

**GW - 022**

**GENERAL  
CORRESPONDENCE**

**YEAR(S): 2007 - 2009**

## **Lowe, Leonard, EMNRD**

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**From:** Michelle Green [michelle@laenvironmental.com]  
**Sent:** Thursday, September 09, 2010 6:59 AM  
**To:** Lowe, Leonard, EMNRD; VonGonten, Glenn, EMNRD; Bonham, Sherry, EMNRD  
**Cc:** Dave Harris - Frontier Abo; Mark Larson  
**Subject:** Frontier Field Services Sampling Event (GW-022)

Good morning All,

Groundwater Sampling for the Frontier Field Service Empire Abo Gas Plant is scheduled for September 13, 2010:

Empire Abo Gas Plant  
GW-022  
Unit I (NE/4, SE/4), Section 3, Township 18 South, Range 27 East  
Artesia, Eddy County, New Mexico

Analytical Parameters: BTEX, Metals-RCRA+Ca, Mg, K, Na, Alkalinity, Anions and TDS

If you have any questions or require additional information please let me know.

Thank you,

Michelle L. Green  
Environmental Scientist - Chemist  
**Larson & Associates, Inc.**  
507 N Marienfeld, Suite 200  
Midland, TX 79701

Office: 432.687.0901  
Fax: 432.687.0789  
Cell: 432.934.3231



## **Lowe, Leonard, EMNRD**

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**From:** Lowe, Leonard, EMNRD  
**Sent:** Monday, October 05, 2009 2:08 PM  
**To:** Harris, Dave; 'Mark Larson'  
**Cc:** Dade, Randy, EMNRD  
**Subject:** Sulfur Plant Demolition Report for GW-022, Frontier Field Services

Mr. Harris,

The OCD has reviewed the February 19, 2009 report for the samples taken of the sulfur plant.

The OCD has concluded that this item is now closed.

llowe

### **Leonard Lowe**

Environmental Engineer  
Oil Conservation Division/EMNRD  
1220 S. St. Francis Drive  
Santa Fe, N.M. 87505  
Office: 505-476-3492  
Fax: 505-476-3462  
E-mail: [leonard.lowe@state.nm.us](mailto:leonard.lowe@state.nm.us)  
Website: <http://www.emnrd.state.nm.us/oed/>

RECEIVED

2009 FEB 25 AM 11 48

February 19, 2009

VIA EMAIL: [leonard.lowe@state.nm.us](mailto:leonard.lowe@state.nm.us)

Mr. Leonard Lowe  
Environmental Engineer  
New Mexico Oil Conservation Division  
Environmental Bureau  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

**Re: Sulfur Plant Demolition and Sampling Report, Frontier Field Services, LLC,  
Empire Abo Gas Plant, (GW-022), Unit I (NE/4, SE/4), Section 3, Township  
18 South, Range 37 East, Eddy County, New Mexico**

Dear Mr. Lowe,

This report is submitted to the New Mexico Oil Conservation Division (OCD) on behalf of Frontier Field Services, LLC (Frontier) by Larson & Associates, Inc. (LAI), its consultant, to report the results of demolition and sampling of out-of-service sulfur tank and recovery equipment at the Empire Abo Gas Plant (Facility) located at latitude 32° 46' 33.7" north and 104° 15' 37.2" west. The legal description for the Facility is Unit I (NE/4, SE/4), Section 3, Township 18 South, Range 37 East, in Eddy County, New Mexico. Figure 1 presents a location and topographic map. Figure 2 presents an aerial photograph showing the location of the former sulfur recovery area. Contact information for Frontier is as follows:

David Harris - Plant Manager  
P.O. Drawer 70  
Artesia, New Mexico 88211  
Telephone - (575) 677-2192  
E mail - [dharris@frontierfieldservices.com](mailto:dharris@frontierfieldservices.com)

**Background**

The sulfur recovery equipment was located near the northwest corner of the Facility and was out of service for about 20 years. The process included a boiler, sulfur recovery equipment and storage tank. The storage tank was partially buried and was used to store molten sulfur. The tank was constructed of single walled steel about 6 feet in diameter and about 25 feet in length. The lower portion of the tank was buried beneath the surface. There was no leak detection or secondary containment equipment associated with the tank. Placards on the sulfur recovery equipment stated that no asbestos containing material (ACM) was present.

On January 26, 2009, LAI, on behalf of Frontier, submitted a demolition and sampling plan to the OCD. On February 2, 2009, the OCD approved the demolition and sampling plan with the following conditions:

- Tanks, boiler, recovery equipment, all metal equipment shall be cleaned out and taken to a metal scrap yard for recycling. Effluent and debris from the cleaning efforts shall be taken to either of two OCD approved landfills stated within the plan;
- The OCD would like testing of the pH levels within the soil underneath the equipment once removed. PH balance of the soil must be within a range of 6 – 8.
- All soil shall be removed and disposed at an approved site. Larson and Associates may still perform and submit the stated testing to the OCD.

Appendix A presents the OCD approval.

On February 5, 2009, Watson Construction Company (Watson) was contracted by Frontier to remove the tank and equipment. Once removed, LAI personnel collected soil samples from beneath the tank and equipment. A 3-part composite sample was collected beneath the tank (SS-A, 0-1'), and a 5-part composite sample (SS-B, 0-1') was collected beneath the equipment. A background sample (SS-C, 0-1') was also collected from an undisturbed area north of the Facility. The samples were placed in glass laboratory containers, sealed, chilled in an ice chest and delivered under chain of custody control to DHL Analytical (DHL) located in Round Rock, Texas. DHL analyzed the samples for pH, moisture percent, and total petroleum hydrocarbons (TPH) including gasoline range organics (GRO) and diesel range organics (DRO). The laboratory method included SW-846-9045C (pH), D-2216 (moisture percent), SW-846-8015V (GRO) and SW-846-8015D (DRO). The background sample was analyzed for pH only. A stainless steel trowel was used to collect the samples and was thoroughly cleaned between uses with a solution of potable water and laboratory-grade detergent and rinsed with distilled water. The tank and out-of-service equipment was placed in a temporary salvage area near the southeast corner of the Facility pending transport to a metal recycler. Table 1 presents a summary of the laboratory results. Appendix B presents the laboratory report. Appendix C presents photographs.

#### **Sample Results**

Referring to Table 1, the pH balance of samples SS-A and SS-B was 6.8 and 7.15 standard units (S.U.), respectively. The pH of the background sample was 7.54 S.U. The TPH in sample SS-A was 164 milligrams per kilogram (mg/Kg) and 256 mg/Kg in sample SS-B. The tank excavation was filled with crushed caliche.

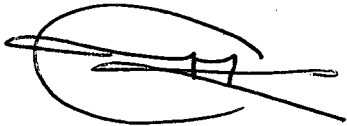
Mr. Leonard Lowe  
February 19, 2009  
Page 3

**Conclusions**

The laboratory results confirm that no releases of concern have occurred from the former sulfur recovery operation, therefore, Frontier requests closure for this operation. Please contact Mr. David Harris with Frontier at (575) 677-2192 or myself at (432) 687-0901, if you have questions. We may also be reached by emailing [dharris@frontierfieldservices.com](mailto:dharris@frontierfieldservices.com) or [mark@laenvironmental.com](mailto:mark@laenvironmental.com).

Sincerely,

***Larson & Associates, Inc.***

A handwritten signature in dark ink, appearing to be "Mark J. Larson", written over a circular stamp or seal.

