# 1R - 474

# GENERAL CORRESPONDENCE

# 2007

## VonGonten, Glenn, EMNRD

**From:** Randall Hicks [R@rthicksconsult.com]
**Sent:** Thursday, August 16, 2007 1:23 PM
**To:** VonGonten, Glenn, EMNRD
**Cc:** 'Scott Rose'; 'Floyd Steed'; mmeyer@slo.state.nm.us
**Subject:** Samson BD-04
**Follow Up Flag:** Follow up
**Flag Status:** Red
**Attachments:** august update.pdf

Glenn

That hearing went for so long that I forgot to send this to you last week!

Randall Hicks
Tel: 505-266-5004
Cell 505-238-9515

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745


August 16, 2007

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H, 1R0474

Dear Mr. von Gonten:

Chloride and TDS concentrations from the source removal well, MW-3s, have not declined over the past few months despite continual pumping (see Figure 1). Figure 2 shows that the chloride concentrations in MW-1 and MW-4s remain well below WQCC Standards.

**Figure 1- Recovery Well**

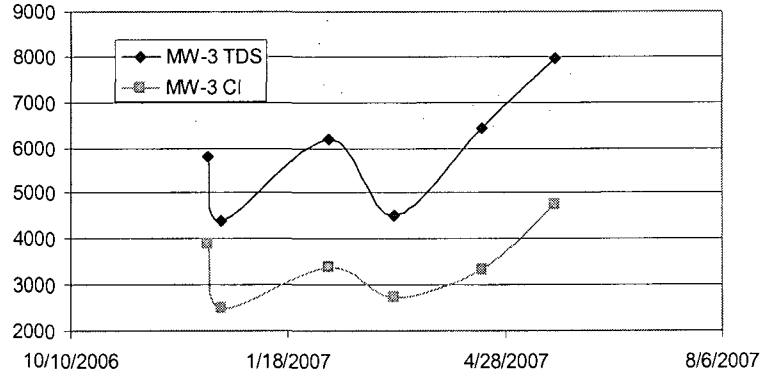
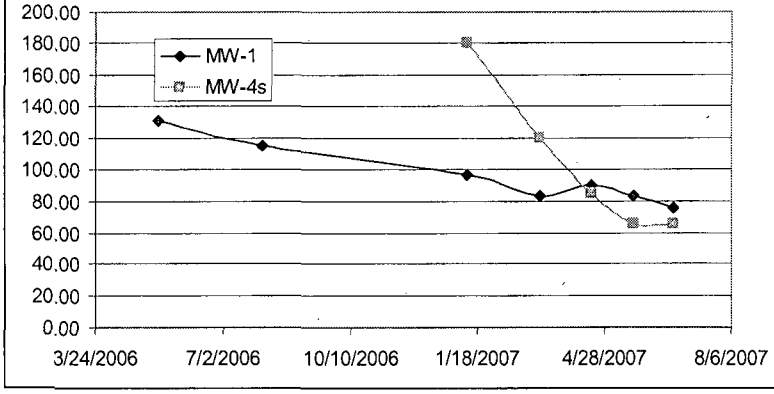



**Figure 2- Chloride in MW-1 and MW 4s**




Within this source area (the former reserve pit), salinity will vary because the aquifer below liner tears or below zones of highly fractured caliche will exhibit higher salt fluxes (from the

pit to ground water) than areas where caliche is less fractured or where the liner remained intact. Therefore, variations of salinity in the pumping well must be expected. We had hypothesized that the salt load would be sufficiently low that 3-6 months of pumping would remove the majority of the salt in the aquifer beneath the pit. The data do not appear to support this hypothesis.

Although pumping at MW-3 has not caused a material decline in the salinity of the aquifer beneath the former pit, pumping has caused a significant decline in chloride at MW-4s (see Figure 2). However, the observed rate of decline in salinity at MW-4s now appears to be similar to the rate of decline at MW-1 prior to pumping, which is the rate of decline caused by natural restoration of the aquifer (dilution and dispersion).

If the pump-and-dispose source removal strategy is not superior to natural restoration, then we must strongly consider moving to the pump-and-use strategy proposed in our earlier communications with NMOCD despite the fact that the TDS of MW-3s is higher than 3,000 mg/L. Continuing the pump-and-dispose source removal strategy may simply be wasting the resource.

To compare the efficacy of the pump-and-dispose source removal program to a natural restoration strategy (which preserves the ground water resource), we ceased source removal pumping in late June. We propose to sample all wells in August and September, evaluate the results and determine if we should re-start the source removal pumping or convert the site to a pump-and-use ground water restoration strategy. We respectfully request a postponement of our scheduled August report to late September.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy: Samson Resources, Scott Rose
New Mexico State Land Office

## VonGonten, Glenn, EMNRD

**From:** Randall Hicks [R@rthicksconsult.com]
**Sent:** Wednesday, November 07, 2007 10:47 AM
**To:** VonGonten, Glenn, EMNRD; 'Kostrubala, Thaddeus'; Gum, Tim, EMNRD
**Cc:** 'Scott Rose'; 'Dale Littlejohn'; 'Floyd Steed'
**Subject:** Samson State BD-04
**Follow Up Flag:** Follow up
**Flag Status:** Red
**Attachments:** november update.pdf

Glenn

Hard copy in snail mail to NMOCD Santa Fe office only.

Randall Hicks
Tel: 505-266-5004
Cell 505-238-9515

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

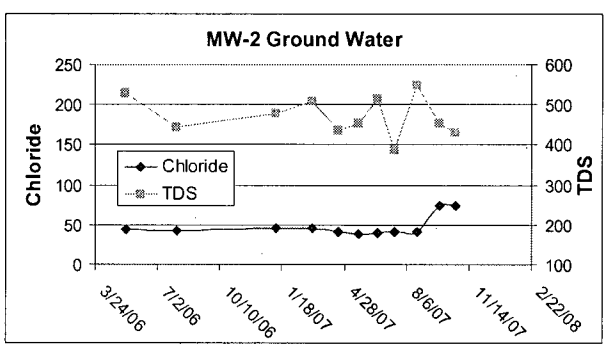

November 7, 2007

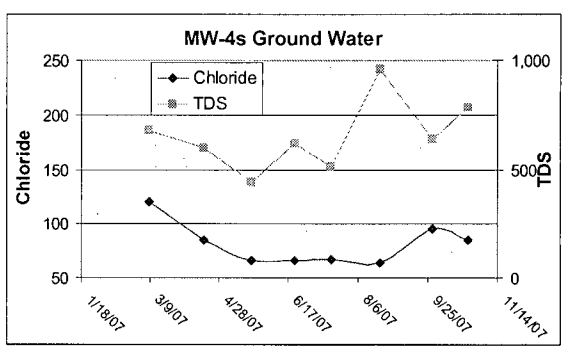
Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H,
NMOCD #1R0474

Dear Mr. von Gonten:

Below are two plots of water quality in MW-4s and MW-2 showing all data up to October 24, the most recent sampling event. MW-1 and MW-4d follow a similar pattern showing a slight




increase in chloride concentrations after cessation of source removal pumping. Table 1 presents all the ground water data. All samples from monitored wells remain below WQCC standards for chloride and TDS. With the October sampling event we are ceasing monthly sampling. The next sampling events will be January, April, July and October 2008. We will submit an annual monitoring report in December of 2008.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy: Samson Resources, Scott Rose
New Mexico State Land Office
NMOCD District II

