

**GW-025**

**SOUTH # 1 POND  
INVESTIGATION REPORT**

**DATE:  
July 21, 2009**

RECEIVED  
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July 21, 2009

Mr. Glenn Von Gonten, Sr. Hydrologist  
State of New Mexico – Oil Conservation Division  
1220 South St. Francis Drive  
Santa Fe, New Mexico 87505

Re: South (#1) Brine Pond Investigation Report  
Targa Midstream Services, L.P., Monument Gas Plant (GW-025)  
Lea County, New Mexico

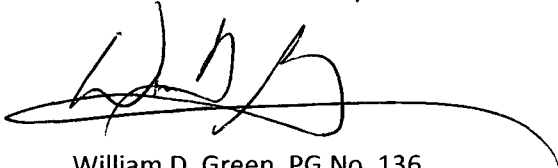
Dear Mr. Von Gonten:

The enclosed report is submitted to the New Mexico Oil Conservation Division on behalf of Targa Midstream Services, L. P. (Targa) to present the results of closure and investigation activities for the South (#1) Brine Pond at the Monument Gas Plant.

If you have any questions or concerns, please call me at 432.687.0901 to discuss.

Sincerely,

**LARSON & ASSOCIATES, INC.**



William D. Green, PG No. 136  
Texas Licensed Professional Geologist  
[wgreen@laenvironmental.com](mailto:wgreen@laenvironmental.com)

Attachments South Brine Pond Investigation Report

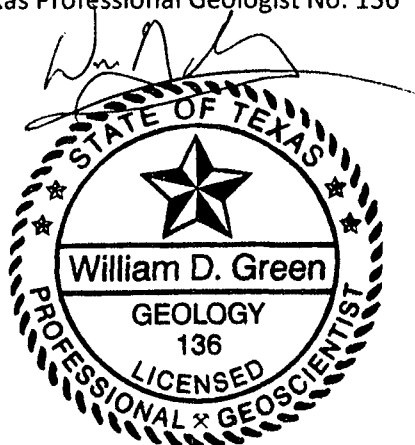
CC Mr. Cal Wrangham, Targa Midstream Services, L.P.  
Mr. Todd Young, Targa Midstream Services, L.P.  
~~Mr. Carl Chavez, OCD Santa Fe~~  
Mr. Larry Hill, OCD Hobbs

**South Brine Pond Investigation Report**  
**Monument Gas Plant**  
**(GW-025)**  
**Lea County, New Mexico**

**July 17, 2009**

Prepared for:  
Targa Midstream Services, L.P.  
6 Desta Drive, Suite 3300  
Midland, Texas 79705

Prepared by:  
William D. Green, PG  
Texas Professional Geologist No. 136



7/17/09

Larson & Associates, Inc.  
507 North Marienfeld, Suite 200  
Midland, Texas 79701

July 17, 2009

**Table of Content**

1.0	Executive Summary.....	1
2.0	Investigation Chronology .....	1
3.0	Investigation Activities.....	1
4.0	Conclusions Based Upon Current Investigation Data .....	2
5.0	Proposed Final Closure Activities.....	2

**List of Tables**

Table 1	Soil Boring Analytical Summary
Table 2	Waste Manifests Summary

**List of Figures**

Figure 1	Topographic Map
Figure 2	Facility Drawing
Figure 3	Aerial Map
Figure 34	Site Drawing

**List of Appendices**

Appendix A	OCD Communications
Appendix B	Photodocumentation
Appendix C	Waste Disposal Manifests and Laboratory Analytical Reports and Chain of Custody Documentation (CD ROM)
Appendix D	Soil Boring Logs

July 17, 2009

## 1.0 Executive Summary

This report presents the soil investigation results for the South (#1) Brine Pond (Site) at the Targa Midstream Services, L.P. (Targa) Monument Gas Plant (Facility) located about 2.6 miles southeast of Monument, New Mexico, in unit N (SE/4, SW/4), Section 36, Township 19 South, Range 36 East, Lea County, New Mexico (Figures 1 and 2). The Facility operates under New Mexico Oil Conservation Division (OCD) discharge permit GW-025.

The following investigation activities were conducted:

- Fluid removal and disposal
- Sediment removal and disposal
- Liner, cushion sand, and sump removal and disposal
- Soil boring installation

Based on the investigation results, Larson & Associates, Inc. (LAI) recommends backfilling the former pond, installing an engineered cap, and re-grading and reseedling the area to match natural slope and native vegetation.

## 2.0 Investigation Chronology

The following events have been documented in connection with the South (#1) Brine Pond investigation.

March 3, 2006	LAI submits to the OCD the South (#1) Brine Pond investigation and closure plan.
August 20, 2008	Mr. Wayne Price of the OCD approves the investigation and closure plan.
September 2 – 25, 2008	LAI oversees pond closure activities.
September 30, 2008	LAI installs five soil borings in the South (#1) Brine Pond as part of closure investigation.

