



Environmental & Safety Solutions, Inc.

Electronic Correspondence

December 31, 2015

Mr. Mike Bratcher
State of New Mexico
Oil Conservation Division
811 S. 1st Street
Artesia, NM 88210
mike.bratcher@state.nm.us

Re: Corrective Action Plan- 2RP-3355
Memorial Production Operating, Loco Hills A6
Legal: Unit D, Sec 15, T17S, R30E, Eddy County, NM
Latitude/Longitude: 32.839398/ -103.966176
Etech Project Number: 416-6682-000
Depth to Groundwater: >300 feet
Release Type: Produced Water
Contaminants of Concern (COC's) Threshold Levels
Chlorides 1,000 mg/kg
TPH 5,000 mg/kg

Dear Mike:

Etech Environmental & Safety Solutions, Inc. (Etech) is submitting the following corrective action plan on the aforementioned site for your review and approval.

Background

On October 25, 2015 a leak was discovered and reported from the Loco Hills A6. A hole developed in the transfer line due to corrosion releasing approximately seven barrels (bbl.) of produced water. No fluid was recovered. An assessment of the site was conducted on November 3, 2015 by Etech personnel. The release flowed west and south from the transfer line in the pasture on the south side of the location. Length of the release was approximately 175 feet with varying widths from 6 feet to 20 feet. The impacted area affected approximately 4,300 square feet of surface area.

An initial sampling was conducted of the impacted area on November 3, 2015. Samples were collected from three (3) locations of the impacted area. Note: All of the samples were collected from low areas to present a "worse case" basis. The samples were analyzed for TPH, BTEX and Chlorides. TPH levels ranged from non-detect to 20,100 mg/kg. BTEX and Benzene levels were found to be below regulatory levels. Chloride levels ranged from 506 to 26,000 mg/kg. We were unable to delineate to 250 mg/kg with the hand auger, and due to the amount of above ground poly lines as well as a below ground line running right through the spill path we deemed it unsafe to delineate the site with a geoprobe rig. A copy of the assessment sheet and analytical results are attached.

## Scope of Work

The corrective action for this site will be to remediate impacted soils onsite. Impacted soils will be treated with DeSalt Plus as well as calcium sulfate to treat the elevated chloride levels and a microbial amendment to remediate elevated levels of hydrocarbons. We believe treating the site with DeSalt and calcium sulfate to be the most practicable way to approach this site, due to the depth to groundwater in the area being greater than 300 feet and the soil's sandy content. Therefore, the corrective action goals for this project will be 1,000 mg/kg of chlorides and 5,000 mg/kg of TPH. The particulars for remediation will involve the actions summarized as follows:

1. Placement of a one-call for utility location.
2. The impacted soil will be mechanically tilled to break up the soil. The impacted area will then be treated with the amendments and mechanically tilled in to incorporate the amendments.
3. Once screening determines the remediation objectives have been reached, confirmation samples will be collected.
4. If the results of analysis indicate that the hydrocarbon or chloride levels are above regulatory threshold levels, additional treatment will be performed until the remediation objectives are met.
5. The site will be seeded with BLM #2. Seeding will take place when the seasonal conditions are conducive to maximizing the potential for seed germination. Actual seeding will be accomplished by broadcast or drilling; whichever is the most practical for the site.

## Notifications and Special Conditions

1. The OCD and BLM will be notified prior to the commencement of on-site operations.
2. The OCD and BLM will be notified prior to each sampling event to allow the opportunity to witness the sampling events. Splits will be made available if requested.
3. Prior to seeding, the OCD and BLM will be notified when the site is closed for final inspection.
4. A final report documenting the closure of the site will be submitted along with a final C-141.

Thank you for your assistance on this matter. Should you have any questions, require additional information, or have any additional stipulations for this site, please me at (432) 563-2200 (office) or via email at [tim@etechnv.com](mailto:tim@etechnv.com).

