

### Imagine the result

### **Apache Corporation**

State SWD Flowline Remediation Plan Proposal

Eddy County, New Mexico

August 6, 2016

Jennifer Van Curen
Environmental Project Scientist

### **STATE SWD FLOWLINE**

Remediation Plan Proposal

Prepared for:
Apache
Corporation
Eddy County, New Mexico

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Our Ref.: MT001200.0000.0000

Date:

August 6, 2016

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### Remediation Plan Proposal

Apache Corporation Eddy County, New Mexico

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### **Appendic C** Figures Vicinity Map Figure 1 Surface and Mineral Map Figure 2 Archaeology Map Figure 3 Hydrology Map Figure 4 Karst Potential Map Figure 5 Range Map Figure 6 Soils, Geology, and Vegetation Map Figure 7 Wildlife and Special Status Species Map Figure 8



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### 1. INTRODUCTION

The subject site is a well pad site located east of Loco Hills, New Mexico. The site is operated by Apache Corporation.

Five vertical samples were taken within the release area at the subject site. Elevated chloride concentrations were detected in soil samples collected from verticals. Elevated chlorides were detected down gradient from release point with the stained area encompassing 695 square feet.

### 2. SUMMARY OF SITE INVESTIGATION ACTIVITIES

New Mexico Oil Conservation Division (NMOCD) was notified of the 7 bbl. release at the site via form C-141, submitted on October 7, 2015 by Bruce Baker with Apache Corporation.

The release was reported to have had a 3 inch metal transition in the flowline developed a hole resulting in the release. The flow line was isolated and repaired. The release affected a total of 695 square feet with 100 square feet in pasture and 595 square feet on lease road and NM state pit 337. The release site was mapped and initial field sampling was conducted. The state land office was notified due to the contamination inside caliche pit. (Attachment 1 in Appendix A)

Initial release site investigation activities were conducted in May of 2016 with follow-up sampling completed in June of 2016. Soil sampling activities included soil sampling of five verticals to a varied depth to reach the NMOCD delineation guidelines for chlorides utilizing a hand auger. (Attachment 2 in Appendix A)

A table was prepared for all depths of the soil sampling activities and includes both field and lab results. (Table 1 of Appendix B)

### 3. ENVIRONMENTAL ASSESSMENT

### 3.1 Surface and Mineral Ownership

The 100 square foot area at the source falls inside BLM managed lands and on an existing ROW and lease road. The 595 square feet area where fluid ran down slope into the caliche pit is state managed lands. Apache will work with the BLM and OCD to



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remediate the area around the ROW and lease road, and the State will address the portion of the state caliche pit. (Figure 2 in Appendix C)

### 3.2 Arch and Paleo

The release site falls within the boundaries of the Permian Participating Area. Apache could pay into this program instead of hiring an archaeologist to complete a survey. This release site falls within a previously arched area of a ROW and inside a state caliche pit. No areas outside these two areas will be disturbed. (Figure 3 in Appendix C)

This release site falls into PFYC 2, which means that there is little chance of paleontology to be discovered.

### 3.3 Hydrology

Water depths were not located in the area. There are storm water drainages and collection areas within a quarter mile, but will not be affected by this release site. There are no bodies of water, lakes, or streams near this release site. (Figure 4 in Appendix C)

### 3.4 Karst

The area surrounding this release site has a low karst potential. There are no known karst features in this area. (Figure 5 in Appendix C)

### 3.5 Range

The range allotment is in the Cedar Lake, 77008 and cattle are sometimes in the area. All open trenches or excavations will be fenced to prevent injury to cattle if left unattended. All equipment left overnight will be positioned to prevent injury to cattle. (Figure 6 in Appendix C)

### 3.6 Soils, Geology, and Vegetation

KM – Kermit-Berino fine sands, 0-3 percent slopes. The natural drainage is excessively drained to well-drained. Water movement is very high to moderately high. Shrink – swell potential is low to medium. The soils in the area is sandy to loamy sand soils with caliche found in some areas from very shallow to deeper zones. The underlying



