1R - 500

REPORTS

DATE:

4-29-11

Texerra

75 Wuthering Hts Drive Colorado Springs, CO 80921
Tel: 719-339-6791 E-mail: lpg@texerra.com

April 29th, 2011

Mr. Geoffrey Leking
New Mexico Oil Conservation Division
1625 N. French Drive
Hobbs, New Mexico 88240

Re: Rice Operating Company
Preliminary Site Characterization
BD N-18 Below Grade Tanks
UL-N, Sec 18, T22S, R37E

Mr. Leking:

Rice Operating Company (ROC) has completed a preliminary investigation of soil and groundwater at their BD N-18 Below Grade Tanks (BD N-18 BGT) site. My company, Texerra, is serving as the project consultant for ROC. A summary of results is presented here which may serve to guide the course of future remedial actions.

The BD N-18 SWD facility is located approximately 4 miles southwest of Eunice, New Mexico (Figure 1). ROC analyzed soils for chlorides and petroleum hydrocarbons at varying depths from near the surface (5 ft bgs) to the groundwater capillary fringe (approximately 100 ft bgs) beneath the former tanks (these having been removed and replaced in 2010 with new above-ground tanks located to the southwest on the lease pad) and in areas exhibiting apparent surface evidence of historical impacts (Figure 2 & 3). ROC also installed groundwater monitor wells at BG N-18 BGT and at up-gradient and down-gradient locations, and sampled groundwater for chlorides and BTEX (Figure 4).

It is clear from the high groundwater chloride concentration in the up-gradient monitor well (MW-2: 1,220 ppm) that the on-coming regional, base-line groundwater is not pristine but has been degraded by historical impacts from up-gradient sources (Figure 5) and not caused by activities at the BD N-18 BGT location. Nevertheless, historical activities at the subject site do appear to have caused a moderate increase in down-gradient groundwater chlorides, as evidenced by the elevated groundwater chloride concentration beneath the site (MW-1: 2,400 ppm) and a down-gradient concentration that is moderately elevated above that of the on-coming (up-gradient) groundwater (MW-3: 1,720 ppm); (Figure 4). This is supported by the generally elevated levels of soil chlorides measured at and across the affected area (Figures 2 & 3). It should be pointed out that no petroleum hydrocarbons (either as BTEX in groundwater or PID in soils) were found in this investigation.

BD N-18 BGT – Preliminary Site Characterization

In order to compensate for the potential future effects of residual soil chlorides and the groundwater impact presumably caused from this facility, ROC proposes to quantify the residual soil and groundwater chloride mass beneath the affected area and to remove an equivalent amount of chloride from the surface aquifer from within the BD field from a location to be determined. Ideally, groundwater at the remediation well should have a high chloride concentration so as to minimize the volume of water needed to be withdrawn in order to achieve removal of the desired chloride mass. The removal of groundwater chlorides from another well in the BD field will thus serve to remedy any potential future impacts of residual soil chlorides in the vadose zone beneath the BD N-18 BGT location and to compensate for the moderate elevation in groundwater chlorides presumably caused by historical activities at this location.

We will conduct additional monitoring of groundwater for chlorides and analyze this data in combination with the soil data collected thus far. We will use this information to ascertain the extent of groundwater impact from this location and to determine a groundwater and vadose zone remedy.

We submit this report to NMOCD for your review, consideration and authorization to develop a Corrective Action Plan along the lines that we propose. Please contact either myself, or Katie Jones of Rice Operating Company, if you need additional information or have any questions.

We appreciate your consideration of this report.