**Table 1**
**Laboratory Results Summary - Groundwater Samples**

| Monitor Well TOC Elev. | Sample Date | Water Depth | Water Elevation | pH (unitless) | Cond. (uS/cm) | Chloride (mg/L) | TDS (mg/L) | % Cl of TDS |
|---|---|---|---|---|---|---|---|---|
| MW-1 | 5/11/2006 | 41.18 | 4,192.05 | 7.41 | 1.17 | -- | -- | |
| 4,233.23 | 5/12/2006 | 41.24 | 4,191.99 | 7.15 | 0.88 | 131 | 838 | 16% |
| | 8/2/2006 | 41.22 | 4,192.01 | 7.07 | 0.99 | 115 | 648 | 18% |
| | 10/17/2006 | 41.14 | 4,192.09 | | | | | |
| | 12/12/2006 | 41.09 | 4,192.14 | | | | | |
| | 1/9/2007 | 41.07 | 4,192.16 | | | 97 | | |
| | 2/6/2007 | 41.32 | 4,191.91 | | | | | |
| | 2/6/2007 | 41.25 | 4,191.98 | | | | | |
| | 2/16/2007 | 41.37 | 4,191.86 | | 0.985 | | | |
| | 3/8/2007 | 41.39 | 4,191.84 | | | 83 | 620 | 13% |
| | 3/13/2007 | 41.36 | 4,191.87 | | 1.025 | | | |
| | 4/17/2007 | 41.13 | 4,192.10 | 7.41 | 0.82 | 89.6 | 674 | 13% |
| | 5/21/2007 | 40.99 | 4,192.24 | 7.96 | 0.79 | 83.8 | 630 | 13% |
| | 6/21/2007 | 41.02 | 4,192.21 | 7.52 | 0.74 | 76.5 | 632 | 12% |
| | 7/18/2007 | 41.05 | 4,192.18 | 7.50 | 0.80 | 102 | 650 | 16% |
| | 8/22/2007 | 40.96 | 4,192.27 | 7.26 | 0.86 | 88.0 | 672 | 13% |
| | 9/28/2007 | 40.94 | 4,192.29 | 7.62 | 0.94 | 122 | 606 | 20% |
| | 10/24/2007 | 41 | 4,192.23 | 7.75 | 0.93 | 117 | 710 | 16% |
| MW-2 | 5/11/2006 | 41.85 | 4,192.02 | 7.80 | 0.81 | | | |
| 4,233.87 | 5/12/2006 | 41.88 | 4,191.99 | 7.50 | 0.60 | 44.5 | 530 | 8% |
| | 8/2/2006 | 41.88 | 4,191.99 | 7.38 | 0.67 | 42.2 | 444 | 10% |
| | 10/17/2006 | 41.82 | 4,192.05 | | | | | |
| | 12/12/2006 | 41.77 | 4,192.10 | | | | | |
| | 1/9/2007 | 41.75 | 4,192.12 | | | 46.0 | | |
| | 2/6/2007 | 41.93 | 4,191.94 | | | | | |
| | 2/6/2007 | 41.88 | 4,191.99 | | | | | |
| | 2/16/2007 | 41.97 | 4,191.90 | | 0.924 | | | |
| | 3/8/2007 | 42.03 | 4,191.84 | | | 45 | 510 | 9% |
| | 3/13/2007 | 41.99 | 4,191.88 | | 0.663 | | | |
| | 4/17/2007 | 41.81 | 4,192.06 | 7.93 | 0.65 | 41.5 | 436 | 10% |
| | 5/21/2007 | 41.73 | 4,192.14 | 8.31 | 0.63 | 38.6 | 452 | 9% |
| | 6/21/2007 | 41.73 | 4,192.14 | 7.72 | 0.57 | 39.7 | 516 | 8% |
| | 7/18/2007 | 41.72 | 4,192.15 | 8.16 | 0.56 | 41.7 | 388 | 11% |
| | 8/22/2007 | 41.66 | 4,192.21 | 7.60 | 0.68 | 40.9 | 550 | 7% |
| | 9/28/2007 | 41.65 | 4,192.22 | 7.82 | 0.66 | 74.4 | 452 | 16% |
| | 10/24/2007 | 41.67 | 4,192.20 | 7.64 | 0.73 | 74.4 | 430 | 17% |
| MW-3 (Deep) | 12/18/2006 | -- | -- | | 0.87 | 2,000 | 3,700 | 54% |
| 4,224.52 | 3/8/2007 | -- | -- | | 10.28 | 3,500 | 6,200 | 56% |
| | 3/13/2007 | 42.41 | 4,182.11 | | 10.06 | | | |
| MW-3 (RW) | 12/12/2006 | 32.81 | 4,191.71 | | | | | |
| 4,224.52 | 12/18/2006 | 32.82 | 4,191.70 | | | 3,900 | 5,800 | 67% |
| | 1/9/2007 | 32.27 | 4,192.25 | | | | | |
| | 2/6/2007 | 32.7 | 4,191.82 | | | | | |
| Pump On | 2/6/2007 | 44.47 | 4,180.05 | | | 2,500 | 4,400 | 57% |
| | 2/16/2007 | 44.45 | 4,180.07 | | 8.71 | | | |
| | 3/8/2007 | 40.12 | 4,184.40 | | 10.31 | 3,400 | 6,200 | 55% |
| | 3/13/2007 | 42.41 | 4,182.11 | | 10.27 | | | |
| | 4/17/2007 | 42 | 4,182.52 | 8.08 | 7.45 | 2,730 | 4,520 | 60% |
| | 5/21/2007 | 41 | 4,183.52 | 8.20 | 8.67 | 3,340 | 6,430 | 52% |
| | 6/21/2007 | 42 | 4,182.52 | 7.78 | 10.24 | 4,750 | 7,960 | 60% |
| Pump Off | 7/18/2007 | 32.48 | 4,192.04 | 7.45 | 10.24 | 5,730 | 8,730 | 66% |
| | 8/22/2007 | 32.22 | 4,192.30 | -- | -- | -- | -- | -- |
| | 9/28/2007 | 32.24 | 4,192.28 | -- | -- | -- | -- | -- |
| | 10/24/2007 | 32.35 | 4,192.17 | -- | -- | -- | -- | -- |
| MW-4(D) | 1/9/2007 | -- | -- | | | 100 | | |
| 4,233.38 | 2/6/2007 | 41.61 | 4,191.77 | | | | | |
| | 2/6/2007 | 41.53 | 4,191.85 | | | | | |
| | 2/16/2007 | 41.64 | 4,191.74 | | 0.95 | | | |
| | 3/8/2007 | 41.65 | 4,191.73 | | | 52.0 | 550 | 9% |
| | 3/13/2007 | 41.63 | 4,191.75 | | 0.78 | | | |
| | 4/17/2007 | 41.42 | 4,191.96 | 7.87 | 0.70 | 45.7 | 562 | 8% |
| | 5/21/2007 | 41.32 | 4,192.06 | 8.33 | 0.69 | 44.8 | 458 | 10% |
| | 6/21/2007 | 41.33 | 4,192.05 | 7.72 | 0.61 | 42.4 | 610 | 7% |
| | 7/18/2007 | 41.34 | 4,192.04 | 7.93 | 0.62 | 48.2 | 508 | 9% |
| | 8/22/2007 | 41.26 | 4,192.12 | 7.53 | 0.74 | 50.4 | 494 | 10% |
| | 9/28/2007 | 41.24 | 4,192.14 | 7.79 | 0.75 | 79.8 | 474 | 17% |
| | 10/24/2007 | 41.29 | 4,192.09 | 7.94 | 0.87 | 95.7 | 690 | 14% |
| MW-4(S) | 1/9/2007 | -- | -- | | | 180 | | |
| 4,233.52 | 2/6/2007 | 41.73 | 4,191.79 | | | | | |
| | 2/6/2007 | 41.80 | 4,191.72 | | | | | |
| | 2/16/2007 | 41.84 | 4,191.68 | | 0.98 | | | |
| | 3/8/2007 | 41.85 | 4,191.67 | | | 120 | 680 | 18% |
| | 3/13/2007 | 41.82 | 4,191.70 | | 0.988 | | | |
| | 4/17/2007 | 41.61 | 4,191.91 | 7.78 | 0.79 | 84.8 | 598 | 14% |
| | 5/21/2007 | 41.50 | 4,192.02 | 8.16 | 0.73 | 65.7 | 442 | 15% |
| | 6/21/2007 | 41.51 | 4,192.01 | 7.79 | 0.65 | 65.8 | 618 | 11% |
| | 7/18/2007 | 41.54 | 4,191.98 | 7.81 | 0.68 | 67.5 | 514 | 13% |
| | 8/22/2007 | 41.44 | 4,192.08 | 7.46 | 0.78 | 64.0 | 960 | 7% |
| | 9/28/2007 | 41.43 | 4,192.09 | 7.89 | 0.77 | 95.7 | 640 | 15% |
| | 10/24/2007 | 41.48 | 4,192.04 | 7.97 | 0.84 | 85.1 | 786 | 11% |

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

April 2, 2007

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H, 1R0474

Dear Mr. von Gonten:

On behalf of Samson Resources, R.T. Hicks Consultants is pleased to submit this progress report for the above-referenced site. The report and accompanying CD will be mailed to your office this week. Currently the report is available on our ftp site. To access our FTP, please see the setup instructions at the end of this letter.

In response to recent NMOCD comments regarding the level of detail contained in our reports, we have modified our format and approach in this submission. We appreciate not only your evaluation of the data, conclusions and path forward, but also your comments on the readability and level of detail contained in the report.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy:
Samson Resources, Scott Rose
New Mexico State Land Office

To access our FTP site, perform the following. If you already have a FTP program installed, enter your FTP setting (user name, password etc) provided at the end of the instructions and skip the following setup details.

The setup process is as follows:

1. Download FileZilla (if you have Filezilla already installed, proceed to Step E)
2. Download the attached file (via email) to your Desktop.
3. Connect to our FTP site.

Setup Details (you only need to do this once):

a) Download the latest FileZilla Source Code for Windows: http://downloads.sourceforge.net/filezilla/FileZilla_2_2_31_setup.exe?modtime=1172667588&big_mirror=0
b) Run the setup accepting the default install options.
c) Copy the attached NMOCD.xml file to your desktop. This file contains the setup parameters (usename, password, etc)
d) Start FileZilla
e) Open the Site Manager (File>Site Manager) or press the icon directly below the FILE header.
f) In the Site Manager, select file import. Then import the NMOCD.xml file.
g) Then Connect.