Respectfully:



Tim McMinn

cc: Heather Patterson, NMOCD Division 2 Office  
Dara Glass, BLM Carlsbad District Office

**Attachment A**  
**Initial C-141**

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  
District IV  
1220 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 Notification and Corrective Action**

NAB1530048797

303900 OPERATOR

Initial Report  Final Report

Name of Company	Memorial Production Operating LLC	Contact	Heather Dolphin
Address	500 Dallas Street Houston TX 77002	Telephone No.	832-797-1334
Facility Name	Loco Hills A Federal No.6 (Closest Well)	Facility Type	Injection Line
Surface Owner	Mineral Owner	API No. 30-015-20611	

**LOCATION OF RELEASE**

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
D	15	17S	30E					Eddy

Latitude 32.8400116 Longitude -103.9662933 (NAD83)

**NATURE OF RELEASE**

Type of Release	Produced Water	Volume of Release	7bbl	Volume Recovered	0bbl
Source of Release	Well	Date and Hour of Occurrence	10/25/15	Date and Hour of Discovery	3:00 pm
Was Immediate Notice Given?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Not Required	If YES, To Whom?	Heather Patterson/ Mike Bratcher, OCD & Shelly Tucker/ Art Arias, BLM		
By Whom?	Heather Dolphin	Date and Hour	10/25/15 3:57pm	<u>* 2:57pm</u>	
Was a Watercourse Reached?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	If YES, Volume Impacting the Watercourse.	n/a		

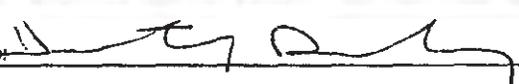
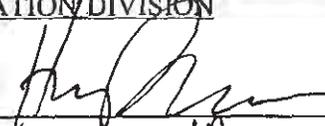
If a Watercourse was Impacted, Describe Fully.\*  
n/a

Describe Cause of Problem and Remedial Action Taken.\*  
Injection line developed a hole.

Describe Area Affected and Cleanup Action Taken.\*  
Puddle is approximately 15 yards in diameter in the pasture. Will clean-up per OCD/ BLM instruction.

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.

**NM OIL CONSERVATION**  
ARTESIA DISTRICT  
OCT 26 2015  
**RECEIVED**

Signature: 	<b>OIL CONSERVATION DIVISION</b>	
Printed Name: Heather Dolphin	Approved by Environmental Specialist: 	
Title: Sr. Regulatory Specialist	Approval Date: <u>10/27/15</u>	Expiration Date: <u>NIA</u>
E-mail Address: heather.dolphin@memorialrd.com	Conditions of Approval: <input type="checkbox"/> Attached <input type="checkbox"/>	
Date: 10/25/15 Phone: 832-797-1334	Mediation per O.C.D. Rules & Guidelines	

\* Attach Additional Sheets If Necessary

Submit Remediation Proposal no  
LATER THAN: 11/20/15 200-3355

**Attachment B**  
**Annotated Aerial Imagery**



Assessment Results					
Sample I.D.	Depth (ft.)	Chlorides (mg/kg)	TPH (mg/kg)	Benzene (mg/kg)	BTEX (mg/kg)
AH 1	0-1	11700	20100	0.0843	1.8393
AH 1	1-2	12200	359	ND	0.00778
AH 2	0-1	6790	408	ND	ND
AH 2	1-2	12200	ND	ND	ND
AH 2	2-3	21800	46.7	ND	ND
AH 2	3-4	26000	48.2	ND	ND
AH 3	0-1	11700	ND	ND	ND
AH 3	1-2	11900	ND	ND	ND
AH 3	2-3	3650	ND	ND	ND
AH 3	3-4	506	ND	ND	ND
AH 3	4-5	1020	ND	ND	ND
AH 3	5-6	9380	ND	ND	ND
AH 3	6-7	11800	ND	ND	ND
AH 3	7-8	11500	237	ND	ND
AH 3	8-9	9390	86.4	ND	ND
AH 3	9-10	8530	46.9	ND	ND

**Attachment C  
Photograph Log**

Loco Hills A6



Loco Hills A6



Loco Hills A6



Loco Hills A6



**Attachment D**  
**Analytical Results**

**PERMIAN BASIN  
ENVIRONMENTAL LAB, LP  
10014 SCR 1213  
Midland, TX 79706**



# Analytical Report

**Prepared for:**

Tim McMinn  
E Tech Environmental & Safety Solutions, Inc.  
13000 West County Road 100  
Odessa, TX 79765