## 3.0 Investigation Activities

LAI submitted to the OCD an investigation and closure plan for the South (#1) Brine Pond on March 3, 2006; the plan was approved on August 20, 2008 (Appendix A). Closure activities began on September 2<sup>nd</sup>, 2008. LAI representative Mr. Roger Brooks directed subcontractors in the removal of excess fluids remaining in the pond. These fluids were transported to the nearby Cooper Salt Water Disposal (SWD) facility. With the fluids removed to the level of the sediment and precipitated salt, a backhoe began excavating the sediment and placing the solids into a stockpile. As the sediment was disturbed, fluids that decanted were extracted by vacuum truck and transported to the Cooper SWD for disposal.

Excavating and stockpiling progressed while great care was taken to not disturb the underlying liner system. The liner system was comprised of two geotextile materials with cushion sand separating the two liners and separating the underlying native soil. The upper, primary liner appeared to be a 60 mil linear polyethylene material, while the bottom, secondary liner appeared to be a 20 mil linear polyethylene material. A leachate collection pipe and sump was set between the two liners at the bottom of the pond.

July 17, 2009

As it became apparent that the sediment had released the bulk of the interstitially-held fluids, the primary liner was removed from the sides of the pond, exposing the upper cushion sand. Upon the removal of all sediments, a chain was attached to the backhoe, and the liner was removed with the upper cushion sand. All sediments, cushion sand and liner materials were properly disposed in either Sundance or Lea Land facilities. Sundance was the preferred facility, but its road is not paved, so seasonal rains required transport to the Lea Land facilities.

After the removal of the primary liner and upper cushion sand, the upper cushion sand and secondary liner were removed and disposed in the same manner as the primary liner. The leachate collection pipe's pea-gravel filter pack and pipe were excavated, and the secondary liner removed. Finally, the lower cushion sand was excavated, stockpiled and transported for off-site disposal. Excavation and disposal activities were concluded on September 25, 2008.

Appendix B contains photo-documentation of site activities. A total of 2,261 cubic yards of sediment, liner and cushion sand were disposed during site excavation activities. Table 2 provides a summary of the waste generated and manifested for disposal. Electronic copies of the waste manifests are included as a CDROM in Appendix C.

On September 30, 2008, LAI geologist Mr. William Green installed five soil borings to 20 feet below ground surface (bgs) from the bottom of the pond. The five borings were set in a "X" pattern, with a boring in each corner and the center of the pond (Figures 3 and 4). Soil samples were collected at the one, three, five, 10, 15, and 20 foot depths from each location. Sample aliquots were collected for laboratory analyses of total petroleum hydrocarbons (TPH) and chlorides by New Mexico-approved methodology.

Laboratory analyses did not identify any concentrations of TPH, but chloride was observed above the 250 milligrams per kilogram (mg/kg) screening level. Elevated soil chloride concentrations were identified nearest the surface, with decreasing soil chloride concentrations observed with increasing depth (Table 1 and CDROM in Appendix C).

Groundwater in the vicinity of the South (#1) Brine Pond is approximately 30 feet bgs, with upgradient wells (north of this brine pond) having chloride concentrations in excess of 7,000 milligrams per liter (mg/l). Groundwater in the vicinity flows from the northwest towards the south-southeast.

## **4.0 Conclusions Based Upon Current Investigation Data**

The following observations are documented in this report:

- Physical pond closure activities were conducted between September 2<sup>nd</sup> and 25<sup>th</sup>, 2008
- Five soil borings to 20 feet were installed within the pond
- Chloride concentrations in soil exceed New Mexico screening levels

## **5.0 Proposed Final Closure Activities**

Based on the investigation results, LAI recommends backfilling the former pond to near surface elevation grade with clean fill material, re-grading the area with topsoil to match natural slope, and reseeding the area with native vegetation.

Table 1  
Soil Boring Analytical Summary  
Targa Resources - Monument Gas Plant (GW-025)  
South (#1) Brine Pond  
Monument, Lea County, New Mexico

