

1R - 441

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# WORKPLANS

Date:

3-29-11

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March 29, 2011

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Mr. Edward Hansen  
New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

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

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

MIDLAND  
2901 State Highway 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

HOBBS  
318 East Taylor Street  
Hobbs, New Mexico 88241  
Phone 505.393.4261  
Fax 505.393.4658

ARTESIA  
408 W. Texas Ave.  
Artesia, New Mexico 88210  
Phone 575.746.8768  
Fax 505.746.8905

Re: Legacy Reserves Operating, L.P., Monsanto '30' State #4  
2010 and 2011 Summary of Groundwater Monitoring Results  
NMOCD Reference 1RP-0441  
Section 30, T16S, R37E  
Latitude: 32° 53' 10.68" N and Longitude: 103° 17' 02.94" W  
Landowner: State of New Mexico  
Lea County, New Mexico

Dear Mr. Hansen:

Talon/LPE (Talon) was retained by Legacy Reserves Operating, L.P. (Legacy) to provide environmental consulting and groundwater remediation services regarding the Monsanto State #4 produced water release in Lea County, New Mexico.

The purpose of this report is to document groundwater monitoring activities that have occurred at the site from March of 2010 to March of 2011 and to outline a scope of work for proposed groundwater monitoring activities.

### **Background Information**

The site is located in Lea County, New Mexico at Global Positioning System (GPS) coordinates N 32.88429° latitude and W 103.29166° longitude in Section 30, Township 16 South, Range 37 East. The following is a synopsis of the site history.

- In February of 2004 Safety and Environmental Solutions (SES) conducted a site investigation regarding an unlined reserve pit at the subject site. The soil below the reserve pit was excavated to a depth of 15-feet below ground surface (bgs) to remove chloride impacted soil.
- In February of 2004, a borehole was advanced below the pit to a depth of 70-feet bgs and soil samples were collected at five (5) feet intervals. Analytical results exhibited chloride concentrations that ranged from 1,823 mg/Kg to 5,838 mg/Kg.
- In April of 2004, a 40 mil polyethylene liner was installed and the excavation was then backfilled with uncontaminated soil to prevent leaching from rainwater infiltration.

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- From May of 2004 to April of 2006 seven (7), two (2) inch monitor wells were installed at various locations around the site to delineate the extent of the groundwater chloride plume.
- Groundwater monitoring commenced subsequent to the initial monitor well installations in May of 2004 and continued to September of 2010.
- A Stage 1 Abatement Plan was submitted in December of 2005 that was initially determined to be insufficient by the NMOCD but was approved in February of 2006 by the NMOCD.
- A revised Stage 1 Abatement Plan was submitted in April of 2006, which proposed additional groundwater monitoring was approved by the NMOCD.

A Topographic Map is provided as Figure 1a and general site location aerial photograph depicting with the City of Lovington water well locations is provided on Figure 1b.

### **Physical Characteristics of the First Water-Bearing Zone**

The primary groundwater resource under the Southern High Plains, including the site, is referred to as the Ogallala Aquifer or High Plains Aquifer. The Southern portion of the Ogallala aquifer underlies an area of about 29,000 square miles (mi<sup>2</sup>) in western Texas and eastern New Mexico, encompassing all or part of 31 counties in Texas and 6 counties in New Mexico.

The Ogallala Aquifer has experienced acute depletion from extensive irrigation and urban demand, which have exceeded the average annual recharge rate. Recharge of the Ogallala Aquifer on the Southern High Plains occurs predominately from rainfall runoff that accumulates in ephemeral streams and playa lakes as well as direct recharge in areas that contain permeable soils such as sand hills. Recharge rates vary depending on mechanism, but averages from 0 to 1.6 inches per year.

The Ogallala Aquifer is generally unconfined and the potentiometric surface generally mirrors the land surface elevation with the regional flow direction from the northwest to the southeast. The mean regional gradient is 15 feet per mile and the typical groundwater velocity averages seven inches per day. The regional hydraulic conductivity averages 17 gallons per day per square-foot and specific yield averages 16%. The depth to groundwater at the site has historically ranged from 64 to 72 feet below ground surface (bgs) and the groundwater flow direction is to the southeast at an average of 20 feet per mile.

The composition of Ogallala groundwater is defined as mixed-cation-HCO<sub>3</sub>, therefore, Ogallala groundwater is considered hard. Problems with scale have occurred with residential and commercial water systems that use Ogallala groundwater and often treatment strategies are employed to reduce the effects of scale. The typical total dissolved solids of Ogallala groundwater in the Hobbs-Lovington area is generally less than 500 mg/L (ppm) in areas not impacted by oil-field brines with an average pH of 7.3.

### **Groundwater Gradient and Flow Direction**

A total of three (3) groundwater monitoring events occurred during the year 2010 on March 31, June 9, and September 16 and one (1) groundwater monitoring event occurred in 2011 on March 10 and 11. Measurements to the depth of fluid were collected during each of the four (4) groundwater monitoring events. The results of the fluid level measurements are summarized in Table 1 in Appendix B.

The collected data was used to construct potentiometric surface maps in order to interpret the groundwater gradient and flow direction. The maps, designated Figures 2a through 2d, are presented in Appendix A.

The potentiometric surface maps indicate that the groundwater flow direction is to south southeast at an approximate gradient of 0.0042 feet/foot or 21.9 feet per mile which is consistent for the area. Groundwater levels at the subject site have exhibited a steady decline of an average of 1.00 feet, which appears to be associated with a regional trend of declining groundwater levels for the Ogallala Aquifer.

### **Groundwater Analytical Results**

During the first quarter, March 2010, groundwater monitoring event, groundwater samples were collected from monitor wells MW-1 through MW-7. Groundwater samples collected during the event exhibited the following analytical results:

- Total chloride (Cl) concentrations ranged from 28.1 mg/L to 1,160 mg/L. The total Cl concentration exceeded the NMWQCC groundwater standard of 250 mg/L in the groundwater sample collected from monitor well MW-1.
- Total dissolved solids (TDS) concentrations ranged from 361 mg/L to 2,330 mg/L. The TDS concentration exceeded the NMWQCC groundwater standard of 1,000 mg/L in the groundwater sample collected from monitor well MW-1.

During the second quarter, June 2010 sampling event, groundwater samples were collected from monitor wells MW-1 through MW-7. The groundwater samples that were collected exhibited the following analytical results:

- Total Cl concentrations ranged from 30.7 to 1,430 mg/L. Total Cl concentrations exceeded the NMWQCC groundwater standard of 250 mg/L in groundwater samples collected from monitor wells MW-1 and MW-7.
- TDS concentrations ranged from 388 mg/L to 2,730 mg/L. The TDS concentration exceeded the NMWQCC groundwater standard of 1,000 mg/L in the groundwater sample collected from monitor wells MW-1.

