

January 2014

**C-144 Permit Package for  
Marbob 11H  
Temporary Pit  
Section 19 T19S R29E Eddy County NM**



*View south to staked location (center of image) from Section line lease road.*

**Prepared for  
Read and Stevens, Inc.  
Roswell, New Mexico**

**Prepared by  
R.T. Hicks Consultants, Ltd.  
Albuquerque, New Mexico**

# R. T. HICKS CONSULTANTS, LTD.

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

February 10, 2014

Mr. Mike Bratcher  
NMOCD District 2  
811 S. First Street  
Artesia, New Mexico 88210  
Via E-mail and US Mail

RE: Read and Stevens, Inc. –Marbob 11H

Dear Mike:

On behalf of Read and Stevens, Inc., R.T. Hicks Consultants, Ltd. is pleased to submit the C-144 application package for the above-referenced well. Please note the following:

1. Generic Plans included in this submission have been recently approved by OCD.
2. Plates 1 and 2 are based on a previously-approved C-144 application with similar dimensions and volumes.
3. The design and construction plan for the pit calls for engineering measures to address any concerns relating to cave/karst features that are documented about 200 feet below the site.
4. We anticipate “in place” burial of stabilized solids.
5. I certify that I performed a visual inspection of the site.

Cave/karst solution features are documented about 200 feet below surface in this area in the form of lost circulation at 195 feet encountered during the drilling of the Read and Stevens Marbob State #4, which is located about 2500 feet southwest of the Marbob 11H. Although the BLM does not allow reserve pits in areas mapped as “high cave/karst potential”, there is ample evidence that the ground at the site is sufficiently stable to allow the use of a temporary pit. This evidence includes

- The fact that the rock units that create the solution features (the Rustler) is at least 30 feet and probably about 80 feet below surface
- Caliche, silt and sand comprise the Older Alluvium that comprise the material between ground surface and the underlying Rustler
- The Concho frac pond has been filled several times with fresh water and there is no evidence of unstable ground at this site – the liner remains intact without any signs of settling

The BLM cave/karst potential map is a coarse tool that is continually being upgraded based upon field data. A “low potential” cave/karst area is 1 mile north and 1 mile west of the proposed reserve pit. The difference between the high and low classifications in this area is not consistent with my understanding of the local geology and the BLM definitions of the various classifications<sup>1</sup> - but this lack of understanding does not mean my interpretation is correct.

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<sup>1</sup>A high karst zone is defined as an area occurring in known soluble rock types and containing a high frequency of significant caves and karst features such as sinkholes, bedrock fractures that provide rapid recharge of karst aquifers, and springs that provide riparian habitat.

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I suggest that TC, you and I visit the site and carefully examine:

- The nature and thickness of the caliche and underlying rock material exposed in the nearby caliche pit
- The surface features (e.g. exposed caliche) at the site and the nearby Concho Frac Pond
- The condition of the nearby Concho Frac Pond
- The nature of the Older Alluvium exposures between the Concho Frac Pond and the Devon Frac Pond to the east (see below)



We believe that if we put all carefully examine the site, the geology and other factors we can come to a consensus regarding the wisdom of placing a fluid-filled reserve pit at the Marbob 11H location. Let's spend 2 hours in the field and then OCD can make an informed decision. At this same time, we can examine a very small gulley (about 6-inches wide) that some might envision as a watercourse. If OCD believes this small landform meets the regulatory definition of a significant watercourse (we do not believe it fits the definition), we will request a variance from the setback requirement, as is allowed by the Rules.

Sincerely,  
R.T. Hicks Consultants

A handwritten signature in black ink, appearing to read 'Randall Hicks'. The signature is stylized with a large, looped 'R' and a cursive 'Hicks'.

Randall Hicks  
President

Copy: Read and Stevens, Inc.  
State Land Office (surface owner)



# **C-144 and Site Specific Information for Temporary Pit**

**R.T. Hicks Consultants, Ltd.**

901 Rio Grande Blvd. NW, Suite F-142  
Albuquerque, NM 87104

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

State of New Mexico  
Energy Minerals and Natural Resources  
Department  
Oil Conservation Division  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-144  
Revised June 6, 2013

**For temporary pits, below-grade tanks, and multi-well fluid management pits**, submit to the appropriate NMOCD District Office.  
**For permanent pits** submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office.

Pit, Below-Grade Tank, or  
Proposed Alternative Method Permit or Closure Plan Application

Type of action: ☐ Below grade tank registration  
☒ Permit of a pit or proposed alternative method  
☐ Closure of a pit, below-grade tank, or proposed alternative method  
☐ Modification to an existing permit/or registration  
☐ Closure plan only submitted for an existing permitted or non-permitted pit, below-grade tank, or proposed alternative method

**Instructions: Please submit one application (Form C-144) per individual pit, below-grade tank or alternative request**

Please be advised that approval of this request does not relieve the operator of liability should operations result in pollution of surface water, ground water or the environment. Nor does approval relieve the operator of its responsibility to comply with any other applicable governmental authority's rules, regulations or ordinances.

1.  
Operator: Read and Stevens, Inc OGRID #: 18917  
Address: PO Box 1518, Roswell, NM 88202  
Facility or well name: Marbob 11H  
API Number: 30-015-41972 OCD Permit Number: \_\_\_\_\_  
U/L or Qtr/Qtr A Section 19 Township 19S Range 29E County: Eddy  
Center of Proposed Design: Latitude 32°39'11.661 N Longitude 104°06' 23.524 W NAD: ☐ 1927 ☒ 1983  
Surface Owner: ☐ Federal ☒ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.  
☒ **Pit:** Subsection F, G or J of 19.15.17.11 NMAC  
Temporary: ☒ Drilling ☐ Workover  
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A ☐ Multi-Well Fluid Management Low Chloride Drilling Fluid ☐ yes ☒ no  
☒ Lined ☐ Unlined Liner type: Thickness 20 mil ☒ LLDPE ☐ HDPE ☐ PVC ☐ Other \_\_\_\_\_  
☒ String-Reinforced  
Liner Seams: ☒ Welded ☐ Factory ☐ Other \_\_\_\_\_ Volume 9637 bbl Dimensions: L 60 x W 245 x D 6-10 ft Drilling  
4347 bbl L 60 W 80 X D 9 feet Shaker Solids

3.  
☐ **Below-grade tank:** Subsection I of 19.15.17.11 NMAC  
Volume: \_\_\_\_\_ bbl Type of fluid: \_\_\_\_\_  
Tank Construction material: \_\_\_\_\_  
☐ Secondary containment with leak detection ☐ Visible sidewalls, liner, 6-inch lift and automatic overflow shut-off  
☐ Visible sidewalls and liner ☐ Visible sidewalls only ☐ Other \_\_\_\_\_  
Liner type: Thickness \_\_\_\_\_ mil ☐ HDPE ☐ PVC ☐ Other \_\_\_\_\_

4.  
☐ **Alternative Method:**  
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

5.  
**Fencing:** Subsection D of 19.15.17.11 NMAC (*Applies to permanent pits, temporary pits, and below-grade tanks*)  
☐ Chain link, six feet in height, two strands of barbed wire at top (*Required if located within 1000 feet of a permanent residence, school, hospital, institution or church*)  
☒ Four foot height, four strands of barbed wire evenly spaced between one and four feet  
☐ Alternate. Please specify \_\_\_\_\_

6.

**Netting:** Subsection E of 19.15.17.11 NMAC (*Applies to permanent pits and permanent open top tanks*)

- ☐ Screen ☐ Netting ☐ Other \_\_\_\_\_
- ☐ Monthly inspections (If netting or screening is not physically feasible)

7.

**Signs:** Subsection C of 19.15.17.11 NMAC

- ☐ 12"x 24", 2" lettering, providing Operator's name, site location, and emergency telephone numbers
- ☒ Signed in compliance with 19.15.16.8 NMAC

8.

**Variations and Exceptions:**

Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17 NMAC for guidance.

***Please check a box if one or more of the following is requested, if not leave blank:***

- ☐ Variance(s): Requests must be submitted to the appropriate division district for consideration of approval.
- ☐ Exception(s): Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

9.

**Siting Criteria (regarding permitting):** 19.15.17.10 NMAC

***Instructions: The applicant must demonstrate compliance for each siting criteria below in the application. Recommendations of acceptable source material are provided below. Siting criteria does not apply to drying pads or above-grade tanks.***

**General siting**

**Ground water is less than 25 feet below the bottom of a low chloride temporary pit or below-grade tank.**

- ☐ NM Office of the State Engineer - iWATERS database search; ☐ USGS; ☐ Data obtained from nearby wells

☐ Yes ☐ No  
☒ NA

**Ground water is less than 50 feet below the bottom of a Temporary pit, permanent pit, or Multi-Well Fluid Management pit .**

NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells **See Figures 1 & 2**

☐ Yes ☒ No  
☐ NA

Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. **(Does not apply to below grade tanks) See Figure 5**

- Written confirmation or verification from the municipality; Written approval obtained from the municipality

☐ Yes ☒ No

Within the area overlying a subsurface mine. **(Does not apply to below grade tanks) See Figure 7**

- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division

☐ Yes ☒ No

Within an unstable area. **(Does not apply to below grade tanks) See Figure 8 and discussion**

- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map

☐ Yes ☒ No

Within a 100-year floodplain. **(Does not apply to below grade tanks) See Figure 9**

- FEMA map

☐ Yes ☒ No

**Below Grade Tanks**

Within 100 feet of a continuously flowing watercourse, significant watercourse, lake bed, sinkhole, wetland or playa lake (measured from the ordinary high-water mark).

- Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 200 horizontal feet of a spring or a fresh water well used for public or livestock consumption;.

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

**Temporary Pit using Low Chloride Drilling Fluid** (maximum chloride content 15,000 mg/liter)

Within 100 feet of a continuously flowing watercourse, or any other significant watercourse or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). (Applies to low chloride temporary pits.)

- Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 300 feet from an occupied permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

☐ Yes ☐ No

Within 200 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 300feet of any other fresh water well or spring, in existence at the time of the initial application.

NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☐ No



Within 100 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

### **Temporary Pit Non-low chloride drilling fluid**

Within 300 feet of a continuously flowing watercourse, or any other significant watercourse, or within 200 feet of any lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). **See Figure 3**

- Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☒ No

Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image. **See Figure 4**

☐ Yes ☒ No

Within 500 horizontal feet of a spring or a private, domestic fresh water well used by less than five households for domestic or stock watering purposes, or 1000 feet of any other fresh water well or spring, in the existence at the time of the initial application;

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☒ No

**See Figures 1 & 2**

Within 300 feet of a wetland. **See Figure 6**

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☒ No

### **Permanent Pit or Multi-Well Fluid Management Pit**

Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

- Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

☐ Yes ☐ No

Within 500 horizontal feet of a spring or a fresh water well used for domestic or stock watering purposes, in existence at the time of initial application.

- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 500 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

10.

**Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
- ☒ Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC
- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☒ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_ or Permit Number: \_\_\_\_\_

11.

**Multi-Well Fluid Management Pit Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC
- ☐ A List of wells with approved application for permit to drill associated with the pit.
- ☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC
- ☐ Hydrogeologic Data - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC
- ☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_ or Permit Number: \_\_\_\_\_

12.

**Permanent Pits Permit Application Checklist:** Subsection B of 19.15.17.9 NMAC

**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC  
☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC  
☐ Climatological Factors Assessment  
☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Quality Control/Quality Assurance Construction and Installation Plan  
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC  
☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Nuisance or Hazardous Odors, including H<sub>2</sub>S, Prevention Plan  
☐ Emergency Response Plan  
☐ Oil Field Waste Stream Characterization  
☐ Monitoring and Inspection Plan  
☐ Erosion Control Plan  
☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

13.

**Proposed Closure:** 19.15.17.13 NMAC

**Instructions:** Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.

- Type: ☒ Drilling ☐ Workover ☐ Emergency ☐ Cavitation ☐ P&A ☐ Permanent Pit ☐ Below-grade Tank ☐ Multi-well Fluid Management Pit  
☐ Alternative
- Proposed Closure Method: ☐ Waste Excavation and Removal  
☐ Waste Removal (Closed-loop systems only)  
☒ On-site Closure Method (Only for temporary pits and closed-loop systems)  
☒ In-place Burial ☐ On-site Trench Burial  
☐ Alternative Closure Method

14.