Sample ID	Depth ft bgs	Date	GRO C6-C12	DRO C12-C28	ORO C28-C35	TPH C6-C35	Chloride
NMOCD RRAL (mg/Kg)			--	---	--	100	250
NW	1'	9/30/2008	<16.5	<16.5	<16.5	<16.5	<b>8,330</b>
	3'		<17.0	<17.0	<17.0	<17.0	<b>2,650</b>
	5'		<16.7	<16.7	<16.7	<16.7	<b>1,030</b>
	10'		<16.9	<16.9	<16.9	<16.9	<b>970</b>
	15'		<16.8	<16.8	<16.8	<16.8	<b>1,040</b>
	20'		<17.2	<17.2	<17.2	<17.2	<b>644</b>
NE	1'	9/30/2008	<18.1	<18.1	<18.1	<18.1	<b>6,080</b>
	3'		<18.4	<18.4	<18.4	<18.4	<b>5,190</b>
	5'		<19.1	<19.1	<19.1	<19.1	<b>4,400</b>
	10'		<18.0	<18.0	<18.0	<18.0	<b>1,590</b>
	15'		<16.7	<16.7	<16.7	<16.7	<b>774</b>
	20'		<16.8	<16.8	<16.8	<16.8	<b>466</b>
SW	1'	9/30/2008	<16.5	<16.5	<16.5	<16.5	<b>9,660</b>
	3'		<16.7	<16.7	<16.7	<16.7	<b>9,550</b>
	5'		<16.3	<16.3	<16.3	<16.3	<b>5,640</b>
	10'		<16.4	<16.4	<16.4	<16.4	<b>1,300</b>
	15'		<16.3	<16.3	<16.3	<16.3	<b>423</b>
	20'		<16.6	<16.6	<16.6	<16.6	<b>336</b>
SE	1'	9/30/2008	<16.4	<16.4	<16.4	<16.4	<b>5,460</b>
	3'		<16.5	<16.5	<16.5	<16.5	<b>5,200</b>
	5'		<16.5	<16.5	<16.5	<16.5	<b>2,170</b>
	10'		<16.8	<16.8	<16.8	<16.8	<b>815</b>
	15'		<16.7	<16.7	<16.7	<16.7	<b>369</b>
	20'		<17.7	<17.7	<17.7	<17.7	<b>548</b>
Center	1'	9/30/2008	<16.6	<16.6	<16.6	<16.6	<b>13,300</b>
	3'		<16.3	<16.3	<16.3	<16.3	<b>6,920</b>
	5'		<16.9	<16.9	<16.9	<16.9	<b>5,960</b>
	10'		<16.9	<16.9	<16.9	<16.9	<b>738</b>
	15'		<16.5	<16.5	<16.5	<16.5	<b>388</b>
	20'		<17.3	<17.3	<17.3	<17.3	<b>363</b>

**Notes**

Total Petroleum Hydrocarbons analyzed via EPA method 8015B.

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

**Bold** and blue indicates the value exceeds New Mexico Screening Levels.

Table 2  
Waste Manifest Summary  
Targa Resources - Monument Gas Plant (GW-025)  
South (#1) Brine Pond  
Monument, Lea County, New Mexico

Waste Receiver	Date	Manifest Number	Non-Reg Non-Haz (20 Yd <sup>3</sup> Container)	Solid Waste (Cubic Yards)
Lea Land Landfill	9/8/2008	50359	1	
	9/8/2008	50360	1	
	9/8/2008	50361	1	
	9/9/2008	50362	1	
	9/9/2008	50363	1	
	9/9/2008	50364	1	
Lea Land Disposal	9/12/2008	65697	1	
	9/12/2008	65704	1	
	9/12/2008	65696	1	
	9/12/2008	65699	1	
	9/12/2008	65700	1	
	9/12/2008	65698	1	
	9/12/2008	65706	1	
	9/12/2008	65707	1	
	9/12/2008	65708	1	
	9/12/2008	65709	1	
	9/12/2008	65710	1	
	9/12/2008	65711	1	
Sundance Services	9/11/2008	94288		20
	9/11/2008	94289		20
	9/11/2008	94290		20
	9/11/2008	94291		20
	9/11/2008	94349		24
	9/11/2008	94350		20
	9/11/2008	94364		21
	9/11/2008	94365		20
	9/11/2008	94400		20
	9/11/2008	94401		24
	9/11/2008	94405		20
	9/11/2008	94406		20
	9/12/2008	94477		20
	9/12/2008	94478		20
	9/12/2008	94480		20
	9/12/2008	94481		20
	9/12/2008	94488		20
	9/12/2008	94476		20



Table 2  
Waste Manifest Summary  
Targa Resources - Monument Gas Plant (GW-025)  
South (#1) Brine Pond  
Monument, Lea County, New Mexico

Waste Receiver	Date	Manifest Number	Non-Reg Non-Haz (20 Yd <sup>3</sup> Container)	Solid Waste (Cubic Yards)
Sundance Services	9/15/2008	94717		20
	9/15/2008	94718		20
	9/15/2008	94715		20
	9/15/2008	94716		20
	9/15/2008	94739		20
	9/15/2008	94738		20
	9/15/2008	94741		20
	9/15/2008	94747		20
	9/15/2008	94748		20
	9/15/2008	94752		20
	9/15/2008	94756		20
	9/15/2008	94770		20
	9/15/2008	94771		20
	9/15/2008	94772		20
	9/15/2008	94788		20
	9/15/2008	94789		20
	9/15/2008	94791		20
	9/15/2008	94792		20
	9/15/2008	94805		20
	9/15/2008	94806		20
	9/15/2008	94807		20
	9/18/2008	95385		20
	9/18/2008	95384*		20
	9/18/2008	95369		12
	9/18/2008	95368		12
	9/18/2008	95380		20
	9/18/2008	95373		20
	9/18/2008	95387		20
	9/18/2008	95361		20
	9/18/2008	95358		20
	9/18/2008	95357		20
	9/18/2008	95353		20
	9/18/2008	95340		12
	9/18/2008	95341		12
	9/18/2008	95342		20
	9/18/2009	95286		20
	9/18/2008	95302		12
	9/18/2008	95303		12