During the third quarter, September 2010 sampling event, groundwater samples were collected from monitor wells MW-1 through MW-7. The groundwater samples that were collected exhibited the following analytical results:

- Total Cl concentrations ranged from 25.9 mg/L to 1,200 mg/L. Total Cl concentrations exceeded the NMWQCC groundwater standard of 250 mg/L in groundwater samples collected from monitor wells MW-1 and MW-7.
- TDS concentrations ranged from 393 mg/L to 2,500 mg/L. The TDS concentrations exceeded the NMWQCC groundwater standard of 1,000 mg/L in the groundwater sample collected from monitor well MW-1.

During the first quarter, March 2011 sampling event, groundwater samples were collected from monitor wells MW-1 through MW-7. The groundwater samples that were collected exhibited the following analytical results:

- Total Cl concentrations ranged from 26.8 mg/L to 1,060 mg/L. The total Cl concentration exceeded the NMWQCC groundwater standard of 250 mg/L in the groundwater sample collected from monitor well MW-1.

- TDS concentrations ranged from 432 mg/L to 2,310 mg/L. The TDS concentrations exceeded the NMWQCC groundwater standard of 1,000 mg/L in the groundwater sample collected from monitor well MW-1.

Monitor wells MW-1 and MW-7 have consistently exhibited total Cl and TDS concentrations exceeding the NMWQCC groundwater standards; however, down-gradient monitor wells MW-4, MW-5 and MW-6 have maintained relatively stable Cl and TDS concentrations. This indicates that the chloride plume is stable and does not appear to be migrating down-gradient. Currently, the groundwater chloride plume is delineated.

The results of the laboratory analyses are summarized in Table 2 – Summary of Groundwater Analytical Results in Appendix B. Laboratory analytical data reports and chain of custody documentation are provided in Appendix C. In addition, cumulative historical analytical data is located in the tables section on the CD that is an adjunct to this report.

### **Summary of Findings**

- The groundwater flow direction is to southeast at an approximate gradient of 0.0042 feet/foot or 21.9 feet per mile.
- Groundwater levels at the subject site have exhibited a steady decline for the year 2010 that appears to be associated with a regional trend of declining groundwater levels for the Ogallala Aquifer.
- Monitor wells MW-1 and MW-7 have exhibited Cl and TDS concentrations exceeding the NMWQCC groundwater standards; however, down-gradient monitor wells MW-4, MW-5 and MW-6 have maintained relatively stable Cl and TDS concentrations. The chloride plume is currently delineated.

### **Recommendations**

Based upon the results of the four (4) groundwater monitoring events performed in 2010 and 2011, Talon proposes the following actions:

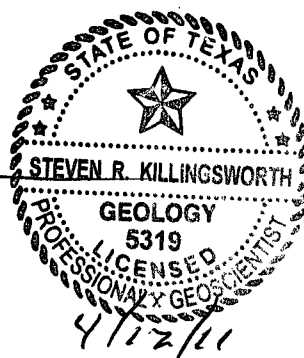
- Continue to perform quarterly groundwater monitoring events in accordance with NMOCD directives.
- Install one (1) four (4) inch recovery well near the center of the chloride plume and perform a pump test to acquire data for a remediation system design.
- Survey the top of casing elevations for monitor well MW-5, MW-6, and MW-7
- Prepare a remediation plan designed to pump and dispose of impacted groundwater and to inhibit migration of the chloride plume.

If you have any questions or require further information, please contact Mr. Kyle Waggoner or me at (432) 522-2133.

Sincerely,



Steven R. Killingsworth, P.G.  
Senior Project Manager



Cc: Mr. Berry Johnson, Legacy Reserves Operating, L.P.  
Mr. Geoffrey R. Leking, NMOCD

Appendices:

Appendix A..... Figures

Appendix B..... Tables

Appendix C..... Laboratory Analytical Data Reports and Chain of Custody Documentation

## **Appendix A**

### **Figures**

Figure 1a - Site Vicinity Topographic Map

Figure 1b - Site Vicinity Aerial Photograph

Figure 2 - Site Map

Figure 2a - Groundwater Gradient Map - 3/10/2011

Figure 2b - Groundwater Gradient Map - 3/27/2010

Figure 2c - Groundwater Gradient Map - 6/9/2010

Figure 2d - Groundwater Gradient Map - 9/27/2010

Figure 3a - Groundwater Chloride Concentration Map - 3/11/2011

Figure 3b - Groundwater Chloride Concentration Map - 3/27/2010

Figure 3c - Groundwater Chloride Concentration Map - 6/9/2010

Figure 3d - Groundwater Chloride Concentration Map - 9/9/2010





Aerial Photograph  
 Monsanto '30' State #4 & #5  
 Lea County, New Mexico  
 Date: March 9, 2011

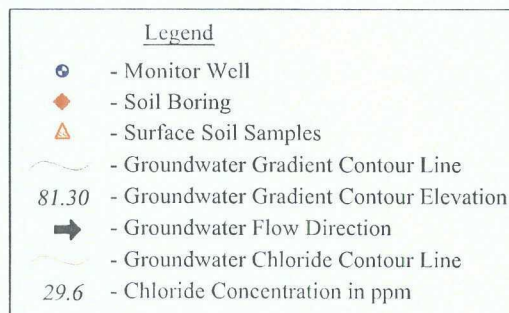
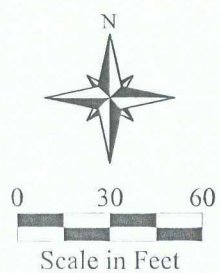
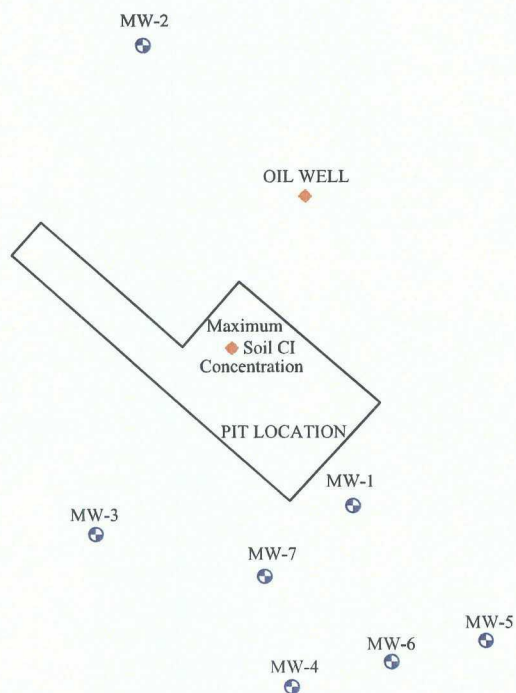
Prepared by: S. R. Killingsworth, PG