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geology is eolian deposits with piedmont alluvial deposits. The vegetation in the area consist of mesquite, sage, four-wing saltbush, cacti, yucca, and grasses found in sandy soils. All areas on the ROW will be seeded with the BLM LPC seed mix. (Figure 7 in Appendix C)

### 3.7 Wildlife and Special Status Species

This area falls inside the BLM mapped Lesser Prairie Chicken area, but will not be affected as the timing stipulation ended on June 15th, and Apache is a CCA participator. No wildlife will be affected by the remediation activity at the release site. (Figure 8 in Appendix C)

### 4. REMEDIATION PLAN

After review of various remedial options, we propose the following Remediation Plan for this release site due to the positioning of the release on an active lease road and state caliche pit.

### 4.1 Soil Remediation Plan

The selected remedial option will be the following:

The 100 square foot area on the Federal ROW will be further delineated while the track hoe is onsite excavating the caliche pit. The anticipated depth of excavation will be based on assessment activities (laboratory analysis and release located on an active ROW). Every effort will be made to delineate this area to show chloride levels reach less than 1,000 ppm or are continuously falling. All contaminants removed will be disposed of at an NMOCD approved disposal facility. If chlorides cannot be safely excavated, the 100 foot area will be lined with a reinforced liner and backfilled with native soils.

The 595 square feet inside the caliche pit will be excavated to a depth required to reach 250 ppm or less of chlorides or to base of caliche bed at sample points 2 and 5. Caliche with greater than 1,000 ppm of chlorides will be disposed of at an NMOCD approved disposal facility. Apache would like to purchase the caliche within the release site containing less than 1,000 ppm of chlorides to build or repair roads, well pads, and berm material for pads and facilities in the Cedar Lake area where ground water will not be affected. Apache will use caliche from the state pit to backfill



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excavated areas in order to allow access to caliche in southern cell to the east of the release site.

### 4.2 Seeding Plan

The ROW area will be seeded with the Lesser Prairie Chicken (LPC) seed mixture. This is an area of 100 square feet plus any other areas disturbed during the remediation of the release site. The seed bed will be prepared by placing topsoil lightly over the area, treading area by walking across to make pockets to catch seed, broadcast seeding, and raking lightly to cover seed.

### 5. REMEDIATION WORK SCHEDULE

Soil remediation activities are expected to be completed in 10 working days (Monday through Friday) with work commencing after receiving approval and funding of this Remediation Plan.

### 6. FOLLOW-UP SCHEDULE

A Closure Report with Form C-141 will be completed and mailed within 30 days of remediation work being completed. This report will have the map of actual excavation and photos of excavation, liner in place, and final product. No further follow-up should be required due to this site being an active ROW, lease road, and caliche pit.





Appendix A

Attachments

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
ict IV
S. St. Francis Dr., Santa Fe, NM 87505

### State of New Mexico Energy Minerals and Natural Resources

Form C-141 Revised August 8, 2011

Oil Conservation Division 1220 South St. Francis Dr. Santa Fe, NM 87505 Submit 1 Copy to appropriate District Office in accordance with 19.15.29 NMAC.

