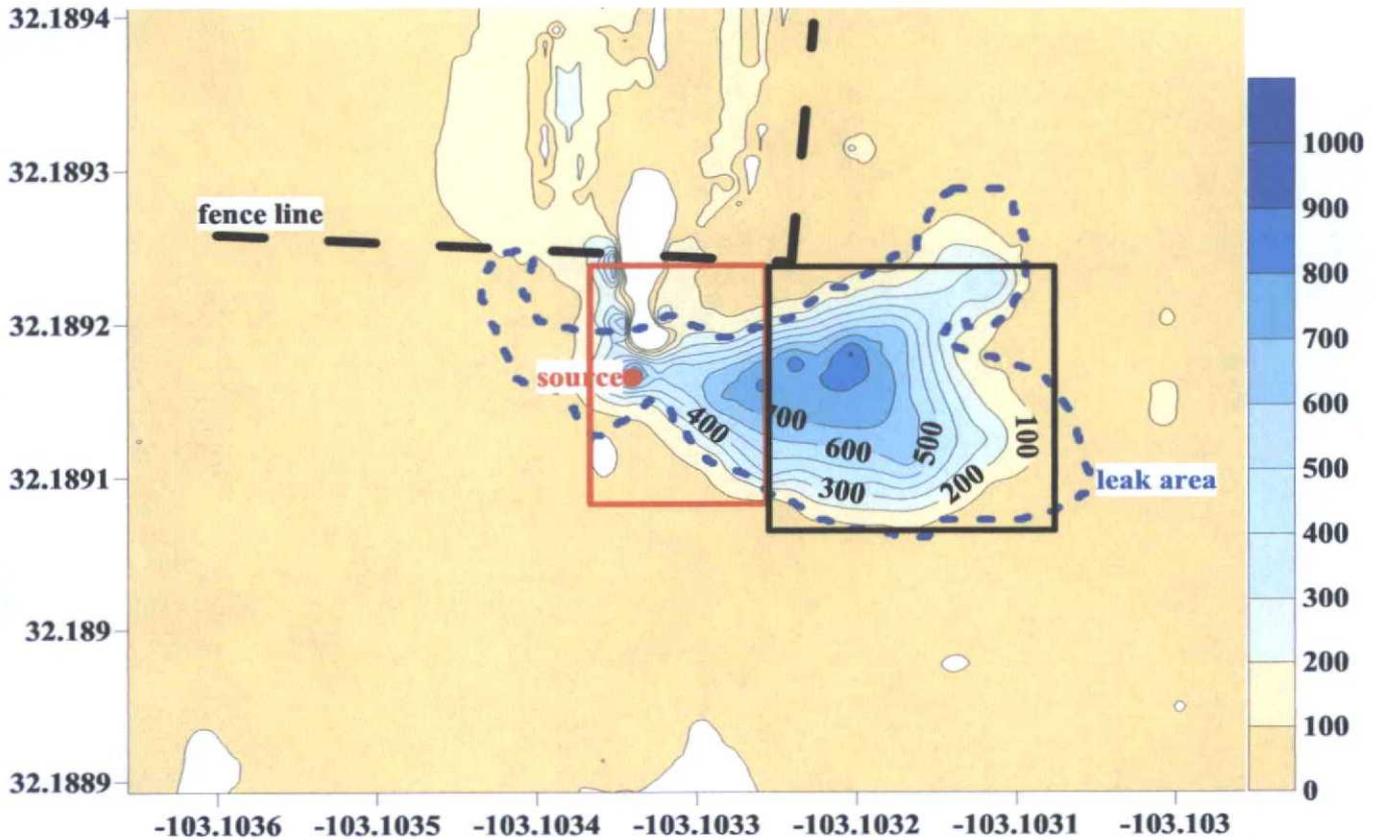
Depth in Feet	GRAPHIC	USCS	Sample	DESCRIPTION
0				Silty sand, brown, loose, damp
		SP		
				Sand and caliche, tan, loose, damp
5				
		SP		
10				
15				Total Depth 15' (AEA TH-3)
20				