Sincerely,

L. Peter Galusky, Jr. Ph.D. P.G.
Principal

Copy: Rice Operating Company
Edward Hansen – NMOCD Santa Fe

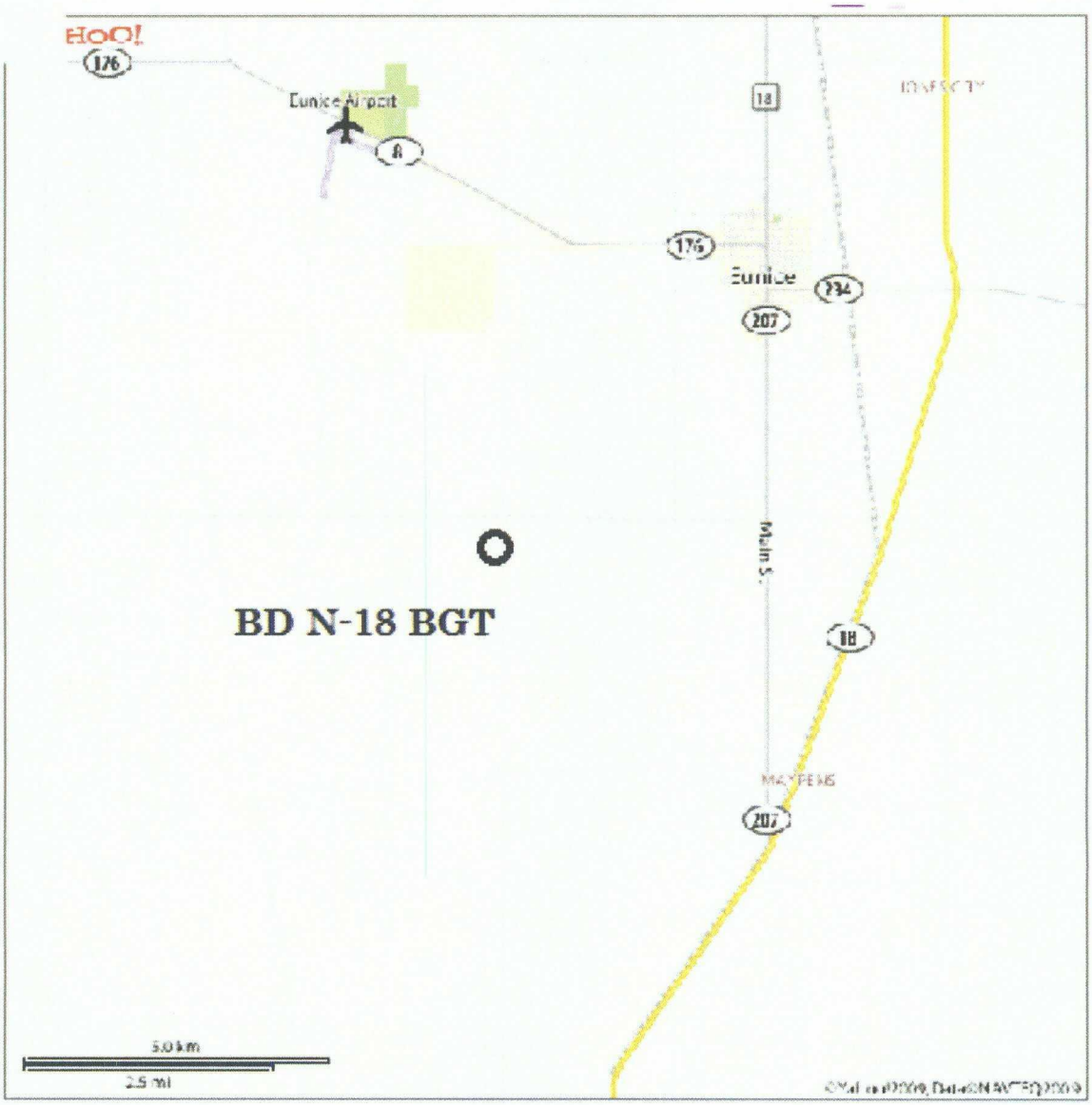


Figure 1 – BD N-18 BGT Location (map not to scale).