**Waste Excavation and Removal Closure Plan Checklist:** (19.15.17.13 NMAC) **Instructions:** Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC  
☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.13 NMAC  
☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings)  
☐ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  
☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  
☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC

15.

**Siting Criteria (regarding on-site closure methods only):** 19.15.17.10 NMAC

**Instructions:** Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria require justifications and/or demonstrations of equivalency. Please refer to 19.15.17.10 NMAC for guidance.

Ground water is less than 25 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Ground water is between 25-50 feet below the bottom of the buried waste - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Ground water is more than 100 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Within 100 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse, lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 horizontal feet of a private, domestic fresh water well or spring used for domestic or stock watering purposes, in existence at the time of initial application. - NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Written confirmation or verification from the municipality; Written approval obtained from the municipality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 feet of a wetland. US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance	




adopted pursuant to NMSA 1978, Section 3-27-3, as amended. - Written confirmation or verification from the municipality; Written approval obtained from the municipality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within a 100-year floodplain. - FEMA map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

16.  
**On-Site Closure Plan Checklist:** (19.15.17.13 NMAC) *Instructions: Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.*

- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☒ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection E of 19.15.17.13 NMAC
- ☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of Subsection K of 19.15.17.11 NMAC
- ☒ Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.15.17.11 NMAC
- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☒ Waste Material Sampling Plan - based upon the appropriate requirements of 19.15.17.13 NMAC
- ☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved)
- ☒ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC
- ☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC

17.  
**Operator Application Certification:**  
 I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Tim Collier Jim Reedy Title: Vice President General Counsel

Signature:  Date: January 31, 2014

email address: tcollier@read-stevens.com Telephone: 575-622-3370 ext- 316

18.  
**OCD Approval:** ☐ Permit Application (including closure plan) ☐ Closure Plan (only) ☐ OCD Conditions (see attachment)

OCD Representative Signature: \_\_\_\_\_ Approval Date: \_\_\_\_\_

Title: \_\_\_\_\_ OCD Permit Number: \_\_\_\_\_

19.  
**Closure Report (required within 60 days of closure completion):** 19.15.17.13 NMAC  
*Instructions: Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.*

☐ Closure Completion Date: \_\_\_\_\_

20.  
**Closure Method:**  
☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)  
☐ If different from approved plan, please explain.

21.  
**Closure Report Attachment Checklist:** *Instructions: Each of the following items must be attached to the closure report. Please indicate, by a check mark in the box, that the documents are attached.*

- ☐ Proof of Closure Notice (surface owner and division)
- ☐ Proof of Deed Notice (required for on-site closure for private land only)
- ☐ Plot Plan (for on-site closures and temporary pits)
- ☐ Confirmation Sampling Analytical Results (if applicable)
- ☐ Waste Material Sampling Analytical Results (required for on-site closure)
- ☐ Disposal Facility Name and Permit Number
- ☐ Soil Backfilling and Cover Installation
- ☐ Re-vegetation Application Rates and Seeding Technique
- ☐ Site Reclamation (Photo Documentation)

On-site Closure Location: Latitude \_\_\_\_\_ Longitude \_\_\_\_\_ NAD: ☐ 1927 ☐ 1983

**Operator Closure Certification:**

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): \_\_\_\_\_ Title: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

e-mail address: \_\_\_\_\_ Telephone: \_\_\_\_\_

## Distance to Groundwater

**Figure 1, Figure 2, and the discussion below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 50 feet beneath the temporary pit that will contain fluids that cannot be classified as “low-chloride.” Groundwater will be more than 50 feet below the bottom of the buried waste, meeting criteria for trench burial or in-place closure.**

Figure 1 is a geologic/ topographic map that shows:

1. The location of the staked well location as an orange square with the surface elevation.
2. Water wells from the OSE database as a blue triangle inside colored circles that indicate well depth. OSE wells are often miss-located in the WATERS database as older wells are plotted in the center of the quarter, quarter, quarter, of the Section Township and Range. Only one OSE well is on the state database.
3. Water wells from the USGS database as large green triangles.
4. Water wells, which are not documented in the public databases but were identified by field inspection or other published reports as colored squares.
5. The depth-to-water from the most recent available measurement for each well is provided adjacent to the well symbol.

Misc-106, located about 1 mile southwest of the proposed pit, shows a depth to water of 130.1 feet in 1971. We measured the depth to water in this abandoned well in 2014 as 123.2 feet below top of casing. Because this 7-foot difference is inconsequential with respect to the slope and elevation of the water table, we elected to show the published data on Figure 1.

Figure 2 is discussed in detail in the following sections and shows:

1. The location of the staked location as an orange square.
2. Water wells measured by the USGS, the year of the measurement and the calculated elevation of the groundwater surface.
3. Isocontour lines displaying the elevation of the groundwater surface (potentiometric surface).

## Geology

The proposed pit is located in the Great Plains physiographic province. The Plains are considered a Cenozoic depositional feature composed of erosional materials from the eastern front of the Rocky Mountains and similarly aligned Basin and Range mountain chains further to the south. In the area of interest, they are unconformably deposited on top of Permian age marine sediments, specifically the Rustler (Pr on Figure 1). Much of the Plains material that comprises the surface was deposited between 40 and 50 million years ago (ma). With some uplift of the Plains, depositional rates slowed to a stop from 30 to 40 ma. Beginning 30 ma, additional deposition spreading from the north to the south and reworking of the earlier materials resulted in the deposition of the Ogallala formation (about 30-5 ma). The later formation of the Pecos Valley by headward erosion due to either uplift to the west or solution/subsidence of the valley resulted in partial stripping of material from the fronts of the mountains (Reeves, 1972). This action has left the Great Plains isolated from the mountain fronts.

The pit lies between the Mescalero rim, the western edge of the Ogallala formation, and the Pecos River. The above mentioned development of the Pecos Drainage removed and reworked

the remnants of the Ogallala formation between the Mescalero rim and the Pecos River. This surface is called the Mescalero Plain and is composed of relatively thin pediment deposits and alluvium of fluvial and eolian origins deposited on top of Triassic and older formations. The Rustler formation (Permian) crops out about 3 miles east of the location (Figure 1).

The proposed temporary pit is located on an outcrop of the Quaternary older alluvium deposits (Qoa on Figure 2). It consists of thin soil underlain by caliche and red-orange to buff colored silt and sand, which is considered to be re-worked Ogallala Formation. Quaternary piedmont (Qp), alluvium (Qa), and eolian deposits (Qe) are also exposed at the surface near the site. Underlying the thin (probably less than 100 feet) layer of Quaternary age sediments is the Permian Rustler Formation (Pr on Figure 2). Based upon the location of the Rustler exposure to the east and the outcrop of the underlying Salado Formation about 8 miles west, the thickness of the Rustler is probably 150-250 feet thick at this site and consists of siltstone, gypsum, sandstone, and dolomite, which provide fresh water to a few nearby wells. The underlying Permian Salado Formation (not shown on Figure 2) is comprised of evaporite sequence rocks (gypsum, shale, salts) and is not considered a source for fresh water.

Topographically, the site is located on a southeast slope of a broad rise. Surface drainage for the area is to the east, into a small closed basin.

### **Hydrogeology of the Pit Location**

Figure 2 shows a potentiometric surface from the Pecos River (14 miles west) to near the Lea County line, which is about 15 miles west of the Mescalero Rim. Note that the site lies on the groundwater flow divide between groundwater flowing southeast, toward the Burton Flats area and groundwater flowing southwest in a more or less direct path to the Pecos drainage (within the Rustler Formation). Groundwater does not exist everywhere beneath the Mescalero Plain. About 10 miles northeast of the pit location is an area of no saturation (near Loco Hills and shown in the northeast corner of Figure 2). The uppermost aquifer beneath the site and in the general area displayed in Figure 2 is the Rustler Formation. In most of Lea County, the uppermost aquifer west of the Caprock is the Triassic Dockum/Chinle Group, which is exposed about 6 miles east of the proposed pit.

### **Water Table Elevation**

We relied upon the most recent data measured by the USGS to create the water table elevation map shown in Figure 2 (seven wells). While the “Misc” well data (see Figure 1) are generally measured water levels, this dataset contains errors (generally of location) that are not present in the USGS data. Water level data from the OSE database rely upon observed water levels by drillers during the completion of the water well. The OSE dataset provides some useful data in certain areas. The area near the proposed pit contains sufficient high-quality data that we did not rely on OSE data.

For the potentiometric surface map (Figure 2), we honored all data that we know are accurate to the best of our knowledge including

- Misc-106, discussed above and
- Misc-39, which we measured in 2011

From these data, we conclude:

- The elevation of the groundwater surface beneath the proposed pit is approximately 3,260 feet above mean sea level.
- The distance between the bottom of a 10-foot deep temporary pit and the potentiometric surface of the regional aquifer is approximately 99 feet ( $3369.4 - 10 - 3260 =$ ).

### **Distance to Surface Water**

**Figure 3 and the site visit demonstrates that the location is not within 300 feet of a continuously flowing watercourse or any other significant watercourse or 200 feet from lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). This temporary pit will also qualify for burial trench or in-place closure as the location is not within 100 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole or playa lake (measured from the ordinary high-water mark).**

- No continuously flowing watercourses, significant watercourses, sinkhole or other water bodies, as defined by NMOCD Rules, exist within the prescribed setback criteria for the siting, trench burial, or in-place closure of a temporary pit at this location.
- The area surrounding the proposed pit location shows little topographic relief and is characterized by exposed caliche and blow sand
- Ephemeral watercourses are mapped about 1 mile east and west of the location
- A small swale does exist south of the site, but no watercourse as defined by OCD Rules is present (see site photographs)

### **Distance to Permanent Residence or Structures**

**Figure 4 and the site visit demonstrates that the location is not within 300 feet from an occupied permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application. This also qualifies the location for burial trench or in-place closure.**

- The nearest structures are oil and gas wells and tank batteries.
- A large fresh water frac pond is northwest of the location

### **Distance to Non-Public Water Supply**

**Figures 1 and Figure 2 demonstrates that the location is not within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1,000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application. Additionally, this location is also not within 300 feet of a spring or private, domestic fresh water well used for domestic or stock watering purposes, thus qualifying for burial trench or in-place closure.**

- Figure 1 shows the locations of all area water wells, active or plugged.
- The nearest active water wells are located approximately 1 mile northwest and 1 mile east: pumping wells used for stock and oil exploration and production activities.
- There are no known domestic wells within 1,000 feet of this location.
- No springs were identified within the mapping area (see Figure 3).

## **Distance to Municipal Boundaries and Fresh Water Fields**

**Figure 5 demonstrates that the location is not within incorporated municipal boundaries or within defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. This also qualifies the location for burial trench or in-place closure.**

- The closest municipality is Artesia, NM approximately 22 miles to the northwest.
- The closest public well field is located approximately 23 miles to the northeast, near Maljamar.

## **Distance to Wetlands**

**Figure 6 demonstrates the location is not within 300 feet of wetlands. This also qualifies the location for burial trench or in-place closure.**

- The nearest designated wetlands are “freshwater pond” located approximately 1 mile northwest of the location

## **Distance to Subsurface Mines**

**Figure 7 and our general reconnaissance of the area demonstrate that the nearest mines are caliche pits. This location is not within an area overlying a subsurface mine.**

- The nearest caliche pit is located approximately 1300 feet to the east and is visible in Figure 4.

## **Distance to High or Critical Karst Areas**

**Figure 8 shows the location of the temporary pits with respect to BLM Karst areas.**

- The proposed temporary pit is mapped as a “high” potential karst area.
- No evidence of solution voids were observed near the site during the field inspection.
- No evidence of unstable ground was observed

Our site visit, our examination of the geology and topography of the area (see Figures 1 and 3), and experience of Read and Stevens in drilling Marbob State 4 suggest that karst is present in the general area of the site. The evidence of karst in the area includes:

1. When drilling Marbob State 4, Read and Stevens lost circulation at a depth of 195 feet (Marbob State 4 lies within Section 19).
2. The topographic map (Figure 3) shows closed contour intervals (i.e. closed depressions) in the northwest quarter of Section 19, south half of Section 20 and the northeast quarter of Section 20.
3. The USGS Karst Map indicates the site is located in an area with fissures and tubes.
4. The geologic map (Figure 1) shows that the Rustler Formation (Pr) crops out about 2 miles east of Section 19 (down dip). Based upon the regional geology, this outcrop is the upper Rustler Formation
5. Therefore, the middle and/or lower Rustler underlie the overburden of Quaternary alluvium. The Rustler Formation is known to be susceptible to karst formation.