Table 2  
Waste Manifest Summary  
Targa Resources - Monument Gas Plant (GW-025)  
South (#1) Brine Pond  
Monument, Lea County, New Mexico

Waste Receiver	Date	Manifest Number	Non-Reg Non-Haz (20 Yd <sup>3</sup> Container)	Solid Waste (Cubic Yards)
Sundance Services	9/18/2008	95304		20
	9/18/2008	95313		20
	9/18/2008	95310		20
	9/18/2008	95311		20
	9/18/2008	95316		20
	9/18/2009	95270		12
	9/18/2008	95269		12
	9/18/2008	95268		12
	9/19/2008	95453		20
	9/19/2008	95452		20
	9/19/2008	95447		20
	9/19/2008	95449		20
	9/19/2008	95445		12
	9/19/2008	95444		12
	9/19/2008	95497		20
	9/19/2008	95558		20
	9/19/2008	95557		20
	9/19/2008	95547		20
	9/19/2008	95546		20
	9/19/2008	95551		12
	9/19/2008	95550		12
	9/19/2008	95496		20
	9/19/2008	95489		12
	9/19/2008	95490		12
	9/22/2008	96022		20
	9/22/2008	96019		20
	9/22/2008	96016		12
	9/22/2008	96024		20
	9/22/2008	96017		20
	9/22/2008	95861		20
	9/22/2008	95848		12
	9/22/2008	95849		20
	9/22/2008	95853		20
	9/22/2008	95857		20
	9/22/2008	95906		20
	9/22/2008	95899		20
	9/22/2008	95904		20
	9/22/2008	95898		20

Table 2  
Waste Manifest Summary  
Targa Resources - Monument Gas Plant (GW-025)  
South (#1) Brine Pond  
Monument, Lea County, New Mexico

Waste Receiver	Date	Manifest Number	Non-Reg Non-Haz (20 Yd <sup>3</sup> Container)	Solid Waste (Cubic Yards)
Sundance Services	9/22/2008	95897		12
	9/22/2008	95952		12
	9/22/2008	95953		20
	9/22/2008	95956		24
	9/22/2008	95957		20
	9/22/2008	95959		20
	9/25/2008	96490		20
	9/25/2008	96534		20

Totals - cubic yards (Yds<sup>3</sup>)

360

1901

*Notes*

\* - Volume not reported, estimate only.