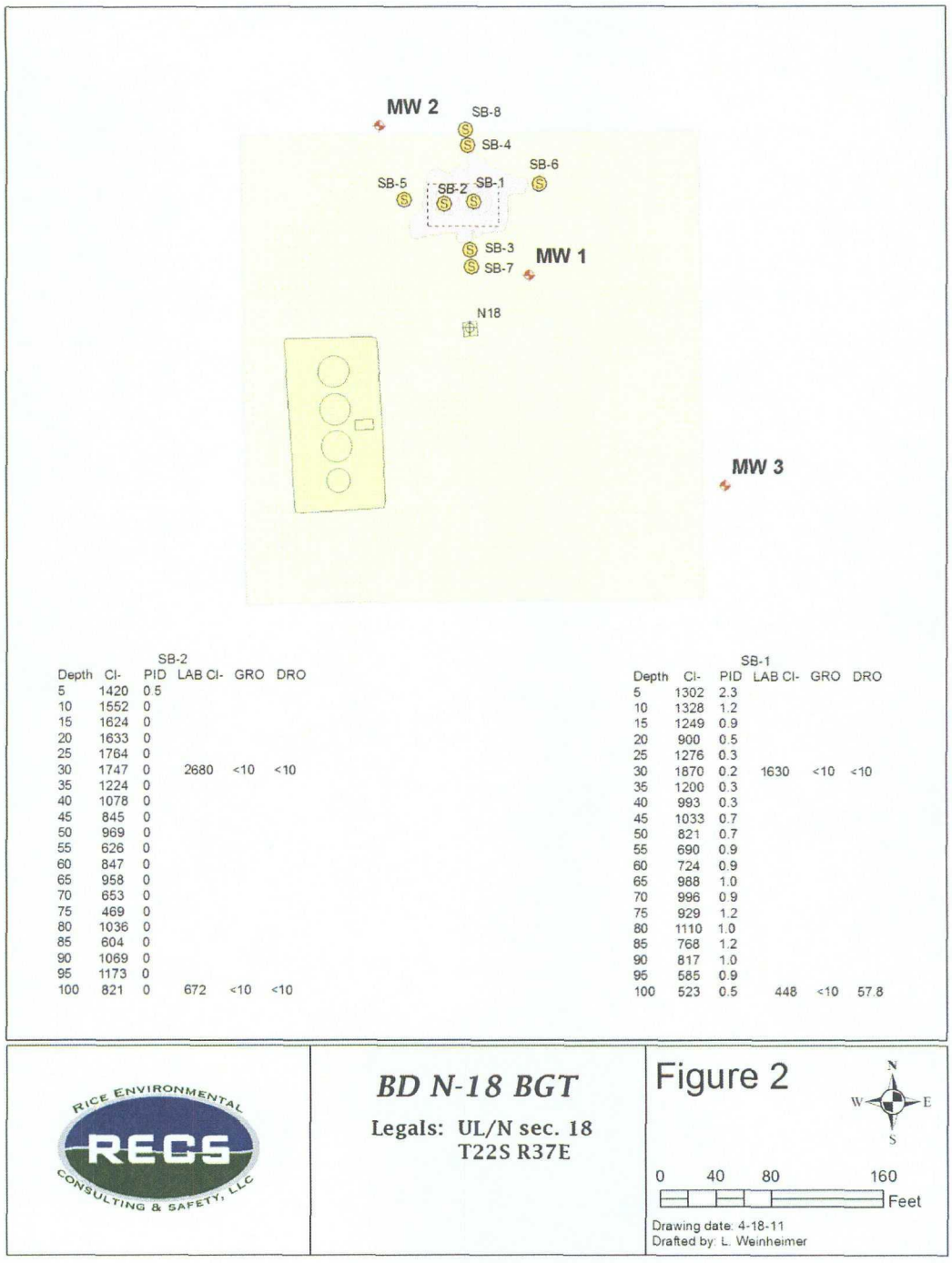


Figure 2 - BD N-18 BGT soil bore and monitor well locations with field and laboratory measured soil chloride and petroleum hydrocarbon concentrations for SB-1 and SB-2.