It is now safe to delete the NMOCD.xml file from you desktop.

To connect at a later time, open Filezilla, then the Site Manager, then connect to NMOCD under ftp.rthicksconsult.com.

NOTE: I have the FTP server to log you off after 2 minutes of inactivity.

Your ftp settings are:

Username: N3wMex0CD (for "New Mexico OCD")
Password: O1Lc0nDiv (for "Oil Conservation Division")
Port: 21
Passive Mode

If you have problems connecting to our FTP site, please contact Andrew Parker at our Albuquerque office.

## VonGonten, Glenn, EMNRD

**From:** Andrew Parker [andrew@rthicksconsult.com]
**Sent:** Monday, April 02, 2007 1:56 PM
**To:** VonGonten, Glenn, EMNRD
**Subject:** Samson BD-04 March Progress Repot
**Follow Up Flag:** Follow up
**Flag Status:** Red
**Attachments:** Samson BD-04 March Report Transmittal Letter.pdf; NMOCD.xml

Glenn

Attached is the Transmittal Letter for the above referenced site. We will mail you a hard copy this week. The report is available for download from our FTP site. Instructions to access our ftp (includes initial setup details) are described in the transmittal letter and repeated below.

Andrew Parker
R.T. Hicks Consultants
Cell: 505-350-5535

To access our FTP site, perform the following. If you already have a FTP program installed, enter your FTP setting (user name, password etc) provided at the end of the instructions and skip the following setup details.

The setup process is as follows:

1. Download FileZilla (if you have Filezilla already installed, proceed to Step E)
2. Download the attached file (via email) to your Desktop.
3. Connect to our FTP site.

Setup Details (you only need to do this once):

a) Download the latest FileZilla Source Code for Windows: http://downloads.sourceforge.net/filezilla/FileZilla_2_2_31_setup.exe?modtime=1172667588&big_mirror=0
b) Run the setup accepting the default install options.
c) Copy the attached NMOCD.xml file to your desktop. This file contains the setup parameters (username, password, etc)
d) Start FileZilla
e) Open the Site Manager (File>Site Manager) or press the icon directly below the FILE header.
f) In the Site Manager, select file import. Then import the NMOCD.xml file.
g) Then Connect.

It is now safe to delete the NMOCD.xml file from you desktop.

To connect at a later time, open Filezilla, then the Site Manager, then connect to NMOCD under ftp.rthicksconsult.com.

NOTE: I have the FTP server to log you off after 2 minutes of inactivity.

Your ftp settings are:

Username: N3wMex0CD (for "New Mexico OCD")
Password: O1Lc0nDiv (for "Oil Conservation Division")
Port: 21
Passive Mode

If you have problems connecting to our FTP site, please contact Andrew Parker at our Albuquerque office.

1R 0474


# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745


March 15, 2007

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505



RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H
1R0474

Dear Mr. von Gonten:

We collected ground water samples at all wells on March 8, 2007. Laboratory results will be available on or about March 18. Our March report, which we hoped to submit on or before March 15, will be delivered to NMOCD before the end of the month.

Source removal pumping at a rate of about 5 gpm began in early February and continues at this time of writing. We have been in contact with the State Land Office and the Office of the State Engineer regarding other required permits.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy:
Samson Resources, Scott Rose
New Mexico State Land Office

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

March 15, 2007

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H
1R0474

Dear Mr. von Gonten:

We collected ground water samples at all wells on March 8, 2007. Laboratory results will be available on or about March 18. Our March report, which we hoped to submit on or before March 15, will be delivered to NMOCD before the end of the month.

Source removal pumping at a rate of about 5 gpm began in early February and continues at this time of writing. We have been in contact with the State Land Office and the Office of the State Engineer regarding other required permits.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy:
Samson Resources, Scott Rose
New Mexico State Land Office

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

March 15, 2007

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H
1R0474

Dear Mr. von Gonten:

We collected ground water samples at all wells on March 8, 2007. Laboratory results will be available on or about March 18. Our March report, which we hoped to submit on or before March 15, will be delivered to NMOCD before the end of the month.

Source removal pumping at a rate of about 5 gpm began in early February and continues at this time of writing. We have been in contact with the State Land Office and the Office of the State Engineer regarding other required permits.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy:
Samson Resources, Scott Rose
New Mexico State Land Office

## VonGonten, Glenn, EMNRD

**From:** Randall Hicks [R@rthicksconsult.com]
**Sent:** Wednesday, March 14, 2007 2:38 PM
**To:** mmeyer@slo.state.nm.us; VonGonten, Glenn, EMNRD
**Cc:** 'Scott Rose'; 'Andrew Parker'
**Subject:** BD-04
**Follow Up Flag:** Follow up
**Flag Status:** Red
**Attachments:** March 12 07 letter.pdf

All

As soon as we complete the report referenced in this letter, we will begin the paperwork associated with monitoring wells and other issues associated with this action on State Land.

Ms. Meyers – if you do not have the previous submittals sent to the SLO (Santa Fe), please contact Andrew Parker of my staff and we will forward electronic copies to you.

Randall Hicks
Tel: 505-266-5004
Cell 505-238-9515

## VonGonten, Glenn, EMNRD

**From:** Randall Hicks [R@rthicksconsult.com]
**Sent:** Thursday, February 01, 2007 2:08 PM
**To:** VonGonten, Glenn, EMNRD
**Cc:** 'Scott Rose'; 'Mark Sikelianos'; fsteed@samson.com; Caperton, Patricia, EMNRD; 'Dale Littlejohn'
**Subject:** BD-04

Glenn

Weather permitting; we plan to commence the source removal pumping at the BD-04 site next Tuesday.

After we confirm that the pumping system is working correctly at BD-04, we plan to turn our attention to the Livestock site. As you may remember, we have been pumping at Livestock since December. In our last submission to NMOCD (December, 2006), we committed to provide NMOCD with a plan for a more complete characterization of the site. We anticipate submission of this plan and a summary of data by the end of this month or early March. NMOCD may wish to delay responding to our Abatement Plan until you have an opportunity to review this next submission.

If you have any questions, you may contact Scott Rose of Samson.

Randy Hicks

## VonGonten, Glenn, EMNRD

**From:** randall hicks [r@rthicksconsult.com]
**Sent:** Thursday, February 01, 2007 2:06 PM
**To:** VonGonten, Glenn, EMNRD
**Cc:** 'Scott Rose'; 'Mark Sikelianos'; fsteed@samson.com; Caperton, Patricia, EMNRD; 'Dale Littlejohn'
**Subject:** BD-04

Glenn

Weather permitting; we plan to commence the source removal pumping at the BD-04 site next Tuesday.

After we confirm that the pumping system is working correctly at BD-04, we plan to turn our attention to the Livestock site. As you may remember, we have been pumping at Livestock since December. In our last submission to NMOCD (December, 2006), we committed to provide NMOCD with a plan for a more complete characterization of the site. We anticipate submission of this plan and a summary of data by the end of this month or early March. NMOCD may wish to delay responding to our Abatement Plan until you have an opportunity to review this next submission.

If you have any questions, you may contact Scott Rose of Samson.

Randy Hicks

## VonGonten, Glenn, EMNRD

**From:** VonGonten, Glenn, EMNRD
**Sent:** Thursday, March 15, 2007 10:33 AM
**To:** Price, Wayne, EMNRD
**Subject:** FW: BD-04
**Follow Up Flag:** Follow up
**Flag Status:** Red
**Attachments:** March 12 07 letter.pdf

---

**From:** Randall Hicks [mailto:R@rthicksconsult.com]
**Sent:** Wednesday, March 14, 2007 1:38 PM
**To:** mmeyer@slo.state.nm.us; VonGonten, Glenn, EMNRD
**Cc:** 'Scott Rose'; 'Andrew Parker'
**Subject:** BD-04

All

As soon as we complete the report referenced in this letter, we will begin the paperwork associated with monitoring wells and other issues associated with this action on State Land.

Ms. Meyers – if you do not have the previous submittals sent to the SLO (Santa Fe), please contact Andrew Parker of my staff and we will forward electronic copies to you.

Randall Hicks
Tel: 505-266-5004
Cell 505-238-9515

## VonGonten, Glenn, EMNRD

**From:** Randall Hicks [R@rthicksconsult.com]
**Sent:** Thursday, January 25, 2007 5:41 PM
**To:** VonGonten, Glenn, EMNRD; srose@samson.com; Floyd Steed; Mark Sikelianos; Caperton, Patricia, EMNRD
**Subject:** BD-04

**Attachments:** jan 30 07 report.pdf

jan 30 07
eport.pdf (255 KE

Glenn

As stated in the letter, the freeze is delaying our proposed pumping.
We hope to begin next week and we will keep you posted.