From these data we conclude that a solution cavity in the Rustler Formation, which can create karst features (see [wipp.energy.gov/library/Karst\\_Chaturvedi\\_062309.pdf](http://wipp.energy.gov/library/Karst_Chaturvedi_062309.pdf)), caused the lost

circulation observed in Marbob State 4. The closed depressions observed on the topographic map (Section 20) could be caused by solution and collapse in the Rustler; but due to their size, are more likely to be the result of salt flow in the underlying Salado Formation. However, Hall and Goble (see [redrockgeological.com/pdf/2006\\_mescalero\\_sands.pdf](http://redrockgeological.com/pdf/2006_mescalero_sands.pdf)) state that the origin of the numerous small closed basins in the area is “uncertain”.

The mapping of “high potential” cave/karst features on the Figure 8 does not necessarily imply that the ground near a drilling or workover pit is “unstable”. Moreover, in our investigation of the area, which included walking along the eastern portion of Section 19 and visiting several other locations (e.g. the closed depression in the northeast corner of Section 20) we found no evidence of recent (Quaternary) collapse or instability.

While the absence of karst features (and mass wasting features, recent fault scarps, etc.) near the proposed pit is a very good indication that an area is “stable”, of equal or greater importance are these observations:

- the loss of circulation at Marbob State 4 did not create any surface collapse due to the flow of fluid from the boring into the strata.
- The presence of a large fresh water frac pond within 1000 feet of the proposed pit (see Figure 6) shows no sign of distress due to instability. This pond has been filled and emptied several times for well stimulation
- The presence of another frac pond about 1 mile east of the proposed pit (see Figure 6), is additional evidence that the ground in the area of stable

These facts and the observations of a professional geologist walking the areas where drilling and workover pits are proposed, allow a conclusion that while karst features are present in the subsurface, the probability that “instability” precludes the use of a drilling pit in Section 19 is essentially nil. We believe the thickness of the Quaternary overburden (30-80 feet) provide a good buffer between the documented voids in the Rustler and the ground surface.

Nevertheless, the design/construction plan calls for implementing engineering measures to create a strong and stable foundation for the liner.

### **Distance to 100-Year Floodplain**

**Figure 9 demonstrates that the location is within Zone D as designated by the Federal Emergency Management Agency with respect to the Flood Insurance Rate 100-Year Floodplain.**

- Zone D is described as areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for flooding.

### **Temporary Pit Design**

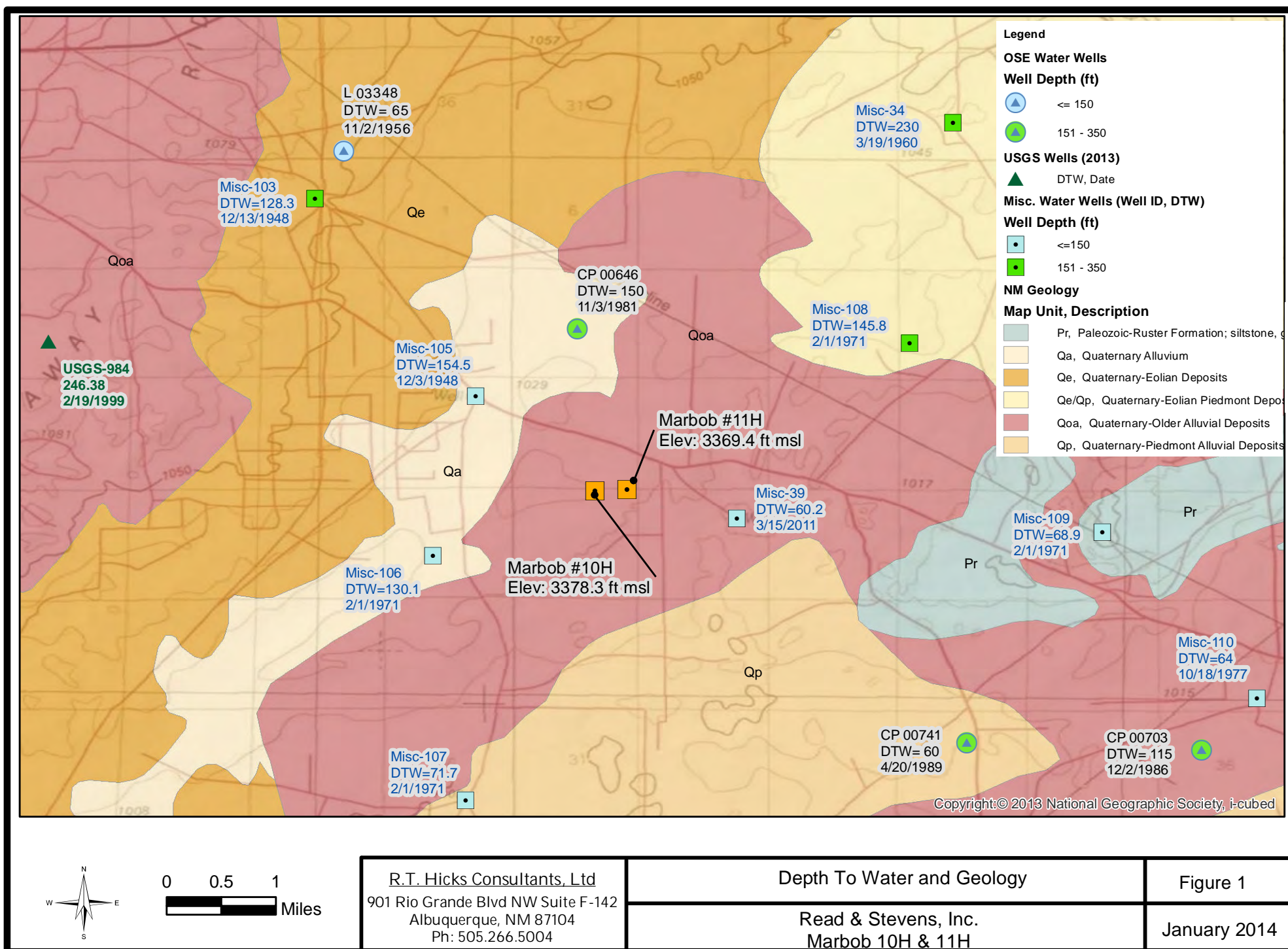
Please refer to Plates 1 and 2 for the design of the temporary pit and the Design and Construction Plan at the end of this application. Please note that a fluids cell is displayed in Figure 2 – this cell of the temporary pit may not be constructed.



# **Site Specific Information Figures**

**R.T. Hicks Consultants, Ltd.**

901 Rio Grande Blvd. NW, Suite F-142  
Albuquerque, NM 87104



0 0.5 1  
Miles

R.T. Hicks Consultants, Ltd  
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Albuquerque, NM 87104  
Ph: 505.266.5004

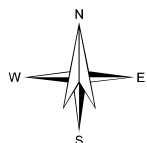
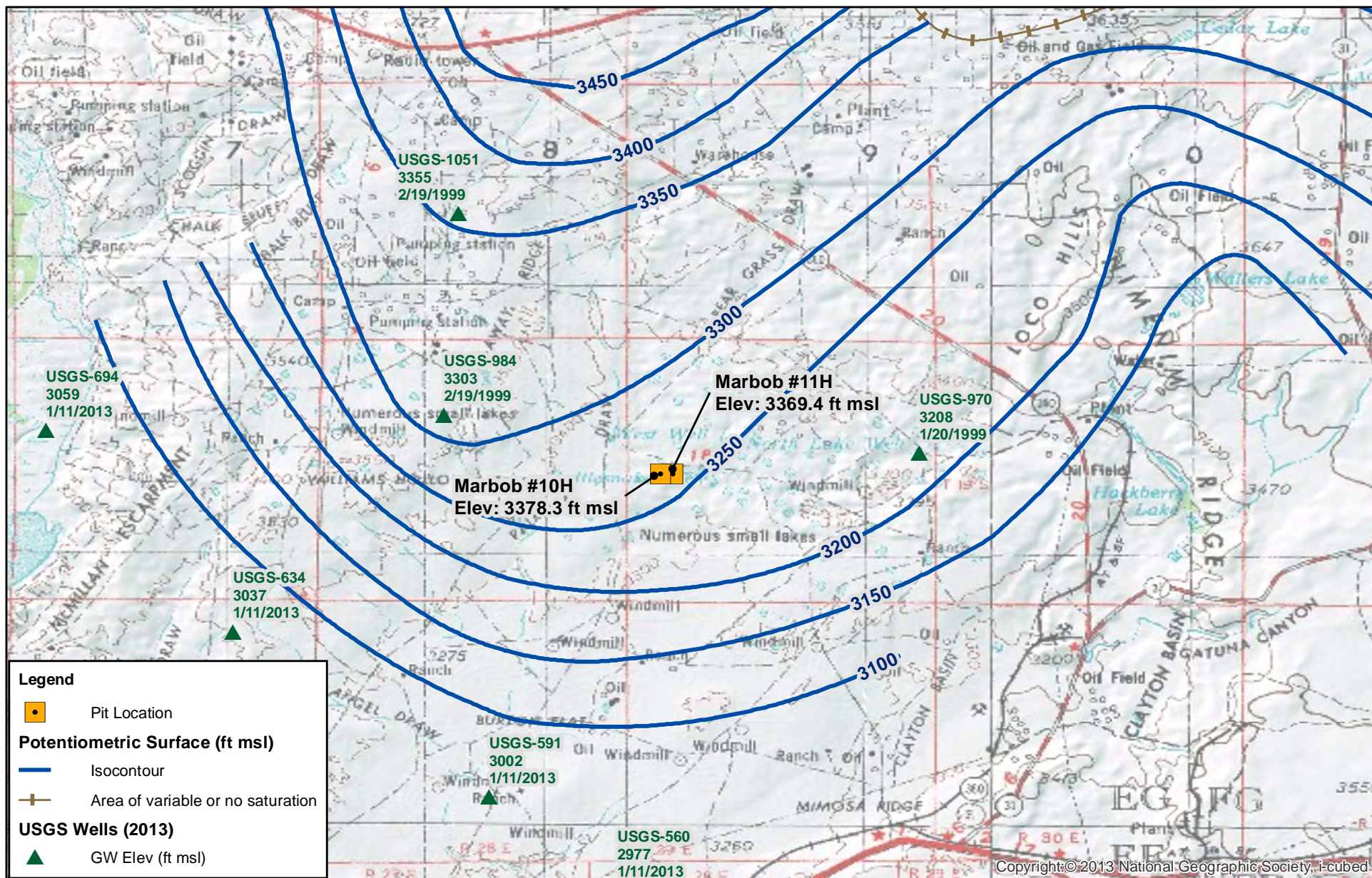
Depth To Water and Geology