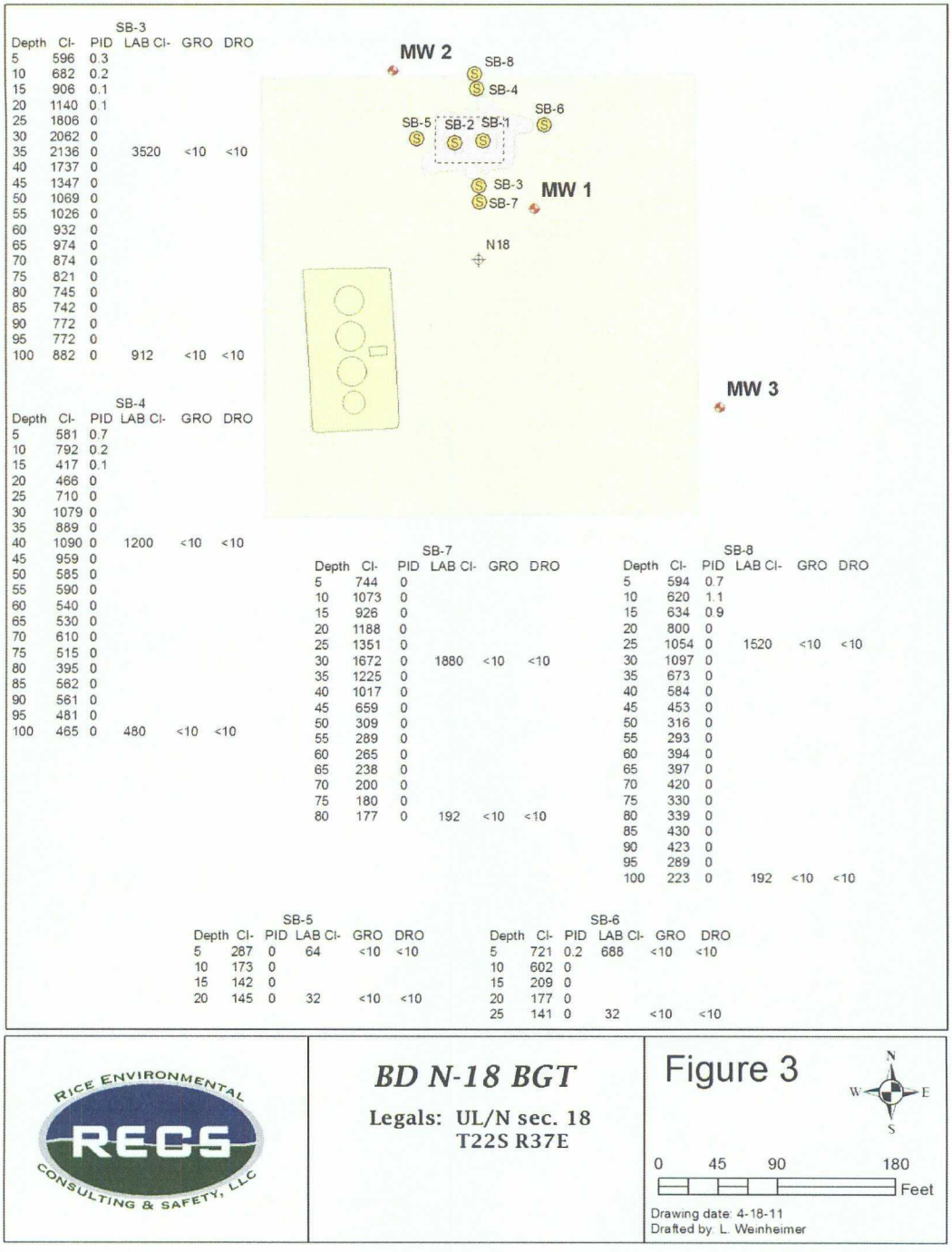