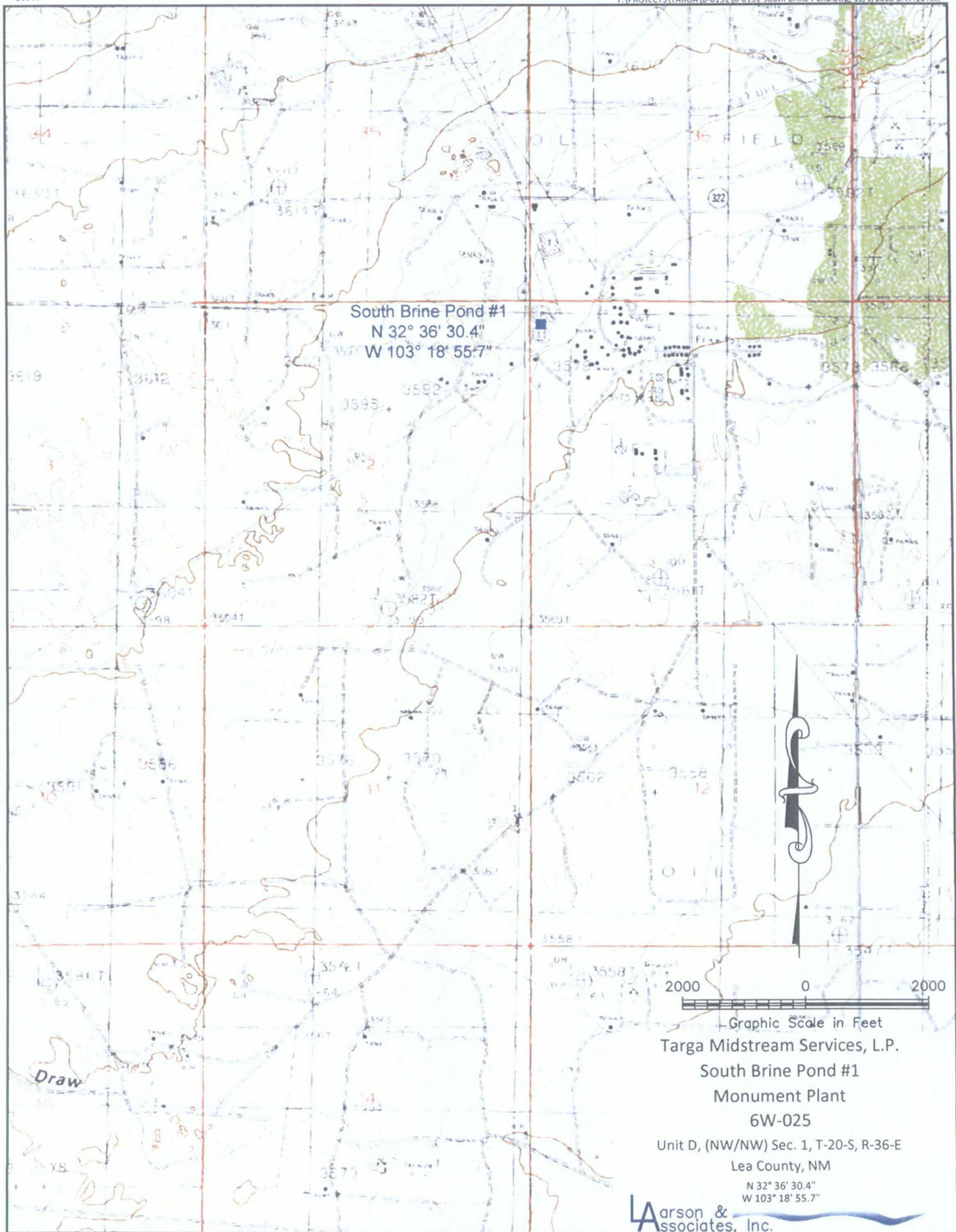
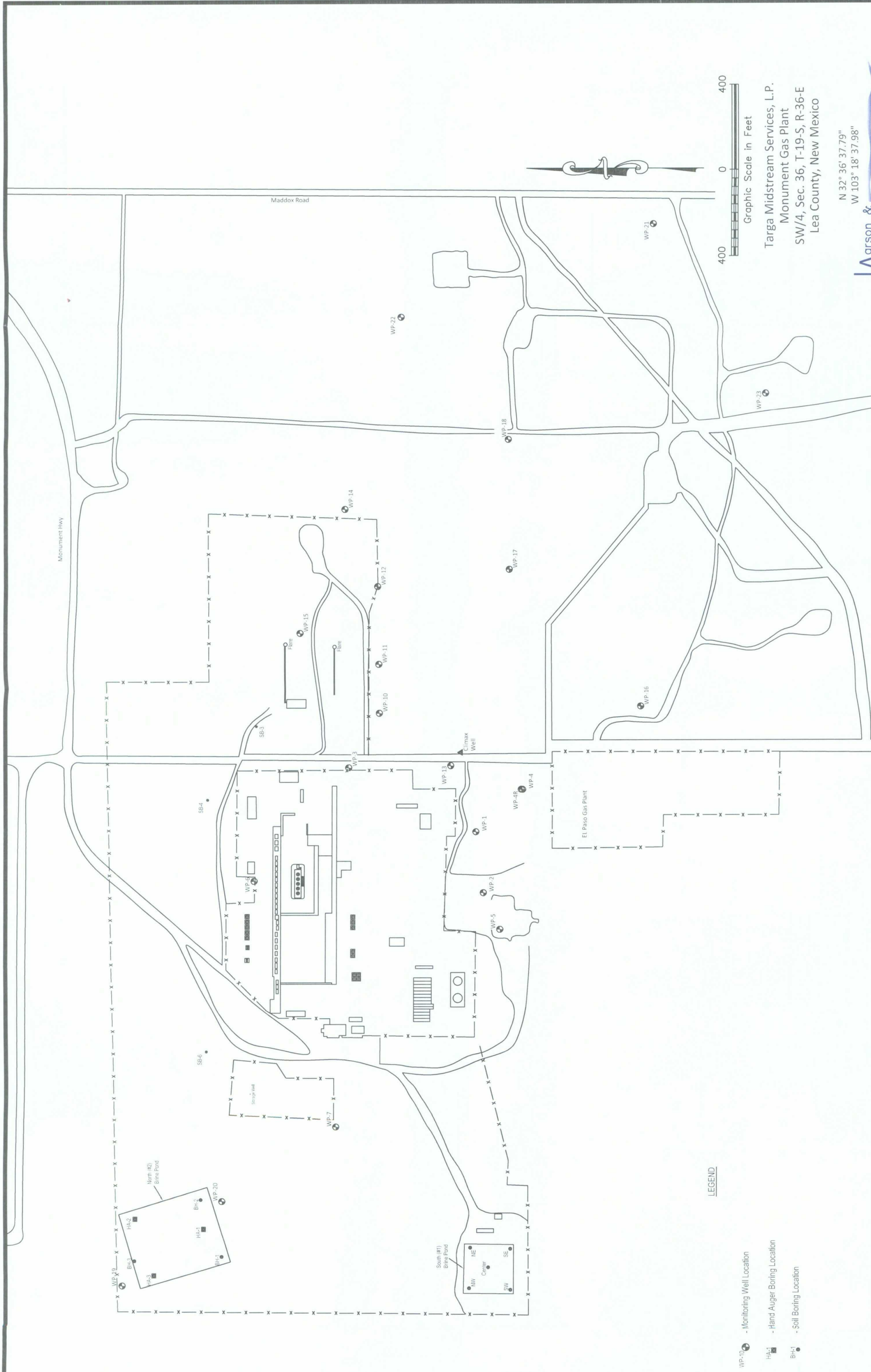