Legacy Reserves Op, LP  
 303 W. Wall - Suite 1600  
 Midland, Texas 79702

Not to scale







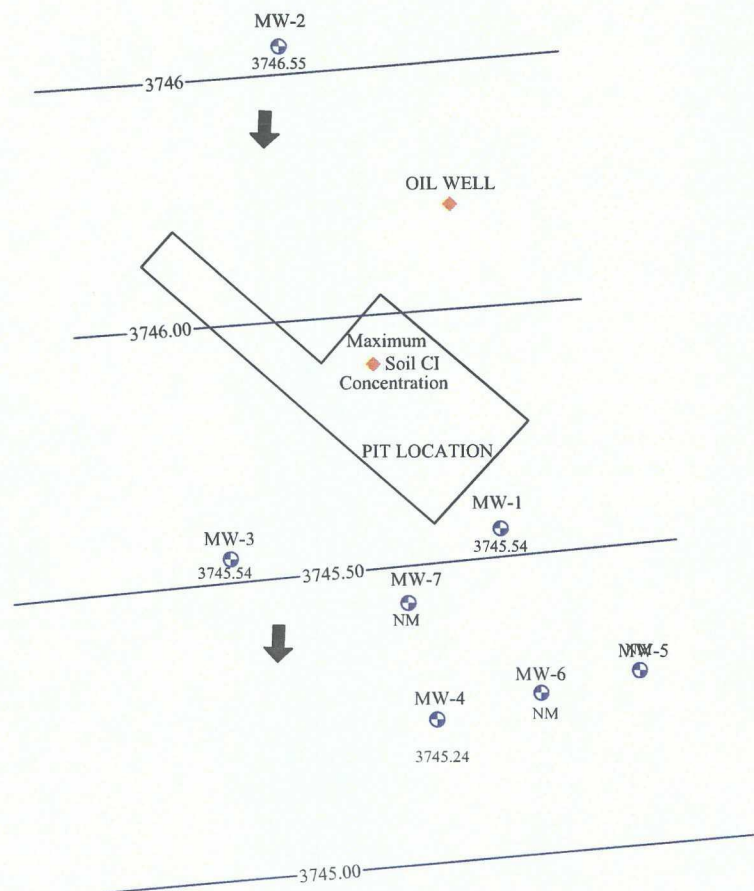
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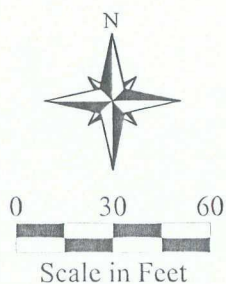
Drawn By: TJS

Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico  
Figure 1 - Site Plan





Gradient  
0.0041 ft/ft  
21.62 ft/mi



Legend	
	- Monitor Well
	- Soil Boring
	- Surface Soil Samples
	- Groundwater Gradient Contour Line
81.30	- Groundwater Gradient Contour Elevation
	- Groundwater Flow Direction
	- Groundwater Chloride Contour Line
29.6	- Chloride Concentration in ppm



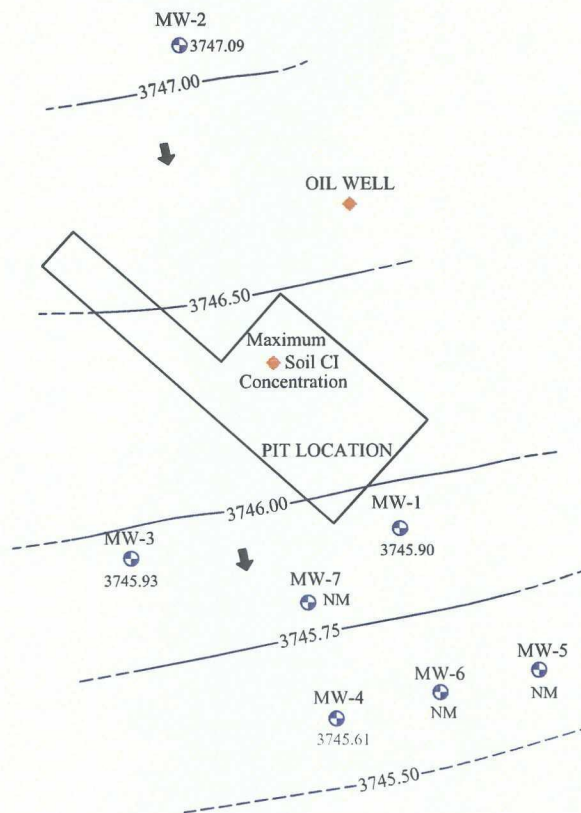
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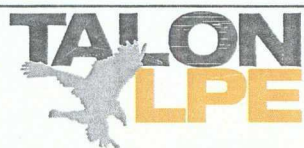
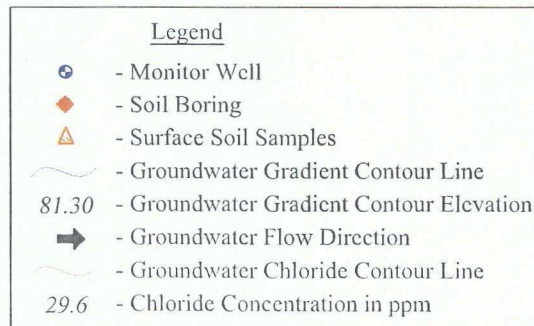
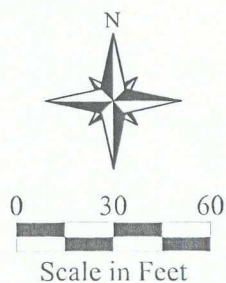
Drawn By: TJS

Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico

Figure 2a - Groundwater Gradient Map, (03/10/2011)