This letter asks that NMOCD forego any formal review of the actions at this site until we submit a report on our findings in March. We would like to pump for 30-days, see how the aquifer responds, then evaluate the data and submit the report.

Original letter via snail mail - sent today.

Randy

1R0474


# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745


January 25, 2007

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H, 1R0474

2007 JAN 26 PM 1 55

Dear Mr. von Gonten:

On behalf of Samson Resources, R.T. Hicks Consultants presents this Letter Report in accordance with the commitments made in the January 3, 2007 Revision to the December 13 Remediation Plan. Because freezing weather prevented the mid-January commencement of ground water restoration pumping, we respectfully request delaying submission of our proposed report scheduled for the end of February. Please expect the report 40-days after we begin the ground water restoration strategy. We hope to begin pumping next week, which would mean submission of a report on or before March 15 that:

1. Describes the field programs and discusses any variation from the protocols outlined in previous submittals to NMOCD.
2. Describes the final grading and installation of the ET infiltration barrier
3. Presents the results of vadose zone sampling to
   a. define the magnitude and extent of salt impact to the vadose zone, and
   b. measure the moisture content below the infiltration barrier
4. Presents the results of the investigation of the saturated zone and includes
   a. Potentiometric surface maps
   b. Interpretation of the planned 4-day pumping test
   c. Tables and graphs of ground water analyses for each well
   d. Interpretation of the magnitude and extent of chloride impact
   e. A hydrogeologic cross-section of the site area
   f. Tables and graphs showing the hydraulic effect of the first 30-days of the source removal pumping program (described below)
5. Presents the results of numerical modeling of the fate and transport of the chloride introduced to the saturated zone
   a. During source removal pumping phase of the remedy and
   b. During the pump-and-use ground water restoration phase
6. Proposes a site monitoring plan and proposed criteria for closure of the regulatory file based upon the results of the monitoring

## Source Removal Pumping

Current data suggests that MW-3 can produce about 5 gallons/minute from the upper screened interval (see Appendix A for a description of the pumping system). Ground water

produced from MW-3 will discharge to a 500-barrel storage tank at the site. From the storage tank, the water flows to the Samson injection well located about 500 feet south of the site. Although we believe that most of the pumped water will flow to the Samson disposal well during this phase of the ground water remedy, we are negotiating with several oilfield service companies to take the water for use in oil and gas well drilling programs.

We anticipate that this aggressive source removal pumping will continue for 30 to 90 days. During this phase of the remedy we will:

- monitor the volume of pumped ground water with a totalizing flow meter
- coordinate water rights permitting with the office of the State Engineer
- routinely measure ground water levels of on-site wells
- routinely measure field conductance of pumped water
- measure the volume of water flowing to the disposal well
- measure the volume of water used in oil and gas drilling operations

## Proposed Pump-and-Use Ground Water Restoration

When the TDS concentration of pumped water from MW-3 declines from the current level of about 5000 mg/L to 3000 mg/L, we will transition from source removal pumping to the pump-and-use strategy. According to New Mexico State University (http://cahe.nmsu.edu/pubs/_m/m-112.html) water with a TDS of 3000 mg/L or less is "Very satisfactory for all classes of livestock and poultry". Therefore, the ground water remedy calls for supplying the surface leaseholder with a water source for cattle since this area of the state lease does not have a water source for stock. Additionally, we anticipate that oilfield service companies will periodically take water from the stock tank for use in nearby oil and gas well drilling operations.

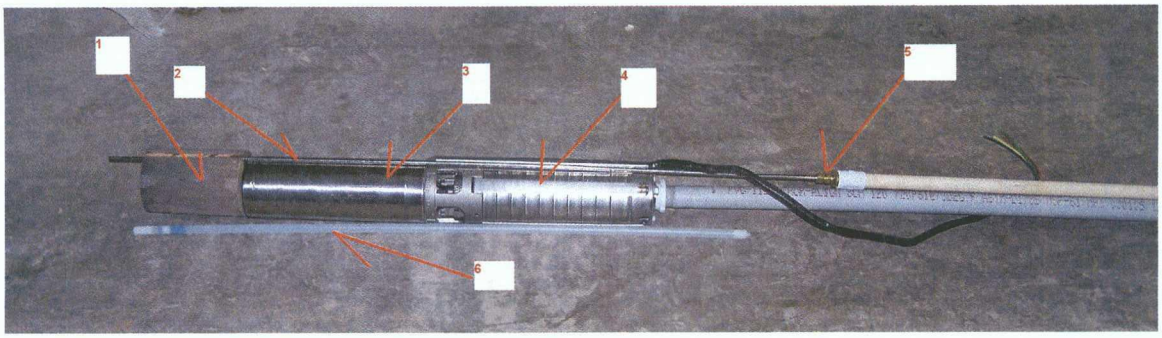
We also request that NMOCD forego any formal evaluation of the site activities until we have submitted the March report. Please contact Mr. Scott Rose of Samson if you have any questions or concerns regarding this plan as he has reviewed and approved this submission.

Sincerely,
R.T. Hicks Consultants, Ltd.

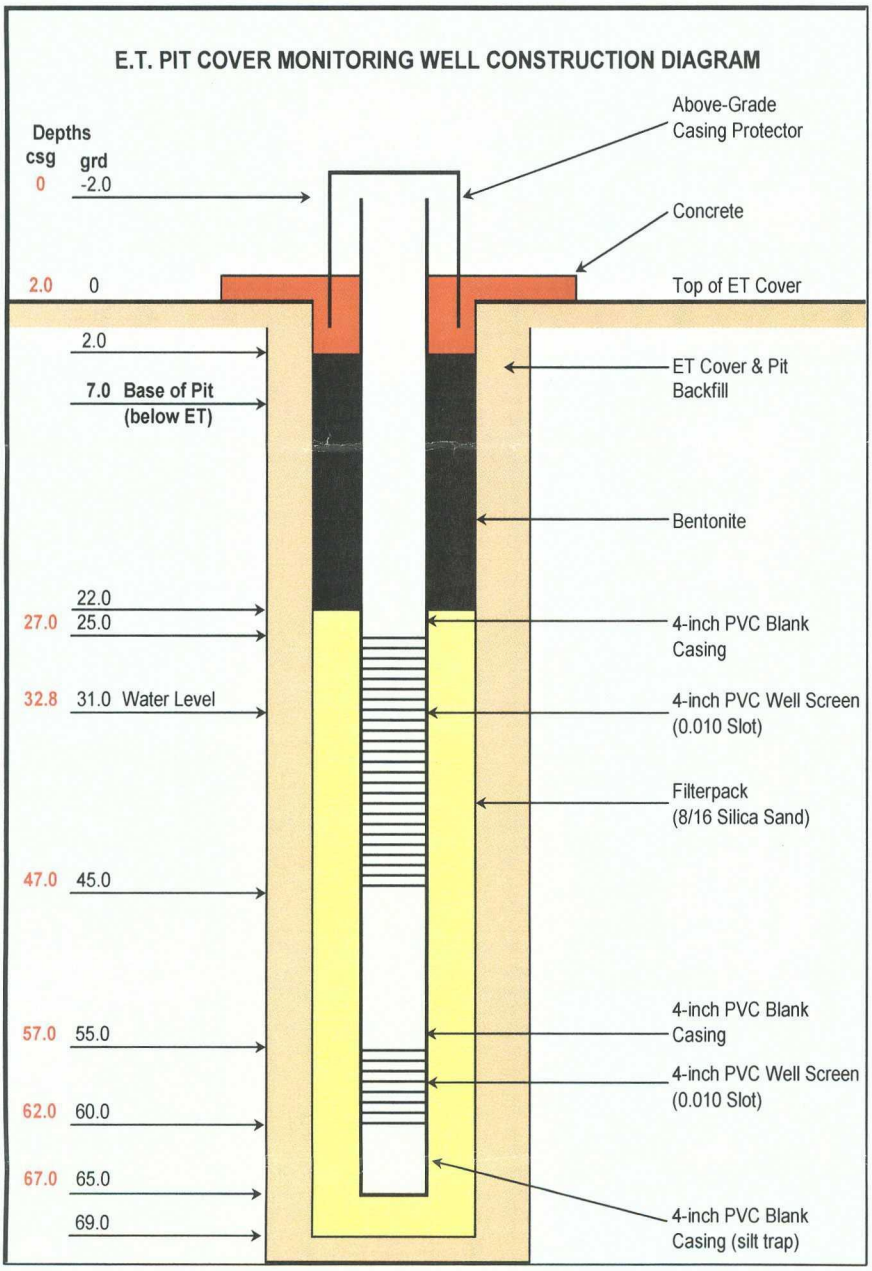
Randall T. Hicks
Principal

Copy:
Samson Resources, Scott Rose
New Mexico State Land Office

Appendix A – Pump and Packer System for MW-3




1) milled redwood plug
2) 1/4 in stainless steel tube
3) submersible pump motor
4) liquid pump end discharging to 1 in schedule 80 pvc column pipe
5) bushing from 1/4 in ss tube to 1/2 in sch 40 pvc riser tube
6) disposable bailer to bail through 1/2 in riser tube




The milled redwood plug is placed at 50-feet below ground surface, within the blank casing. This plug focuses water withdrawal from the upper screen.