Figure 1 - Topographic Map







JWW



Figure 3- Aerial Map

JWW

Property Fence

Security Fence

Leak Detection Well

Pond  
Depth: 8'  
Center

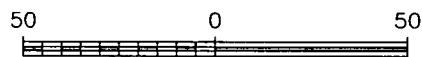
NW

NE

SW

SE

Property Fence



Graphic Scale in Feet

Targa Midstream Services, L.P.

South Brine Pond #1

Monument Plant

6W-025

Unit D, (NW/NE) Sec. 1, T-20-S, R-36-E

Lea County, NM

N 32° 36' 30.4"  
W 103° 18' 55.7"

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

Figure 4- Site Drawing

## Mark Larson

---

**From:** Price, Wayne, EMNRD [wayne.price@state.nm.us]  
**Sent:** Wednesday, August 20, 2008 5:21 PM  
**To:** Mark Larson  
**Cc:** Wrangham, Calvin W.; Embrey, Donald M; TYoung@targaresources.com  
**Subject:** RE: Targa Midstream Services, LP, Monument Gas Plant (GW-025), Brine Pond #1 Investigation and Closure Plan, March 3, 2006  
**Attachments:** image001.jpg

Approved.

---

**From:** Mark Larson [mailto:Mark@laenvironmental.com]  
**Sent:** Tuesday, August 19, 2008 7:26 AM  
**To:** Price, Wayne, EMNRD  
**Cc:** Wrangham, Calvin W.; Embrey, Donald M; TYoung@targaresources.com  
**Subject:** Re: Targa Midstream Services, LP, Monument Gas Plant (GW-025), Brine Pond #1 Investigation and Closure Plan, March 3, 2006

Wayne,

This message is submitted to the New Mexico Oil Conservation Division (OCD) on behalf of Targa Midstream Services, LP by Larson & Associates, Inc. (LAI), its consultant, to follow up on approval to proceed with the investigation and closure of the #1 (south) brine pond at the Monument Gas Plant. An investigation and closure plan was submitted to the OCD for this site on March 3, 2006. Your approval is appreciated. Please contact me if you have questions.

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)

The logo for Larson & Associates, Inc. features a stylized 'LA' monogram on the left, followed by the text 'Larson & Associates, Inc.' in a serif font. Below this, the words 'Environmental Consultants' are written in a smaller, sans-serif font. A decorative wavy line extends from the right side of the company name.

Larson & Associates, Inc.  
Environmental Consultants

---

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

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March 3, 2006

**VIA EMAIL: wayne.price@state.nm.us**

**VIA CERTIFIED MAIL**

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

**Re: Brine Pond #1 Investigation and Closure Plan, Targa Midstream Services, L.P.,  
Monument Gas Plant (GW-025), Unit Letter N ("SE/4, SW/4"), Section 36,  
Township 19 South, Range 36 East, Lea County, New Mexico**

2006 MAR 20 PM 3:31

Dear Mr. Price:

This letter is submitted to the State of New Mexico Oil Conservation Division ("OCD") on behalf of Targa Midstream Services, L.P. ("TMS") by Larson and Associates, Inc. ("LA"), its consultant, and presents an investigation and closure plan for brine pond #1 at the Monument Gas Plant ("Facility") located in unit letter N ("SE/4, SW/4"), Section 36, Township 19 South, Range 36 East, Lea County, New Mexico. The Facility is located approximately 2.6 miles southeast of Monument, New Mexico. Contact information for TMS is as follows:

Contact: Mr. Cal Wrangham  
Title: Region Environmental, Health & Safety Advisor  
Company: Targa Midstream Services, L.P.  
Address: 6 Desta Drive, Suite 3300  
Midland, Texas 79705  
Telephone: (432) 688-0542  
E Mail: cwrangham@targaresources.com

Figure 1 presents a topographic map and location map. Figure 2 presents a Facility drawing.

#### **Background**

The Facility previously used two (2) lined ponds for temporary storage of brine water in conjunction with two (2) gas storage wells. Brine pond #2 was closed in 2003 and the storage wells are temporarily abandoned. The OCD requested a closure plan for brine pond #1 as a condition of renewal of the Facility's ground water discharge plan (GW-025).