Gradient  
0.0041 ft/ft  
21.86 ft/mi

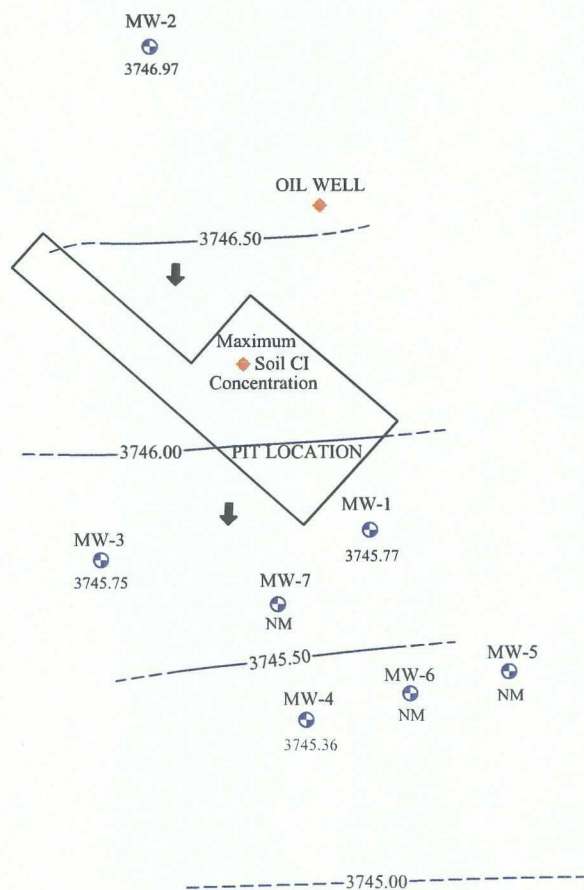


Date: 03/28/2011

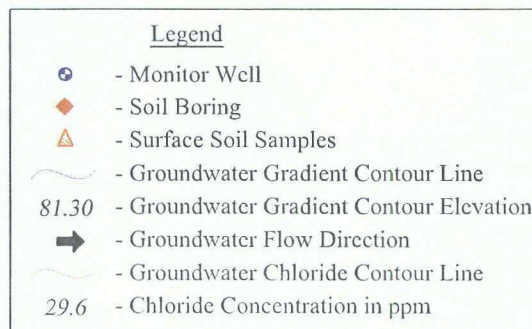
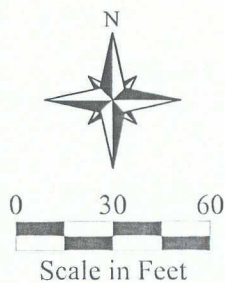
Scale: 1" = 60'

Drawn By: TJS

Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico  
Figure 2b - Groundwater Gradient Map, (03/31/2010)



Gradient  
0.0045 ft/ft  
23.56 ft/mi



Date: 03/28/2011

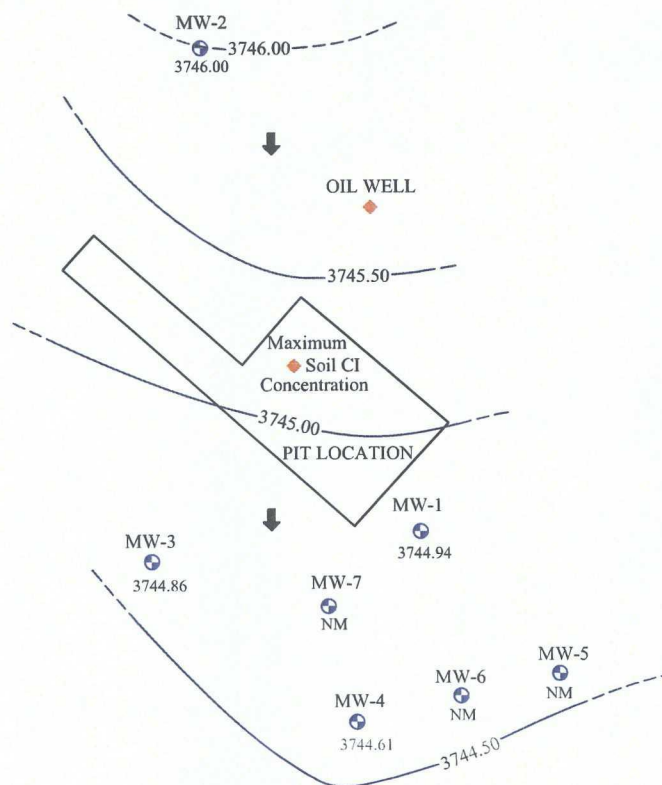
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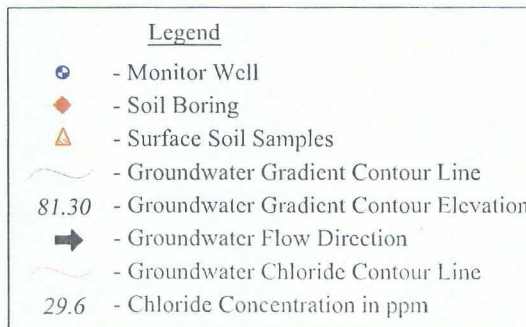
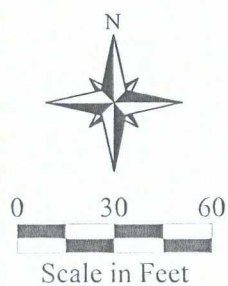
Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico

Figure 2c - Groundwater Gradient Map, (06/09/2010)





Gradient  
0.0039 ft/ft  
20.34 ft/mi



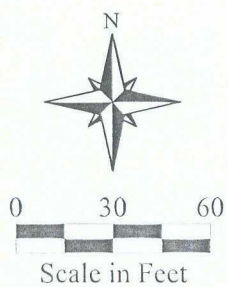
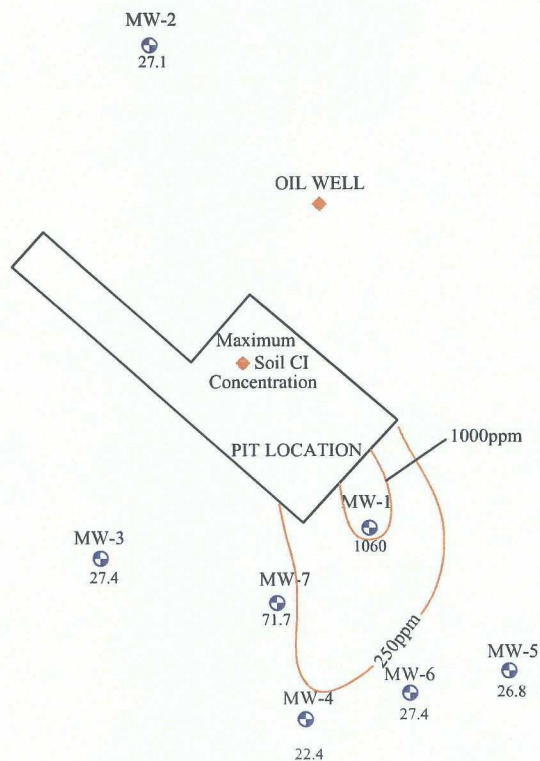
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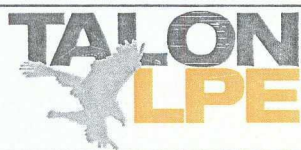
Drawn By: TJS

Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico

Figure 2d - Groundwater Gradient Map, (09/16/2010)



Legend	
	- Monitor Well
	- Soil Boring
	- Surface Soil Samples
	- Groundwater Gradient Contour Line
81.30	- Groundwater Gradient Contour Elevation
	- Groundwater Flow Direction
	- Groundwater Chloride Contour Line
29.6	- Chloride Concentration in ppm



Date: 03/28/2011

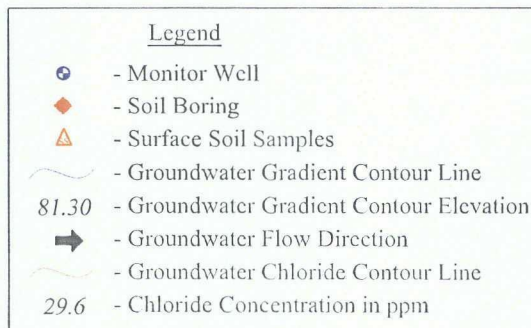
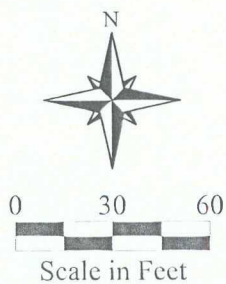
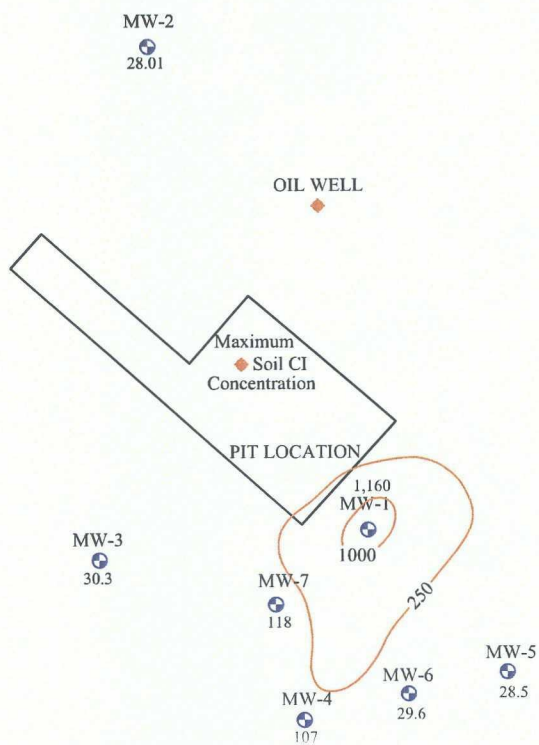
Scale: 1" = 60'

Drawn By: TJS

Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico

Figure 3a - Groundwater Chloride Distribution Map, (03/10/2011)





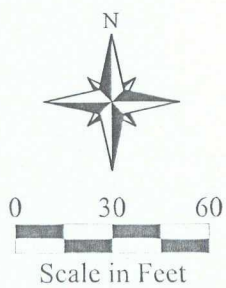
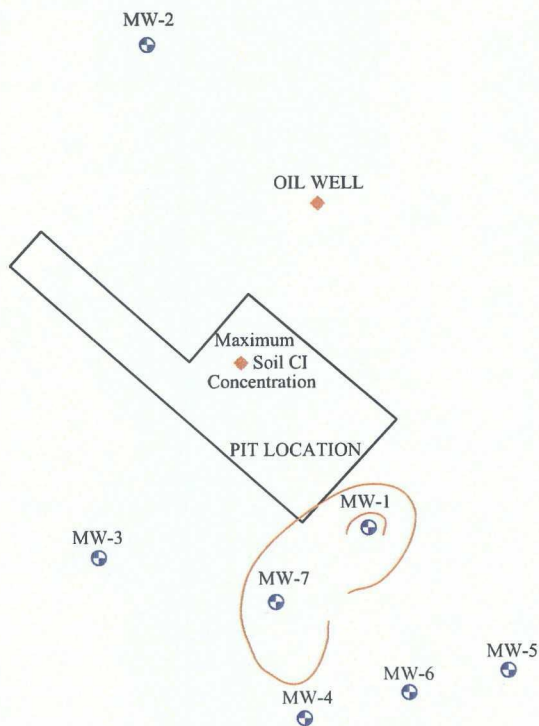
Date: 03/28/2011

Scale: 1" = 60'

Drawn By: TJS

Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico

Figure 3b - Groundwater Chloride Distribution Map, (03/31/2010)



Legend	
	- Monitor Well
	- Soil Boring
	- Surface Soil Samples
	- Groundwater Gradient Contour Line
81.30	- Groundwater Gradient Contour Elevation
	- Groundwater Flow Direction
	- Groundwater Chloride Contour Line
29.6	- Chloride Concentration in ppm



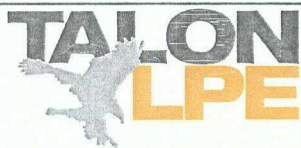
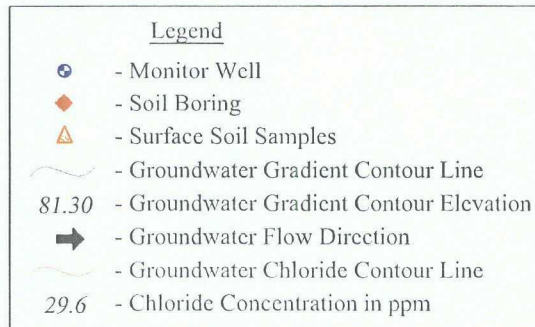
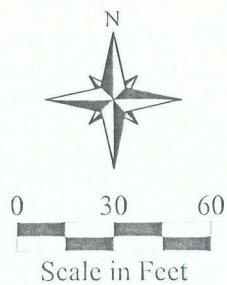
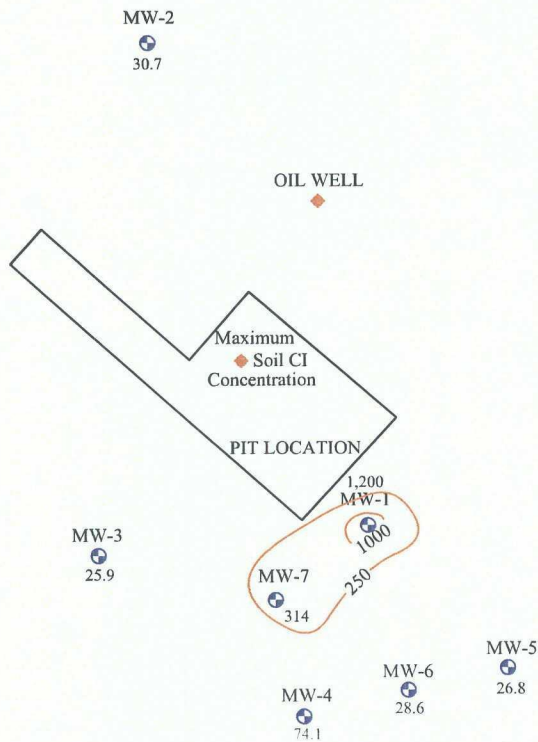
Date: 03/28/2011