Mark J. Larson, P.G., C.P.G., C.G.W.P.  
Sr. Project Manager / President

Encl.

Cc: David Harris – Frontier Field Services  
Sherry Bonham - NMOCD District 2

## Table

Frontier Field Services - Empire ABO  
Sulfur Recovery Area Soil Analytical Data Summary

Sample ID	Date	TPH (DRO)	TPH (GRO)	TPH (DRO + GRO)	pH
SS-A (0-1')	2/6/2009	164	<0.069	164	6.8
SS-B (0-1')	2/6/2009	256	<0.0621	256	7.15
SS-C (0-1') BK	2/6/2009	---	---	---	7.54

**Notes**

Gasoline range organics (GRO) and diesel range organics (DRO) analyzed via EPA SW846 method 8015V and D.

pH analyzed via EPA SW846 method 9054.

All values reported in Milligrams per Kilogram - dry (mg/kg, parts per million).



## Figures

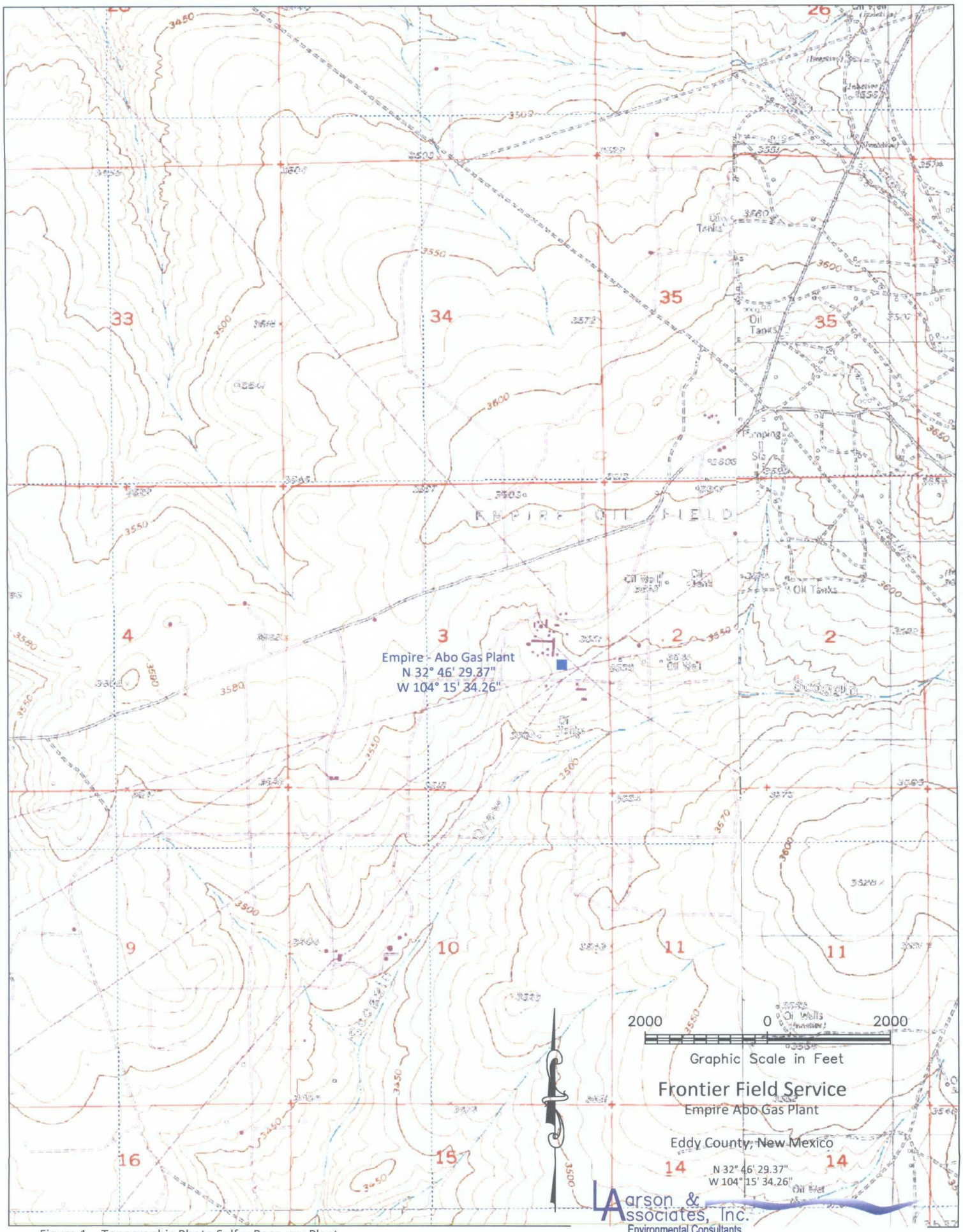


Figure 1 - Topographic Photo Sulfur Recovery Plant





150 0 150

Graphic Scale in Feet

Frontier Field Service  
Empire Abo Gas Plant

Eddy County, New Mexico

N 32° 46' 29.37"  
W 104° 15' 34.26"

**L**arson &  
Associates, Inc.  
Environmental Consultants

Figure 2 - Aerial Photo Sulfur Recovery Plant

**Attachment A**  
**OCD Correspondence**



# New Mexico Energy, Minerals and Natural Resources Department

**Bill Richardson**

Governor

**Joanna Prukop**

Cabinet Secretary

**Reese Fullerton**

Deputy Cabinet Secretary

**Mark Fesmire**

Division Director

**Oil Conservation Division**



February 2, 2009

Mr. David Harris  
Plant Manager  
Frontier Field Services, LLC  
P.O. Box 70  
Artesia, New Mexico 88211

Re: GW-022, Larson and Associates Sulfur Plant Demolition and Sampling plan at the Empire Abo Gas Plant, Eddy County

Dear Mr. Harris

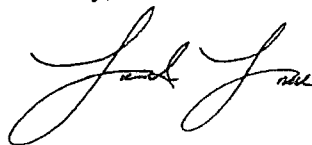
The Environmental Bureau of the New Mexico Oil Conservation Division (NMOCD) has received Mr. Mark J. Larson of Larson & Associates, Inc.'s demolition and sampling plan for the removal of a boiler, sulfur recovery equipment and storage tank from the Empire Abo Gas Plant dated January 26, 2009 and has conducted a review of the report. The OCD hereby approves the removal of the equipment on the following conditions.

- Tanks, boiler, recovery equipment, all metal equipment shall be cleaned out and taken to a metal scrap yard for recycling. Effluent and debris from cleaning efforts shall be taken to either of the two OCD approved landfills stated within the plan.
- The OCD would like testing of the PH levels within the soil underneath the equipment once removed. PH balance of soil must be within a range of 6 – 8. All soil shall be removed and disposed of at an approved site. Larson and Associates may still perform and submit the stated testing to the OCD.

Please be advised that the NMOCD approval of this report does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

If you have any questions pertaining to this process please call me at (505) 476-3492 or e-mail me at [leonard.lowe@state.nm.us](mailto:leonard.lowe@state.nm.us).