#### **Investigation Plan**

Brine pond #1 measures approximately 100 x 150 feet and is about 5 feet deep. A high-density polyethylene ("HDPE") liner retains fluid from seeping into the subsurface. TMS proposes to remove liquid from the brine pond using a vacuum truck or pump and dispose the liquid at an OCD approved commercial salt-water disposal ("SWD") facility. Residual water will be allowed to evaporate before solids are removed and disposed at a facility approved by OCD to accept salt-contaminated oilfield solids. The liner will be removed and disposed at a State of New Mexico approved landfill.

Mr. Wayne Price  
March 3, 2006  
Page 2

TMS proposes to use direct-push or rotary drilling methods to collect soil samples at five (5) locations to assess potential impacts to soil following liner removal. The samples will be collected to depths sufficient to assess the vertical extent of impact and placed in 4-ounce glass sample containers. The containers will be filled to near zero headspace, labeled, preserved and deliver under chain of custody control to an environmental laboratory. Duplicate samples will be collected in 8-ounce glass sample jars for headspace analysis. The headspace containers will be partially filled, covered with a layer of aluminum foil before securing the cap and allowed to warm to the ambient temperature (approximately 30 minutes). The headspace samples will be analyzed using a photoionization detector ("PID") that will be calibrated to an isobutylene span gas tested to 100 parts per million ("ppm"). The sampling device will be washed between samples with a solution of laboratory grade detergent and water, and rinsed with distilled water.

The laboratory will analyze samples for benzene, toluene, ethyl benzene and xylene ("BTEX") using method SW-846-8021B, if the corresponding headspace sample exhibits a PID reading greater than 100 ppm. The laboratory will analyze these and additional samples for total petroleum hydrocarbons ("TPH") using method SW-846-8015 for gasoline range organics ("GRO") and diesel range organics ("DRO"), and chloride, using method SW-846-300. Method SW-846-1312, referred to as the synthetic precipitation leaching procedure ("SPLP"), may be used to assess leaching potential of contaminants to ground water. Figure 3 presents proposed sample locations.

A summary report will be prepared and submitted to OCD within 45 days after receipt and review of analysis from the laboratory and will include a final closure plan for brine pond #1. Your approval of this proposal is requested. Please call Mr. Cal Wrangham with TMS at (432) 688-0452, myself at (432) 687-0901 or email [cwrangham@targaresources.com](mailto:cwrangham@targaresources.com) or [mark@laenvironmental.com](mailto:mark@laenvironmental.com), if you have questions.

Sincerely,

*Larson and Associates, Inc.*



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

Enclosures

cc: Cal Wrangham/TMS  
James Lingnau/TMS  
Chris Williams/OCD – District 1

SITE LOCATION

T-19-S

T-20-S

R-36-E

R-37-E

R-36-E

R-37-E

GRAPHIC SCALE IN FEET

0 2000 4000

FIGURE #1

LEA COUNTY, NEW MEXICO



TARGA

MONUMENT GAS PLANT

SITE LOCATION AND  
TOPOGRAPHIC MAP

DATE  
03-03-06

NAME: SJA

FILE: 6-0107

Larson & Associates, Inc.  
Environmental Consultants



Viewing across the South (#1) Brine Pond prior to closure activities.



A portion of the primary (top) liner is removed to expose the intermediate cushion sand and secondary (bottom) liner.





Another view of primary liner, cushion sand, and secondary liner.



Precipitated salt and sediments are pushed towards the center to encourage decanting liquids for disposal, and to create a solid material stockpile for removal.





Excavated salt and sediment being stockpiled. Vacuum trucks remain onsite as liquids continue to decant from the sediment.



With most of the precipitated salt and sediments removed, the upper liner portion is removed from the sloped walls.





Continued progress in the upper liner removal and disposal.



A backhoe and chain are used to remove the secondary liner. A second layer of cushion sand is between the bottom liner and native soil.





The secondary liner and cushion sand are stockpiled in the former pond pending being loaded for transport for final disposal.



Close up of sump collection system and pea gravel filter pack.





Viewing east along the trench which formerly contained the leachate collection pipe.



Bottom liner removed from the leachate collection system.





Viewing east, at the former leachate collection sump.



View of the former pond with both liners removed. The stock pile of sand is from layer between the secondary liner and native soil.