Read & Stevens, Inc.  
Marbob 10H & 11H

Figure 1

January 2014





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Miles

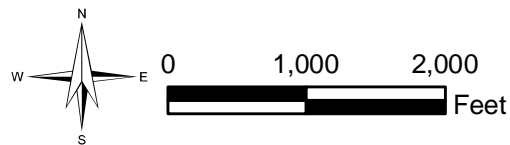
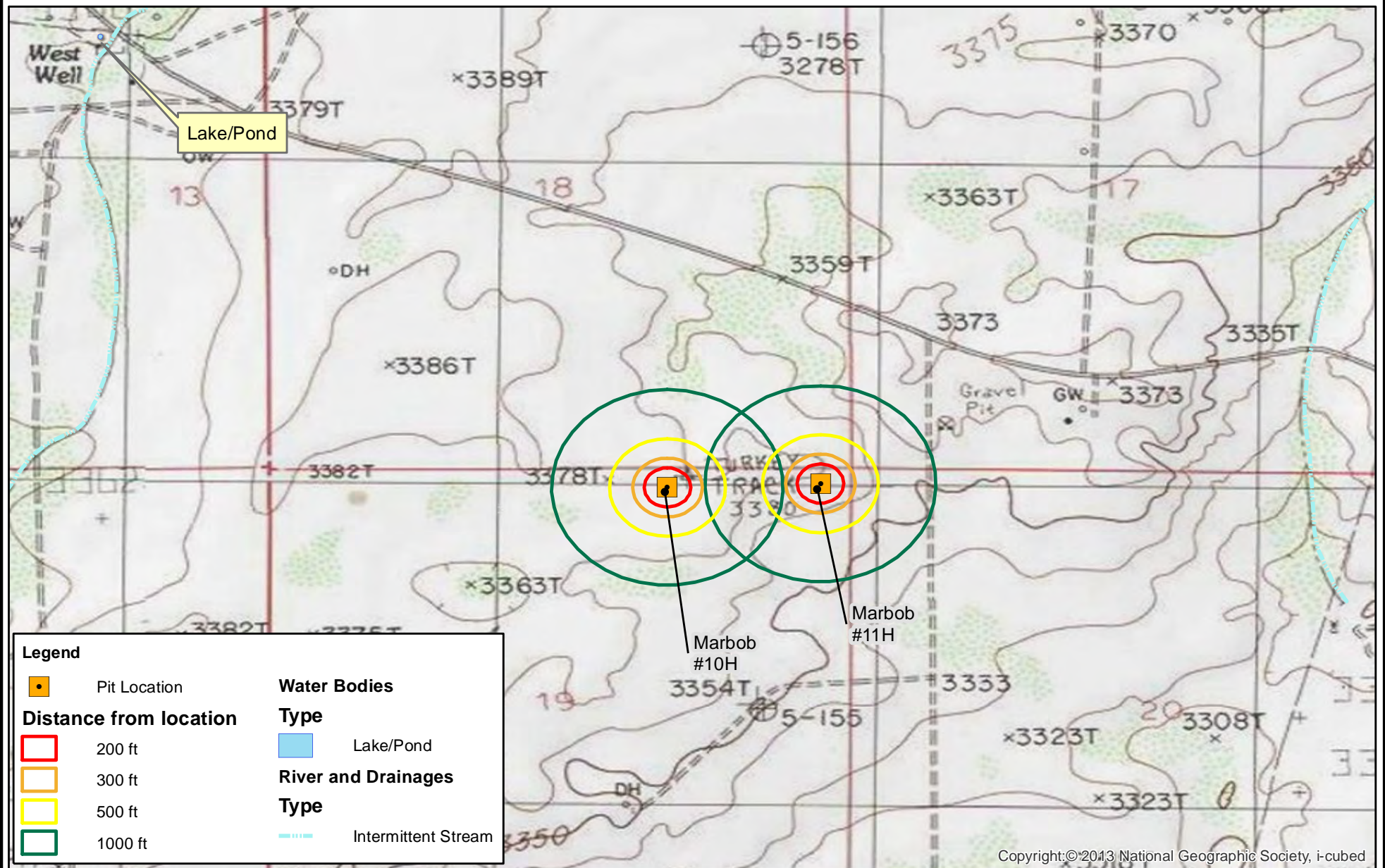
R.T. Hicks Consultants, Ltd  
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Albuquerque, NM 87104  
Ph: 505.266.5004

Potentiometric Surface and Groundwater Elevation  
at Nearby Water Wells  
Read & Stevens, Inc.  
Marbob 10H & 11H

Figure 2

January 2014



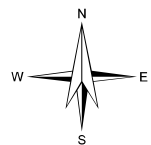


R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Surface Water and Topography	Figure 3
	Read & Stevens, Inc. Marbob 10H & 11H	January 2014





(aerial image c.2012)



0 400 800  
Feet

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901 Rio Grande Blvd NW Suite F-142  
Albuquerque, NM 87104  
Ph: 505.266.5004

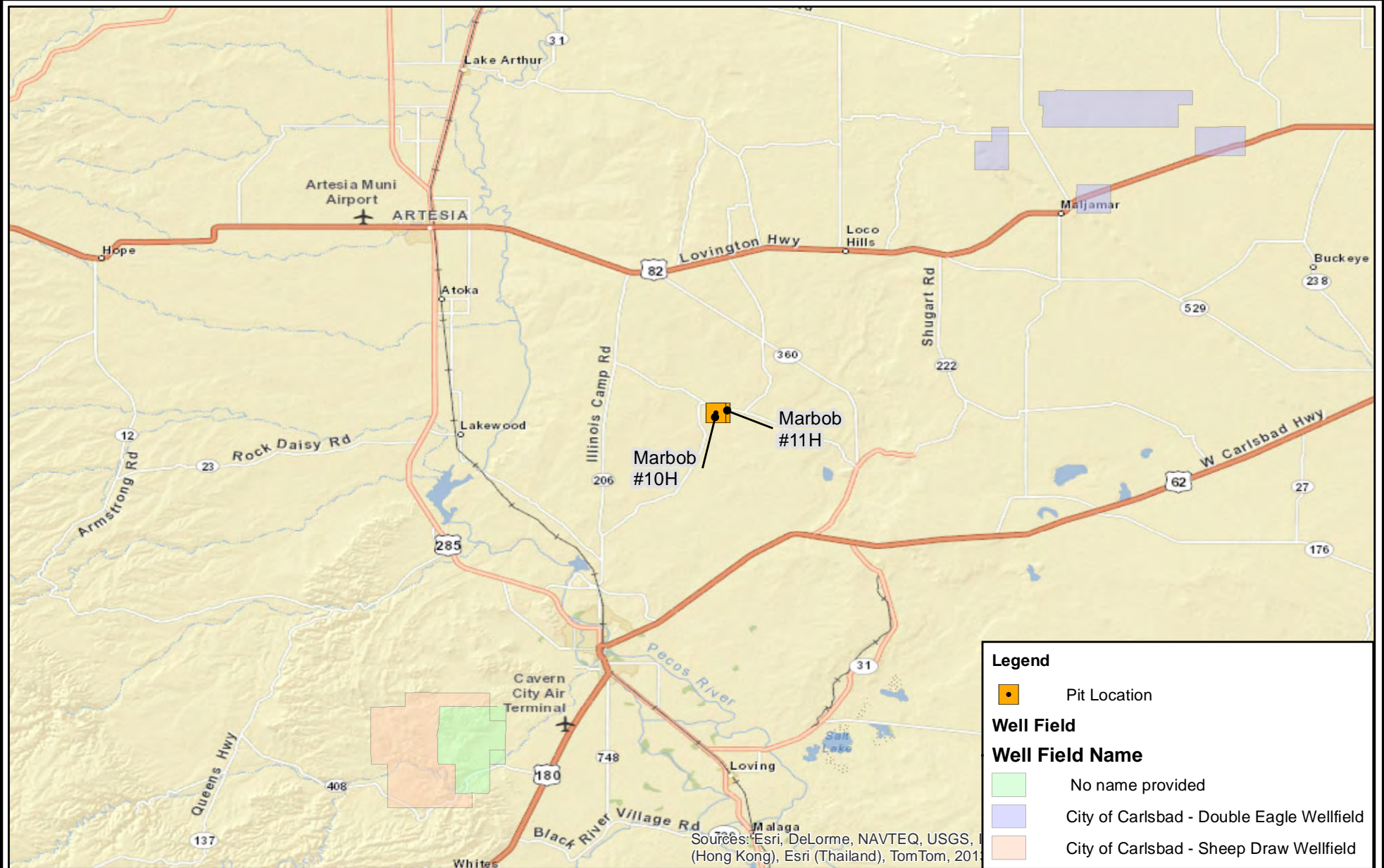
Nearby Structures

Read & Stevens, Inc.  
Marbob 10H & 11H


Figure 4

January 2014








**Legend**

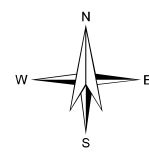
 Pit Location

**Well Field**

**Well Field Name**

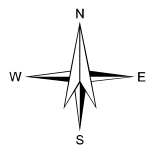
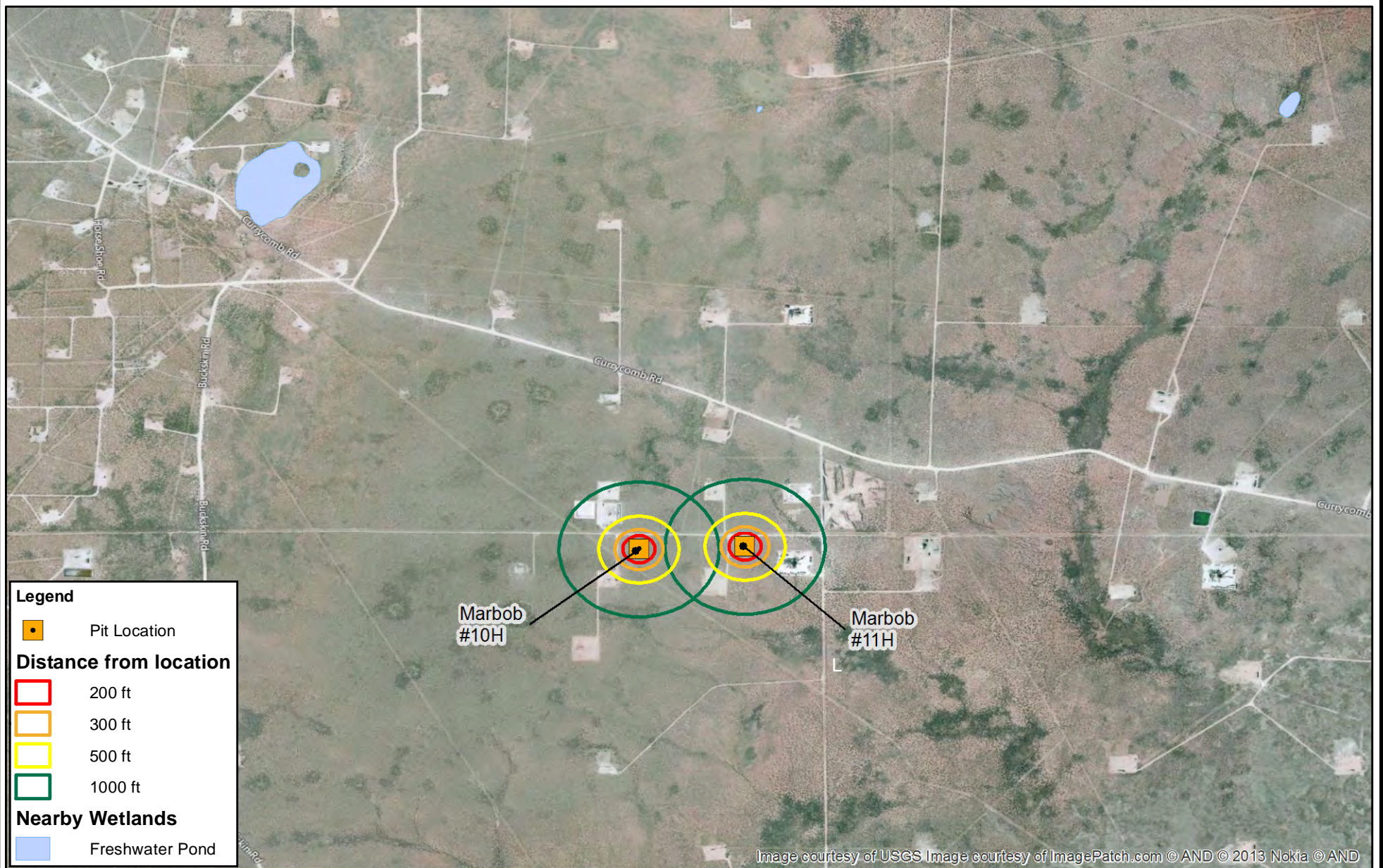
 No name provided  
 City of Carlsbad - Double Eagle Wellfield  
 City of Carlsbad - Sheep Draw Wellfield

Sources: Esri, DeLorme, NAVTEQ, USGS, (Hong Kong), Esri (Thailand), TomTom, 201



<p>R.T. Hicks Consultants, Ltd          901 Rio Grande Blvd NW Suite F-142          Albuquerque, NM 87104          Ph: 505.266.5004</p>	<p>Nearby Municipalities and Well Fields</p> <p>Read &amp; Stevens, Inc.          Marbob 10H &amp; 11H</p>	<p>Figure 5</p> <p>January 2014</p>
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Feet