Release Notifica	tion and Corre	ective A	etion			
	OPERATOR	R		al Report	Final Repo	
Name of Company Apache Corporation	Contact Bruce I					
Address 2350 W Marland Street, Hobbs, NM 88240 Facility Name Apache State SWD # 3	Telephone No. (		982			
	Facility Type S	SWD		_		
Surface Owner State Mineral Ow	/ner		API No	. 30-015-3	8978	
	TION OF RELEA	<b>ASE</b>				
Unit Letter   Section   Township   Range   Feet from the   1	North/South Line Feet	t from the	East/West Line	County		
L 19 17S 31E	•			Edd.		
Latitude 32.8165	26 I amaituda 1	02.01/720		_Eddy		
		_	_			
Type of Release Produced water	RE OF RELEAS					
Type of Release Troduced water	Volume of Relea	ase 7 barrels	of Volume F	Recovered 0	bbls	
Source of Release flow line	Date and Hour of	of Occurrence	Date and	Hours of Disc.	overy 10/2/2015	
Was Immediate Notice Given?	10/2/2015		Date and	Hour of Disc	overy 10/2/2015	
was immediate Notice Given?  ☐ Yes ☐ No ☒ Not Requ	If YES, To Who	om?				
By Whom?						
Was a Watercourse Reached?		Date and Hour If YES, Volume Impacting the Watercourse.				
Yes No  11 a Watercourse was Impacted, Describe Fully.*						
E:						
Describe Cause of Problem and Remedial Action Taken.*  A 3 inch metal transition developed a hole resulting in the release. T	he flow line was isolated	d and repaired	1.			
Describe Area Affected and Cleanup Action Taken.*						
The release affected total of 695 square feet with 100 square mapped and initial field sampling was conducted. The state land offi	feet of pasture and 595 ice was notified due to co	square feet or ontamination	n lease road and I in pit 337.	VM state pit 3	37. The area was	
I hereby certify that the information given above is true and complete regulations all operators are required to report and/or file certain releapublic health or the environment. The acceptance of a C-141 report is should their operations have failed to adequately investigate and remort the environment. In addition, NMOCD acceptance of a C-141 repfederal, state, or local laws and/or regulations.	ase notifications and perf by the NMOCD marked a ediate contamination that	form correctives as "Final Report page a three	ve actions for rele ort" does not relie	ases which m	ay endanger or of liability	
Signature: Bruce Baker	<u>O</u> 1	IL CONSI	ERVATION	DIVISION	1	
Printed Name: Bruce Baker	Approved by Enviro	onmental Spe	cialist:			
Title: Environmental Technician	Approval Date:		Expiration D	Pate:		
نا-mail Address: larry.baker@apachecorp.com	Conditions of Appro	oval:		Attached [	_	
Date: 10/7/2015 Phone: (432) 631-6982 Attach Additional Sheets If Necessary						





May 13, 2016

**BRUCE BAKER** 

**APACHE CORP - HOBBS** 

2350 W. MARLAND BLVD.

**HOBBS, NM 88240** 

RE: SWD #3 FLOWLINE

Enclosed are the results of analyses for samples received by the laboratory on 05/11/16 15:15.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-15-7. 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 <a href="https://www.tceq.texas.gov/field/qa/lab-accred-certif.html">www.tceq.texas.gov/field/qa/lab-accred-certif.html</a>.

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 (V1, V2, V3)

Accreditation applies to public drinking water matrices.

Celey D. Keine

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



**APACHE CORP - HOBBS BRUCE BAKER** 2350 W. MARLAND BLVD. HOBBS NM, 88240 (575) 393-2432 Fax To:

Received:

05/11/2016

Reported:

05/13/2016

Project Name: Project Number: SWD #3 FLOWLINE

Project Location:

Analyte

Analyte

Analyte

Analyte

NONE GIVEN **NOT GIVEN** 

Result

2560

Sampling Date:

Sampling Type:

Soil

Sampling Condition:

\*\* (See Notes)

Sample Received By:

Jodi Henson

05/11/2016

Sample ID: SAMPLE PT. 5 @ 4' (H601037-01)

Chloride, SM4500CI-B

mg/kg

Reporting Limit

16.0

Reporting Limit

16.0

Reporting Limit

16.0

Analyzed By: AP

Analyzed

05/12/2016

Analyzed

Analyzed

05/13/2016

05/13/2016

Method Blank

BS

416

% Recovery 104

True Value QC 400

RPD

Sample ID: SAMPLE PT. 5 @ 5' (H601037-02)

Chloride, SM4500Cl-8

mg/kg

Analyzed By: AP

BS % Recovery

3.77

**Qualifier** 

Chloride

Chloride

Result 240

05/12/2016

Method Blank ND

ND

416

True Value QC 400

**RPD** 3.77 Qualifier

Sample ID: SAMPLE PT. 5 @ 6' (H601037-03)