Project: Loco Hills A6  
Project Number: 416-6682-000  
Location: Memorial  
Lab Order Number: 5K06012



**NELAP/TCEQ # T104704156-13-3**

Report Date: 11/17/15

E Tech Environmental & Safety Solutions, Inc.  
13000 West County Road 100  
Odessa TX, 79765

Project: Loco Hills A6  
Project Number: 416-6682-000  
Project Manager: Tim McMinn

Fax: (432) 563-2213

**ANALYTICAL REPORT FOR SAMPLES**

Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
Auger hole 1 0-1	5K06012-01	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 1 1-2	5K06012-02	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 2 0-1	5K06012-03	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 2 1-2	5K06012-04	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 2 2-3	5K06012-05	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 2 3-4	5K06012-06	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 0-1	5K06012-07	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 1-2	5K06012-08	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 2-3	5K06012-09	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 3-4	5K06012-10	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 4-5	5K06012-11	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 5-6	5K06012-12	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 6-7	5K06012-13	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 7-8	5K06012-14	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 8-9	5K06012-15	Soil	11/03/15 00:00	11-06-2015 16:09
Auger hole 3 9-10	5K06012-16	Soil	11/03/15 00:00	11-06-2015 16:09

**Auger hole 1 0-1**  
**5K06012-01 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

<b>Benzene</b>	<b>0.0843</b>	0.00120	mg/kg dry	1	P5K1010	11/09/15	11/10/15	EPA 8021B	
<b>Toluene</b>	<b>0.374</b>	0.00241	mg/kg dry	1	P5K1010	11/09/15	11/10/15	EPA 8021B	
<b>Ethylbenzene</b>	<b>0.448</b>	0.00120	mg/kg dry	1	P5K1010	11/09/15	11/10/15	EPA 8021B	
<b>Xylene (p/m)</b>	<b>0.592</b>	0.00241	mg/kg dry	1	P5K1010	11/09/15	11/10/15	EPA 8021B	
<b>Xylene (o)</b>	<b>0.341</b>	0.00120	mg/kg dry	1	P5K1010	11/09/15	11/10/15	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		85.8 %	75-125		P5K1010	11/09/15	11/10/15	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		131 %	75-125		P5K1010	11/09/15	11/10/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>11700</b>	60.2	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
<b>% Moisture</b>	<b>17.0</b>	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