Sincerely,



Leonard Lowe  
Environmental Engineer

Oil Conservation Division \* 1220 South St. Francis Drive

\* Santa Fe, New Mexico 87505

\* Phone: (505) 476-3440 \* Fax (505) 476-3462\* <http://www.emnrd.state.nm.us>



**Attachment B**  
**Laboratory Report**



February 19, 2009

Michelle Green  
Larson & Associates  
507 N. Marienfeld #200  
Midland, TX 79701

Order No: 0902042

TEL: (432) 687-0901  
FAX: (432) 687-0456

RE: Frontier Abo Gas Plant

Dear Michelle Green:

DHL Analytical received 11 sample(s) on 2/7/2009 for the analyses presented in the following report.

There were no problems with the analyses and all data met requirements of NELAC except where noted in the Case Narrative. All non-NELAC methods will be identified accordingly in the case narrative and all estimated uncertainties of test results are within method or EPA specifications.

If you have any questions regarding these tests results, please feel free to call. Thank you for using DHL Analytical.

Sincerely,

John DuPont  
Lab Manager

This report was performed under the accreditation of the State of Texas Laboratory Certification Number:  
T104704211-08B-TX



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Nº 29143

# CHAIN-OF-CUSTODY

DATE: 2-6-09 PAGE 1 OF 1  
DHL WORK ORDER #: 0902042  
PROJECT LOCATION OR NAME: Frontier Abo Gas Plant  
CLIENT PROJECT #: 6-0141 COLLECTOR: DA

CLIENT: Jarman + Associates  
 ADDRESS: \_\_\_\_\_  
 PHONE: \_\_\_\_\_ FAX: \_\_\_\_\_  
 DATA REPORTED TO: Michelle Green  
 ADDITIONAL REPORT COPIES TO:

ADDITIONAL REPORT COPIES TO:

[illegible]

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)	TURN AROUND TIME	LABORATORY USE ONLY:
<i>Don Miller</i>	2-6-09 / 1445	<i>Don Miller</i>	RUSH <input type="checkbox"/> CALL FIRST	RECEIVING TEMP: <u>3.4</u> THERM #: <u>57</u>
<i>Don Miller</i>	2-7-09 8:45	<i>Don Miller</i>	1 DAY <input type="checkbox"/> CALL FIRST	CUSTODY SEALS - <input type="checkbox"/> BROKEN <input checked="" type="checkbox"/> INTACT <input type="checkbox"/> NOT USED
<i>Don Miller</i>		<i>Don Miller</i>	2 DAY <input type="checkbox"/>	CARRIER BILL # <u>Don Miller</u>
			NORMAL <input checked="" type="checkbox"/>	<input type="checkbox"/> APC DELIVERY
			OTHER <input type="checkbox"/>	<input type="checkbox"/> HAND DELIVERED



800.800.8984  
[www.iso.com](http://www.iso.com)

Airbill No. ZH549340

To: JENNIFER BARKER  
HOME

1005 HOWELL TERRACE PL  
ROUND ROCK, TX 78664  
(512) 244 - 2247

From: MICHELLE GREEN

LARSON & ASSOCIATES, INC.,  
507 N MARIENFELD  
SUITE 200  
MIDLAND, TX 79701  
(432) 687 - 0901

Service Type: Saturday by 1:00pm  
1D00V

AUS

Saturday by 1:00pm

QuickCode: DHL-SATURDAY

Date Printed: 2/6/2009

Fold on above line and place shipping label in pouch on package. Please be sure the barcodes and addresses can be read and scanned.



## Sample Receipt Checklist

Client Name Larson &amp; Associates

Date Received: 2/7/2009

Work Order Number 0902042

Received by JB

Checklist completed by:

JBain 2/9/09  
Signature Date

Reviewed by

JD 02/09/09  
Initials DateCarrier name: LoneStar

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	3.4 °C
Water - VOA vials have zero headspace?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input checked="" type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Applicable <input checked="" type="checkbox"/>

Adjusted? \_\_\_\_\_ Checked by \_\_\_\_\_

Any No response must be detailed in the comments section below.

Client contacted \_\_\_\_\_ Date contacted: \_\_\_\_\_ Person contacted \_\_\_\_\_

Contacted by: \_\_\_\_\_ Regarding: \_\_\_\_\_

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

Corrective Action \_\_\_\_\_

---

CLIENT: Larson & Associates  
Project: Frontier Abo Gas Plant  
Lab Order: 0902042

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**CASE NARRATIVE**

The samples were analyzed using the method outlined in the following reference:

Method M8015D - DRO Analysis  
Method M8015V - GRO Analysis  
Method SW9045C - pH of a Soil  
Method D2216 - Percent Moisture

**LOG IN**

Samples were received and log-in performed on 2/7/09. A total of 11 samples were received. The time of collection is from mountain standard time. The samples arrived in good condition and were properly packaged.

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CLIENT: Larson & Associates  
Project: Frontier Abo Gas Plant  
Lab Order: 0902042

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**Work Order Sample Summary**

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Lab Smp ID	Client Sample ID	Tag Number	Date Collected	Date Recv'd
0902042-01	SS-A (0-1')		02/06/09 07:30 AM	02/07/09
0902042-02	SS-B (0-1')		02/06/09 07:40 AM	02/07/09
0902042-03	SS-C (0-1') BK		02/06/09 08:05 AM	02/07/09
0902042-04	SS-AN (0-1')		02/06/09 07:30 AM	02/07/09
0902042-05	SS-AM (0-1')		02/06/09 07:30 AM	02/07/09
0902042-06	SS-AS (0-1')		02/06/09 07:30 AM	02/07/09
0902042-07	SS-B1 (0-1')		02/06/09 07:40 AM	02/07/09
0902042-08	SS-B2 (0-1')		02/06/09 07:40 AM	02/07/09
0902042-09	SS-B3 (0-1')		02/06/09 07:40 AM	02/07/09
0902042-10	SS-B4 (0-1')		02/06/09 07:40 AM	02/07/09
0902042-11	SS-B5 (0-1')		02/06/09 07:40 AM	02/07/09

---

CLIENT: Larson & Associates  
Project: Frontier Abo Gas Plant  
Lab Order: 0902042

## PREP DATES REPORT

Sample ID	Client Sample ID	Collection Date	Matrix	Test Number	Test Name	Prep Date	Batch ID
0902042-01A	SS-A (0-1')	02/06/09 07:30 AM	Soil	SW5030B	Purge and Trap Soils GC- Gas	02/11/09 10:45 AM	33415
	SS-A (0-1')	02/06/09 07:30 AM	Soil	SW9045C	pH Preparation	02/10/09 09:30 AM	33384
0902042-01B	SS-A (0-1')	02/06/09 07:30 AM	Soil	SW3550B	Soil Prep Sonication: DRO	02/12/09 01:38 PM	33445
	SS-A (0-1')	02/06/09 07:30 AM	Soil	D2216	Moisture Preparation	02/10/09 10:19 AM	33387
0902042-02A	SS-B (0-1')	02/06/09 07:40 AM	Soil	SW5030B	Purge and Trap Soils GC- Gas	02/11/09 10:45 AM	33415
	SS-B (0-1')	02/06/09 07:40 AM	Soil	SW9045C	pH Preparation	02/10/09 09:30 AM	33384
0902042-02B	SS-B (0-1')	02/06/09 07:40 AM	Soil	SW3550B	Soil Prep Sonication: DRO	02/12/09 01:38 PM	33445
	SS-B (0-1')	02/06/09 07:40 AM	Soil	D2216	Moisture Preparation	02/10/09 10:19 AM	33387
0902042-03A	SS-C (0-1') BK	02/06/09 08:05 AM	Soil	SW9045C	pH Preparation	02/10/09 09:30 AM	33384
	SS-C (0-1') BK	02/06/09 08:05 AM	Soil	D2216	Moisture Preparation	02/10/09 10:19 AM	33387