During pumping, water enters the well from the upper screen and a small bailer lowered into the well can obtain a sample of ground water produced from the upper screen.

Because the redwood plug only restricts flow from the lower screen, water enters the well through the lower screen but at a low rate.

The ¼ inch tube connects the ½ inch riser to the area of the well below the packer. When the well is pumping, a small bailer can draw a discrete sample from the lower well screen

Discrete water level measurements may be obtained using the same protocol as that described for sampling

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

January 25, 2007

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H, 1R0474

Dear Mr. von Gonten:

On behalf of Samson Resources, R.T. Hicks Consultants presents this Letter Report in accordance with the commitments made in the January 3, 2007 Revision to the December 13 Remediation Plan. Because freezing weather prevented the mid-January commencement of ground water restoration pumping, we respectfully request delaying submission of our proposed report scheduled for the end of February. Please expect the report 40-days after we begin the ground water restoration strategy. We hope to begin pumping next week, which would mean submission of a report on or before March 15 that:

1. Describes the field programs and discusses any variation from the protocols outlined in previous submittals to NMOCD.
2. Describes the final grading and installation of the ET infiltration barrier
3. Presents the results of vadose zone sampling to
   a. define the magnitude and extent of salt impact to the vadose zone, and
   b. measure the moisture content below the infiltration barrier
4. Presents the results of the investigation of the saturated zone and includes
   a. Potentiometric surface maps
   b. Interpretation of the planned 4-day pumping test
   c. Tables and graphs of ground water analyses for each well
   d. Interpretation of the magnitude and extent of chloride impact
   e. A hydrogeologic cross-section of the site area
   f. Tables and graphs showing the hydraulic effect of the first 30-days of the source removal pumping program (described below)
5. Presents the results of numerical modeling of the fate and transport of the chloride introduced to the saturated zone
   a. During source removal pumping phase of the remedy and
   b. During the pump-and-use ground water restoration phase
6. Proposes a site monitoring plan and proposed criteria for closure of the regulatory file based upon the results of the monitoring

## Source Removal Pumping

Current data suggests that MW-3 can produce about 5 gallons/minute from the upper screened interval (see Appendix A for a description of the pumping system). Ground water

produced from MW-3 will discharge to a 500-barrel storage tank at the site. From the storage tank, the water flows to the Samson injection well located about 500 feet south of the site. Although we believe that most of the pumped water will flow to the Samson disposal well during this phase of the ground water remedy, we are negotiating with several oilfield service companies to take the water for use in oil and gas well drilling programs.

We anticipate that this aggressive source removal pumping will continue for 30 to 90 days. During this phase of the remedy we will:

- monitor the volume of pumped ground water with a totalizing flow meter
- coordinate water rights permitting with the office of the State Engineer
- routinely measure ground water levels of on-site wells
- routinely measure field conductance of pumped water
- measure the volume of water flowing to the disposal well
- measure the volume of water used in oil and gas drilling operations

## Proposed Pump-and-Use Ground Water Restoration

When the TDS concentration of pumped water from MW-3 declines from the current level of about 5000 mg/L to 3000 mg/L, we will transition from source removal pumping to the pump-and-use strategy. According to New Mexico State University (http://cahe.nmsu.edu/pubs/_m/m-112.html) water with a TDS of 3000 mg/L or less is "Very satisfactory for all classes of livestock and poultry". Therefore, the ground water remedy calls for supplying the surface leaseholder with a water source for cattle since this area of the state lease does not have a water source for stock. Additionally, we anticipate that oilfield service companies will periodically take water from the stock tank for use in nearby oil and gas well drilling operations.

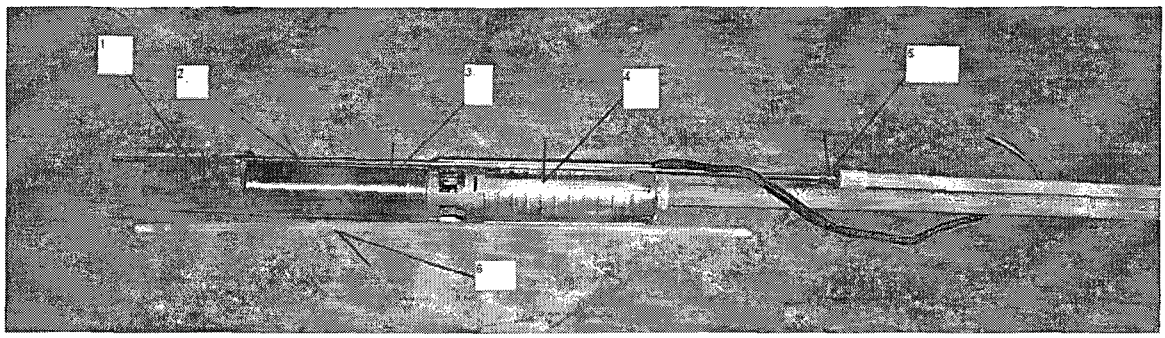
We also request that NMOCD forego any formal evaluation of the site activities until we have submitted the March report. Please contact Mr. Scott Rose of Samson if you have any questions or concerns regarding this plan as he has reviewed and approved this submission.

Sincerely,
R.T. Hicks Consultants, Ltd.

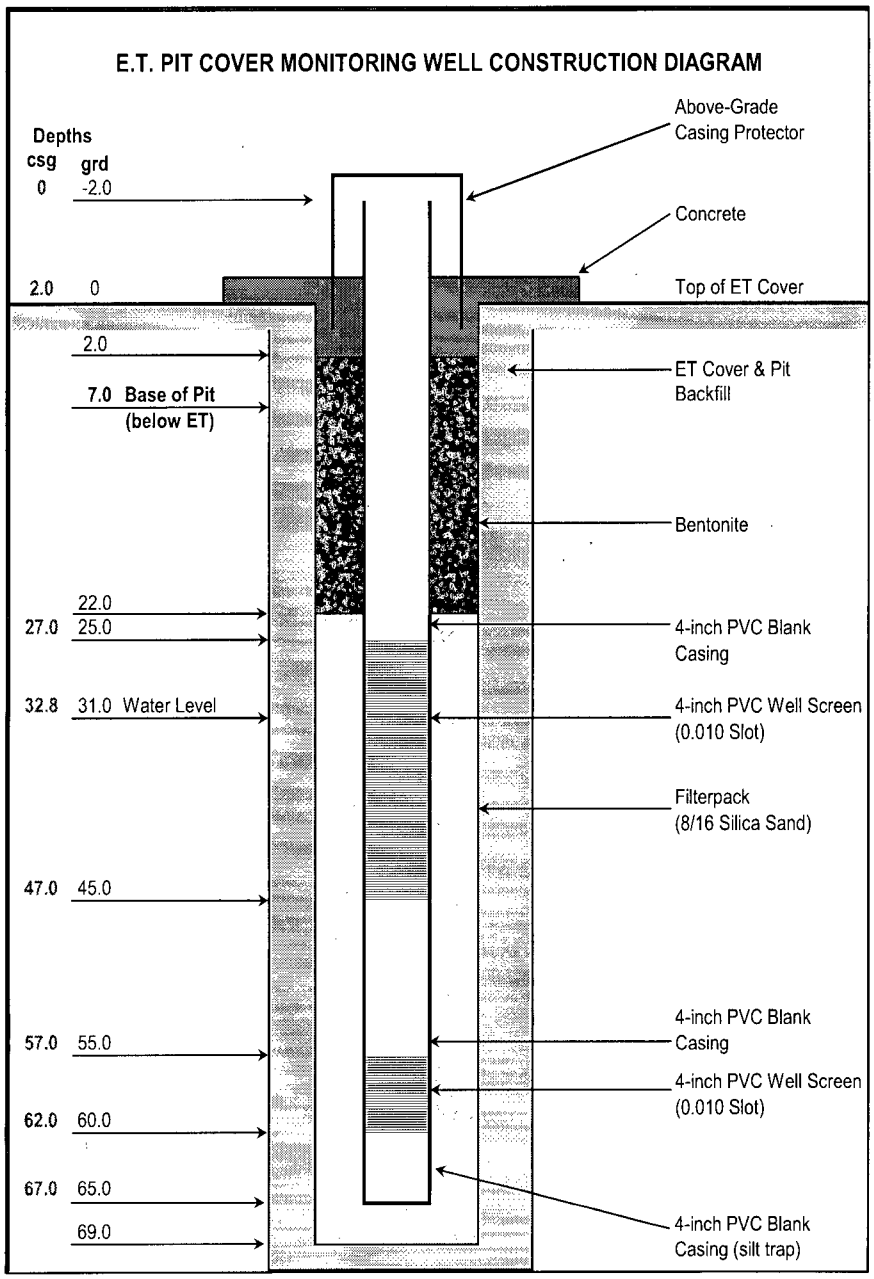
Randall T. Hicks
Principal

Copy:
Samson Resources, Scott Rose
New Mexico State Land Office

Appendix A – Pump and Packer System for MW-3




1) milled redwood plug
2) 1/4 in stainless steel tube
3) submersible pump motor
4) liquid pump end discharging to 1 in schedule 80 pvc column pipe
5) bushing from 1/4 in ss tube to 1/2 in sch 40 pvc riser tube
6) disposable bailer to bail through 1/2 in riser tube




The milled redwood plug is placed at 50-feet below ground surface, within the blank casing. This plug focuses water withdrawal from the upper screen.