<b>C6-C12</b>	<b>1960</b>	151	mg/kg dry	5	P5K1013	11/09/15	11/09/15	TPH 8015M	
<b>&gt;C12-C28</b>	<b>15900</b>	151	mg/kg dry	5	P5K1013	11/09/15	11/09/15	TPH 8015M	
<b>&gt;C28-C35</b>	<b>2200</b>	151	mg/kg dry	5	P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		109 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		109 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<b>Total Petroleum Hydrocarbon C6-C35</b>	<b>20100</b>	151	mg/kg dry	5	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 1 1-2**  
**5K06012-02 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00100	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00200	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<b>Ethylbenzene</b>	<b>0.00135</b>	0.00100	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<b>Xylene (p/m)</b>	<b>0.00529</b>	0.00200	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<b>Xylene (o)</b>	<b>0.00114</b>	0.00100	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		99.6 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		133 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>12200</b>	50.0	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	ND	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	25.0	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
<b>&gt;C12-C28</b>	<b>296</b>	25.0	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
<b>&gt;C28-C35</b>	<b>63.9</b>	25.0	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		117 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		145 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	S-GC
<b>Total Petroleum Hydrocarbon C6-C35</b>	<b>359</b>	25.0	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 2 0-1**  
**5K06012-03 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00217	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00217	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		121 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		114 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	6790	27.2	mg/kg dry	25	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	8.0	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	27.2	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	345	27.2	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	63.5	27.2	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: 1-Chlorooctane		117 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: o-Terphenyl		143 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	S-GC
<b>Total Petroleum Hydrocarbon C6-C35</b>	<b>408</b>	27.2	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 2 1-2**  
**5K06012-04 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00112	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00225	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00112	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00225	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00112	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		94.2 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		137 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	12200	56.2	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	11.0	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	28.1	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	ND	28.1	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	28.1	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: 1-Chlorooctane		103 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: o-Terphenyl		127 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	28.1	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 2 2-3**  
**5K06012-05 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00115	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00230	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00115	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00230	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00115	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		97.8 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		135 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	21800	57.5	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	13.0	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	28.7	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	46.7	28.7	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	28.7	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: 1-Chlorooctane		119 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: o-Terphenyl		147 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	S-GC
<b>Total Petroleum Hydrocarbon C6-C35</b>	<b>46.7</b>	28.7	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 2 3-4**  
**5K06012-06 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00118	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00235	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00118	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00235	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00118	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		93.9 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		141 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>26000</b>	58.8	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
<b>% Moisture</b>	<b>15.0</b>	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	29.4	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	<b>48.2</b>	29.4	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	29.4	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		103 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		126 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<b>Total Petroleum Hydrocarbon C6-C35</b>	<b>48.2</b>	29.4	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 3 0-1**  
**5K06012-07 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00215	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00215	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		98.2 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		130 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	11700	53.8	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	7.0	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	26.9	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: 1-Chlorooctane		114 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: o-Terphenyl		142 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 3 1-2**  
**5K06012-08 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00111	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00222	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00111	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00222	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00111	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		141 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC
<i>Surrogate: 4-Bromofluorobenzene</i>		92.9 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>11900</b>	55.6	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
<b>% Moisture</b>	<b>10.0</b>	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	27.8	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	ND	27.8	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	27.8	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		120 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		148 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	27.8	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 3 2-3**  
**5K06012-09 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00111	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00222	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00111	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00222	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00111	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		93.6 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		137 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>3650</b>	27.8	mg/kg dry	25	P5K1206	11/12/15	11/12/15	EPA 300.0	
<b>% Moisture</b>	<b>10.0</b>	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	27.8	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	ND	27.8	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	27.8	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		109 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		134 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	27.8	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 3 3-4**  
**5K06012-10 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00110	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00220	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00110	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00220	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00110	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		92.5 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		132 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>506</b>	1.10	mg/kg dry	1	P5K1206	11/12/15	11/12/15	EPA 300.0	
<b>% Moisture</b>	<b>9.0</b>	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	27.5	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	ND	27.5	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	27.5	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		114 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		142 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	27.5	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

E Tech Environmental & Safety Solutions, Inc.  
 13000 West County Road 100  
 Odessa TX, 79765

Project: Loco Hills A6  
 Project Number: 416-6682-000  
 Project Manager: Tim McMinn

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**Auger hole 3 4-5**  
**5K06012-11 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00215	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00215	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		137 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC
<i>Surrogate: 4-Bromofluorobenzene</i>		91.5 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>1020</b>	5.38	mg/kg dry	5	P5K1206	11/12/15	11/12/15	EPA 300.0	
<b>% Moisture</b>	<b>7.0</b>	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	26.9	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	ND	26.9	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		110 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		135 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	S-GC
Total Petroleum Hydrocarbon C6-C35	ND	26.9	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 3 5-6**  
**5K06012-12 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00217	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00217	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 4-Bromofluorobenzene		98.9 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		136 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	9380	27.2	mg/kg dry	25	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	8.0	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	27.2	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C12-C28	ND	27.2	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
>C28-C35	ND	27.2	mg/kg dry	1	P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: 1-Chlorooctane		95.5 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
Surrogate: o-Terphenyl		117 %	70-130		P5K1013	11/09/15	11/09/15	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	[CALC]	11/09/15	11/09/15	calc	