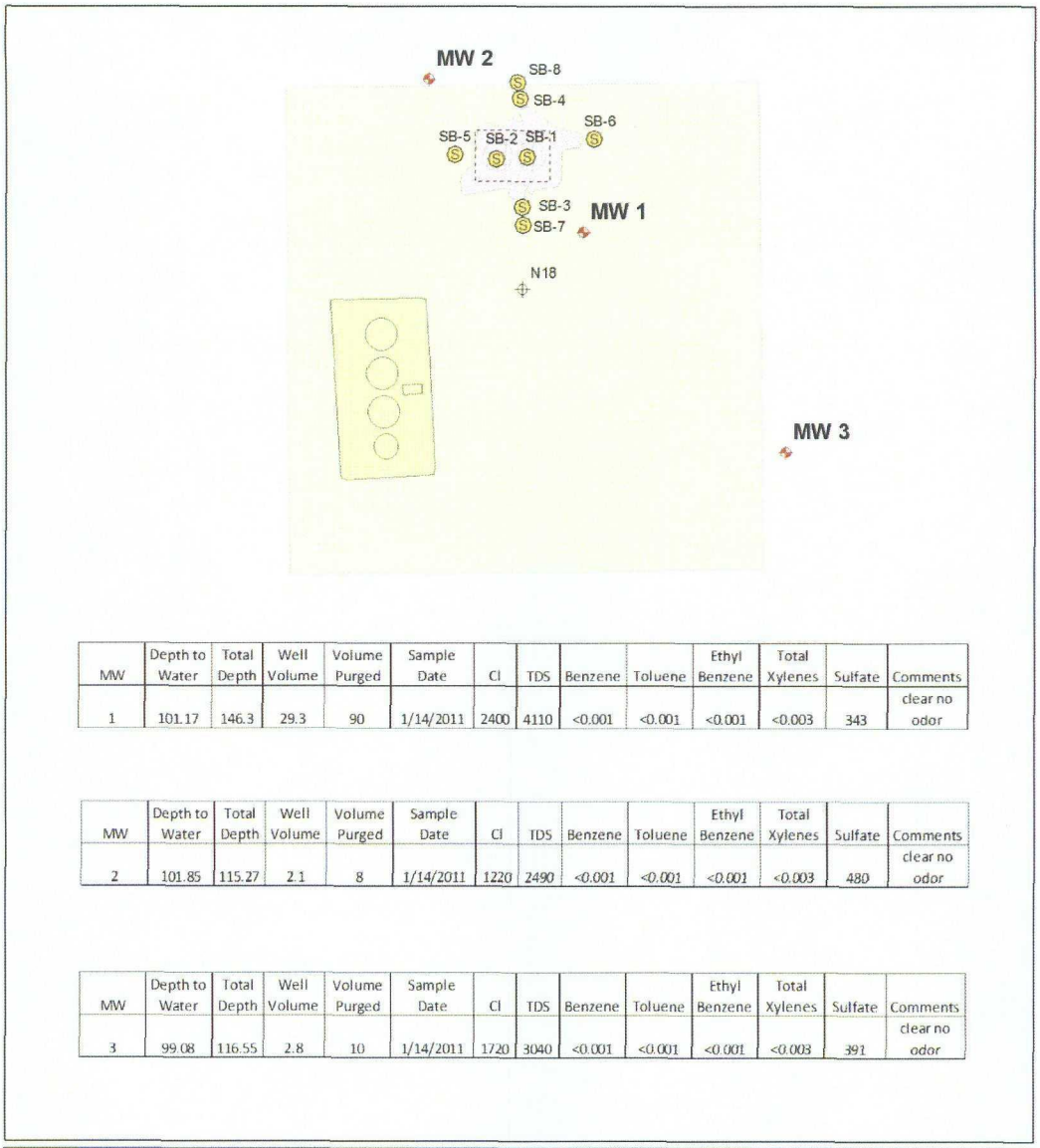