Bentonite Seal

01-09-2012 C:\Users\Paddy\Documents\Whole Earth\Chapparral WDQSU # 12 @Sat #1b3.bor

**CHAPARRAL ENERGY LLC.  
WDQSU #12 @ SATELLITE #1  
UL/F SEC 30 - T24S - R38E  
GPS LAT & LON WQS84  
N32.18916 / W103.1033  
DEPTH TO GW: +/- 70'BGS  
EXCAVATION DIMENSIONS  
RED BOX 33'X51'X5' = 312CYDS  
BLACK BOX 60'X60'X5' = 667CYDS**



All efforts will be made to minimize the extent of the excavation by following the outline of the leak area, starting at the edges, and samples being pulled various locations to ensure minimal excavation and haul off of material.







## **Field & Laboratory Analytical Data With Lithological Descriptions**

1. Field Titration & Lithological Descriptions
2. Cardinal Labs H102375 Deep Boring Results

# WEE INC. CL- FIELD TITRATION RESULTS

LOCATION: CHAPPAREL WDQSU #12

10/26/2011

SAMPLE PT	DEPTH	TIME	SOIL	WATER	CF	AGNO3	CL-	PID	SOIL LITHOLOGY
<b>SOURCE</b>	0>1'	1132	10	32.5	3.25	1	6498	N/A	7.5YR-3/3 dark brown sandy sand damp
	5'	1157	10	32.7	3.27	0.35	2288	N/A	7.5YR-8/1 white sandy sand damp
	10'	1204	10	32.2	3.22	0.3	1931	N/A	7.5YR-8/1 white sandy sand damp
	15'	1209	10	33.8	3.38	0.66	4460	N/A	7.5YR-1/2 white sandy sand damp
	20'	1217	10	34.5	3.45	1.31	9036	N/A	10YR-8/3 very pale brown rocky sandy sand damp
	25'	1227	10	32.4	3.24	1.57	10170	N/A	7.5YR-6/4 light brown sandy sand damp
	30'	1236	10	31.7	3.17	0.08	507	N/A	5YR-6/4 light reddish brown clay sandy sand damp
	35'	1247	10	30.9	3.09	0.04	247	N/A	2.5YR-5/8 red sandy sand damp
	40'	1256	10.1	31.2	3.09	0.04	247	N/A	2.5YR-5/8 red sandy sand damp
<b>BORE 1</b>	0>1'	131	10	32.2	3.22	1.51	9721	N/A	7.5YR-3/3 dark brown sandy sand damp
	5'	140	10	32.4	3.24	0.04	259	N/A	7.5YR-8/1 white sandy sand damp
	10'	147	10	31	3.10	0.04	248	N/A	7.5YR-8/2 pinkish white rocky sandy sand damp

**10/26/2011**

SAMPLE PT	DEPTH	TIME	SOIL	WATER	CF	AGNO3	CL-	PID	SOIL LITHOLOGY
<b>BORE 2</b>	0>1'	207	10	32.6	3.26	0.89	5801	N/A	7.5YR-3/3 dark brown sandy sand damp
	5'	229	10	34.7	3.47	0.14	971	N/A	7.5YR-8/2 pinkish white rocky sandy sand damp
	10'	234	10	31.2	3.12	0.17	1060	N/A	7.5YR-8/2 pinkish white rocky sandy sand damp
	15'	240	10	31.4	3.14	0.24	1507	N/A	7.5YR-8/2 pinkish white rocky sandy sand damp
	20'	254	10	31.3	3.13	0.49	3066	N/A	7.5YR-8/2 pinkish white rocky sandy sand damp
	25'	307	10	30.4	3.04	0.5	3039	N/A	5YR-7/4 pink rocky sandy sand damp
	30'	321	10	31	3.10	0.55	3409	N/A	5YR-6/4 light reddish brown clay sandy sand damp
	35'	330	10	32.5	3.25	0.39	2534	N/A	2.5YR-5/4 reddish brown clay sandy sand damp
	40'	339	10	31.5	3.15	0.27	1700	N/A	2.5YR-7/3 light reddish brown sandy sand damp
	45'	354	10	29.4	2.94	0.22	1293	N/A	5YR-6/4 light reddish brown clay sandy sand damp
	50'	413	10	29.6	2.96	0.19	1124	N/A	5YR-7/4 pink sandy sand damp
	55'	439	10	28.1	2.81	0.27	1517	N/A	5YR-6/4 light reddish brown sandy sand damp
60'	519	10	31.5	3.15	0.17	1071	N/A	5YR-6/4 light reddish brown sandy sand damp	