**Auger hole 3 6-7**  
**5K06012-13 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00217	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00217	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		130 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC
Surrogate: 4-Bromofluorobenzene		98.6 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	11800	54.3	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	8.0	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	27.2	mg/kg dry	1	P5K1013	11/09/15	11/10/15	TPH 8015M	
>C12-C28	ND	27.2	mg/kg dry	1	P5K1013	11/09/15	11/10/15	TPH 8015M	
>C28-C35	ND	27.2	mg/kg dry	1	P5K1013	11/09/15	11/10/15	TPH 8015M	
Surrogate: 1-Chlorooctane		101 %	70-130		P5K1013	11/09/15	11/10/15	TPH 8015M	
Surrogate: o-Terphenyl		123 %	70-130		P5K1013	11/09/15	11/10/15	TPH 8015M	
Total Petroleum Hydrocarbon C6-C35	ND	27.2	mg/kg dry	1	[CALC]	11/09/15	11/10/15	calc	

**Auger hole 3 7-8**  
**5K06012-14 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00217	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00217	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00109	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		142 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC
Surrogate: 4-Bromofluorobenzene		94.0 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	11500	54.3	mg/kg dry	50	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	8.0	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	27.2	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
>C12-C28	186	27.2	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
>C28-C35	50.7	27.2	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
Surrogate: 1-Chlorooctane		110 %	70-130		P5K1102	11/10/15	11/10/15	TPH 8015M	
Surrogate: o-Terphenyl		133 %	70-130		P5K1102	11/10/15	11/10/15	TPH 8015M	S-GC
<b>Total Petroleum Hydrocarbon C6-C35</b>	<b>237</b>	27.2	mg/kg dry	1	[CALC]	11/10/15	11/10/15	calc	

**Auger hole 3 8-9**  
**5K06012-15 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00110	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00220	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00110	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00220	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00110	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Surrogate: 1,4-Difluorobenzene		134 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC
Surrogate: 4-Bromofluorobenzene		92.9 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	

**General Chemistry Parameters by EPA / Standard Methods**

Chloride	9390	27.5	mg/kg dry	25	P5K1206	11/12/15	11/12/15	EPA 300.0	
% Moisture	9.0	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	27.5	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
>C12-C28	86.4	27.5	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
>C28-C35	ND	27.5	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
Surrogate: 1-Chlorooctane		121 %	70-130		P5K1102	11/10/15	11/10/15	TPH 8015M	
Surrogate: o-Terphenyl		144 %	70-130		P5K1102	11/10/15	11/10/15	TPH 8015M	S-GC
<b>Total Petroleum Hydrocarbon C6-C35</b>	<b>86.4</b>	27.5	mg/kg dry	1	[CALC]	11/10/15	11/10/15	calc	

**Auger hole 3 9-10**  
**5K06012-16 (Soil)**

Analyte	Result	Reporting Limit	Units	Dilution	Batch	Prepared	Analyzed	Method	Notes
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**Permian Basin Environmental Lab, L.P.**

**Organics by GC**

Benzene	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Toluene	ND	0.00215	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Ethylbenzene	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (p/m)	ND	0.00215	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
Xylene (o)	ND	0.00108	mg/kg dry	1	P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 4-Bromofluorobenzene</i>		94.2 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	
<i>Surrogate: 1,4-Difluorobenzene</i>		140 %	75-125		P5K1010	11/09/15	11/09/15	EPA 8021B	S-GC

**General Chemistry Parameters by EPA / Standard Methods**

<b>Chloride</b>	<b>8530</b>	26.9	mg/kg dry	25	P5K1206	11/12/15	11/12/15	EPA 300.0	
<b>% Moisture</b>	<b>7.0</b>	0.1	%	1	P5K1001	11/10/15	11/10/15	% calculation	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M**

C6-C12	ND	26.9	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
<b>&gt;C12-C28</b>	<b>46.9</b>	26.9	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
>C28-C35	ND	26.9	mg/kg dry	1	P5K1102	11/10/15	11/10/15	TPH 8015M	
<i>Surrogate: 1-Chlorooctane</i>		111 %	70-130		P5K1102	11/10/15	11/10/15	TPH 8015M	
<i>Surrogate: o-Terphenyl</i>		133 %	70-130		P5K1102	11/10/15	11/10/15	TPH 8015M	S-GC
<b>Total Petroleum Hydrocarbon C6-C35</b>	<b>46.9</b>	26.9	mg/kg dry	1	[CALC]	11/10/15	11/10/15	calc	