During pumping, water enters the well from the upper screen and a small bailer lowered into the well can obtain a sample of ground water produced from the upper screen.

Because the redwood plug only restricts flow from the lower screen, water enters the well through the lower screen but at a low rate.

The ¼ inch tube connects the ½ inch riser to the area of the well below the packer. When the well is pumping, a small bailer can draw a discrete sample from the lower well screen

Discrete water level measurements may be obtained using the same protocol as that described for sampling

## VonGonten, Glenn, EMNRD

**From:** Randall Hicks [R@rthicksconsult.com]
**Sent:** Wednesday, January 03, 2007 3:35 PM
**To:** Dale Littlejohn
**Cc:** VonGonten, Glenn, EMNRD; 'Scott Rose'; Mark Sikelianos
**Subject:** BD-04 site

**Attachments:** BD-04Investigation Plan2.pdf

BD-04Investigati
on Plan2.pdf (...

Glenn

On Monday January 8 (about 10 am), we will begin drilling the proposed boring/well cluster at the eastern edge of the former pit. We hope to finish this well on Monday and complete the two proposed soil borings on Tuesday. If you find time on your way to Artesia for the Pit Meeting please stop in. I will be there from about 10 am to noon leaving Mark Sikelianos in charge of the project for the afternoon.

The ground water sampling results show impairment above WQCC Standards.
As the attached letter states, we plan to focus our efforts over the next few months on source removal and data collection.

As I am in Artesia overnight, I may drop into the pit public meeting.

Happy New Year.

Randy Hicks
>
>
>

R. T. HICKS CONSULTANTS, LTD.
901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745

January 3, 2007

Mr. Glenn von Gonten
New Mexico Oil Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Samson BD-04, T12S-R33E-Section 2, Unit Letter H
1R0474

Dear Mr. von Gonten:

Enclosed are the results of the December 2006 field program at the BD-04 site. The most important result of the investigation is the determination of the salt concentration in water below the pit.

| | | TDS mg/L | Cl mg/L |
|---|---|---|---|
| MW-3 Upper | 12/18/2006 | 5800 | 3900 |
| MW-3 Lower | 12/18/2006 | 2000 | 3700 |

As shown in the attached lithologic log and completion diagrams, the upper screen obtains a sample from the uppermost 15 feet of the saturated zone (30-feet to 45-feet below ground surface) and the lower screen samples the screened interval from 55-60 feet below ground surface (about 63-68 feet below the natural ground surface.

As expected, these findings have caused some minor changes to the characterization plan submitted to NMOCD in December. These changes are:

1. Some final grading of the site will cause an expansion of the excavation to the south and possibly to the east to eliminate the small escarpment caused by the installation of the ET infiltration barrier. As a result, the proposed boring and well near the eastern edge of the former pit may need to be re-located 10-15 feet east of the location shown in the December plan.
2. Sloughing sand in the uppermost aquifer will prevent effective sampling below the water table, which we planned to use to guide the placement of the lower well screen. The uppermost well in the cluster proposed for east of the former pit will be completed with about 10-feet of screen in the uppermost saturated zone and 5-feet of screen above the water table. The deeper well in the cluster will be placed 10-feet below the screened interval of MW-3, which we believe will be from 75-80 feet below ground surface at the proposed location.
3. Because chloride and TDS concentrations are above WQCC Standards in MW-3, we plan to implement a pump-and-use ground water remedy in January. In order to monitor the efficacy of this pump-and-use program,

the well cluster described above may become a permanent well location and we will construct it as such.

4. In January, we will install a pump and packer at MW-3 that will cause withdrawal of ground water from primarily the uppermost screen. We hope to use recovered water for drilling fluids at nearby oil and gas exploration or production wells. Initially, recovered water will be discharged to a nearby Class II injection well. NMOCD can expect correspondence from us during the month of January regarding the implementation of this proposed remedy.
5. Implementing and monitoring the pump-and-use ground water restoration strategy will provide very useful data that can assist in determining the most appropriate location for other down gradient monitoring wells. Therefore, we plan to delay installation of the three down gradient monitoring wells proposed in the December investigation plan until we have three months of data from the pump-and-use strategy (May 2007).

NMOCD can expect a progress report on or before January 30th that summarizes the results of the work planned for early January. NMOCD can expect monthly reports on the progress of the pump-and-use or pump-and-dispose remedy. As stated in our December investigation plan, characterization of ground water is an iterative process. Each step in the process is based upon the data collected during the previous step. Samson is committed to:

- complying with NMOCD Rules,
- applying sound science to the problem at hand and
- protecting fresh water, public health and the environment

Please contact Mr. Scott Rose of Samson if you have any questions or concerns regarding this plan as he has reviewed and approved this submission.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy:
Samson Resources, Scott Rose
New Mexico State Land Office

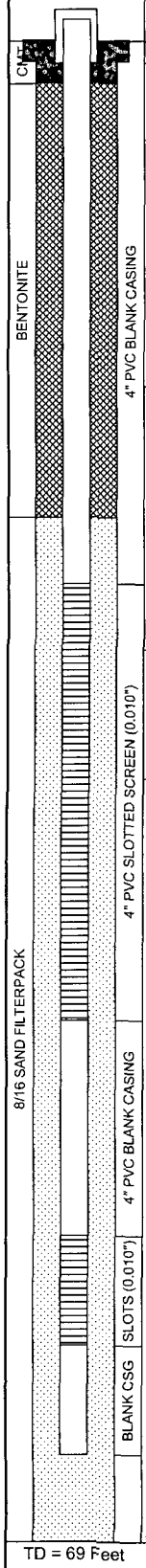
# LITHOLOGIC LOG (MONITORING WELL)

**R T Hicks Consultants Ltd**

P O Box 7624
Midland, TX 79708
(432) 528-3878

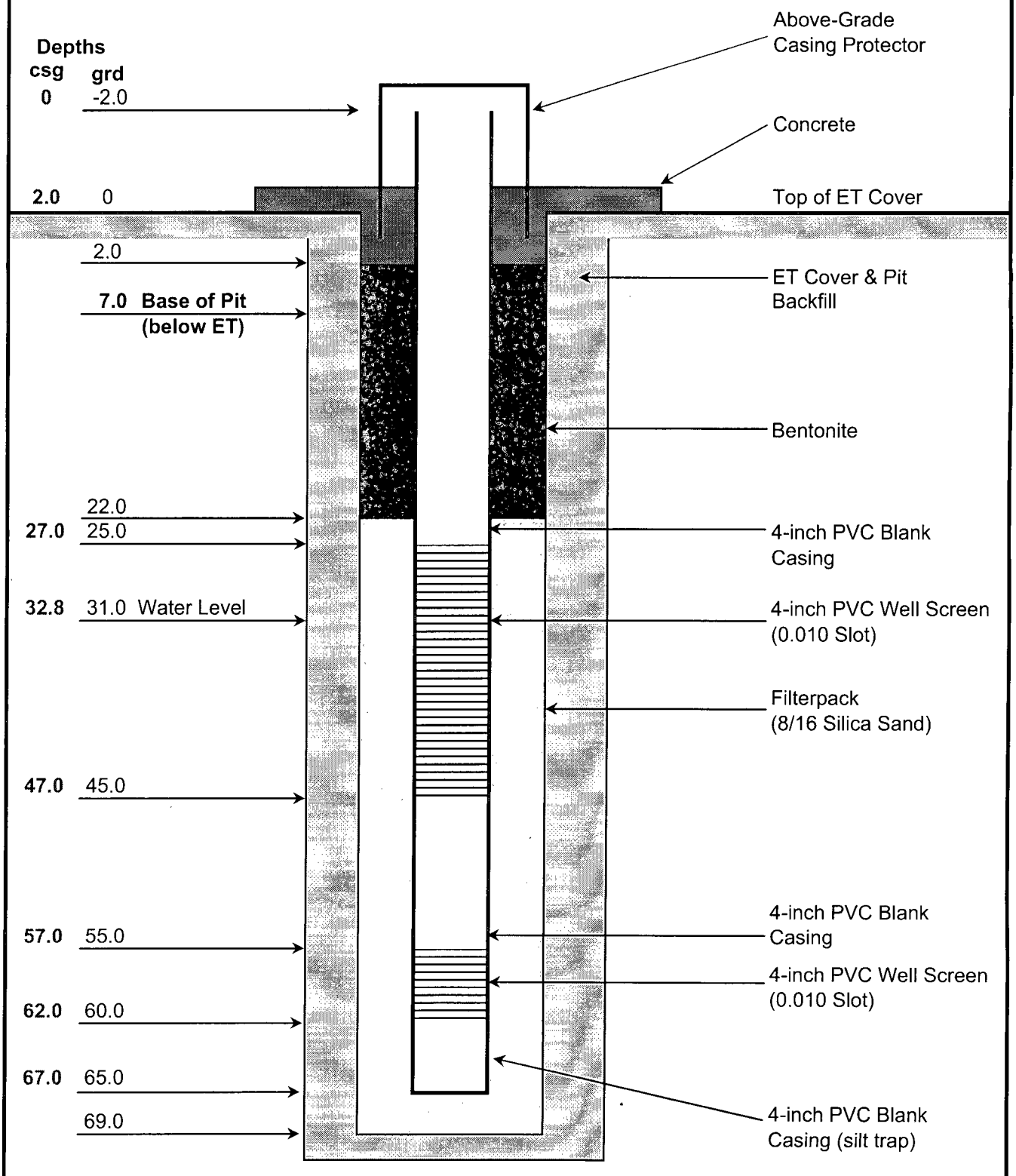
MONITOR WELL NO.: MW-3
SITE ID: Samson State BD No. 4
SURFACE ELEVATION: Csg = 4,224.48
CONTRACTOR: Atkins Engineering
DRILLING METHOD: Hollow-Stem
INSTALLATION DATE: 12/11/06
WELL PLACEMENT: Center of Former Res. Pit
COMMENTS: Lat. 32° 18' 35.0" North, Long. 103° 34' 39.2" West