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Albuquerque, NM 87104  
Ph: 505.266.5004

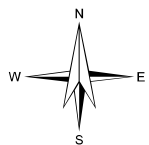
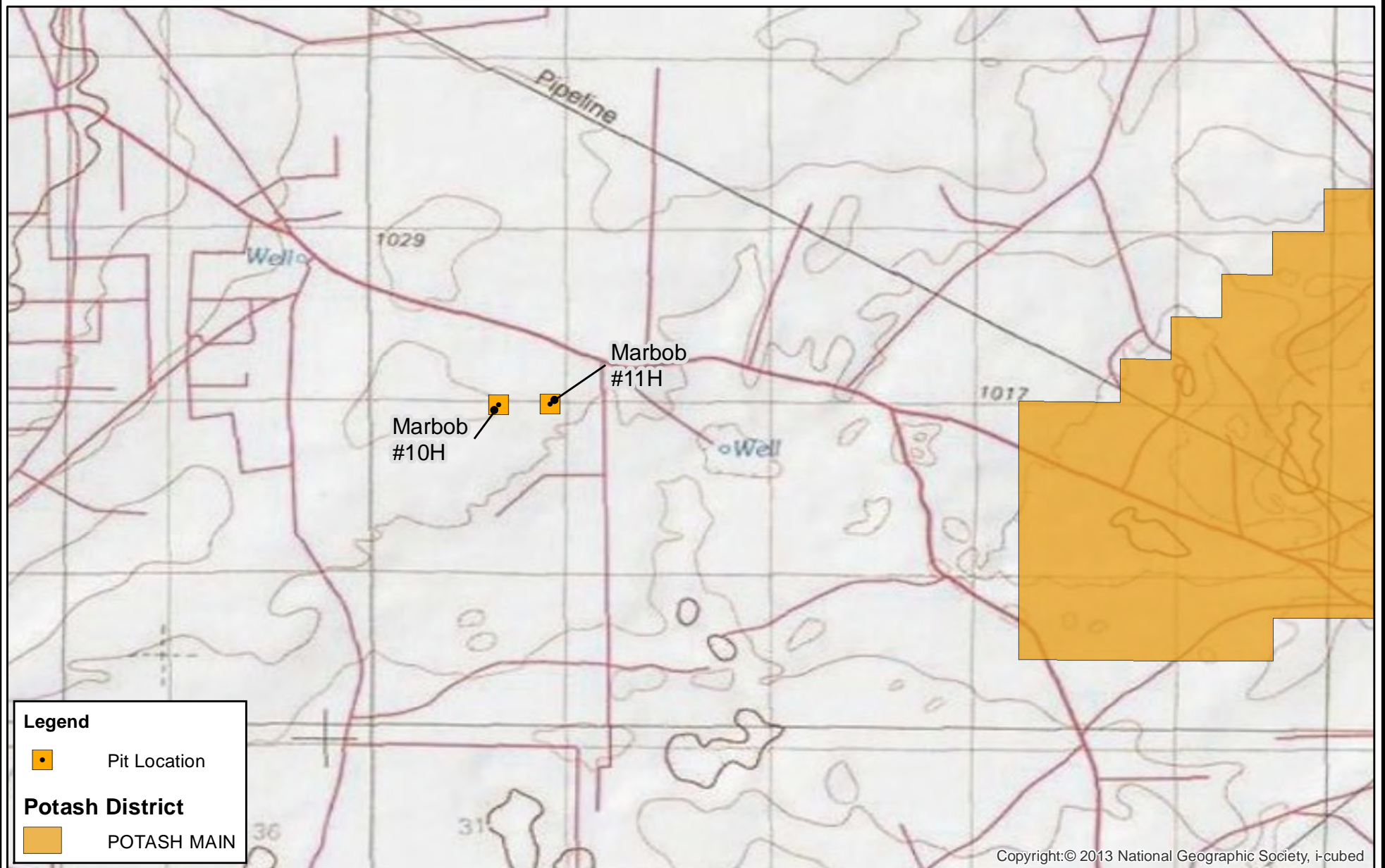
Nearby Wetlands

Read & Stevens, Inc.  
Marbob 10H & 11H

Figure 6

January 2014





0 0.5 1  
Miles

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Albuquerque, NM 87104  
Ph: 505.266.5004

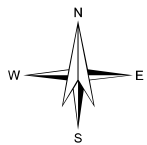
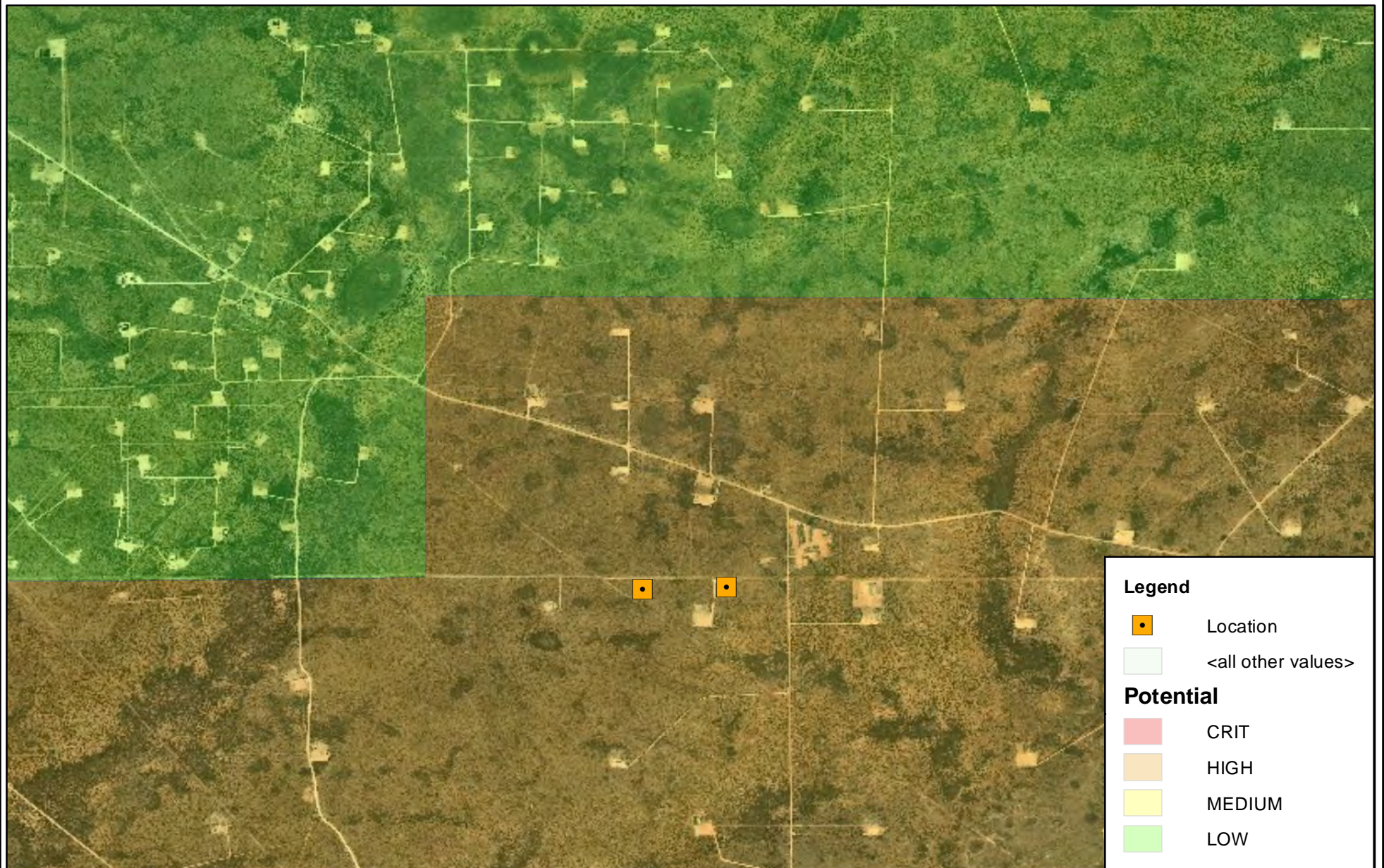
Nearby Mines and Minerals

Read & Stevens, Inc.  
Marbob 10H & 11H

Figure 7

January 2014





0 0.5  
Miles

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BLM Karst Potential Map

Read and Stevens - Marbob 10H & 11H

Figure 8

Jan 2014

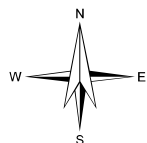




FEMA NFHL

## Undetermined Risk Areas

ZONE	DESCRIPTION
D	Areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted. Flood insurance rates are commensurate with the uncertainty of the flood risk.



0 500 1,000  
Feet

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FEMA Flood Map

Read & Stevens, Inc.  
Marbob 10H & 11H

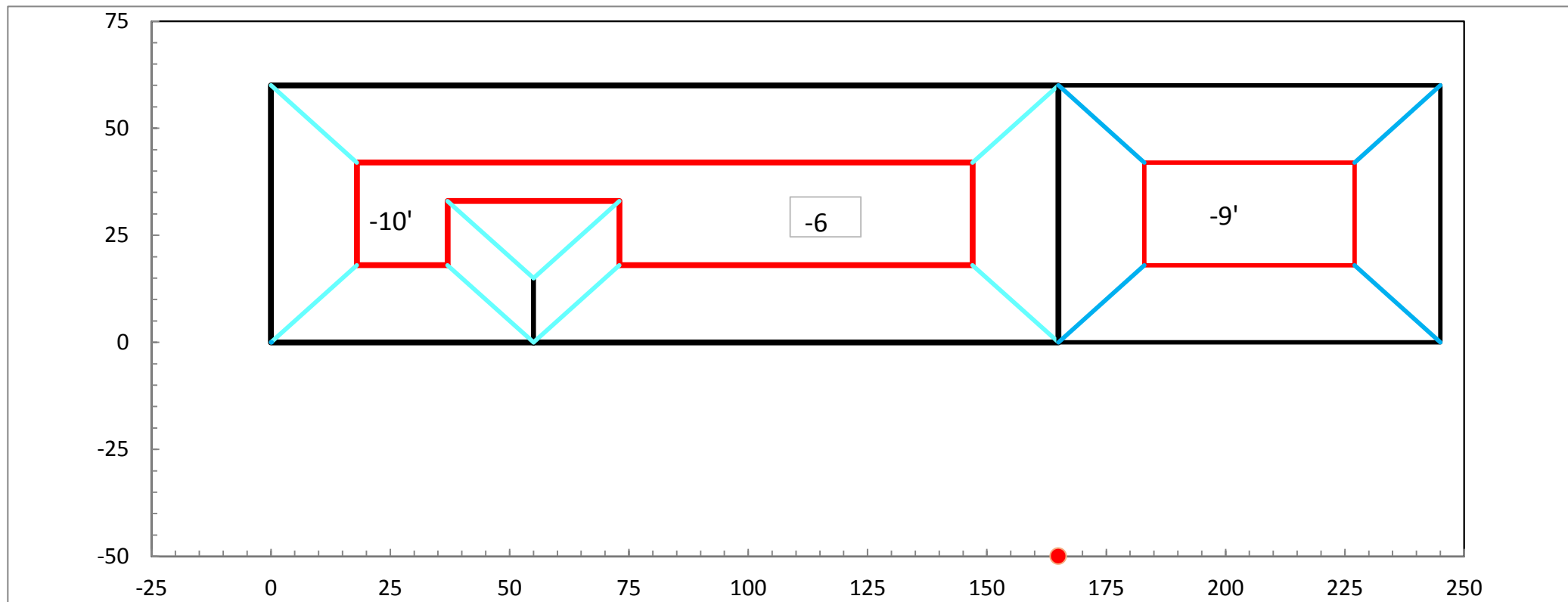
Figure 9

January 2014

# **Site Specific Information Plates**

**R.T. Hicks Consultants, Ltd.**

901 Rio Grande Blvd. NW, Suite F-142  
Albuquerque, NM 87104



#### Drilling Cell Dimensions

Drilling Cell Total Width	165.0
Drilling Cell Total Length	60.0

Slopes of Pit Horizontal Distance	2.00
Slopes of Pit Vertical Distance	1.00
Horseshoe divider width at surface	0.0