DHL Analytical

Date: 02/19/09

CLIENT: Larson & Associates  
 Project: Frontier Abo Gas Plant  
 Lab Order: 0902042

## ANALYTICAL DATES REPORT

Sample ID	Client Sample ID	Matrix	Test Number	Test Name	Batch ID	Dilution	Analysis Date	Run ID
0902042-01A	SS-A (0-1')	Soil	M8015V	Modified 8015 Gasoline (GRO)	33415	1	02/11/09 05:43 PM	GC4_090211A
	SS-A (0-1')	Soil	SW9045C	pH of Solid (Corrosivity)	33384	1	02/10/09 11:15 AM	PH_090210A
0902042-01B	SS-A (0-1')	Soil	D2216	Percent Moisture	33387	1	02/10/09 04:05 PM	PMOIST_090210A
	SS-A (0-1')	Soil	M8015D	TPH Extractable by GC - Soil	33445	1	02/13/09 10:44 AM	GC15_090213A
0902042-02A	SS-B (0-1')	Soil	M8015V	Modified 8015 Gasoline (GRO)	33415	1	02/11/09 06:05 PM	GC4_090211A
	SS-B (0-1')	Soil	SW9045C	pH of Solid (Corrosivity)	33384	1	02/10/09 11:15 AM	PH_090210A
0902042-02B	SS-B (0-1')	Soil	D2216	Percent Moisture	33387	1	02/10/09 04:05 PM	PMOIST_090210A
	SS-B (0-1')	Soil	M8015D	TPH Extractable by GC - Soil	33445	1	02/13/09 11:01 AM	GC15_090213A
0902042-03A	SS-C (0-1') BK	Soil	D2216	Percent Moisture	33387	1	02/10/09 04:05 PM	PMOIST_090210A
	SS-C (0-1') BK	Soil	SW9045C	pH of Solid (Corrosivity)	33384	1	02/10/09 11:15 AM	PH_090210A

## DHL Analytical

Date: 02/19/09

**CLIENT:** Larson & Associates  
**Project:** Frontier Abo Gas Plant  
**Project No:** 6-0141  
**Lab Order:** 0902042

**Client Sample ID:** SS-A (0-1')  
**Lab ID:** 0902042-01  
**Collection Date:** 02/06/09 07:30 AM  
**Matrix:** Soil

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>TPH Extractable by GC - Soil</b>		<b>M8015D</b>					<b>Analyst: AV</b>
TPH-DRO C10-C28	164	3.36	11.2		mg/Kg-dry	1	02/13/09 10:44 AM
Surr: Isopropylbenzene	64.0	0	47 - 142		%REC	1	02/13/09 10:44 AM
Surr: Octacosane	116	0	25 - 162		%REC	1	02/13/09 10:44 AM
<b>Modified 8015 Gasoline (GRO)</b>		<b>M8015V</b>					<b>Analyst: JAW</b>
Gasoline Range Organics	ND	0.0690	0.230		mg/Kg-dry	1	02/11/09 05:43 PM
Surr: Tetrachlorethene	99.9	0	70 - 134		%REC	1	02/11/09 05:43 PM
<b>pH of Solid (Corrosivity)</b>		<b>SW9045C</b>					<b>Analyst: AAD</b>
pH	6.80	0	0		pH Units	1	02/10/09 11:15 AM
<b>Percent Moisture</b>		<b>D2216</b>					<b>Analyst: RP</b>
Percent Moisture	15.6	0	0		WT%	1	02/10/09 04:05 PM

**Qualifiers:** \* Value exceeds TCLP Maximum Concentration Level  
 B Analyte detected in the associated Method Blank  
 C Sample Result or QC discussed in the Case Narrative  
 DF Dilution Factor  
 E TPH pattern not Gas or Diesel Range Pattern

J Analyte detected between MDL and RL  
 MDL Method Detection Limit  
 N Parameter not NELAC certified  
 ND Not Detected at the Method Detection Limit  
 RL Reporting Limit  
 S Spike Recovery outside control limits



## DHL Analytical

Date: 02/19/09

CLIENT: Larson & Associates  
 Project: Frontier Abo Gas Plant  
 Project No: 6-0141  
 Lab Order: 0902042

Client Sample ID: SS-B (0-1')  
 Lab ID: 0902042-02  
 Collection Date: 02/06/09 07:40 AM  
 Matrix: Soil

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>TPH Extractable by GC - Soil</b>		<b>M8015D</b>					<b>Analyst: AV</b>
TPH-DRO C10-C28	256	3.54	11.8		mg/Kg-dry	1	02/13/09 11:01 AM
Surr: Isopropylbenzene	67.3	0	47 - 142		%REC	1	02/13/09 11:01 AM
Surr: Octacosane	143	0	25 - 162		%REC	1	02/13/09 11:01 AM
<b>Modified 8015 Gasoline (GRO)</b>		<b>M8015V</b>					<b>Analyst: JAW</b>
Gasoline Range Organics	ND	0.0621	0.207		mg/Kg-dry	1	02/11/09 06:05 PM
Surr: Tetrachlorethene	95.5	0	70 - 134		%REC	1	02/11/09 06:05 PM
<b>pH of Solid (Corrosivity)</b>		<b>SW9045C</b>					<b>Analyst: AAD</b>
pH	7.15	0	0		pH Units	1	02/10/09 11:15 AM
<b>Percent Moisture</b>		<b>D2216</b>					<b>Analyst: RP</b>
Percent Moisture	17.9	0	0		WT%	1	02/10/09 04:05 PM

Qualifiers: \* Value exceeds TCLP Maximum Concentration Level  
 B Analyte detected in the associated Method Blank  
 C Sample Result or QC discussed in the Case Narrative  
 DF Dilution Factor  
 E TPH pattern not Gas or Diesel Range Pattern

J Analyte detected between MDL and RL  
 MDL Method Detection Limit  
 N Parameter not NELAC certified  
 ND Not Detected at the Method Detection Limit  
 RL Reporting Limit  
 S Spike Recovery outside control limits

## DHL Analytical

Date: 02/19/09

**CLIENT:** Larson & Associates  
**Project:** Frontier Abo Gas Plant  
**Project No:** 6-0141  
**Lab Order:** 0902042

**Client Sample ID:** SS-C (0-1') BK  
**Lab ID:** 0902042-03  
**Collection Date:** 02/06/09 08:05 AM  
**Matrix:** Soil

Analyses	Result	MDL	RL	Qual	Units	DF	Date Analyzed
<b>pH of Solid (Corrosivity)</b>		<b>SW9045C</b>					<b>Analyst: AAD</b>
pH	7.54	0	0		pH Units	1	02/10/09 11:15 AM
<b>Percent Moisture</b>		<b>D2216</b>					<b>Analyst: RP</b>
Percent Moisture	13.7	0	0		WT%	1	02/10/09 04:05 PM

Qualifiers: \* Value exceeds TCLP Maximum Concentration Level  
B Analyte detected in the associated Method Blank  
C Sample Result or QC discussed in the Case Narrative  
DF Dilution Factor  
E TPH pattern not Gas or Diesel Range Pattern

J Analyte detected between MDL and RL  
MDL Method Detection Limit  
N Parameter not NELAC certified  
ND Not Detected at the Method Detection Limit  
RL Reporting Limit  
S Spike Recovery outside control limits