**10/27/2011**

<b>BORE 2</b>	65'	953	10	32	3.20	0.07	448	N/A	5YR-5/1 gray sandy silty clay moist
	70'	1035	10.2	28.7	2.81	0.04	225	N/A	5YR-5/8 yellowish red sandy sand wet
	75'	1103	10.1	31.6	3.13	0.03	188	N/A	5YR-5/8 yellowish red sandy sand wet

**10/27/2011**

<b>BORE 3</b>	0>1'	1148	10	27.5	2.75	0.74	4069	N/A	7.5YR-3/4 dark brown sandy sand damp
	5'	1156	10	30	3.00	0.36	2159	N/A	7.5YR-8/1 white sandy sand damp
	10'	1203	10	31.9	3.19	0.04	255	N/A	7.5YR-8/1 white sandy sand damp
	15'	1218	10.1	27	2.67	0.05	267	N/A	7.5YR-8/1 white sandy sand damp

November 08, 2011

ROY R. RASCON

WHOLE EARTH ENVIRONMENTAL, INC.

2103 ARBOR COVE

KATY, TX 77494

RE: CHAPARRAL WDQSU #12

Enclosed are the results of analyses for samples received by the laboratory on 11/02/11 14:20.

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 Hydrocarbons

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

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 (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:**

 WHOLE EARTH ENVIRONMENTAL, INC.  
 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	11/02/2011	Sampling Date:	10/26/2011
Reported:	11/08/2011	Sampling Type:	Soil
Project Name:	CHAPARRAL WDQSU #12	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Hope S. Moreno
Project Location:	JAL, NM		

**Sample ID: SOURCE 0 > 1' (H102375-01)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	11/03/2011	ND	2.21	111	2.00	4.71		
Toluene*	<0.050	0.050	11/03/2011	ND	2.19	110	2.00	4.32		
Ethylbenzene*	<0.050	0.050	11/03/2011	ND	2.15	108	2.00	5.08		
Total Xylenes*	<0.150	0.150	11/03/2011	ND	6.62	110	6.00	3.99		

Surrogate: 4-Bromofluorobenzene (PIL) 105 % 64.4-134

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	8960	16.0	11/04/2011	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS							S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier		
GRO C6-C10	<10.0	10.0	11/06/2011	ND	201	100	200	8.28			
DRO >C10-C28	17.9	10.0	11/06/2011	ND	234	117	200	7.59			

Surrogate: 1-Chlorooctane 150 % 55.5-154

Surrogate: 1-Chlorooctadecane 189 % 57.6-158

**Sample ID: SOURCE 25' (H102375-02)**

Chloride, SM4500CI-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	12600	16.0	11/04/2011	ND	448	112	400	3.64		

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:**

 WHOLE EARTH ENVIRONMENTAL, INC.  
 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	11/02/2011	Sampling Date:	10/26/2011
Reported:	11/08/2011	Sampling Type:	Soil
Project Name:	CHAPARRAL WDQSU #12	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Hope S. Moreno
Project Location:	JAL, NM		