#### Drilling Cell Dimensions

Total Width (left right)	165.0
Total Length (up down)	60.0
Depth	9.0
Length of Divider	15.0
Divider Width	0.0
Width of discharge floor	129.0
Width of suction floor	19.0

#### Shale Shaker Discharge Cell

Width (left-right)	80.0
Length (up-down)	60.0
Depth	9.0

Horseshoe Capacity 9637 bbl

Shaker Solids Cell Capacity  
Total Capacity

4,347  
13,984

North



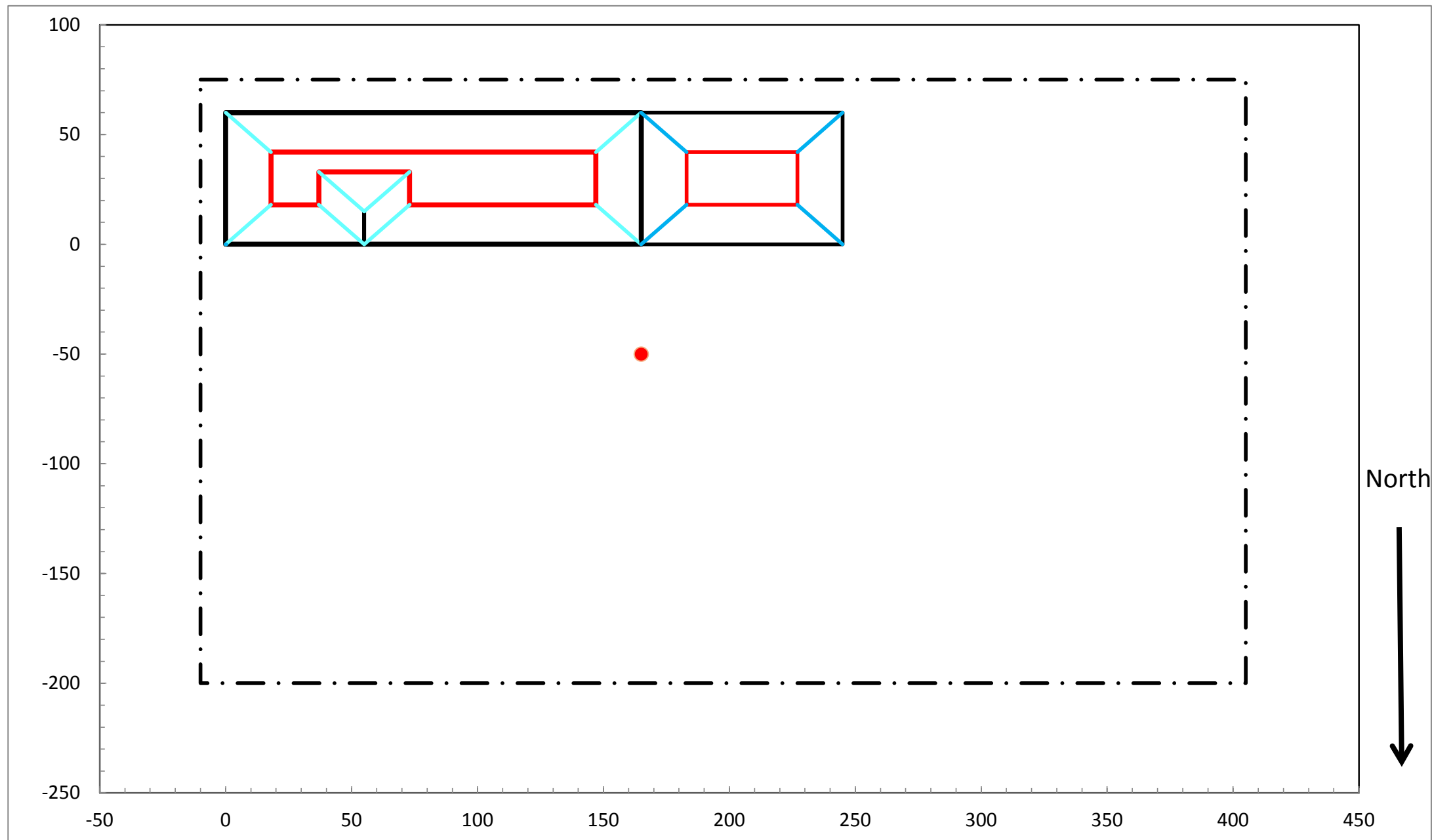
**R.T. Hicks Consultants**  
901 Rio Grande Blvd. NW  
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Albuquerque, N. M. 87104

**Drawing of Temporary Pit**  
Bottom of Pit Not To Scale

**Read-Stevens : Marbob 11H**

**Plate 1**

**February, 2014**



**R.T. Hicks Consultants**  
 901 Rio Grande Blvd. NW  
 Suite F-142  
 Albuquerque, N. M. 87104

**Drawing of Drilling Pit and Well in Relation to Pad Boundary**

**Plate 2**

**Read-Stevens : Marbob 11H**

**February, 2014**

# **Site Inspection Photographs**

**R.T. Hicks Consultants, Ltd.**

901 Rio Grande Blvd. NW, Suite F-142  
Albuquerque, NM 87104





View southeast from staked location toward Devon (?) well



View south from staked location showing re-vegetation along pipeline trace (above red line) and small swale south of pipeline.





Image left is view west in bottom of swale to the south of the proposed pit site. No evidence of the characteristics of a significant watercourse as defined by NMOCD Rules is evident.

Image right is view east from the same location. At this point, several poorly defined swales appear to coalesce to create a small gulley. If OCD considers this a significant watercourse, which we do not, we request a variance from the setback criteria.



Below is 2013 Google Earth image. Based upon this image, no drainage or watercourse can be imagined in the area south of the proposed pit.





## **Survey Information**

**R.T. Hicks Consultants, Ltd.**

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District I  
1625 N. French Dr., Hobbs, NM 88240  
Phone: (575) 393-6161 Fax: (575) 393-0720  
District II  
811 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720  
District III  
1000 Rio Brazos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico  
Energy, Minerals & Natural Resources Department  
OIL CONSERVATION DIVISION  
1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-102  
Revised August 1, 2011  
Submit one copy to appropriate  
District Office  
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number		<sup>2</sup> Pool Code	<sup>3</sup> Pool Name
<sup>4</sup> Property Code	<sup>5</sup> Property Name <b>MARBOB</b>		<sup>6</sup> Well Number <b>11H</b>
<sup>7</sup> OGRID No. <b>18917</b>	<sup>8</sup> Operator Name <b>READ &amp; STEVENS, INC.</b>		<sup>9</sup> Elevation <b>3369.4</b>

<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
<b>A</b>	<b>19</b>	<b>19 S</b>	<b>29 E</b>		<b>148</b>	<b>NORTH</b>	<b>288</b>	<b>EAST</b>	<b>EDDY</b>

<sup>11</sup> Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
<b>P</b>	<b>19</b>	<b>19 S</b>	<b>29 E</b>		<b>330</b>	<b>SOUTH</b>	<b>350</b>	<b>EAST</b>	<b>EDDY</b>

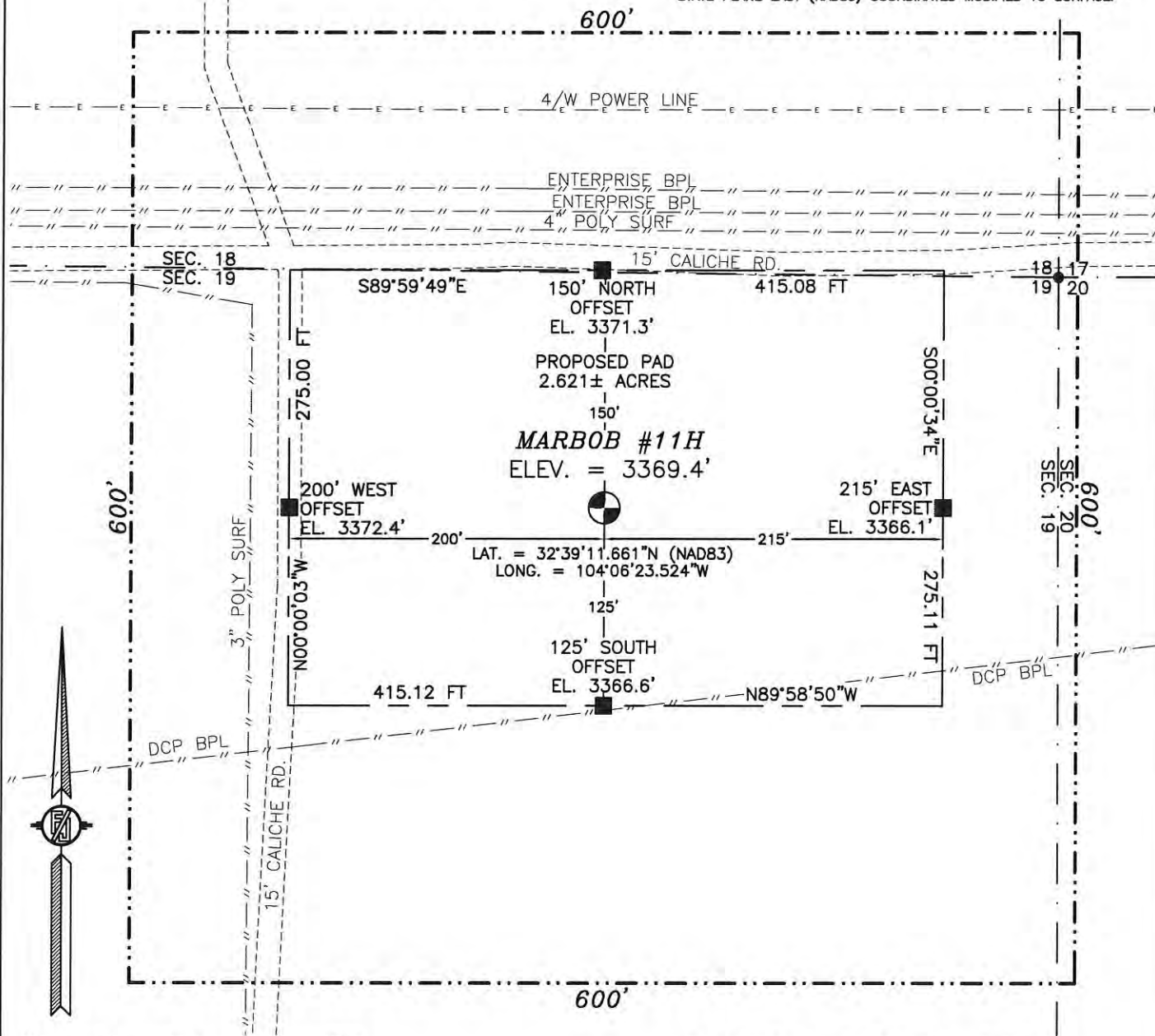
<sup>12</sup> Dedicated Acres	<sup>13</sup> Joint or Infill	<sup>14</sup> Consolidation Code	<sup>15</sup> Order No.
-------------------------------	-------------------------------	----------------------------------	-------------------------

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

<p>S89°51'14"E 2522.39 FT</p> <p>S89°18'18"E 2512.24 FT</p> <p>NW CORNER SEC. 19 LAT. = 32°39'13.566"N LONG. = 104°07'19.029"W</p> <p>N/4 CORNER SEC. 19 COMPUTED</p> <p><b>MARBOB #11H</b> ELEV. = 3369.4' LAT. = 32°39'11.661"N (NAD83) LONG. = 104°06'23.524"W</p> <p>SURFACE LOCATION</p> <p>NE CORNER SEC. 19 LAT. = 32°39'13.098"N LONG. = 104°06'20.156"W</p> <p>W/4 CORNER SEC. 19 LAT. = 32°38'47.449"N LONG. = 104°07'19.043"W</p> <p>E/4 CORNER SEC. 19 LAT. = 32°38'46.980"N LONG. = 104°06'20.154"W</p> <p>NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83) IN DEGREES MINUTES DECIMAL SECONDS FORMAT. BASIS OF BEARING IS NEW MEXICO STATE PLANE EAST (NAD83) COORDINATES MODIFIED TO SURFACE.</p> <p>BOTTOM OF HOLE LAT. = 32°38'24.157"N LONG. = 104°06'24.250"W</p> <p>SE CORNER SEC. 19 LAT. = 32°38'20.863"N LONG. = 104°06'20.159"W</p> <p>SW CORNER SEC. 19 LAT. = 32°38'21.248"N LONG. = 104°07'19.046"W</p> <p>S/4 CORNER SEC. 19 LAT. = 32°38'21.080"N LONG. = 104°06'51.047"W</p> <p>BOTTOM OF HOLE</p> <p>N89°42'28"W 2394.76 FT</p> <p>N89°38'49"W 2641.85 FT</p>	<p><b><sup>17</sup> OPERATOR CERTIFICATION</b></p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p>Signature _____ Date _____</p> <p>Printed Name _____</p> <p>E-mail Address _____</p> <p><b><sup>18</sup> SURVEYOR CERTIFICATION</b></p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>JULY 9, 2013</p> <p>Date of Survey _____</p> <p>Signature and Seal of Professional Surveyor _____</p> <p>Certificate Number: FILMON F. JARAMILLO, PLS 12797</p> <p>SURVEY NO. 1881A</p>
---	--

SECTION 19, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83) IN DEGREES, MINUTES AND DECIMAL SECONDS FORMAT. BASIS OF BEARING IS NEW MEXICO STATE PLANE EAST (NAD83) COORDINATES MODIFIED TO SURFACE.