**Organics by GC - Quality Control**  
**Permian Basin Environmental Lab, L.P.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch P5K1010 - General Preparation (GC)**

<b>Blank (P5K1010-BLK1)</b>										
										Prepared & Analyzed: 11/09/15
Benzene	ND	0.00100	mg/kg wet							
Toluene	ND	0.00200	"							
Ethylbenzene	ND	0.00100	"							
Xylene (p/m)	ND	0.00200	"							
Xylene (o)	ND	0.00100	"							
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0483</i>		<i>"</i>	<i>0.0500</i>		<i>96.6</i>	<i>75-125</i>			
<i>Surrogate: 1,4-Difluorobenzene</i>	<i>0.0611</i>		<i>"</i>	<i>0.0500</i>		<i>122</i>	<i>75-125</i>			

<b>LCS (P5K1010-BS1)</b>										
										Prepared & Analyzed: 11/09/15
Benzene	0.0960	0.00100	mg/kg wet	0.100		96.0	70-130			
Toluene	0.107	0.00200	"	0.100		107	70-130			
Ethylbenzene	0.119	0.00100	"	0.100		119	70-130			
Xylene (p/m)	0.205	0.00200	"	0.200		103	70-130			
Xylene (o)	0.104	0.00100	"	0.100		104	70-130			
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0503</i>		<i>"</i>	<i>0.0500</i>		<i>101</i>	<i>75-125</i>			
<i>Surrogate: 1,4-Difluorobenzene</i>	<i>0.0736</i>		<i>"</i>	<i>0.0500</i>		<i>147</i>	<i>75-125</i>			<i>S-GC</i>

<b>LCS Dup (P5K1010-BSD1)</b>										
										Prepared & Analyzed: 11/09/15
Benzene	0.0889	0.00100	mg/kg wet	0.100		88.9	70-130	7.70	20	
Toluene	0.100	0.00200	"	0.100		100	70-130	6.82	20	
Ethylbenzene	0.114	0.00100	"	0.100		114	70-130	3.79	20	
Xylene (p/m)	0.197	0.00200	"	0.200		98.6	70-130	3.92	20	
Xylene (o)	0.104	0.00100	"	0.100		104	70-130	0.192	20	
<i>Surrogate: 4-Bromofluorobenzene</i>	<i>0.0518</i>		<i>"</i>	<i>0.0500</i>		<i>104</i>	<i>75-125</i>			
<i>Surrogate: 1,4-Difluorobenzene</i>	<i>0.0700</i>		<i>"</i>	<i>0.0500</i>		<i>140</i>	<i>75-125</i>			<i>S-GC</i>

**General Chemistry Parameters by EPA / Standard Methods - Quality Control**  
**Permian Basin Environmental Lab, L.P.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
<b>Batch P5K1001 - % Solids</b>										
<b>Blank (P5K1001-BLK1)</b>										Prepared & Analyzed: 11/10/15
% Moisture	ND	0.1	%							
<b>Duplicate (P5K1001-DUP1)</b>		<b>Source: 5K06010-01</b>								Prepared & Analyzed: 11/10/15
% Moisture	7.0	0.1	%		6.0			15.4	20	
<b>Duplicate (P5K1001-DUP2)</b>		<b>Source: 5K06012-11</b>								Prepared & Analyzed: 11/10/15
% Moisture	8.0	0.1	%		7.0			13.3	20	
<b>Duplicate (P5K1001-DUP3)</b>		<b>Source: 5K06013-03</b>								Prepared & Analyzed: 11/10/15
% Moisture	4.0	0.1	%		4.0			0.00	20	
<b>Batch P5K1206 - *** DEFAULT PREP ***</b>										
<b>Blank (P5K1206-BLK1)</b>										Prepared & Analyzed: 11/12/15
Chloride	ND	1.00	mg/kg wet							
<b>LCS (P5K1206-BS1)</b>										Prepared & Analyzed: 11/12/15
Chloride	94.4	1.00	mg/kg wet	100		94.4	80-120			
<b>LCS Dup (P5K1206-BSD1)</b>										Prepared & Analyzed: 11/12/15
Chloride	94.5	1.00	mg/kg wet	100		94.5	80-120	0.138	20	
<b>Duplicate (P5K1206-DUP1)</b>		<b>Source: 5K06010-05</b>								Prepared & Analyzed: 11/12/15
Chloride	1720	5.21	mg/kg dry		1710			0.328	20	
<b>Duplicate (P5K1206-DUP2)</b>		<b>Source: 5K06012-07</b>								Prepared & Analyzed: 11/12/15
Chloride	11600	53.8	mg/kg dry		11700			0.775	20	