**Sample ID: SOURCE 40' (H102375-03)**

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	11/03/2011	ND	2.21	111	2.00	4.71		
Toluene*	<0.050	0.050	11/03/2011	ND	2.19	110	2.00	4.32		
Ethylbenzene*	<0.050	0.050	11/03/2011	ND	2.15	108	2.00	5.08		
Total Xylenes*	<0.150	0.150	11/03/2011	ND	6.62	110	6.00	3.99		

Surrogate: 4-Bromofluorobenzene (PIL) 105 % 64.4-134

Chloride, SM4500Cl-B		mg/kg		Analyzed By: AP						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Chloride	112	16.0	11/04/2011	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS							S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier		
GRO C6-C10	<10.0	10.0	11/06/2011	ND	201	100	200	8.28			
DRO >C10-C28	<10.0	10.0	11/06/2011	ND	234	117	200	7.59			

Surrogate: 1-Chlorooctane 144 % 55.5-154

Surrogate: 1-Chlorooctadecane 185 % 57.6-158

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:**

 WHOLE EARTH ENVIRONMENTAL, INC.  
 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	11/02/2011	Sampling Date:	10/26/2011
Reported:	11/08/2011	Sampling Type:	Soil
Project Name:	CHAPARRAL WDQSU #12	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Hope S. Moreno
Project Location:	JAL, NM		

**Sample ID: B1 10' (H102375-04)**

BTEX 8021B		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	11/03/2011	ND	2.21	111	2.00	4.71		
Toluene*	<0.050	0.050	11/03/2011	ND	2.19	110	2.00	4.32		
Ethylbenzene*	<0.050	0.050	11/03/2011	ND	2.15	108	2.00	5.08		
Total Xylenes*	<0.150	0.150	11/03/2011	ND	6.62	110	6.00	3.99		

Surrogate: 4-Bromofluorobenzene (PIL) 102 % 64.4-134

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	11/04/2011	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS							S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier		
GRO C6-C10	<10.0	10.0	11/06/2011	ND	201	100	200	8.28			
DRO >C10-C28	<10.0	10.0	11/06/2011	ND	234	117	200	7.59			

Surrogate: 1-Chlorooctane 141 % 55.5-154

Surrogate: 1-Chlorooctadecane 179 % 57.6-158

Cardinal Laboratories

\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 WHOLE EARTH ENVIRONMENTAL, INC.  
 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	11/02/2011	Sampling Date:	10/27/2011
Reported:	11/08/2011	Sampling Type:	Soil
Project Name:	CHAPARRAL WDQSU #12	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Hope S. Moreno
Project Location:	JAL, NM		

**Sample ID: B2 75' (H102375-05)**

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	11/03/2011	ND	2.21	111	2.00	4.71		
Toluene*	<0.050	0.050	11/03/2011	ND	2.19	110	2.00	4.32		
Ethylbenzene*	<0.050	0.050	11/03/2011	ND	2.15	108	2.00	5.08		
Total Xylenes*	<0.150	0.150	11/03/2011	ND	6.62	110	6.00	3.99		

*Surrogate: 4-Bromofluorobenzene (PIL)*      103 %      64.4-134

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>96.0</b>	16.0	11/04/2011	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS							S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier		
GRO C6-C10	<10.0	10.0	11/06/2011	ND	201	100	200	8.28			
DRO >C10-C28	<10.0	10.0	11/06/2011	ND	234	117	200	7.59			

*Surrogate: 1-Chlorooctane*      149 %      55.5-154

*Surrogate: 1-Chlorooctadecane*      191 %      57.6-158

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\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Analytical Results For:**

 WHOLE EARTH ENVIRONMENTAL, INC.  
 ROY R. RASCON  
 2103 ARBOR COVE  
 KATY TX, 77494  
 Fax To: (281) 394-2051

Received:	11/02/2011	Sampling Date:	10/27/2011
Reported:	11/08/2011	Sampling Type:	Soil
Project Name:	CHAPARRAL WDQSU #12	Sampling Condition:	** (See Notes)
Project Number:	NONE GIVEN	Sample Received By:	Hope S. Moreno
Project Location:	JAL, NM		