TOTAL DEPTH: 69.0 Ft
CLIENT: Samson Investment Co.
COUNTY: Lea County
STATE: New Mexico
LOCATION: T-12-S, R-33-E, Sec. 2 (H)
FIELD REP.: Dale Littlejohn
FILE NAME: \BD-4\Lithlogs (12-06)



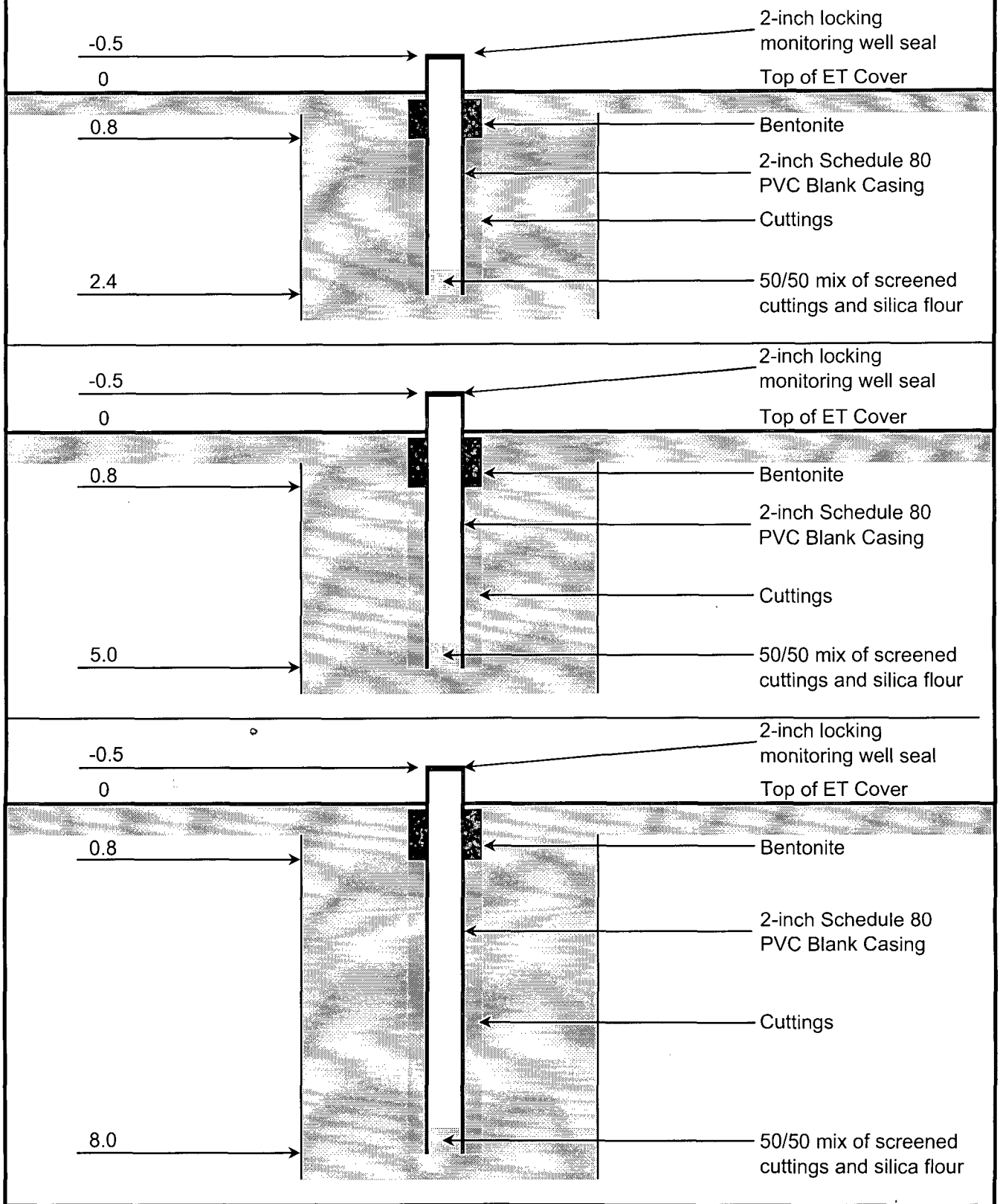

| Lithology | PHOTO | SAMPLE DATA DEPTH | % REC | PID | Cl (Lab) | DEPTH | LITHOLOGIC DESCRIPTION: LITHOLOGY, COLOR, GRAIN SIZE, SORTING, ROUNDING, CONSOL., DIST. DEATURES |
|---|---|---|---|---|---|---|---|
| | | | | | | | SILTY CLAY dark brown (top soil) with some caliche. |
| | | | | | | | CALICHE light grayish brown with some fine grain sand (10% gradient to 25% with depth). Very difficult to determine the base of former excavation. |
| | | | | | | 5 | |
| | | | | | | | Possible base of original excavation |
| | | | | | | 10 | |
| | | 14-16 | 20% | <1 ppm | 5,740 mg/kg | 15 | |
| | | | | | | | SAND light brown, fine grain, sub-rounded, poorly sorted, with some caliche. |
| | | 19-21 | 20% | <1 ppm | 5,320 mg/kg | 20 | |
| | | 24-26 | 30% | <1 ppm | 5,7402 mg/kg | 25 | |
| | | 29-31 | 20% | <1 ppm | 936 mg/kg | 30 | SAND light to medium brown, medium grain size, sub-rounded, poorly sorted with some clay. |
| | | | | | | | Moist Formation at 30 - 31 feet |
| | | 34-36 | 10% | <1 ppm | wet, no sample | 35 | SAND AND CLAY light reddish brown, very fine grain sand with 50 to 60% clay. Saturated formation (no returns) below 39 feet. |
| | | | | | | 40 | |
| | | | | | | 45 | |
| | No Sample Recovery | | | | | 50 | |
| | | | | | | 55 | |
| | | | | | | 60 | |
| | | | | | | 65 | |

# E.T. PIT COVER MONITORING WELL CONSTRUCTION DIAGRAM




| | | | |
|---|---|---|---|
| **R T Hicks Consultants Ltd** | SITE: Samson BD-4 Site Site | | **E.T. Pit Cover Monitoring Well No. 3** |
| | DATE: 12/28/06 | REV. NO.: 1 | |
| | AUTHOR: DTL | TECH: DTL | |
| | *DRILLER: Proposed* | FILE: \Lith (12-06) | |

# E.T. PIT COVER VADOSE ZONE ACCESS PORT CONSTRUCTION DIAGRAM




| | | | | |
|---|---|---|---|---|
| **R T Hicks Consultants Ltd** | SITE: Samson BD-4 Site Site | | | **E.T. Pit Cover Vadose Zone Monitoring Port** |
| | DATE: 12/28/06 | REV. NO.: | 1 | |
| | AUTHOR: DTL | TECH: | DTL | |
| | DRILLER: Proposed | FILE: | \Lith (12-06) | |

HALL
ENVIRONMENTAL
ANALYSIS
LABORATORY

# COVER LETTER

Thursday, December 21, 2006

Randall Hicks
Atkins Engineering Associates
2904 West Second Street
Roswell, NM 88201

TEL: (505) 624-2420
FAX (505) 624-2421

RE: Samson State BD-04 Samples

Order No.: 0612227

Dear Randall Hicks:

Hall Environmental Analysis Laboratory, Inc. received 2 sample(s) on 12/20/2006 for the analyses presented in the following report.