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control**  
**Permian Basin Environmental Lab, L.P.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch P5K1013 - TX 1005**

**Blank (P5K1013-BLK1)**

Prepared & Analyzed: 11/09/15

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	89.3		"	100		89.3	70-130			
Surrogate: o-Terphenyl	53.2		"	50.0		106	70-130			

**LCS (P5K1013-BS1)**

Prepared & Analyzed: 11/09/15

C6-C12	956	25.0	mg/kg wet	1000		95.6	75-125			
>C12-C28	945	25.0	"	1000		94.5	75-125			
Surrogate: 1-Chlorooctane	105		"	100		105	70-130			
Surrogate: o-Terphenyl	53.3		"	50.0		107	70-130			

**LCS Dup (P5K1013-BSD1)**

Prepared & Analyzed: 11/09/15

C6-C12	1030	25.0	mg/kg wet	1000		103	75-125	7.33	20	
>C12-C28	1010	25.0	"	1000		101	75-125	6.96	20	
Surrogate: 1-Chlorooctane	114		"	100		114	70-130			
Surrogate: o-Terphenyl	59.5		"	50.0		119	70-130			

**Matrix Spike (P5K1013-MS1)**

Source: 5K06012-13

Prepared: 11/09/15 Analyzed: 11/10/15

C6-C12	938	27.2	mg/kg dry	1090	19.0	84.5	75-125			
>C12-C28	937	27.2	"	1090	ND	86.2	75-125			
Surrogate: 1-Chlorooctane	136		"	109		125	70-130			
Surrogate: o-Terphenyl	66.7		"	54.3		123	70-130			

**Matrix Spike Dup (P5K1013-MSD1)**

Source: 5K06012-13

Prepared: 11/09/15 Analyzed: 11/10/15

C6-C12	859	27.2	mg/kg dry	1090	19.0	77.3	75-125	8.90	20	
>C12-C28	842	27.2	"	1090	ND	77.5	75-125	10.6	20	
Surrogate: 1-Chlorooctane	124		"	109		114	70-130			
Surrogate: o-Terphenyl	61.1		"	54.3		112	70-130			

**Total Petroleum Hydrocarbons C6-C35 by EPA Method 8015M - Quality Control**  
**Permian Basin Environmental Lab, L.P.**

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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**Batch P5K1102 - TX 1005**

**Blank (P5K1102-BLK1)**

Prepared & Analyzed: 11/10/15

C6-C12	ND	25.0	mg/kg wet							
>C12-C28	ND	25.0	"							
>C28-C35	ND	25.0	"							
Surrogate: 1-Chlorooctane	103		"	100		103	70-130			
Surrogate: o-Terphenyl	61.1		"	50.0		122	70-130			

**LCS (P5K1102-BS1)**

Prepared & Analyzed: 11/10/15

C6-C12	1000	25.0	mg/kg wet	1000		100	75-125			
>C12-C28	1000	25.0	"	1000		100	75-125			
Surrogate: 1-Chlorooctane	119		"	100		119	70-130			
Surrogate: o-Terphenyl	58.3		"	50.0		117	70-130			

**LCS Dup (P5K1102-BSD1)**

Prepared & Analyzed: 11/10/15

C6-C12	1010	25.0	mg/kg wet	1000		101	75-125	1.17	20	
>C12-C28	1030	25.0	"	1000		103	75-125	2.10	20	
Surrogate: 1-Chlorooctane	123		"	100		123	70-130			
Surrogate: o-Terphenyl	63.7		"	50.0		127	70-130			