**Sample ID: B3 15' (H102375-06)**

BTEX 80218		mg/kg		Analyzed By: MS						
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier	
Benzene*	<0.050	0.050	11/03/2011	ND	2.21	111	2.00	4.71		
Toluene*	<0.050	0.050	11/03/2011	ND	2.19	110	2.00	4.32		
Ethylbenzene*	<0.050	0.050	11/03/2011	ND	2.15	108	2.00	5.08		
Total Xylenes*	<0.150	0.150	11/03/2011	ND	6.62	110	6.00	3.99		

*Surrogate: 4-Bromofluorobenzene (PIL) 104 % 64.4-134*

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>320</b>	16.0	11/04/2011	ND	448	112	400	3.64		

TPH 8015M		mg/kg		Analyzed By: MS							S-04
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier		
GRO C6-C10	<10.0	10.0	11/06/2011	ND	201	100	200	8.28			
DRO >C10-C28	<10.0	10.0	11/06/2011	ND	234	117	200	7.59			

*Surrogate: 1-Chlorooctane 141 % 55.5-154*
*Surrogate: 1-Chlorooctadecane 176 % 57.6-158*

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\* = Accredited Analyte

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Celey D. Keene, Lab Director/Quality Manager

**Notes and Definitions**

- S-04            The surrogate recovery for this sample is outside of established control limits due to a sample matrix effect.
- 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





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**Remediation and Site Restoration Protocol  
Chaparral Energy Co. LLC  
WDQSU #12 @ Sat. 1  
1RP-2751**

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**1.0 Purpose**

This protocol is to provide a detailed outline of the steps to be employed in the remediation of a produced water & hydrocarbon release impact area in Jal, Lea County, New Mexico.

**2.0 Scope**

This protocol is site specific for the above project.

**3.0 Preliminary**

Prior to any field operations, Whole Earth Environmental shall conduct the following activities:

**3.1 Client Review**

3.1.1 Whole Earth shall meet or communicate with the appointed personnel within Chaparral Energy Co. LLC to review this protocol and make any requested modifications or alterations.

3.1.2 Changes to this protocol will be documented and submitted for final review by Chaparral Energy Co. LLC prior to the initiation of actual fieldwork.

3.1.3 Upon client approval, this protocol and supporting documentation will be submitted to the Hobbs district office of the NMOCD for approval.

**4.0 Safety**

4.1 Prior to work on the site, Whole Earth shall obtain the location and phone numbers of the nearest emergency medical treatment facility. We will review all safety related issues with the appropriate Chaparral personnel, sub-contractors and exchange phone numbers.

4.2 A tailgate safety meeting shall be held and documented each day. All sub-contractors must attend and sign the daily log-in sheet.

4.3 Anyone allowed on to location will be wearing the required standard PPE (hardhat, safety glasses, and steel toed boots).

#### **5.0 Remediation Procedure**

The deeply impacted area will be excavated to a depth of 5' bgs. The excavated material will be transported to Parabo in Eunice and a bentonite geo-synthetic liner will be placed at the bottom of the excavation. The side walls and bottom will be sampled using a 5pt. composite method and field titrated for chlorides in accordance with WEQP-97. The area above the bentonite liner will be backfilled with soils obtained from the landowner.

#### **6.0 Site Restoration Procedure**

The site will be backfilled with clean soil backfilled, and re-contoured to match the surrounding contours area and reseeded with a seed mixture approved by the landowner.

#### **7.0 Closure Report**

At the conclusion of the project, Whole Earth shall prepare a closure report which contains the following minimum information:

- Photographs of the location prior to remediation
- Photographs of excavation at the point of maximum soil removal
- Photographs of installation of geo-textile liner
- Photographs of the location at time of final closure
- Lab results
- Copies of this protocol and all testing procedures
- A copy of all material manifest sent to commercial disposal
- Photograph of the approved seed mixture bag used for seeding
- Field chloride titration results