Scale: 1" = 60'

Drawn By: TJS

Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico

Figure 3c - Groundwater Chloride Distribution Map, (06/09/2010)



Date: 03/28/2011

Scale: 1" = 60'

Drawn By: TJS

Monsanto '30' State #4  
Legacy Reserves Operating, L.P.  
Hobbs, Lea County, New Mexico

Figure 3d - Groundwater Chloride Distribution Map, (09/16/2010)

## **Appendix B**

### **Tables**

**Table 1 - Summary of Fluid Level Measurements**

**Table 2 - Groundwater Analytical Results**



**TABLE 1**  
**SUMMARY OF FLUID LEVEL MEASUREMENTS**  
**LEGACY RESERVES OPERATING, L.P.**  
**MONSANTO '30' STATE #4**  
**NMOCD REF. # 1R-0441**  
**LEA COUNTY, NEW MEXICO**  
**TALON/LPE PROJECT NUMBER 701047.014.01**

Monitor Well	Date Gauged	Relative Top of Casing Elevation (ft amsl)	Depth to Water Below Top of Casing (ft btoc)	Groundwater Elevation (ft amsl)
MW-1	03/31/10	3,838.24	92.34	3,745.90
MW-1	06/09/10		92.47	3,745.77
MW-1	09/16/10		93.30	3,744.94
MW-1	03/10/11		92.70	3,745.54
MW-2	03/31/10	3,836.31	89.22	3,747.09
MW-2	06/09/10		89.34	3,746.97
MW-2	09/16/10		90.31	3,746.00
MW-2	03/10/11		89.76	3,746.55
MW-3	03/31/10	3,842.49	96.56	3,745.93
MW-3	06/09/10		96.74	3,745.75
MW-3	09/16/10		97.63	3,744.86
MW-3	03/10/11		96.95	3,745.54
MW-4	03/31/10	3,840.95	95.34	3,745.61
MW-4	06/09/10		95.59	3,745.36
MW-4	09/16/10		96.34	3,744.61
MW-4	03/10/11		95.71	3,745.24
MW-5	03/31/10	NM	92.33	
MW-5	06/09/10		92.54	
MW-5	09/16/10		93.52	
MW-5	03/10/11		92.80	
MW-6	03/31/10	NM	96.74	
MW-6	06/09/10		93.96	
MW-6	09/16/10		94.74	
MW-6	03/10/11		94.18	
MW-7	03/31/10	NM	93.95	
MW-7	06/09/10		94.10	
MW-7	09/16/10		94.97	
MW-7	03/10/11		94.33	



**TABLE 2**  
**GROUNDWATER ANALYTICAL RESULTS**  
**LEGACY RESERVES OPERATING, L.P.**  
**MONSANTO '30' STATE #4**  
**NMOCD REF. # 1R-0441**  
**LEA COUNTY, NEW MEXICO**  
**Talon/LPE Project Number 701047.014.01**

*All concentrations are in mg/L*

Sample Location	Sample Date	Chloride	TDS
MW-1	03/31/10	<b>1,160</b>	<b>2,330</b>
MW-1	06/09/10	<b>1,430</b>	<b>2,730</b>
MW-1	09/16/10	<b>1,200</b>	<b>2,500</b>
MW-1	03/11/11	<b>1,060</b>	<b>2,310</b>
MW-2	03/31/10	28.1	494
MW-2	06/09/10	30.7	461
MW-2	09/16/10	25.9	423
MW-2	03/11/11	27.1	526
MW-3	03/31/10	30.3	361
MW-3	06/09/10	30.8	388
MW-3	09/16/10	25.9	393
MW-3	03/11/11	27.4	432
MW-4	03/31/10	107	587
MW-4	06/09/10	145	620
MW-4	09/16/10	74.1	546
MW-4	03/11/11	224.0	695
MW-5	03/31/10	28.5	447
MW-5	06/09/10	31.5	456
MW-5	09/16/10	26.8	396
MW-5	03/11/11	26.8	436
MW-6	03/31/10	29.6	414
MW-6	06/09/10	32.0	483
MW-6	09/16/10	28.6	401
MW-6	03/11/11	27.4	442
MW-7	03/31/10	118	96
MW-7	06/09/10	<b>314</b>	788
MW-7	09/16/10	<b>314</b>	896
MW-7	03/11/11	71.1	539
NMWQCC Remedial Limits		250	1,000

<sup>1</sup> *Bolded values are in excess of the NMWQCC Remediation Thresholds*

## **Appendix C**

### **Laboratory Analytical Data Reports and Chain of Custody Documentation**





6701 Aberdeen Avenue, Suite 9 Lubbock, Texas 79424 800•378•1296 806•794•1296 FAX 806•794•1296  
200 East Sunset Road, Suite E El Paso, Texas 79922 888•588•3443 915•585•3443 FAX 915•585•4944  
5002 Basin Street, Suite A1 Midland, Texas 79703 432•689•6301 FAX 432•689•6313  
6015 Harris Parkway, Suite 110 Ft. Worth, Texas 76132 817•201•5260  
E-Mail: lab@traceanalysis.com

## Certifications

WBENC: 237019

HUB: 1752439743100-86536  
NCTRCA WFWB38444Y0909

DBE: VN 20657

## NELAP Certifications

Lubbock: T104704219-08-TX  
LELAP-02003  
Kansas E-10317

El Paso: T104704221-08-TX  
LELAP-02002

Midland: T104704392-08-T

## Analytical and Quality Control Report

Steve Killingsworth  
Talon LPE-Midland  
2901 State Highway 349  
Midland, TX, 79706

Report Date: March 22, 2011

Work Order: 11031133



Project Location: Hobbs, NM  
Project Name: Monsanto #4  
Project Number: 701047.014.01

Enclosed are the Analytical Report and Quality Control Report for the following sample(s) submitted to TraceAnalysis, Inc.