CLIENT: Larson & Associates  
Work Order: 0902042  
Project: Frontier Abo Gas Plant

## ANALYTICAL QC SUMMARY REPORT

RunID: PH\_090210A

Sample ID:	0902026-18A-DUP	Batch ID:	33384	TestNo:	SW9045C	Units:	pH Units				
SampType:	DUP	Run ID:	PH_090210A	Analysis Date:	02/10/09 11:15 AM	Prep Date:	02/10/09				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH		7.71	0	0	7.352				4.81	5	

Sample ID:	0902042-01A-DUP	Batch ID:	33384	TestNo:	SW9045C	Units:	pH Units				
SampType:	DUP	Run ID:	PH_090210A	Analysis Date:	02/10/09 11:15 AM	Prep Date:	02/10/09				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH		6.78	0	0	6.797				0.221	5	

Qualifiers:	B	Analyte detected in the associated Method Blank	R	RPD outside accepted control limits
	DF	Dilution Factor	RL	Reporting Limit
	J	Analyte detected between MDL and RL	S	Spike Recovery outside control limits
	MDL	Method Detection Limit	J	Analyte detected between SDL and RL
	ND	Not Detected at the Method Detection Limit	N	Parameter not NELAC certified

CLIENT: Larson & Associates  
Work Order: 0902042  
Project: Frontier Abo Gas Plant

## ANALYTICAL QC SUMMARY REPORT

RunID: PH\_090210A

Sample ID:	ICV10-090210	Batch ID:	PH_S-02/10/09	TestNo:	SW9045C	Units:	pH Units				
SampType:	ICV	Run ID:	PH_090210A	Analysis Date:	02/10/09 11:15 AM	Prep Date:	02/10/09				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH		10.0	0	10.00	0	100	99	101			

Sample ID:	CCV1-090210	Batch ID:	PH_S-02/10/09	TestNo:	SW9045C	Units:	pH Units				
SampType:	CCV	Run ID:	PH_090210A	Analysis Date:	02/10/09 11:15 AM	Prep Date:	02/10/09				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH		6.96	0	7.000	0	99.4	97.1	102.9			

Sample ID:	CCV2-090210	Batch ID:	PH_S-02/10/09	TestNo:	SW9045C	Units:	pH Units				
SampType:	CCV	Run ID:	PH_090210A	Analysis Date:	02/10/09 11:15 AM	Prep Date:	02/10/09				
Analyte		Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
pH		7.08	0	7.000	0	101	97.1	102.9			

Qualifiers: B Analyte detected in the associated Method Blank  
DF Dilution Factor  
J Analyte detected between MDL and RL  
MDL Method Detection Limit  
ND Not Detected at the Method Detection Limit

R RPD outside accepted control limits  
RL Reporting Limit  
S Spike Recovery outside control limits  
J Analyte detected between SDL and RL  
N Parameter not NELAC certified

CLIENT: Larson & Associates  
Work Order: 0902042  
Project: Frontier Abo Gas Plant

## ANALYTICAL QC SUMMARY REPORT

RunID: PMOIST\_090210A

Sample ID:	0902055-02A-DUP	Batch ID:	33387	TestNo:	D2216	Units:	WT%			
SampType:	DUP	Run ID:	PMOIST_090210A	Analysis Date:	02/10/09 04:05 PM	Prep Date:	02/10/09			
Analyte	Result	RL	SPK value	Ref Val	%REC	LowLimit	HighLimit	%RPD	RPD Limit	Qual
Percent Moisture	24.4	0	0	24.83				1.73	30	

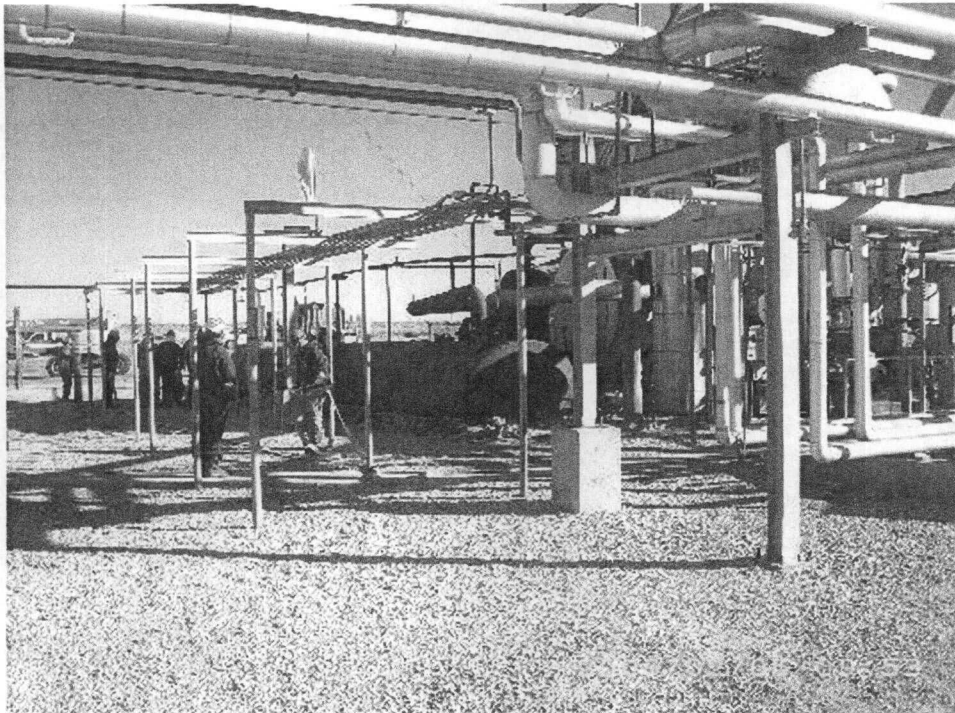
Qualifiers: B Analyte detected in the associated Method Blank  
DF Dilution Factor  
J Analyte detected between MDL and RL  
MDL Method Detection Limit  
ND Not Detected at the Method Detection Limit

R RPD outside accepted control limits  
RL Reporting Limit  
S Spike Recovery outside control limits  
J Analyte detected between SDL and RL  
N Parameter not NELAC certified