010 50 100 200  
SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF CO. RD. 206 (ILLINOIS CAMP) & CO. RD. 235 (CURRY COMB) GO SE ON 235 FOR APPROX. 8 MILES. GO SOUTH ON CALICHE LEASE ROAD APPROX. 0.3 OF A MILE. GO WEST ON CALICHE LEASE ROAD APPROX. 0.15 OF A MILE. LOCATION IS APPROX. 150' SOUTH.

READ & STEVENS, INC.

MARBOB #11H

LOCATED 148 FT. FROM THE NORTH LINE  
AND 288 FT. FROM THE EAST LINE OF  
SECTION 19, TOWNSHIP 19 SOUTH,  
RANGE 29 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

JULY 9, 2013

SURVEY NO. 1881A

MADRON SURVEYING, INC.

301 SOUTH CANAL  
(575) 234-3341

CARLSBAD, NEW MEXICO



**SECTION 19, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
LOCATION VERIFICATION MAP**

**MARBOB #11H**

USGS QUAD MAP:  
ILLINOIS CAMP NE NOT TO SCALE

**READ & STEVENS, INC.**  
**MARBOB #11H**  
LOCATED 148 FT. FROM THE NORTH LINE  
AND 288 FT. FROM THE EAST LINE OF  
SECTION 19, TOWNSHIP 19 SOUTH,  
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EDDY COUNTY, STATE OF NEW MEXICO

JULY 9, 2013

SURVEY NO. 1881A  
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

**NOT TO SCALE**

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SECTION 19, TOWNSHIP 19 SOUTH,  
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EDDY COUNTY, STATE OF NEW MEXICO

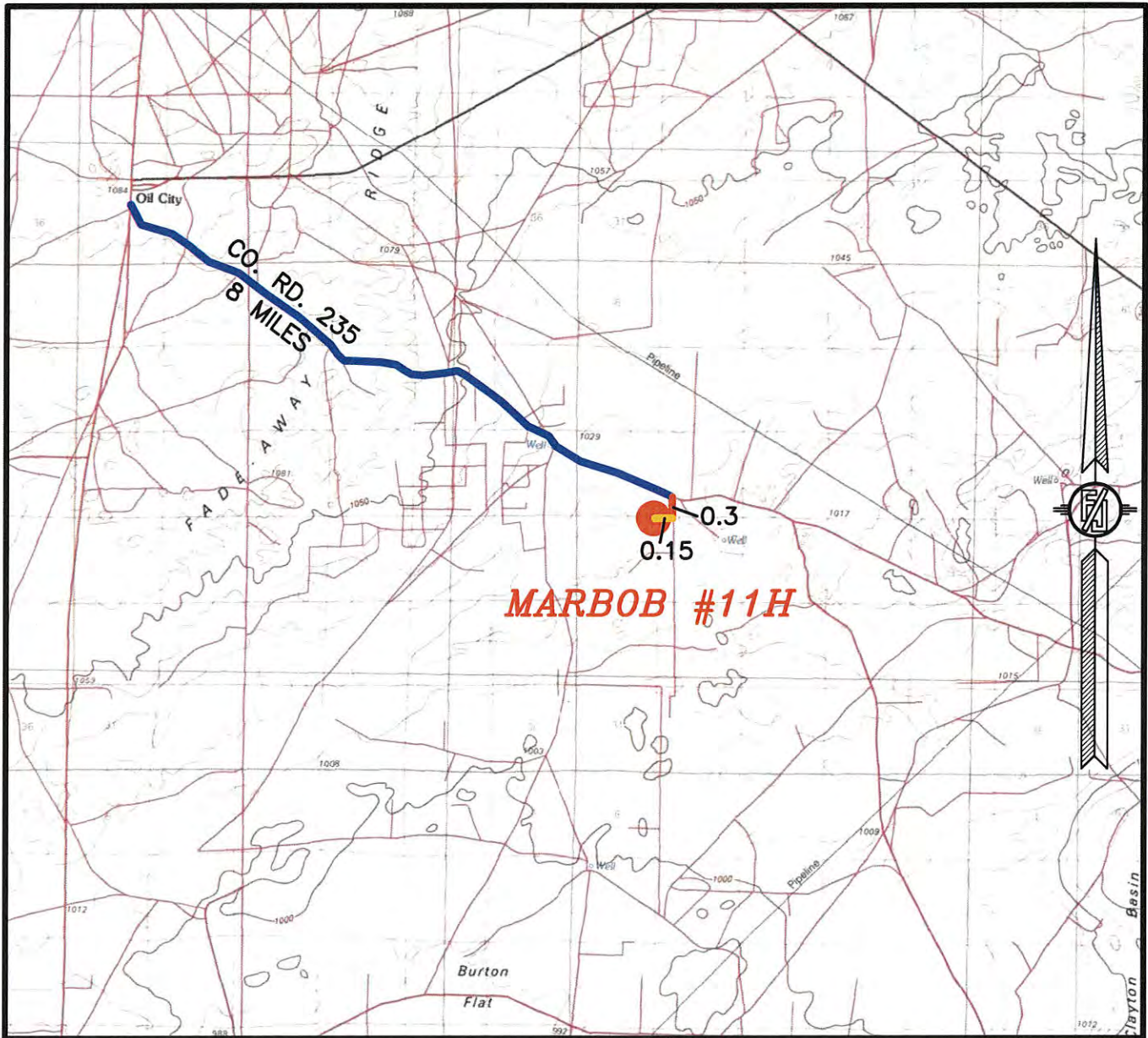
*JULY 9, 2013*

*SURVEY NO. 1881A*

**MADRON SURVEYING, INC.** 301 SOUTH CANAL CARLSBAD, NEW MEXICO  
(575) 234-3341



SECTION 19, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

READ & STEVENS, INC.

**MARBOB #11H**

LOCATED 148 FT. FROM THE NORTH LINE  
AND 288 FT. FROM THE EAST LINE OF  
SECTION 19, TOWNSHIP 19 SOUTH,  
RANGE 29 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

JULY 9, 2013

**DIRECTIONS TO LOCATION**

FROM THE INTERSECTION OF CO. RD. 206 (ILLINOIS CAMP) & CO. RD. 235 (CURRY COMB) GO SE ON 235 FOR APPROX. 8 MILES. GO SOUTH ON CALICHE LEASE ROAD APPROX. 0.3 OF A MILE. GO WEST ON CALICHE LEASE ROAD APPROX. 0.15 OF A MILE. LOCATION IS APPROX. 150' SOUTH.

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MADRON SURVEYING, INC. 301 SOUTH CANAL  
(575) 234-3341

CARLSBAD, NEW MEXICO



SECTION 19, TOWNSHIP 19 SOUTH, RANGE 29 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
AERIAL PHOTO



NOT TO SCALE  
AERIAL PHOTO:  
GOOGLE EARTH  
APRIL 2013

READ & STEVENS, INC.  
MARBOB #11H  
LOCATED 148 FT. FROM THE NORTH LINE  
AND 288 FT. FROM THE EAST LINE OF  
SECTION 19, TOWNSHIP 19 SOUTH,  
RANGE 29 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

JULY 9, 2013

SURVEY NO. 1881A

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

# **Generic Plans for Temporary Pits**

**R.T. Hicks Consultants, Ltd.**

901 Rio Grande Blvd. NW, Suite F-142  
Albuquerque, NM 87104

## **Temporary Pit Design/Construction Plan**

Plates 1 and 2 show the design of the temporary pit proposed for this project. Field conditions and the drilling rig layout will determine the final configuration of the pit cells, which will consist of the following:

1. A cell for drilling fluid circulation and cuttings storage consisting of:
  - a. An outer horseshoe for brine and cut-brine fluid and cuttings
  - b. An inner horseshoe for freshwater and cuttings
2. A cell for the storage of fresh water (drilling/stimulation) and stimulation flow-back water prior to re-use or disposal (OPTIONAL)

In addition to the commitments listed below, the operator may install a system that can drain water entrained in the drilling waste of the drilling pit. As described in the closure plan, this system of fabric-wrapped perforated pipe and drainage mats lie on the bottom of the drilling cell of the pit – generally the brine cell. The system will drain to the lowest corner of each cell, generally near the suction area. The exact location will be determined upon completion of the cells. Standpipes rise from the depression and can house a solar-powered pump. The drainage system for the brine cell removes water to an above-ground tank, the fluids cell of the pit, or directly to a truck for re-use or disposal. The drainage system may also be used to introduce fresher water below the residual cuttings/mud, causing the introduced fluid to move upwards through the cuttings/mud and enhance the solids rinsing process. Introduced water can be removed from the pit for re-use via a vacuum truck or recovered from the drainage system at the bottom.

The temporary storage of fluids, fluid reuse or fluid disposal will be conducted in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. This drainage and rinsing system allows the operator to:

- Recover clear water for possible re-use
- Reduce the concentration of constituents of concern in the drilling waste by removing some water entrained in the drilling waste.

Precipitation and the possible addition of relatively fresh water (see closure plan) will rinse the solid drilling waste, causing additional reduction in the constituents of concern as the water is recovered for re-use or disposal.

For any temporary storage of fluids derived from the drilling pit and placed in an above-ground tank, the following will apply:

1. Construction, operation and maintenance of the temporary storage tank(s) will adhere to all applicable NMOCD Rules including but not limited to:
  - a. Safety stipulations
  - b. Protection from hydrogen sulfide mandates
  - c. Signage and identification requirements
  - d. Secondary containment requirements for temporary tanks
  - e. Applicable netting requirements

## **C-144 Supplemental Documentation for Temporary Pit**

2. Any cleaning of the temporary tank(s) will adhere to NMOCD Rules relating to tank cleaning.
3. Transportation of water or drilling fluids derived from the drilling pit will adhere to all applicable NMOCD Rules relating to transportation.
4. Storage of water or drilling fluids in temporary above-ground tanks will also adhere to all applicable Federal mandates.

During final closure of the pit, the tanks and secondary containment system will be removed from the location and the area beneath the tank inspected for any leakage. If any leakage is suspected, the operator will sample the soil beneath the tanks and report any release pursuant to NMOCD Rules.

Finally, we intend to place any temporary tank used in conjunction with the pit drainage system on a 20-mil liner with a berm around it that would allow any inadvertently released fluids to drain or be pumped back into the pit.

### ***Construction/Design Plan of Temporary Pit***

#### **Stockpile Topsoil**

Prior to constructing the pit, the qualified contractor will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.

#### **Signage**

The operator will post an upright sign in a conspicuous place in compliance with 19.15.16.8 NMAC as the pit and the well are operated by the same operator. Section 19.15.16.8 states in part:

19.15.16.8 SIGN ON WELLS:

B. For drilling wells, the operator shall post the sign on the derrick or not more than 20 feet from the well.

C. The sign shall be of durable construction and the lettering shall be legible and large enough to be read under normal conditions at a distance of 50 feet.