Sample	Description	Matrix	Date Taken	Time Taken	Date Received
260360	MW-1	water	2011-03-11	10:45	2011-03-11
260361	MW-2	water	2011-03-11	11:15	2011-03-11
260362	MW-3	water	2011-03-11	11:10	2011-03-11
260363	MW-4	water	2011-03-11	10:52	2011-03-11
260364	MW-5	water	2011-03-11	11:03	2011-03-11
260365	MW-6	water	2011-03-11	10:40	2011-03-11
260366	MW-7	water	2011-03-11	10:58	2011-03-11

These results represent only the samples received in the laboratory. The Quality Control Report is generated on a batch basis. All information contained in this report is for the analytical batch(es) in which your sample(s) were analyzed.



This report consists of a total of 9 pages and shall not be reproduced except in its entirety, without written approval of TraceAnalysis, Inc.



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Dr. Blair Leftwich, Director  
Dr. Michael Abel, Project Manager

#### Standard Flags

**B** - The sample contains less than ten times the concentration found in the method blank.

## Case Narrative

Samples for project Monsanto #4 were received by TraceAnalysis, Inc. on 2011-03-11 and assigned to work order 11031133. Samples for work order 11031133 were received intact at a temperature of 3.6 C.

Samples were analyzed for the following tests using their respective methods.

Test	Method	Prep Batch	Prep Date	QC Batch	Analysis Date
Chloride (IC)	E 300.0	67337	2011-03-15 at 13:36	79419	2011-03-16 at 11:05
TDS	SM 2540C	67335	2011-03-15 at 13:34	79592	2011-03-21 at 14:17

Results for these samples are reported on a wet weight basis unless data package indicates otherwise.

A matrix spike (MS) and matrix spike duplicate (MSD) sample is chosen at random from each preparation batch. The MS and MSD will indicate if a site specific matrix problem is occurring, however, it may not pertain to the samples for work order 11031133 since the sample was chosen at random. Therefore, the validity of the analytical data reported has been determined by the laboratory control sample (LCS) and the method blank (MB). These quality control measures are performed with each preparation batch to ensure data integrity.

All other exceptions associated with this report have been footnoted on the appropriate analytical page to assist in general data comprehension. Please contact the laboratory directly if there are any questions regarding this project.

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701047.014.01

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Monsanto #4

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## Analytical Report

### Sample: 260360 - MW-1

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Chloride (IC)	Date Analyzed:	2011-03-16	Analyzed By:	AR
QC Batch:	79419	Sample Preparation:	2011-03-15	Prepared By:	AR
Prep Batch:	67337				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		1060	mg/L	50	2.50

### Sample: 260360 - MW-1

Laboratory:	Midland	Analytical Method:	SM 2540C	Prep Method:	N/A
Analysis:	TDS	Date Analyzed:	2011-03-21	Analyzed By:	AR
QC Batch:	79592	Sample Preparation:	2011-03-15	Prepared By:	AR
Prep Batch:	67335				

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		2310	mg/L	2	10.0

### Sample: 260361 - MW-2

Laboratory:	Midland	Analytical Method:	E 300.0	Prep Method:	N/A
Analysis:	Chloride (IC)	Date Analyzed:	2011-03-16	Analyzed By:	AR
QC Batch:	79419	Sample Preparation:	2011-03-15	Prepared By:	AR
Prep Batch:	67337				

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		27.1	mg/L	5	2.50

### Sample: 260361 - MW-2

Laboratory:	Midland	Analytical Method:	SM 2540C	Prep Method:	N/A
Analysis:	TDS	Date Analyzed:	2011-03-21	Analyzed By:	AR
QC Batch:	79592	Sample Preparation:	2011-03-15	Prepared By:	AR
Prep Batch:	67335				

continued ...

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*sample 260361 continued ...*

Parameter	Flag	RL Result	Units	Dilution	RL
Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		526	mg/L	1	10.0

**Sample: 260362 - MW-3**

Laboratory:	Midland			
Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method: N/A
QC Batch:	79419	Date Analyzed:	2011-03-16	Analyzed By: AR
Prep Batch:	67337	Sample Preparation:	2011-03-15	Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		27.4	mg/L	5	2.50

**Sample: 260362 - MW-3**

Laboratory:	Midland			
Analysis:	TDS	Analytical Method:	SM 2540C	Prep Method: N/A
QC Batch:	79592	Date Analyzed:	2011-03-21	Analyzed By: AR
Prep Batch:	67335	Sample Preparation:	2011-03-15	Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		432	mg/L	1	10.0

**Sample: 260363 - MW-4**

Laboratory:	Midland			
Analysis:	Chloride (IC)	Analytical Method:	E 300.0	Prep Method: N/A
QC Batch:	79419	Date Analyzed:	2011-03-16	Analyzed By: AR
Prep Batch:	67337	Sample Preparation:	2011-03-15	Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		224	mg/L	5	2.50

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**Sample: 260363 - MW-4**

Laboratory: Midland  
Analysis: TDS  
QC Batch: 79592  
Prep Batch: 67335

Analytical Method: SM 2540C  
Date Analyzed: 2011-03-21  
Sample Preparation: 2011-03-15

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		695	mg/L	1	10.0

**Sample: 260364 - MW-5**

Laboratory: Midland  
Analysis: Chloride (IC)  
QC Batch: 79419  
Prep Batch: 67337

Analytical Method: E 300.0  
Date Analyzed: 2011-03-16  
Sample Preparation: 2011-03-15

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		26.8	mg/L	5	2.50

**Sample: 260364 - MW-5**

Laboratory: Midland  
Analysis: TDS  
QC Batch: 79592  
Prep Batch: 67335

Analytical Method: SM 2540C  
Date Analyzed: 2011-03-21  
Sample Preparation: 2011-03-15

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		436	mg/L	1	10.0

**Sample: 260365 - MW-6**

Laboratory: Midland  
Analysis: Chloride (IC)  
QC Batch: 79419  
Prep Batch: 67337

Analytical Method: E 300.0  
Date Analyzed: 2011-03-16  
Sample Preparation: 2011-03-15

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		27.4	mg/L	5	2.50

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**Sample: 260365 - MW-6**

Laboratory: Midland  
Analysis: TDS  
QC Batch: 79592  
Prep Batch: 67335

Analytical Method: SM 2540C  
Date Analyzed: 2011-03-21  
Sample Preparation: 2011-03-15