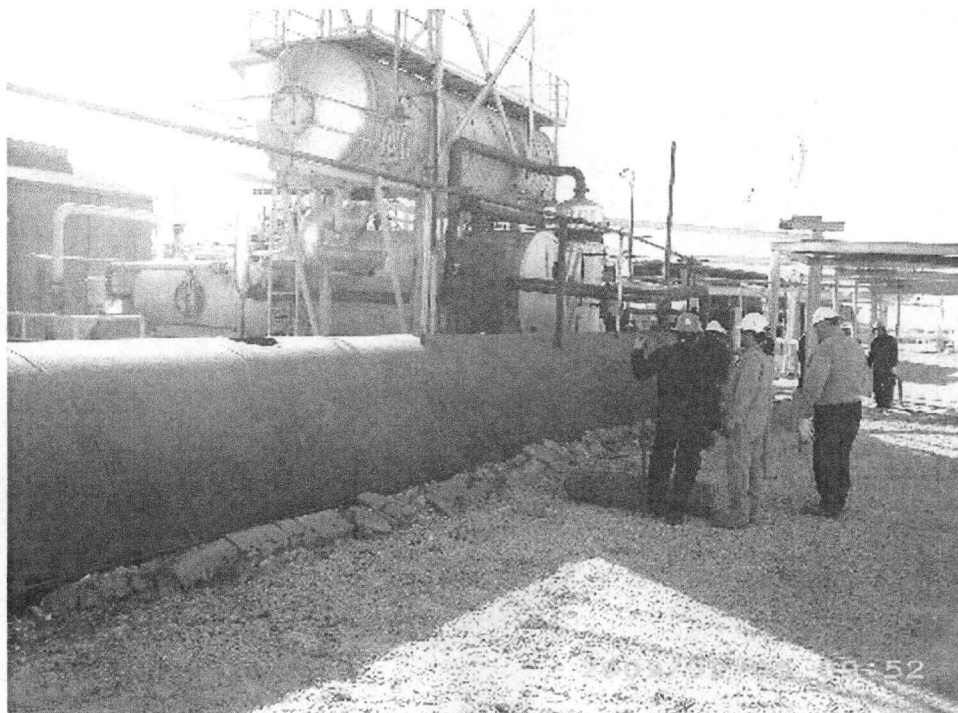
**Attachment C**

**Photographs**

**Photographic Documentation**



**Sulfur Tank (Prior to Removal) Looking North**



**Sulfur Tank (Prior to Removal) Looking South**

**Photographic Documentation**



Trenching at Base of Sulfur Tank Looking North



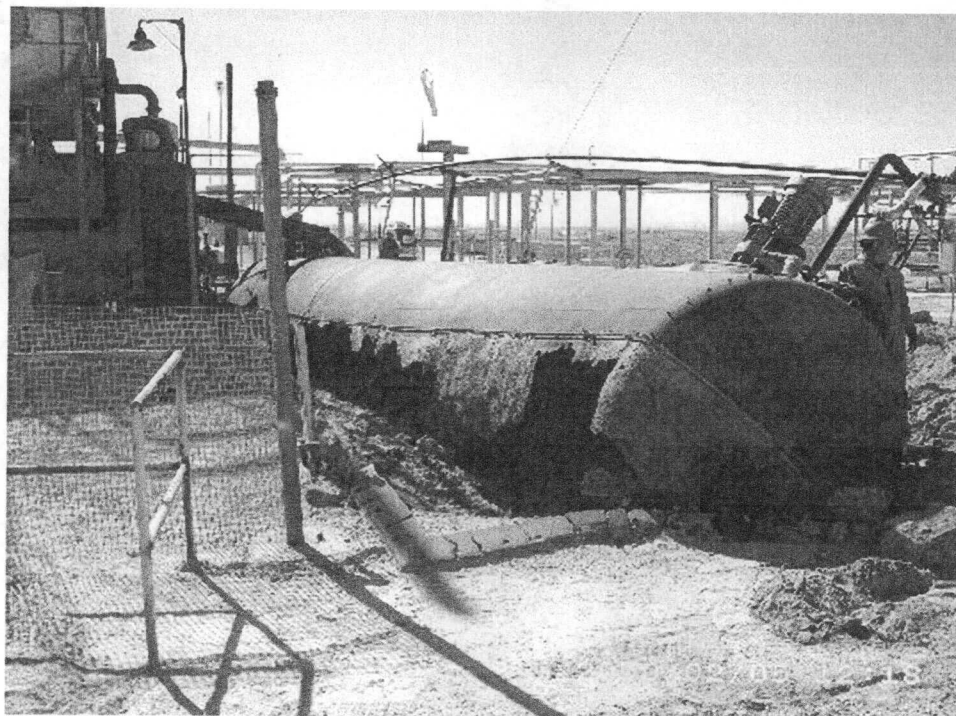
Exposed Sulfur Tank Looking North



Photographic Documentation



Exposed Sulfur Tank Looking North



Sulfur Tank Removal Looking Southwest

**Photographic Documentation**



Sulfur Tank Removal Looking Southwest



Removed Sulfur Tank Looking North

**Photographic Documentation**



**Sulfur Tank Excavation Looking Southeast**



**Sulfur Tank Excavation Looking North**



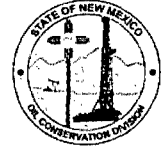
# New Mexico Energy, Minerals and Natural Resources Department

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**Bill Richardson**

Governor  
Joanna Prukop  
Cabinet Secretary  
Reese Fullerton  
Deputy Cabinet Secretary

Mark Fesmire  
Division Director  
Oil Conservation Division



February 2, 2009

Mr. David Harris  
Plant Manager  
Frontier Field Services, LLC  
P.O. Box 70  
Artesia, New Mexico 88211

Re: GW-022, Larson and Associates Sulfur Plant Demolition and Sampling plan at the Empire Abo Gas Plant, Eddy County

Dear Mr. Harris

The Environmental Bureau of the New Mexico Oil Conservation Division (NMOCD) has received Mr. Mark J. Larson of Larson & Associates, Inc.'s demolition and sampling plan for the removal of a boiler, sulfur recovery equipment and storage tank from the Empire Abo Gas Plant dated January 26, 2009 and has conducted a review of the report. The OCD hereby approves the removal of the equipment on the following conditions.

- Tanks, boiler, recovery equipment, all metal equipment shall be cleaned out and taken to a metal scrap yard for recycling. Effluent and debris from cleaning efforts shall be taken to either of the two OCD approved landfills stated within the plan.
- The OCD would like testing of the PH levels within the soil underneath the equipment once removed. PH balance of soil must be within a range of 6 – 8. All soil shall be removed and disposed of at an approved site. Larson and Associates may still perform and submit the stated testing to the OCD.

Please be advised that the NMOCD approval of this report does not relieve the owner/operator of responsibility should operations pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve the owner/operator of responsibility for compliance with any OCD, federal, state, or local laws and/or regulations.

If you have any questions pertaining to this process please call me at (505) 476-3492 or e-mail me at [leonard.lowe@state.nm.us](mailto:leonard.lowe@state.nm.us).

Sincerely,

Leonard Lowe  
Environmental Engineer

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Oil Conservation Division \* 1220 South St. Francis Drive

\* Santa Fe, New Mexico 87505

\* Phone: (505) 476-3440 \* Fax (505) 476-3462\* <http://www.emnrd.state.nm.us>



February 2, 2009

Page 2

xc: Mr. Mark J. Larson, Larson & Associates, Inc

## **Lowe, Leonard, EMNRD**

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**From:** Lowe, Leonard, EMNRD  
**Sent:** Monday, February 02, 2009 4:41 PM  
**To:** 'dharris@frontierfieldservices.com'  
**Cc:** 'mark@laenvironmental.com'  
**Subject:** Work Plan approval letter  
**Attachments:** GW-022 work plan-sulfur.pdf

Mr. David Harris,

Thank you for submitting the plan for the removal of the sulfur recovery equipment.

If you have any questions please feel free to contact me or Wayne Price.

llowe

### **Leonard Lowe**

Environmental Engineer  
Oil Conservation Division/EMNRD  
1220 S. St. Francis Drive  
Santa Fe, N.M. 87505  
Office: 505-476-3492  
Fax: 505-476-3462  
E-mail: [leonard.lowe@state.nm.us](mailto:leonard.lowe@state.nm.us)  
Website: <http://www.emnrd.state.nm.us/ocd/>



## **Lowe, Leonard, EMNRD**

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**From:** Price, Wayne, EMNRD  
**Sent:** Monday, January 26, 2009 4:07 PM  
**To:** Lowe, Leonard, EMNRD  
**Subject:** FW: Sulfur Recovery Equipment Demolition and Sampling Plan, Frontier Field Services, L.P., Empire Abo Gas Plant (GW-022), Eddy County, New Mexico  
**Attachments:** Frontier Field Services Empire Abo Plant Sulfur Equipment Demolition and Sampling Plan, January 26, 2009.pdf

Yours or somebody.