These were analyzed according to EPA procedures or equivalent.

Reporting limits are determined by EPA methodology. No determination of compounds below these (denoted by the ND or < sign) has been made.

Please don't hesitate to contact HEAL for any additional information or clarifications.

Sincerely,

Andy Freeman, Business Manager
Nancy McDuffie, Laboratory Manager

NM Lab # NM9425
AZ license # AZ0682
ORELAP Lab # NM100001

# Hall Environmental Analysis Laboratory, Inc.

Date: *21-Dec-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | Atkins Engineering Associates | **Client Sample ID:** | 4" Monitor Well Lower |
| **Lab Order:** | 0612227 | **Collection Date:** | 12/18/2006 12:00:00 PM |
| **Project:** | Samson State BD-04 Samples | **Date Received:** | 12/20/2006 |
| **Lab ID:** | 0612227-01 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **TES** |
| Chloride | 2000 | 10 | | mg/L | 100 | 12/21/2006 |
| **EPA METHOD 160.1: TDS** | | | | | | Analyst: **KS** |
| Total Dissolved Solids | 3700 | 20 | | mg/L | 1 | 12/20/2006 |

| Qualifiers: | | | | |
|---|---|---|---|---|
| | * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| | E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| | J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| | ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| | S | Spike recovery outside accepted recovery limits | | |

# Hall Environmental Analysis Laboratory, Inc.

**Date:** *21-Dec-06*

| | | | |
|---|---|---|---|
| **CLIENT:** | Atkins Engineering Associates | **Client Sample ID:** | 4" Monitor Well Upper |
| **Lab Order:** | 0612227 | **Collection Date:** | 12/18/2006 12:15:00 PM |
| **Project:** | Samson State BD-04 Samples | **Date Received:** | 12/20/2006 |
| **Lab ID:** | 0612227-02 | **Matrix:** | AQUEOUS |

| Analyses | Result | PQL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **EPA METHOD 300.0: ANIONS** | | | | | | Analyst: **TES** |
| Chloride | 3900 | 10 | | mg/L | 100 | 12/20/2006 3:09:42 PM |
| **EPA METHOD 160.1: TDS** | | | | | | Analyst: **KS** |
| Total Dissolved Solids | 5800 | 20 | | mg/L | 1 | 12/20/2006 |

**Qualifiers:**

| | | | |
|---|---|---|---|
| * | Value exceeds Maximum Contaminant Level | B | Analyte detected in the associated Method Blank |
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | MCL | Maximum Contaminant Level |
| ND | Not Detected at the Reporting Limit | RL | Reporting Limit |
| S | Spike recovery outside accepted recovery limits | | |

# QA/QC SUMMARY REPORT

**Client:** Atkins Engineering Associates
**Project:** Samson State BD-04 Samples **Work Order:** 0612227

| Analyte | Result | Units | PQL | %Rec | LowLimit | HighLimit | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|
| **Method:** E300 | | | | | | | | | |
| **Sample ID: MBLK** | | *MBLK* | | | Batch ID: | **R21895** | Analysis Date: | 12/20/2006 12:33:03 PM | |
| Chloride | ND | mg/L | 0.10 | | | | | | |
| **Sample ID: MBLK** | | *MBLK* | | | Batch ID: | **R21901** | Analysis Date: | 12/21/2006 8:18:18 AM | |
| Chloride | ND | mg/L | 0.10 | | | | | | |
| **Sample ID: LCS ST300-06026** | | *LCS* | | | Batch ID: | **R21895** | Analysis Date: | 12/20/2006 12:50:27 PM | |
| Chloride | 4.780 | mg/L | 0.10 | 95.6 | 90 | 110 | | | |
| **Method:** E160.1 | | | | | | | | | |
| **Sample ID: MB-12010** | | *MBLK* | | | Batch ID: | **12010** | Analysis Date: | 12/20/2006 | |
| Total Dissolved Solids | ND | mg/L | 20 | | | | | | |
| **Sample ID: LCS-12010** | | *LCS* | | | Batch ID: | **12010** | Analysis Date: | 12/20/2006 | |
| Total Dissolved Solids | 977.0 | mg/L | 20 | 97.7 | 80 | 120 | | | |

**Qualifiers:**

| | | | |
|---|---|---|---|
| E | Value above quantitation range | H | Holding times for preparation or analysis exceeded |
| J | Analyte detected below quantitation limits | ND | Not Detected at the Reporting Limit |
| R | RPD outside accepted recovery limits | S | Spike recovery outside accepted recovery limits |

Hall Environmental Analysis Laboratory, Inc.

## Sample Receipt Checklist

Client Name ATK | Date and Time Received: 12/20/2006

Work Order Number 0612227 | Received by AT

Checklist completed by _____ 12/20/06
Signature | Date

Matrix | Carrier name Greyhound

| | | | | |
|---|---|---|---|---|
| Shipping container/cooler in good condition? | Yes ☑ | No ☐ | Not Present ☐ | |
| Custody seals intact on shipping container/cooler? | Yes ☑ | No ☐ | Not Present ☐ | Not Shipped ☐ |
| Custody seals intact on sample bottles? | Yes ☐ | No ☑ | N/A ☐ | |
| Chain of custody present? | Yes ☑ | No ☐ | | |
| Chain of custody signed when relinquished and received? | Yes ☑ | No ☐ | | |
| Chain of custody agrees with sample labels? | Yes ☑ | No ☐ | | |
| Samples in proper container/bottle? | Yes ☑ | No ☐ | | |
| Sample containers intact? | Yes ☑ | No ☐ | | |
| Sufficient sample volume for indicated test? | Yes ☑ | No ☐ | | |
| All samples received within holding time? | Yes ☑ | No ☐ | | |
| Water - VOA vials have zero headspace? | No VOA vials submitted ☑ | Yes ☐ | No ☐ | |
| Water - pH acceptable upon receipt? | Yes ☐ | No ☐ | N/A ☑ | |

Container/Temp Blank temperature? 1° *4° C ± 2 Acceptable* If given sufficient time to cool.

COMMENTS:

---

Client contacted _____ Date contacted: _____ Person contacted _____

Contacted by: _____ Regarding _____

Comments: _____

_____

_____

_____

_____

Corrective Action _____

_____

_____

# CHAIN-OF-CUSTODY RECORD

QA / QC Package:
Std ☐ Level 4 ☐
Other:


**HALL ENVIRONMENTAL ANALYSIS LABORATORY**
4901 Hawkins NE, Suite D
Albuquerque, New Mexico 87109
Tel. 505.345.3975 Fax 505.345.4107
www.hallenvironmental.com


Client: Atkins Engineering Associates, Inc.
Address: 2904 West Second St. Roswell, NM 88201
Phone #: 505.624.2420
Fax #: 505.624.2421

Project Name: Samson State BD-04 Samples
Project #: RTH BD04.SAM.06
Project Manager: Randall Hicks
Sampler: M. Bates
Sample Temperature: 1.4

## ANALYSIS REQUEST

| Date | Time | Matrix | Sample I.D. No. | Number/Volume | Preservative $HgCl_2$ | Preservative $HNO_3$ | Preservative | HEAL No. |
|---|---|---|---|---|---|---|---|---|
| 12/18/06 | 1200 | Aqueous | 4" Monitor Well Lower | 1-500mL H2O HLe | | | | 0612227 -1 |
| 12/18/06 | 1215 | ↓ | 4" Monitor Well Upper | ↓ | | | | -2 |

BTEX + MTBE + TMB's (8021) | BTEX + MTBE + TPH (Gasoline Only) | TPH Method 8015B (Gas/Diesel) | TPH (Method 418.1) | EDB (Method 504.1) | EDC (Method 8021) | 8310 (PNA or PAH) | RCRA 8 Metals | Anions (F, Cl, NO3, NO2, PO4, SO4) | 8081 Pesticides / PCB's (8082) | 8260B (VOA) | 8270 (Semi-VOA) | TDS 160.1 | | | | Air Bubbles or Headspace (Y or N)

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | ✓ | | | | ✓ | | | | |
| | | | | | | | | | | ✓ | | | | ✓ | | | | |

| Date | Time | Relinquished By: (Signature) | Received By: (Signature) |
|---|---|---|---|
| 12-19-06 | 9:30 | Tina Valenzuela | |
| Date: | Time: | Relinquished By: (Signature) | Received By: (Signature) 12/20/06 1030 |

Remarks: → 24-hour Turn Around ←
Send Results to Randall Hicks @ RT Hicks
>Chloride + TDS