**Matrix Spike (P5K1102-MS1)**

Source: 5K06013-15

Prepared: 11/10/15 Analyzed: 11/11/15

C6-C12	956	25.3	mg/kg dry	1010	21.9	92.5	75-125			
>C12-C28	928	25.3	"	1010	39.6	88.0	75-125			
Surrogate: 1-Chlorooctane	114		"	101		113	70-130			
Surrogate: o-Terphenyl	50.7		"	50.5		100	70-130			

**Matrix Spike Dup (P5K1102-MSD1)**

Source: 5K06013-15

Prepared: 11/10/15 Analyzed: 11/11/15

C6-C12	948	25.3	mg/kg dry	1010	21.9	91.7	75-125	0.857	20	
>C12-C28	900	25.3	"	1010	39.6	85.1	75-125	3.28	20	
Surrogate: 1-Chlorooctane	111		"	101		110	70-130			
Surrogate: o-Terphenyl	49.7		"	50.5		98.4	70-130			

### Notes and Definitions

S-GC	Surrogate recovery outside of control limits. The data was accepted based on valid recovery of the remaining surrogate.
DET	Analyte DETECTED
ND	Analyte NOT DETECTED at or above the reporting limit
NR	Not Reported
dry	Sample results reported on a dry weight basis
RPD	Relative Percent Difference
LCS	Laboratory Control Spike
MS	Matrix Spike
Dup	Duplicate

Report Approved By:



Date:

11/17/2015

Brent Barron, Laboratory Director/Technical Director

This material is intended only for the use of the individual (s) or entity to whom it is addressed, and may contain information that is privileged and confidential.

If you have received this material in error, please notify us immediately at 432-686-7235.

# Etech Environmental & Safety Solutions, Inc.

P.O. Box 8469  
Midland, Texas 79708

CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

Phone: 432-563-2200  
Fax: 432-563-2213

Project Manager: Tim McMin  
Company Name: Etech Environmental & Safety Solutions, Inc.

Company Address: P.O. Box 8469

City/State/Zip: Midland/TX/79708

Telephone No: 432-563-2200

Sampler Signature: \_\_\_\_\_

Fax No: 432-563-2213

e-mail: Tim@etech.com

Project Name: Logo Hills PLU  
Project #: 414-UGS-2-000  
Project Loc: Memorial

Report Format:  Standard  TRRP  NPDES

PO #: \_\_\_\_\_

LAB: SPL - Lafayette, LA  
ORDER #: SK00012

LAB # (lab use only)	FIELD CODE	Beginning Depth	Ending Depth	Date Sampled	Time Sampled	No. of Containers	Ice	HNO <sub>3</sub>	HCl	H <sub>2</sub> SO <sub>4</sub>	NaOH	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub>	None	Other (Specify)	Matrix	TPH: 418.1 (8015M) 1005 1006	Cations (Ca, Mg, Na, K)	Anions (Cl, SO <sub>4</sub> , CO <sub>3</sub> , HCO <sub>3</sub> )	SAR / ESP / CEC	Metals: As Ag Ba Cd Cr Pb Hg Se	Volatiles	Semivolatiles	BTEX 802/85030 or BTEX 8260	RCI	N.O.R.M.	TOC	Chlorides	RUSH TAT (Pre-Schedule) 24 HOUR	Standard TAT
01	Auger hole 1	0	1	11-5-15		1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
02	Auger hole 2	1	2			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
03	Auger hole 2	0	1			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
04		1	2			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
05		2	3			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
070		3	4			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
07	Auger hole 3	0	1			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
08		1	2			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
09		2	3			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10		3	4			1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	S	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Special Instructions: \_\_\_\_\_

Relinquished by: Timothy Brady Date: 11-0-15 Time: 10:00 Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Relinquished by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_ Received by: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

Laboratory Comments: \_\_\_\_\_

Sample Containers Intact?  N  
VOCs Free of Headspace?  N  
Labels on containers?  N  
Custody seals on containers?  N  
Custody seals on cooler?  N  
Sample Hand Delivered by Sampler/Client Rep.?  N  
by Courier?  N  
Temperature Upon Receipt: \_\_\_\_\_ °C