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		442	mg/L	1	10.0

**Sample: 260366 - MW-7**

Laboratory: Midland  
Analysis: Chloride (IC)  
QC Batch: 79419  
Prep Batch: 67337

Analytical Method: E 300.0  
Date Analyzed: 2011-03-16  
Sample Preparation: 2011-03-15

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Chloride		71.7	mg/L	5	2.50

**Sample: 260366 - MW-7**

Laboratory: Midland  
Analysis: TDS  
QC Batch: 79592  
Prep Batch: 67335

Analytical Method: SM 2540C  
Date Analyzed: 2011-03-21  
Sample Preparation: 2011-03-15

Prep Method: N/A  
Analyzed By: AR  
Prepared By: AR

Parameter	Flag	RL Result	Units	Dilution	RL
Total Dissolved Solids		539	mg/L	1	10.0

**Method Blank (1)**      QC Batch: 79419

QC Batch: 79419  
Prep Batch: 67337

Date Analyzed: 2011-03-16  
QC Preparation: 2011-03-15

Analyzed By: AR  
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Chloride		0.699	mg/L	2.5

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**Method Blank (1)**      QC Batch: 79592

QC Batch: 79592  
Prep Batch: 67335

Date Analyzed: 2011-03-21  
QC Preparation: 2011-03-15

Analyzed By: AR  
Prepared By: AR

Parameter	Flag	MDL Result	Units	RL
Total Dissolved Solids		12.0	mg/L	10

**Duplicates (1)**      Duplicated Sample: 260366

QC Batch: 79592  
Prep Batch: 67335

Date Analyzed: 2011-03-21  
QC Preparation: 2011-03-15

Analyzed By: AR  
Prepared By: AR

Param	Duplicate Result	Sample Result	Units	Dilution	RPD	RPD Limit
Total Dissolved Solids	525	539	mg/L	1	3	10

**Laboratory Control Spike (LCS-1)**

QC Batch: 79419  
Prep Batch: 67337

Date Analyzed: 2011-03-16  
QC Preparation: 2011-03-15

Analyzed By: AR  
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	22.7	mg/L	1	25.0	<0.265	91	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	23.7	mg/L	1	25.0	<0.265	95	90 - 110	4	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Laboratory Control Spike (LCS-1)**

QC Batch: 79592  
Prep Batch: 67335

Date Analyzed: 2011-03-21  
QC Preparation: 2011-03-15

Analyzed By: AR  
Prepared By: AR

Param	LCS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Total Dissolved Solids	1030	mg/L	1	1000	<9.75	103	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

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Param	LCSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Total Dissolved Solids	1070	mg/L	1	1000	<9.75	107	90 - 110	4	10

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Matrix Spike (MS-1)**      Spiked Sample: 260366

QC Batch: 79419      Date Analyzed: 2011-03-16      Analyzed By: AR  
Prep Batch: 67337      QC Preparation: 2011-03-15      Prepared By: AR

Param	MS Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit
Chloride	2360	mg/L	50	1380	1060	94	90 - 110

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

Param	MSD Result	Units	Dil.	Spike Amount	Matrix Result	Rec.	Rec. Limit	RPD	RPD Limit
Chloride	2360	mg/L	50	1380	1060	94	90 - 110	0	20

Percent recovery is based on the spike result. RPD is based on the spike and spike duplicate result.

**Standard (ICV-1)**

QC Batch: 79419      Date Analyzed: 2011-03-16      Analyzed By: AR

Param	Flag	Units	ICVs True Conc.	ICVs Found Conc.	ICVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	25.0	24.3	97	90 - 110	2011-03-16

**Standard (CCV-1)**

QC Batch: 79419      Date Analyzed: 2011-03-16      Analyzed By: AR

Param	Flag	Units	CCVs True Conc.	CCVs Found Conc.	CCVs Percent Recovery	Percent Recovery Limits	Date Analyzed
Chloride		mg/L	25.0	23.9	96	90 - 110	2011-03-16



# TraceAnalysis, Inc.

email: lab@traceanalysis.com

5701 Aberdeen Avenue, Suite 9  
Lubbock, Texas 79424  
Tel (806) 794-1298  
Fax (806) 794-1298  
1 (800) 378-1298

5002 Basin Street, Suite A1  
Midland, Texas 79703  
Tel (432) 689-6301  
Fax (432) 689-6313

BioAquatic Testing  
2501 Mayes Rd., Ste 100  
Carrollton, Texas 75006  
Tel (972) 242-7750

Company Name: Talon LPE  
Phone #: 806-467-0467

Fax #:

Address: 3901 State Hwy 349  
Spillingsworth Hobbs, NM

Contact Person: Spillingsworth Hobbs, NM

Invoice to:

(If different from above)

Project #: 701047.014.01

Project Location (including state): Hobbs, NM

Project Name: MCDonto #4  
Sampler Signature:

## ANALYSIS REQUEST (Circle or Specify Method No.)

MTBE 8021 / 602 / 8260 / 624	TPH 418.1 / TX1005 / TX1005 Ext(C35)	TPH 8015 GRO / DRO / TVHC	PAH 8270 / 625	Total Metals Ag As Ba Cd Cr Pb Se Hg 6010/200.7	TCLP Metals Ag As Ba Cd Cr Pb Se Hg	TCLP Volatiles	TCLP Semi Volatiles	TCLP Pesticides	RCI	GC/MS Vol. 8260 / 624	GC/MS Semi. Vol. 8270 / 625	PCBs 8082 / 608	Pesticides 8081 / 608	BOD, TSS, pH	Moisture Content	Cl, F, S04, NO3, NO2, Alkalinity	Na, Ca, Mg, K, TDS, EC	TDS	300.0 Total Chlorides	Turn Around Time if different from standard

Relinquished by: [Signature]	Company: Talon LPE	Date: 3-11-11	Time: 1400	Received by: [Signature]	Company: Trace	Date: 3-11-11	Time: 14:20	INST OBS COR
Relinquished by: [Signature]	Company: Talon LPE	Date: 3-11-11	Time: 1400	Received by: [Signature]	Company: Trace	Date: 3-11-11	Time: 14:20	INST OBS COR
Relinquished by: [Signature]	Company: Talon LPE	Date: 3-11-11	Time: 1400	Received by: [Signature]	Company: Trace	Date: 3-11-11	Time: 14:20	INST OBS COR

Submittal of samples constitutes agreement to Terms and Conditions listed on reverse side of C. O. C.

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