Chloride, SM4500Cl-B

Analyzed By: AP

Method Blank BS

416

% Recovery

104

104

True Value QC

400

RPD

0.00

Qualifier

Chloride

Chloride

Result

448

Result

512

Sample ID: SAMPLE PT. 5 @ 7' (H601037-04) Chloride, SM4500Cl-B

mg/kg

Analyzed By: AP

Analyzed Reporting Limit

16.0

Method Blank ND

ND

BS 416

% Recovery 104

True Value QC 400

RPD 0.00 Qualifier

Cardinal Laboratories

\*=Accredited Analyte

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Celey & Kenne



APACHE CORP - HOBBS **BRUCE BAKER** 2350 W. MARLAND BLVD. HOBBS NM, 88240 (575) 393-2432

Fax To:

Received:

05/11/2016

Reported:

05/13/2016

Project Name: Project Number: **SWD #3 FLOWLINE** NONE GIVEN

Project Location:

**NOT GIVEN** 

Sampling Date:

05/11/2016

Sampling Type:

Soil

Sampling Condition:

\*\* (See Notes)

Sample Received By:

Jodi Henson

### Sample ID: SAMPLE PT. 5 @ 8' (H601037-05)

mg/kg

Analyzed By: AP

Analyte

Chloride

Chloride

Chloride

Chloride

Result 384

Reporting Limit 16.0

Analyzed 05/13/2016 Method Blank ND

BS 416 % Recovery 104

True Value OC 400

RPD

0.00

### Sample ID: SAMPLE PT. 5 @ 9' (H601037-06)

Chloride,	SM4500CI-B
-----------	------------

mg/kg

Analyzed By: AP

Analyte

Result Reporting Limit 16.0

Analyzed 05/13/2016 Method Blank ND

BS 416 % Recovery 104

True Value QC 400

400

RPD

0.00

Qualifier

Qualifier

Sample ID: SAMPLE PT. 5 @ 10' (H601037-07)

Chloride, SM4500CI-B

Analyzed By: AP

Analyte

Result 432

480

Reporting Limit 16.0

Analyzed 05/13/2016

Method Blank ND

BS 416 % Recovery

104

True Value QC

Qualifier

RPD 0.00

### Sample ID: SAMPLE PT. 5 @ 11' (H601037-08)

Chloride, SM4500CI-B

Analyte

mg/kg

Analyzed By: AP

Result 608

Reporting Limit 16.0

Analyzed 05/13/2016 Method Blank ND

BS 416 % Recovery

104

True Value QC

400

RPD 0.00 Qualifier

Sample ID: SAMPLE PT. 5 @ 12' (H601037-09)

Chloride, SM4500CI-B

mg/kg

Analyzed By: AP

Analyte Chloride

Result 720

Reporting Limit 16.0

Analyzed 05/13/2016 Method Blank ND

RS 416 % Recovery 104

True Value QC

400

RPD 0.00 Qualifier

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\*=Accredited Analyte

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Celey D. Keena ...



APACHE CORP - HOBBS **BRUCE BAKER** 2350 W. MARLAND BLVD. HOBBS NM, 88240

Fax To:

(575) 393-2432

Received:

05/11/2016

Reported:

05/13/2016

Project Name: Project Number: SWD #3 FLOWLINE NONE GIVEN

Project Location:

Analyte

Analyte

Analyte

Analyte

**NOT GIVEN** 

Sampling Date:

05/11/2016

Sampling Type:

Soil

Sampling Condition:

\*\* (See Notes)

Sample Received By:

BS

416

B\$

416

Jodi Henson

Sample ID: SAMPLE PT. 5 @ 13' (H601037-10)

Chloride, SM4500CI-B

Chloride

Chloride

Reporting Limit

16.0

Reporting Limit

16.0

Result

464

Result

304

Analyzed By: AP

Analyzed

05/13/2016

Analyzed

05/13/2016

Method Blank

% Recovery 104

True Value QC

RPD 0.00

Qualifier

Chloride, SM4500Cl-B

mg/kg

Analyzed By: AP

400

Sample ID: SAMPLE PT. 5 @ 14' (H601037-11)

Method Blank

ND

% Recovery

104

True Value QC

RPD

Qualifler

Sample ID: SAMPLE PT. 5 @ 15' (H601037-12)