Figure 3 - BD N-18 BGT soil bore and monitor well locations with field and laboratory measured soil chloride and petroleum hydrocarbon concentrations for SB-3 through SB-8.



MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
1	101.17	146.3	29.3	90	1/14/2011	2400	4110	<0.001	<0.001	<0.001	<0.003	343	clear no odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
2	101.85	115.27	2.1	8	1/14/2011	1220	2490	<0.001	<0.001	<0.001	<0.003	480	clear no odor

MW	Depth to Water	Total Depth	Well Volume	Volume Purged	Sample Date	Cl	TDS	Benzene	Toluene	Ethyl Benzene	Total Xylenes	Sulfate	Comments
3	99.08	116.55	2.8	10	1/14/2011	1720	3040	<0.001	<0.001	<0.001	<0.003	391	clear no odor

RICE ENVIRONMENTAL RECS CONSULTING & SAFETY, LLC

BD N-18 BGT

Legals: UL/N sec. 18
T22S R37E

Figure 4

N W E S

0 45 90 180 Feet

Drawing date: 4-18-11
Drafted by: L. Weinheimer

Figure 4 - BD N-18 BGT soil bore and monitor well locations with groundwater chloride concentrations on January 14th, 2011. The direction of groundwater flow is assumed to be generally from the northwest (upper left) toward the southeast (lower right).