---

**From:** Mark Larson [mailto:Mark@laenvironmental.com]  
**Sent:** Monday, January 26, 2009 3:14 PM  
**To:** Price, Wayne, EMNRD  
**Cc:** dharris@frontierfieldservices.com  
**Subject:** Re: Sulfur Recovery Equipment Demolition and Sampling Plan, Frontier Field Services, L.P., Empire Abo Gas Plant (GW-022), Eddy County, New Mexico

Wayne,

Please find attached demolition and sampling plan for sulfur recovery equipment, including the sulfur storage tank, at the Frontier Field Services, L.P., Empire Abo Gas Plant (GW-022). Your approval of the plan I requested and appreciated.

Please contact Mr. David Harris (575-677-2192) with Frontier or myself if you have questions.

Thank you,

Mark J. Larson  
Sr. Project Manager / President  
507 N. Marienfeld St., Ste. 202  
Midland, Texas 79701  
(432) 687-0901 (office)  
(432) 687-0456 (fax)  
(432) 556-8656 (cell)  
[mark@laenvironmental.com](mailto:mark@laenvironmental.com)



Check for  
Ph of soil (6-8)

soil → dI H<sub>2</sub>O to sample.  
↳ Acid. fertilizer

All metal taken to metal scrap yard &  
recycled.

---

I am using the Free version of SPAMfighter  
We are a community of 5.9 million users fighting spam.  
SPAMfighter has removed 3617 of my spam emails to date.  
The Professional version does not have this message

---

This inbound email has been scanned by the MessageLabs Email Security System.

---



January 26, 2009

**VIA EMAIL: [wayne.price@state.nm.us](mailto:wayne.price@state.nm.us)**

Mr. Wayne Price, Chief  
Environmental Bureau  
New Mexico Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

**Re: Sulfur Plant Demolition and Sampling Plan  
Frontier Field Services, LLC, Empire Abo Gas Plant, (GW-022),  
Unit I (NE/4, SE/4), Section 3, Township 18 South, Range 37 East  
Eddy County, New Mexico**

Dear Mr. Price:

This letter is submitted to the New Mexico Oil Conservation Division (OCD) on behalf of Frontier Field Services, LLC (Frontier) by Larson & Associates, Inc. (LAI), its consultant, for approval to remove out-of-service sulfur recovery equipment at the Empire Abo Gas Plant (Facility) located at latitude 32° 46' 33.7" north and 104° 15' 37.2" west. The legal description is the Unit I (NE/4, SE/4), Section 3, Township 18 South, Range 37 East, in Eddy County, New Mexico. Figure 1 presents a location and topographic map. Figure 2 presents an aerial photograph showing the location of the sulfur recovery equipment. Contact information is as follows:

David Harris - Plant Manager  
P.O. Drawer 70  
Artesia, New Mexico 88211  
Telephone - (575) 677-2192  
E mail - [dharris@frontierfieldservices.com](mailto:dharris@frontierfieldservices.com)

#### **Background**

The sulfur recovery equipment is located near the northwest corner of the Facility and has been out of service for about 20 years. The process includes a boiler, sulfur recovery equipment and storage tank. The storage tank was partially buried and was used to store molten sulfur. The tank is constructed of single walled steel about 6 feet in diameter and about 25 feet in length. The lower portion of the tank is buried beneath the surface. There is no leak detection or secondary containment equipment. Placards on the equipment state that no asbestos containing material (ACM) is present. Appendix A presents photographs.

#### **Work Plan**

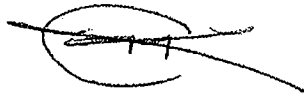
Frontier proposes to remove the equipment and storage tank, including residual elemental sulfur, for disposal at Controlled Recovery, Inc. (CRI) or Lea Land Landfill, Inc. (LLI) located between Hobbs and Carlsbad, New Mexico. A visual examination will be performed after the tank is removed, and a composite sample, consisting of three (3) discreet samples, will be collected beneath the tank and analyzed by laboratory method (SW-846-8015) for total petroleum hydrocarbons (TPH), including gasoline range organics (GRO) and diesel range organics (DRO).

Mr. Wayne Price  
January 26, 2009  
Page 2

The laboratory results will be submitted to the OCD within 45 days following receipt of the final laboratory report along with photographs taken after the equipment and tank is removed. Your approval of this demolition and sampling plan is greatly appreciated. Please contact Mr. David Harris with Frontier at (575) 677-2192 or myself at (432) 687-0901, if you have questions. We may also be reached by emailing [dharris@frontierfieldservices.com](mailto:dharris@frontierfieldservices.com) or [mark@laenvironmental.com](mailto:mark@laenvironmental.com).

Sincerely,

*Larson & Associates, Inc.*



Mark J. Larson, P.G., C.P.G., C.G.W.P.  
Sr. Project Manager / President

Encl.