Chioride, SM4500Ci-B

Analyzed By: AP

0.00

Chloride

Result 640

Reporting Limit 16.0

Analyzed 05/13/2016 Method Blank ND

ND

BS 416 % Recovery

True Value QC

400

RPD

Qualifler

Chloride, SM4500CI-B

104

400

0.00

Sample ID: SAMPLE PT. 3 @ SURFACE (H601037-13)

mg/kg

Analyzed By: AP

Chloride

Reporting Limit

Analyzed 05/13/2016 Method Blank

BS

% Recovery

True Value QC

RPD

Qualifier

Result

<16.0

Result

64.0

mg/kg

05/13/2016

ND

416

104

400

0.00

Chloride

Sample ID: SAMPLE PT. 3 @ 1' (H601037-14)

Chloride, SM4500CI-B

16.0

16.0

Reporting Limit Analyzed

Analyzed By: AP Method Blank

ND

BS

416

% Recovery

104

True Value QC

400

RPD

0.00

Qualifier

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Analyte

\*=Accredited Analyte

All claims, including those for m Iraal within thirty (30) days after comp In no event shall Cardinal be liable for incidental or consequ arising out of or related to the performance of the services her ns or otherwise. Results relate only to the samples identified above. This report shall not be repro

Celly to Kana

Celey D. Keene, Lab Director/Quality Manager



**APACHE CORP - HOBBS BRUCE BAKER** 2350 W. MARLAND BLVD. **HOBBS NM, 88240** 

Fax To:

(575) 393-2432

Received:

05/11/2016

Reported:

05/13/2016

Project Name: Project Number: SWD #3 FLOWLINE

Project Location:

NONE GIVEN **NOT GIVEN** 

Sampling Date:

05/11/2016

Sampling Type:

Soil

Sampling Condition:

\*\* (See Notes)

Sample Received By:

Jodi Henson

### Sample ID: SAMPLE PT. 3 @ 2' (H601037-15)

Chloride, SM4500CI-B

Chloride

Analyzed By: AP

Analyte

Result

Reporting Limit

Analyzed

Method Blank

% Recovery

True Value QC

RPD

Qualifier

<16.0 16.0 05/13/2016 ND 416 104 400 0.00

### Sample ID: SAMPLE PT. 3 @ 3' (H601037-16)

Chloride, SM4500C -B	mg,	/kg	Analyze	d By: AP					
Analyte	Result	Reporting Limit	Analyzed	Method Blank	BS	% Recovery	True Value QC	RPD	Qualifier
Chloride	32.0	16.0	05/13/2016	ND	416	104	400	0.00	

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\*=Accredited Analyte

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Celegra Keena



### **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 SM4500CI-B does not require samples be received at or below 6°C

Samples reported on an as received basis (wet) unless otherwise noted on report

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Celey D. Kenne



# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

Company reason. House land		01 77/8	ANALYSIS REQUEST
Project Manager: R. M.C. Ballan		P.O. #:	
Address:		Company:	
City: State:	Zip:	Attn:	
Phone #:		Address:	
Project #: Project Owner:		City:	
Project Name: Poche		State: Zip:	
Project Location:		*	
Sampler Name: Their Tieves		Fax#:	
FOR INBUREDITY	MATRIX	PRESERV. SAMPLING	
	TER		~P \(
Lab I.D. Sample I.D.	NTAINE UNDWA TEWAT	BASE: COOL	louid
H601037	# CO GROI WAS SOIL OIL SLUD	ACIDA ICE /OTHE	
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(Circle One)	Sample Condition	CHECKED BY:	
Sampler-UPS - Bus - Other: 2 0	COTT Vess Wess	1785	- + 10 % 6 % 7 % 7 % 7 % 7 % 7 % 7 % 7 % 7 % 7

10

12



# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

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

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Company Name: L			BILL 10		ANALIGIG ARGURG	
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Address:		and and with differ the second spring of proper remains the second secon	Company			
City:	State:	Zip:	Attn:			
Phone #:	Fax #:		Address:			
Project #:	Project Owner:	er.	City:			
Project Name:			State: Zip:			
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	H 3 5 4.0	*****	1 5/m/2 orb	12:20m X		
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12

Page 8 of 8



June 21, 2016

**BRUCE BAKER** 

APACHE CORP - HOBBS

2350 W. MARLAND BLVD.

**HOBBS, NM 88240** 

**RE: SWD #3 FLOWLINE** 

Enclosed are the results of analyses for samples received by the laboratory on 06/15/16 16:45.