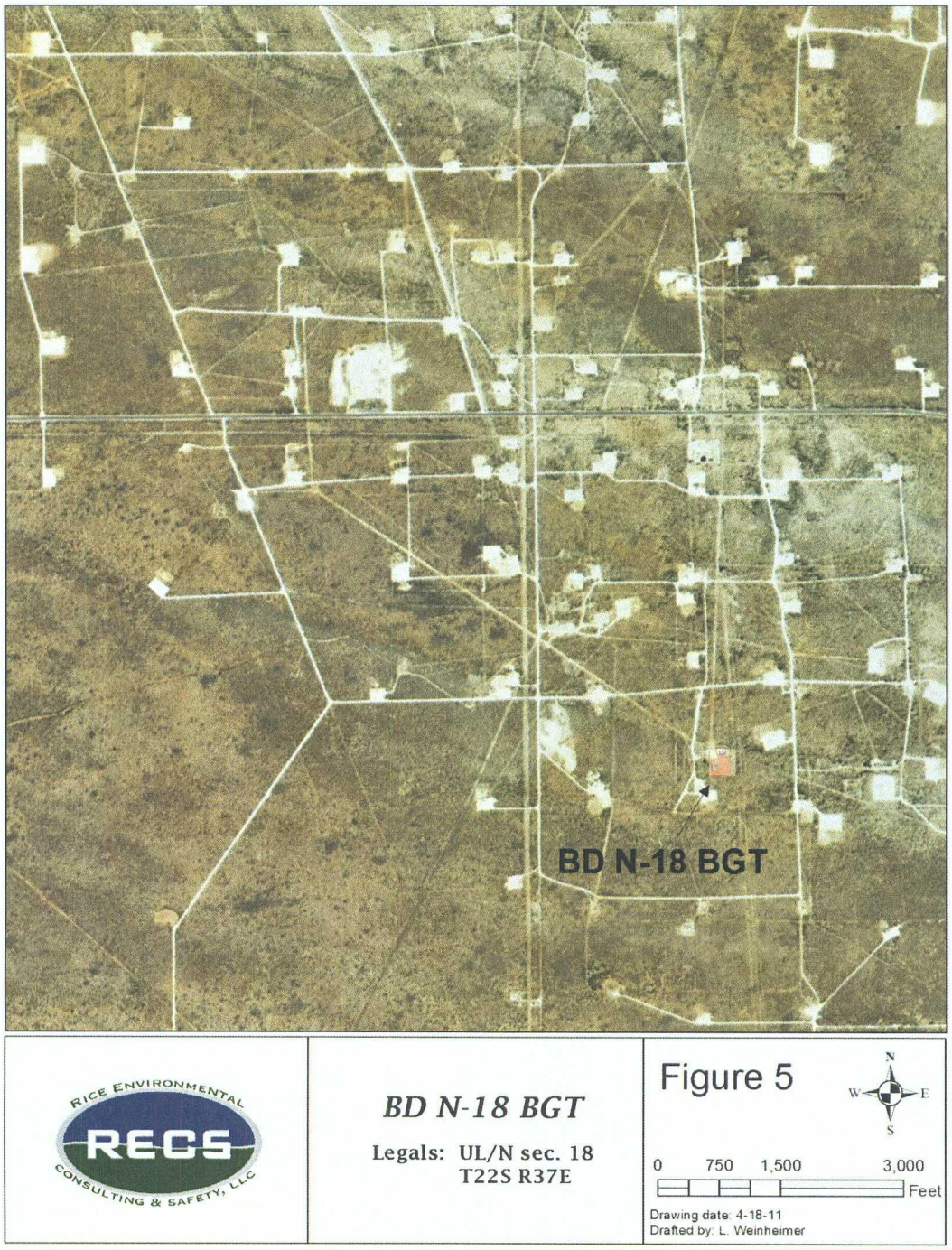


Figure 5 – BD N-18 BGT location showing up-gradient (northwest of site) oil field facilities.

District I
1625 N. French Dr., Hobbs, NM 88240
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy Minerals and Natural Resources

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-141
Revised October 10, 2003

Submit 2 Copies to appropriate District Office in accordance with Rule 116 on back side of form

Release Notification and Corrective Action

OPERATOR

☒ Initial Report ☐ Final Report

Name of Company **RICE Operating Company**	Contact **Hack Conder**
Address **112 West Taylor Hobbs, NM 88240**	Telephone No. **(575) 393-9174**
Facility Name **BD N-18 below grade tanks (BGT)**	Facility Type **SWD**

Surface Owner **State**	Mineral Owner	API No. **30-025-25616**

LOCATION OF RELEASE

Unit Letter	Section	Township	Range	Feet from the	North/South Line	Feet from the	East/West Line	County
N	**18**	**22S**	**37E**					**Lea**

Latitude 32*23'16.72: N **Longitude** 103*12'11.328:W

NATURE OF RELEASE

Type of Release **produced water**	Volume of Release **unknown**	Volume Recovered **unknown**
Source of Release **unknown**	Date and Hour of Occurrence **unknown**	Date and Hour of Discovery **soil investigation began in October 2010 and was complete in December 2010**
Was Immediate Notice Given? ☐ Yes ☒ No ☐ Not Required	If YES, To Whom?	
By Whom?	Date and Hour	
Was a Watercourse Reached? ☐ Yes ☒ No	If YES, Volume Impacting the Watercourse.	

If a Watercourse was Impacted, Describe Fully.*

Describe Cause of Problem and Remedial Action Taken.*

The below grade tanks located at this site were removed according to 19.15.17 NMAC. Upon removal of the former tanks and investigation of the soils beneath the tanks, impact was evident.

Describe Area Affected and Cleanup Action Taken.*

Use of the BD N-18 below grade tanks (BGT) was discontinued and a new facility was built on location. An air-rotary drilling rig was utilized to investigate soils located beneath the former below grade tanks. Soil samples were collected at regular intervals and field screened for chlorides and volatile organic compounds (VOCs) using a PID meter. Laboratory analysis confirmed chloride concentrations above 250 mg/kg and low concentrations of TPH (<10 mg/kg). Near-source (MW-1), up-gradient (MW-2), and down-gradient (MW-3) monitoring wells were installed to verify impact to groundwater. Chloride impact to groundwater was confirmed in all three monitoring wells. Depth to groundwater 101 ft below ground surface (bgs).

I hereby certify that the information given above is true and complete to the best of my knowledge and understand that pursuant to NMOCD rules and regulations all operators are required to report and/or file certain release notifications and perform corrective actions for releases which may endanger public health or the environment. The acceptance of a C-141 report by the NMOCD marked as "Final Report" does not relieve the operator of liability should their operations have failed to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD acceptance of a C-141 report does not relieve the operator of responsibility for compliance with any other federal, state, or local laws and/or regulations.

Signature:	OIL CONSERVATION DIVISION
Printed Name: **Hack Conder**	Approved by District Supervisor:
Title: **Environmental Manager**	Approval Date: / Expiration Date:
E-mail Address: **hconder@riceswd.com**	Conditions of Approval: / Attached ☐
Date: **4/29/2011** Phone: **(575) 393-9174**	

* Attach Additional Sheets If Necessary