Latitude N 32° 36' 29.42"  
Longitude W 103° 18' 57.75"

PID Response Log Plot  
(parts per million)

Lithologic Well Log

Drilling started 09/30/2008, completed 09/30/2008.  
Drilled with Air Rotary by Layne Drilling.  
SM - Pale Yellow (2.5YR 7/3) silty, very fine sand

SM - Pink (7.5YR 7/3) silty, very fine sand

SM - Very Pale Brown (10YR 8/3) silty, very fine sand

SM - Pink (5YR 7/4) silty, very fine sand

SP - Pink (7.5YR 7/4) very fine sand

SP - Pink (7.5YR 7/4) very fine sand

10' bgs

20' bgs

30' bgs

40' bgs

50' bgs

60' bgs

70' bgs

80' bgs

Targa Midstream Services, L.P.  
Monument Plant

South Brine Pond #1

Unit C (NE/NW) Sec. 1, T-20-S, R-36-E

Lea County, New Mexico

Larson &  
Associates, Inc.  
Environmental Consultants

Latitude N 32° 36' 29.92"  
Longitude W 103° 18' 57.19"

PID Response Log Plot  
(parts per million)

Lithologic Well Log

Drilling started 09/30/2008, completed 09/30/2008.  
Drilled with Air Rotary by Layne Drilling.  
SC - Strong Brown (7.5YR 5/6) clayey, fine sand, indurated, ≈10% Caliche nodules  
SC - Reddish Brown (5YR 5/4) clayey, silty fine sand <3% Caliche  
SM - Pink (7.5YR 7/4) silty, very fine sand <5% Caliche - sand sized nodules

SP - Light Brown (7.5YR 6/4) very fine sand ≈ 3% 1" Caliche nodules

SP - Pink (7.5YR 7/3) clean, very fine sand with <3% gravel - quartz sandstone pebbles with carbonate content

SP - Pinkish Gray (7.5YR 7/2) clean very fine sand

10' bgs

20' bgs

30' bgs

40' bgs

50' bgs

60' bgs

70' bgs

80' bgs

Targa Midstream Services, L.P.  
Monument Plant  
South Brine Pond #1  
Unit C (NE/NW) Sec. 1, T-20-S, R-36-E  
Lea County, New Mexico

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



Latitude N 32° 36' 29.94"  
Longitude W 103° 18' 58.24"

PID Response Log Plot  
(parts per million)

Lithologic Well Log

Drilling started 09/30/2008, completed 09/30/2008.  
Drilled with Air Rotary by Layne Drilling.  
SP - Brown (7.5YR 5/3) very fine sand, subround  
with fine gravel of mixed source  
SM - Very Pale Brown (10YR 8/2) silty, very fine  
sand  
SM - Pinkish Gray (7.5YR 7/2) silty, very fine sand

10' bgs

20' bgs

30' bgs

40' bgs

50' bgs

60' bgs

70' bgs

80' bgs

Targa Midstream Services, L.P.  
Monument Plant  
South Brine Pond #1  
Unit C (NE/NW) Sec. 1, T-20-S, R-36-E  
Lea County, New Mexico

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

Latitude N 32° 36' 28.91"  
Longitude W 103° 18' 57.27"

PID Response Log Plot  
(parts per million)

Lithologic Well Log

Drilling started 09/30/2008, completed 09/30/2008.  
Drilled with Air Rotary by Layne Drilling.  
SP - Light Gray (10YR 6/3) very fine sand

SM - Pinkish Gray (7.5YR 7/2) very fine sand, silty

SP - Light Gray (10YR 6/3) very fine sand, some  
induration

SP - Pink (7.5YR 7/3) clean, very fine sand

SP - Pink (7.5YR 7/3) clean, very fine sand, < 3% 1"  
gravel

SP - Pinkish Gray (5YR 7/2) very fine sand, <3% 1"  
gravel

10' bgs

20' bgs

30' bgs

40' bgs

50' bgs

60' bgs

70' bgs

80' bgs

Targa Midstream Services, L.P.

Monument Plant

South Brine Pond #1

Unit C (NE/NW) Sec. 1, T-20-S, R-36-E

Lea County, New Mexico

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

Latitude N 32° 36' 29.01"  
Longitude W 103° 18' 58.33"

PID Response Log Plot  
(parts per million)

Lithologic Well Log

10' bgs

20' bgs

30' bgs

40' bgs

50' bgs

60' bgs

70' bgs

80' bgs

0.8  
0.8  
0.8

0.9

0.6

0.6

Drilling started 09/30/2008, completed 09/30/2008.  
Drilled with Air Rotary by Layne Drilling.  
SP - Light Reddish Brown (5YR 6/3) very fine sand,  
<15% caly and silt  
SP - Pinkish Gray (7.5YR 7/2) very fine sand,  
calcareous  
SP - Pinkish Gray (7.5YR 7/2) very fine sand, some  
carbonate indurate beds ≈1" thick

SP - Pink (7.5YR 7/3) clean, very fine sand, < 3% 1"  
gravel

SP - Pink (7.5YR 7/3) clean, very fine sand, < 3% 1"  
gravel

SP - Light Reddish Brown (5YR 6/3) clean, very fine  
sand

Targa Midstream Services, L.P.  
Monument Plant  
South Brine Pond #1  
Unit C (NE/NW) Sec. 1, T-20-S, R-36-E  
Lea County, New Mexico

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Associates, Inc.  
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