Cc: David Harris – Frontier Field Services  
Tim Gum – NMOCD District 2

## Figures

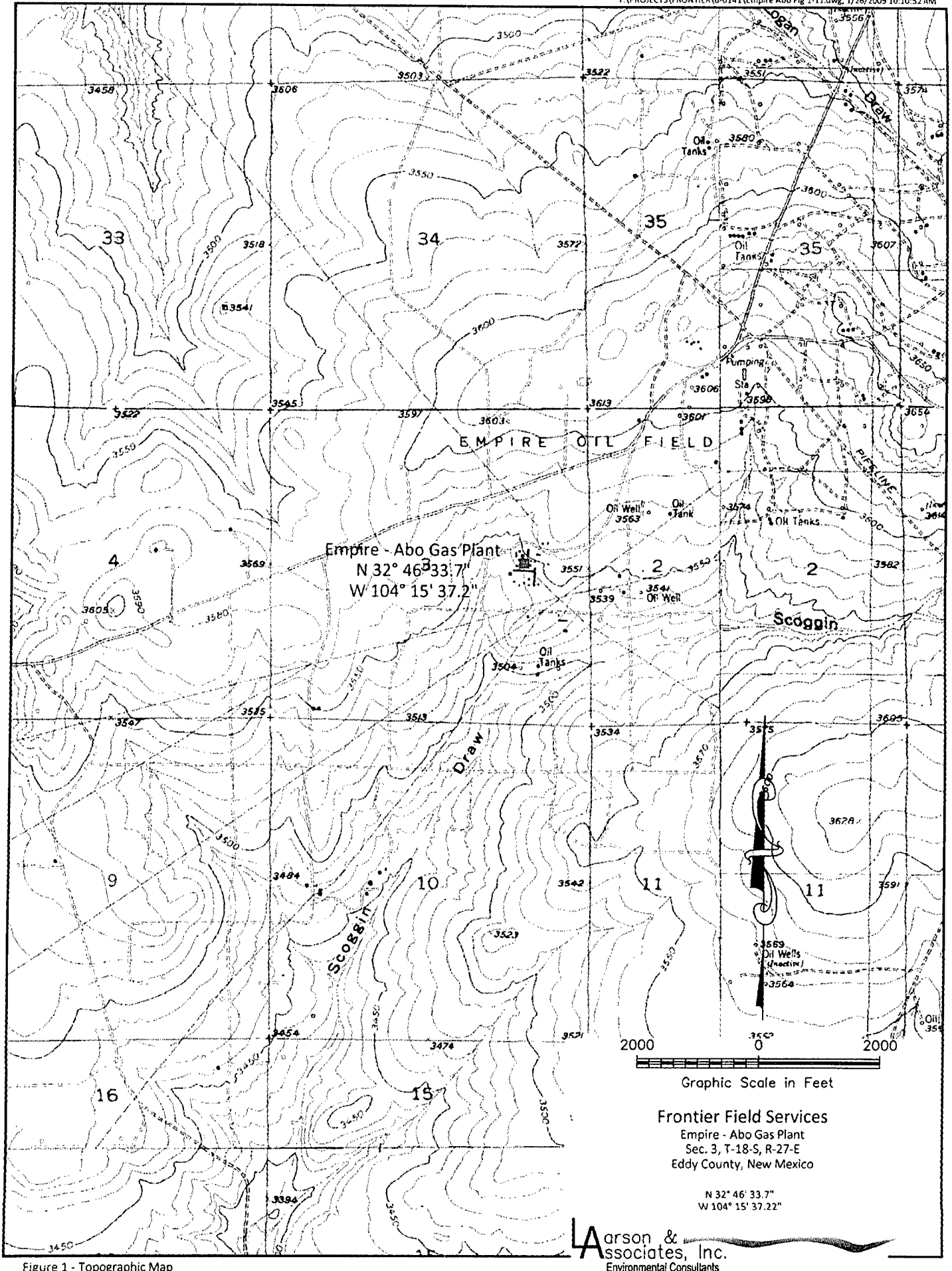


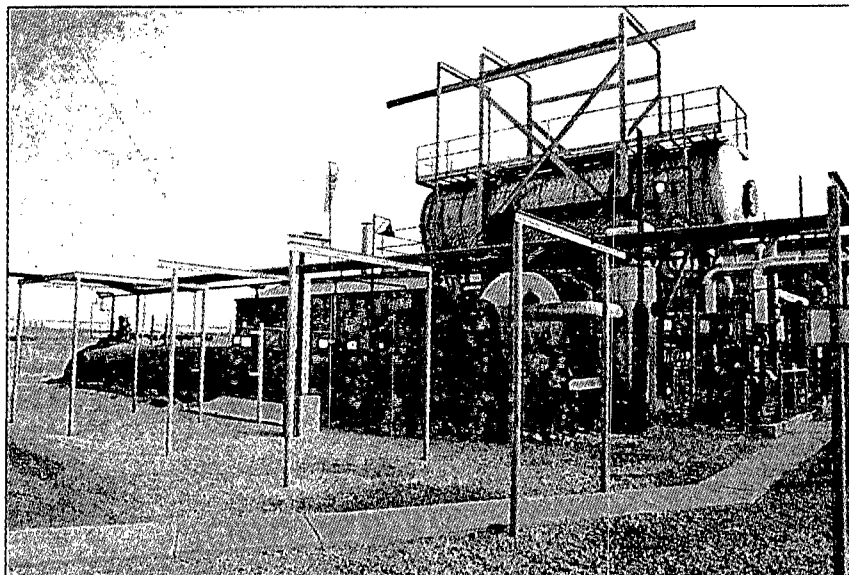
Figure 1 - Topographic Map



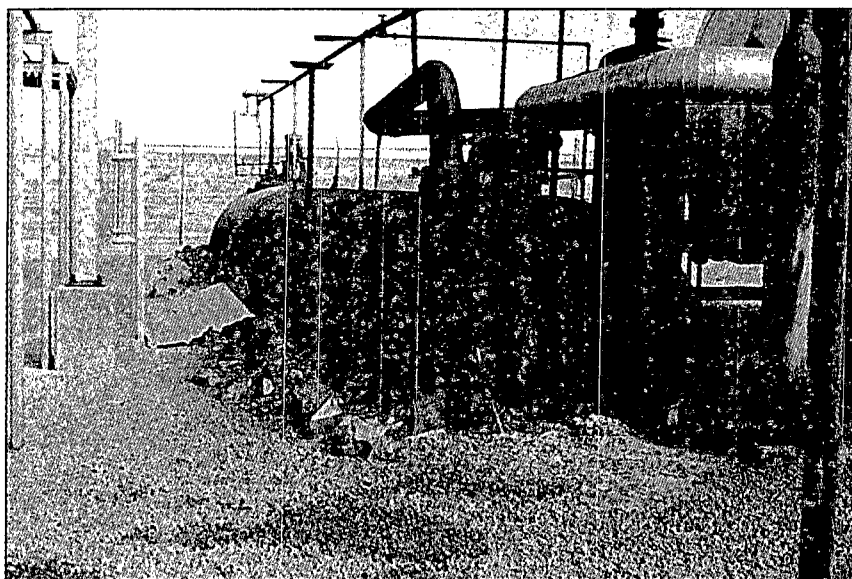
Figure 2 - Sulfur Plant Location

**Attachment A**

**Photographs**



Sulfur Recovery Equipment , Frontier Field Services,  
Empire Abo Gas Plant, Looking Northeast, January 23,  
2009



Sulfur Recovery Tank, Frontier Field Services, Empire  
Abo Gas Plant, Looking North, January 23, 2009

Frontier Field Services

Empire - Abo Gas Plant  
Sec. 3, T-18-S, R-27-E  
Eddy County, New Mexico

N 32° 46' 33.7"  
W 104° 15' 37.22"

## Price, Wayne, EMNRD

---

**From:** Price, Wayne, EMNRD  
**Sent:** Tuesday, December 11, 2007 12:29 PM  
**To:** Price, Wayne, EMNRD; Lowe, Leonard, EMNRD  
**Cc:** VonGonten, Glenn, EMNRD  
**Subject:** RE: Frontier Field Services Empire Abo Plant GW-022

PS after scanning give the hard copy to Glenn:

---

**From:** Price, Wayne, EMNRD  
**Sent:** Tuesday, December 11, 2007 12:27 PM  
**To:** Lowe, Leonard, EMNRD  
**Cc:** VonGonten, Glenn, EMNRD  
**Subject:** FW: Frontier Field Services Empire Abo Plant GW-022

Dear Leonard, I am putting a report and this approval on your desk, please scan the report with a copy of the approval together under a new thumbnail and put the approval in 2007 correspondence.

---

**From:** Price, Wayne, EMNRD  
**Sent:** Tuesday, December 11, 2007 12:21 PM  
**To:** 'dharris@frontierfieldservices.com'  
**Cc:** mark@laenvironmental.com  
**Subject:** Frontier Field Services Empire Abo Plant GW-022

Dear Mr. Harris:

OCD is in receipt of the December 10, 2007 Interim Groundwater report which recommends additional installation of monitor and recovery wells. OCD hereby approves of the path forward plan.

Please be advised that OCD approval of this plan does not relieve the owner/operator of responsibility should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, OCD approval does not relieve the owner/operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Wayne Price-Environmental Bureau Chief  
Oil Conservation Division  
1220 S. Saint Francis  
Santa Fe, NM 87505  
E-mail [wayne.price@state.nm.us](mailto:wayne.price@state.nm.us)  
Tele: 505-476-3490  
Fax: 505-476-3462

12/11/2007