F. Each sign shall show the:

(1) well number;

(2) property name;

(3) operator's name;

(4) location by footage, quarter-quarter section, township and range (or unit letter can be substituted for the quarter-quarter section);

and

(5) API number.

The sign will also provide emergency telephone numbers.

#### **Fencing:**

During drilling or workover operations, the operator will not fence the edge of the pit adjacent to the drilling or workover rig.

As the pit is not located within 1000 feet of a permanent residence, school, hospital, institution or church, the operator will fence the pit to exclude livestock with four-wire strands evenly spaced in the interval between one foot and four feet above ground level.

## **C-144 Supplemental Documentation for Temporary Pit**

### **Earthwork**

The temporary pit will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.

The slopes of the pit will be no steeper than two horizontal feet to one vertical foot (2H:1V) unless in the transmittal letter the operator requested an alternative to the slope requirement with a demonstration that the pit can be operated in a safe manner to prevent contamination of fresh water and protect public health and the environment.

A berm or ditch will surround the temporary pit to prevent run-on of surface water.

If the transmittal letter identifies concerns relating to the presence of karst and associated instability, during construction of the pit the contractor will compact the earth material that forms the foundation for the pit liner. An expected proctor density of greater than 90% will be achieved by

1. adding water to the earth material as appropriate,
2. compacting the earth by walking a crawler-type tractor down the sides and bottom of the pit
3. repeating this process with a second 6-inch lift of earth material if necessary

### **Liner Installation**

The geomembrane liner will consist of 20-mil string reinforced LLDPE or equivalent liner material identified in the transmittal letter or on Form C-144 (that the appropriate division district office approves through approval of this permit application). The geomembrane liner will be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. The liner material will be resistant to ultraviolet light. Liner compatibility will comply with EPA SW-846 method 9090A.

The operator will direct the liner installation contractor to:

1. minimize liner seams and orient them up and down, not across a slope
2. use factory welded seams where possible
3. overlap liners four to six inches and orient seams parallel to the line of maximum slope, i.e., oriented along, not across, the slope, prior to any field seaming
4. minimize the number of welded field seams in comers and irregularly shaped areas
5. utilize only qualified personnel to weld field seams
6. avoid excessive stress-strain on the liner
7. place geotextile under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity
8. anchor the edges of all liners in the bottom of a compacted earth-filled trench that is at least 18 inches deep
9. place additional material (liner, felt, etc.) to ensure that the liner is protected from any fluid force or mechanical damage at any point of discharge into or suction from the lined temporary pit.

## **C-144 Supplemental Documentation for Temporary Pit**

A berm or ditch will surround the temporary pit to prevent run-on of surface water. During drilling operations, the operator may elect to remove run-on protection on the pit edge adjacent to the drilling or workover rig provided that the pit is being used to collect liquids escaping from the drilling or workover rig and this additional fluid will not cause a breach of the temporary pit.

The temporary pit will not be used to vent or flare gas and the volume of the temporary drilling pit, including freeboard, will not exceed 10 acre-feet.



## **Temporary Pit Operating and Maintenance Plan**

The operator will maintain and operate the pit in accordance with the following plan to contain liquids and solids and maintain the integrity of the liner to prevent contamination of fresh water and protect public health and the environment.

If feasible, the operator will recycle, reuse or reclaim all drilling fluids in the temporary pit in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. Re-use of drilling fluids and workover fluids (stimulation flow-back) for drilling and stimulation of subsequent wells is anticipated. If re-use is not possible, fluids will be sent to disposal at a division-approved facility.

The operator will not discharge into or store any hazardous waste in the pit.

If the pit develops a leak or if any penetration of the pit liner occurs above the liquid's surface, then the operator will repair the damage or initiate replacement of the liner within 48 hours of discovery or will seek a variance from the division district office within this time period.

If the pit develops a leak or if any penetration of the pit liner occurs below the liquid's surface, then the operator will remove all liquid above the damage or leak line within 48 hours of discovery. The operator will also notify the district division office (19.15.29 NMAC) within this same 48 hours of the discovery and repair the damage or replace the pit liner.

The operator will ensure that the drilling contractor installs and uses a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes during injection or withdrawal of liquids.

During construction, the operator or qualified contractor will install diversion ditches and berms around the pit as necessary to prevent the collection of surface water run-on. As outlined in the Construction and Design Plan, during drilling operations, the edge of the temporary pit adjacent to the drilling or workover rig may not have run-on protection if the operator is using the temporary pit to collect liquids escaping from the drilling or workover rig and run-on will not result in a breach of the temporary pit.

The operator will maintain on site an oil absorbent boom to contain and remove oil from the pit's surface.

The operator will only discharge fluids or mineral solids (including cement) generated or used during the drilling, completion, or workover processes into the pit.

The operator will maintain the temporary pit free of miscellaneous solid waste or debris. Immediately after cessation of drilling or a workover operation, the operator will remove any visible or measurable layer of oil from the surface of the pit.

The operator will maintain at least two feet of freeboard for the temporary pit, except under extenuating circumstances, which will be noted on the pit inspection log as described below.



## **C-144 Supplemental Documentation for Temporary Pit**

The operator will inspect the temporary pit containing drilling fluids daily while the drilling rig or workover rig is on site. After the rigs have left the site, the operator will inspect the pit weekly as long as liquids are present in the pit. The operator will maintain a log of the inspections. The operator will make the log available to the division district office upon request.

The operator will remove all free drilling fluids from the surface of the temporary pit within 60 days from the date that the last drilling or workover rig associated with the pit permit is released. The operator will note the date of this release upon Form C-105 or C-103 upon well or workover completion. The operator may request an extension up to two months from the division district office as long as this additional time does not exceed the temporary pit life span (Subsection R of 19.15.17.7 NMAC).

## **Temporary Pit In-Place Closure Plan**

The wastes in the temporary pit are destined for in place burial at the drilling location or, if stated in the permit transmittal letter, a nearby site on the same lease.

The operator will not begin closure operations without approval of the closure plan submitted with the permit application.

### **Siting Criteria Compliance Demonstration**

Compliance with siting criteria is described in the site-specific information appended to the C-144.

### **Proof of Surface Owner Notice**

The application package was transmitted to the surface landowner and OCD via email.

### **Construction/Design Plan of Temporary Pit**

The design and construction protocols for the temporary pit are provided in the design and construction plan and in Plates 1-2. The optional drainage system described in the design and construction plan (above) is not shown on the Plates but can be important element of the closure plan.

### **General Protocols and Procedures**

- All free liquids from the pit will be recycled or disposed in a manner consistent with OCD Rules.
- Residual drilling fluids will be removed from the pit within 60 days of release of the drilling rig.
- Water derived from the well stimulation program (flow-back or unused fresh water) that is significantly higher quality than the residual drilling fluids *may* discharge into the pit. The fresher water *may* discharge into the drainage system to flow through the solids or onto the solids in the pit.
- A low-flow pump *may* remove water from the drainage system to a tank or a fluids cell of the temporary pit; thereby further rinsing the residual solids in the pit.
- 20-60 days after placement of fresh flow-back water into the drilling cell, any water in the pit will be removed for re-use or disposal.
- The residual drilling mud and cuttings will be stabilized to a capacity sufficient to support the 4-foot thick soil cover.
- The residual pit solids will not be mixed at a ratio greater than 1 part pit solids to 3 parts dry earth material (e.g. subsoil).
- The pit will not be closed until the stabilized pit contents pass the paint filter liquids test.

### **Waste Material Sampling Plan**

Prior to closure, a five-point (minimum) composite sample of the residual solids in the pit will be tested in a laboratory to demonstrate that the stabilized material will not exceed the contaminant concentrations listed in Table II of 19.15.17.13 NMAC mixed in a ratio of 3:1 with the earth material to be used for mixing and stabilization of the residual cuttings and mud.

## C-144 Supplemental Documentation for Temporary Pit

In-place burial is the selected on-site disposal alternative.

If a concentration of a contaminant within the material mixed at a ratio not exceeding 3:1 is higher than the concentration given in Table II, closure will proceed in accordance with Subsection C of 19.15.17.13 NMAC.

In the event that on-site closure standards cannot be achieved, the operator will remove the solid pit contents and transfer to the following division-approved facility:

Disposal Facility Name: R360      Permit Number: NM 01-0006

### Protocols and Procedures for Earthwork

Stabilization of the residual cuttings and mud is accomplished by mixing dry earth material within the temporary pit footprint. After stabilization the operator or qualified contractor will:

1. Place a geomembrane cover over the waste material in a way to prevent infiltration of water and so that infiltrated water does not collect on the geomembrane cover after the upper soil cover has been placed.
2. Use a geomembrane cover made of 20-mil string reinforced LLDPE liner or an equivalent cover approved by the district office that is composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions and complies with EPA SW-846 Method 9090A.
3. Over the sloping, stabilized material and liner, place the **Soil Cover**:
  - a. at least 3-feet of compacted, uncontaminated, non-waste containing earthen fill with chloride concentrations less than 600 mg/kg as analyzed by EPA Method 300.0.
  - b. either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater, over the 3-foot earth material.
4. Contour the cover to
  - a. blend with the surrounding topography
  - b. prevent erosion of the cover and
  - c. prevent ponding over the cover.

### Closure Notice

The operator will notify the surface owner by certified mail, return receipt requested, that the operator plans closure operations at least 72 hours, but not more than one week, prior to any closure operation. The notice will include the well name, API number, and location.

After approval for in-place burial, the operator shall notify the district office verbally and in writing at least 72 hours but not more than one week before any closure operation. Notice will include the operator's name and the location of the temporary pit. The location will include unit letter, section number, township and range. If the location is associated with a well, then the well's name, number and API number will be included.

Should onsite burial be on private land, the operator will file a deed notice including exact location of the burial with the county clerk of the county where the onsite burial is located.

## **C-144 Supplemental Documentation for Temporary Pit**

### **Closure Report**

Within 60 days of closure completion, the operator will submit a

- i. closure report on form C-144, with necessary attachments
- ii. a certification that all information in the report and attachments is correct, that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan
- iii. a plat of the pit location on form C-105
- iv. if burial is in a nearby trench/pit, a separate C-105 showing the exact location

Unless the permit transmittal letter requests an alternative marker to comply with surface landowner specifications, the operator will place at the center of an onsite burial a steel marker that

- is not less than four inches in diameter
- is placed at the bottom of a three-foot deep hole (minimum) that is filled with cement to secure the marker
- is at least four feet above mean ground level
- permanently displays the operator name, lease name, well number, unit letter, section, township and range in welded or stamped legible letters/numbers

### **Timing of Closure**

The operator will close the temporary pit within 6 months from the date the drilling or workover rig was released from the site. This date will be noted on form C-105 or C-103 filed with the division upon the well's or workover's completion.

### **Reclamation and Re-vegetation Plan**

In addition to the area of the in-place burial, the operator will reclaim the surface to a safe and stable condition that blends with the surrounding undisturbed area including:

1. the pit location not used for burial
2. other areas associated with the in-place burial including access roads

Areas not reclaimed as described herein due to their use in production or drilling operations will be stabilized and maintained to minimize dust and erosion.

As stated above, the soil cover for burial in-place

- A. consists of a minimum of three feet of non-waste containing, uncontaminated, earthen material with chloride concentrations less than 600 mg/kg (or background concentration) as analyzed by EPA Method 300.0 placed over the liner and stabilized solids
- B. is capped by the background thickness of topsoil or 1-foot of suitable material to establish vegetation, whichever is greater
- C. blends into surrounding topography
- D. is graded to prevent ponding and to minimize erosion

## **C-144 Supplemental Documentation for Temporary Pit**

For all areas disturbed by the closure process that will not be used for production operations or future drilling, the operator will

- I. Replace topsoils and subsoils to their original relative positions
- II. Grade so as to achieve erosion control, long-term stability and preservation of surface water flow patterns
- III. Reseed in the first favorable growing season following closure

Re-vegetation and reclamation plans imposed by the surface owner will be outlined in communications with the OCD.

The operator will notify the division when the surface grading work element of reclamation is complete.

The operator will notify the division when the site meets the surface owner's requirements or exhibits a uniform vegetative cover that reflects a life-form ratio of plus or minus fifty percent (50%) of pre-disturbance levels and a total percent plant cover of at least seventy percent (70%) of pre-disturbance levels, excluding noxious weeds.