Cardinal Laboratories is accredited through Texas NELAP under certificate number T104704398-15-7. 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 <a href="https://www.tceq.texas.gov/field/qa/lab">www.tceq.texas.gov/field/qa/lab</a> accredited certif.html.

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 (V1, V2, V3)

Accreditation applies to public drinking water matrices.

Celecy D. Keine

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



**APACHE CORP - HOBBS BRUCE BAKER** 2350 W. MARLAND BLVD. **HOBBS NM, 88240** 

Fax To:

(575) 393-2432

Received:

06/15/2016

Reported:

06/21/2016

Project Name: Project Number: SWD #3 FLOWLINE NONE GIVEN

Project Location:

**NOT GIVEN** 

Sampling Date:

06/15/2016

Sampling Type:

Soil

Sampling Condition:

\*\* (See Notes)

Sample Received By:

Jodi Henson

Sample ID: SAMPLE PT. 5 @ 16' (H601326-01)

Chloride, SM4500Cl-B

mg/kg

Analyzed By: AP

BS

% Recovery

True Value QC

RPD

3.77

Qualifier

Analyte Chloride

Result 288

Result

320

16.0

Reporting Limit

Reporting Limit

16.0

Reporting Limit

16.0

Analyzed 06/20/2016

Analyzeo

06/20/2016

ND

Method Blank

416

104

400

Chloride

Sample ID: SAMPLE PT. 5 @ 17' (H601326-02)

Chloride, SM4500CI-B

Analyte

Analyte

mg/kg

Analyzed By: AP

Method Blank

ND

BS

416

% Recovery

104

% Recovery

104

True Value QC

400

RPD

3.77

Qualifier

Sample ID: SAMPLE PT. 5 @ 18' (H601326-03)

Chloride, SM4500Cl-B

Analyzed By: AP

Analyzed

idethod Blank

BS

True Value QC

RPD

Qualifier

Chloride

1010

Result

06/20/2016

ND

416

400

3.77

Cardinal Laboratories

\*=Accredited Analyte

PLEASE NOTE: Likelikey and Damages. Continuel's Lebelly and clearly exclusive remedy for any clear cases, whether based in contract or text, shall be finited to the amount prid by clear for analyses. All claims, including those for any clear cause, undersoned as the continue of the applicable sends. In no event shall Cardinal be liable for incidental or consequences. All chalms, including those for negligence and and other presentation, business included as the performance of the services herounder by Cardinal, regardless of whether such dains as successors arising out of a related to the performance of the services herounder by Cardinal, regardless of whether such dains as bread upon any of the above obtained as a successor of the control of the services herounder by Cardinal, regardless of whether such dains as bread upon any of the above obtained as a successor of the above of the above

Celeg I Kens

Celey D. Keene, Lab Director/Quality Manager



### **Notes and Definitions**

ND Analyte NOT DETECTED at or above the reporting limit

RPD Relative Percent Difference

Samples not received at proper temperature of 6°C or below.

\*\*\* Insufficient time to reach temperature.

Chloride by SM4500CI-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

Cardinal Laboratories

\*=Accredited Analyte

PLEASE NOTE: Liability and Damages. Cardinal's liability and clerk's evolusive 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 table for incidental or consequential darinages, including, without limitation, business interruptions, loss of use, or loss of profits incurred by client, its substitutes or successors arising out of or related to the performance of the services hareunder 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 Liaboratories.

Celey D. Keene -



# CHAIN-OF-CUSTODY AND ANALYSIS REQUEST

Company Name: 11/1/1/ Project Manager: 5144 Phone #: Address: Sampler Name: Project Location: Stock SUD #3 Flowling Project Name: HATCHE Project #: ACSIONH undyset. All claims including those for high service. In no event shall Caronal be liable Lab I.D. LEASE MOTE: Clabby and Damages (575) 393-2326 FAX (575) 393-2476 101 East Marland, Hobbs, NM 88240 Sample I.D. Flore Project Owner: Fax #: State: towers that be deemed weeked unless makes a writing and meaked by Cardinal within 13 days after completion of the a hapen stability without initiality. Dualities maken upbornt, loss of use, or loss of politic impured by dans, as subsidiants Zip (G)RAB OR (C)OMP. # CONTAINERS GROUNDWATER WASTEWATER MATRIX < SOIL OIL SLUDGE Phone #: State: City: Attn: P.O. #: Company: Address: Fax #: OTHER PRESERV ACID/BASE ICE / COOL BILL TO OTHER Zip SAMPLING 400 (V) 2.412 11:30 m TIME bon of the apt XXX Chloridge **ANALYSIS** REQUEST

Relinquished By:

Relinquished by

Time:

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

Cardinal cannot accept verbal changes. Please fax written changes to (575) 393-2326

Sample Condition
Cool Intact
Yes Ares

CHECKED BY:

mpotherson moningen Pome:1 Phone Result: Fax Result: REMARKS:

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to: It loves (adiversified Fsi-com

☐ Yes ☐ No Add'l Phone #:



Appendix B

Tables

Date   Sample # (feet)   BTEX   TPH   CU's   for CU's	STATE SWD FLOWLINE							
4/5/2016       PT.1       0       11         1       1       21         2       164         3       289         4       1299         5       730         6       999         17       1369         8       1192         9       1267         10       1248         11       905         12       830         13       653         14       830         15       910         16       946         17       1130         4/5/2016       PT.2       0         11       78         4       842         3       1162         4       842         5       903         6       889         7       7400       700         8       377         9       416         10       116       116         11       165       34         12       34       37         10       116       34         11       165       34			Depth		Lab Data		Field Data	
1	Date	Sample #		BTEX	TPH	CL's	for CL's	
2	4/5/2016	PT.1	0	<u> </u>			116	
3			1				218	
							1646	
S			3				2899	
6 999 7 1369 8 1192 9 1267 10 1248 11 909 12 830 13 651 14 838 15 910 16 946 17 1130 4/5/2016 PT.2 0 11 4 842 5 903 6 889 7 7 7400 700 8 8 377 9 416 10 116 11 1 165 12 34 15 16 16 16 377 17400 700 18 377 19 416 10 116 11 1 165 11 1 1 165			4				12960	
7   1366 8   1192 9   1267 10   1248 11   909 12   830 13   651 14   838 15   910 16   946 17   1130 4/5/2016   PT.2   0   11 1   78 2   423 3   1162 4   842 5   903 6   889 7   7400   700 8   377 9   416 10   116 11   165 12   34 16 17   165 189 416 19   416 10   116 11   165 12   34 16 17   30   64 17   130 16 16   14   330   45 16 17   17   17   17   17   17   17   17							7309	
8							9993	
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4/5/2016       PT.2       0       11         1       1       78         2       423         3       1162         4       842         5       903         6       889         7       7400       700         8       377         9       416         10       116         11       165         12       34         13       43       16         14       330       45         6/15/2016       PT.3       0       64       11         ND       13       ND       13         14       ND       13       ND       14							9468	
1			17				11306	
1	4/5/0046	27.4						
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3 1162 4 842 5 903 6 889 7 7400 700 8 7400 700 8 7400 700 10 116 11 1 165 12 34 13 43 16 14 330 45 6/15/2016 PT.3 0 64 11 1 ND 13							789	
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1 ND 13 ND 14		-	14			330	454	
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2 ND 14							139	
<del></del>							149	
							111	

	STATE SWD FLOWLINE								
		Depth	Lab Data Field Da						
Date	Sample #	(feet)	BTEX	TPH	CL's	for CL's			
4/5/2016	PT.4	0				111			
		1				112			
		2				624			
		3				684			
		4				1762			
5/11/2016	PT. 5	0				168			
		1				1278			
		2				194			
		3				1146			
		4			2560				
		5			240				
		6			448				
		7			512				
		8			384				
		9			480				
		10			432				
		11			608				
		12			720				
		13			464				
		14			304				
		15			640				
		16			288				
		17			320				
		18		<u> </u>	1010				



Appendix C

Figures















