RECEIVED
By OCD; Dr. Oberding at 1:28 pm, Jun 30, 2015

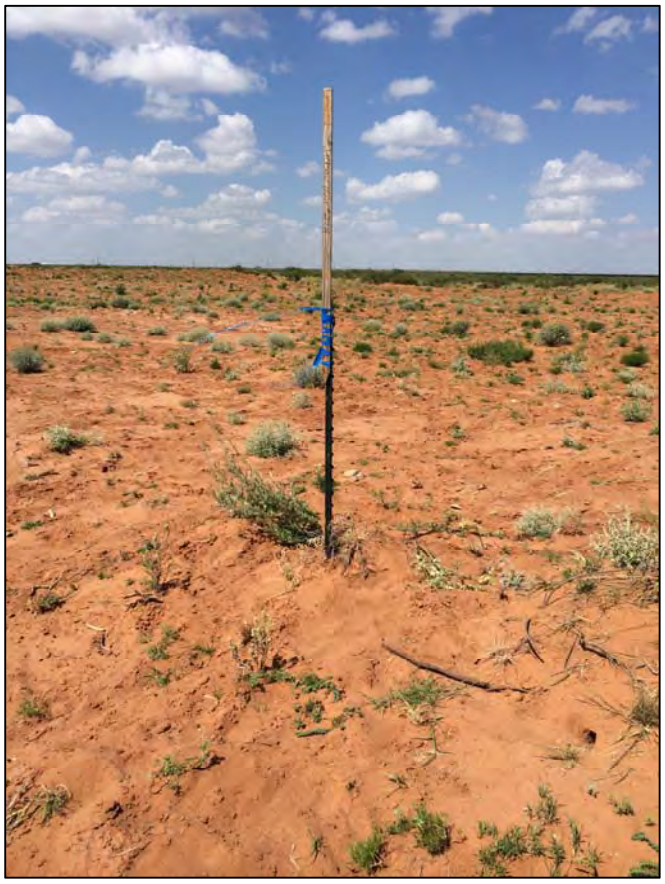
APPROVED
By OCD; Dr. Oberding at 10:35 am, Jul 17, 2015

June 2015

**C-144 Permit Application Package for**

# Jackson Unit #27H Temporary Pit

**SHL Unit M, Section 21, T24S, R33E, Lea County**



*Well stake for Jackson Unit #27H, view north*
*Construction of location began in 2014 but was not completed at that time.*

## Prepared for
## Murchison Oil and Gas, Inc.
## Plano, Texas

**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


June 30, 2015

Ms. Kellie Jones
NMOCD District 1
1625 French Drive
Hobbs, NM 88240
Via E-Mail and US Mail

RE: Murchison-**Jackson Unit #27H** temporary pit C-144 application

Dear Ms. Jones:

On behalf of Murchison Oil and Gas, R.T. Hicks Consultants is pleased to submit the attached C-144 application for a temporary pit at the above-referenced well. Please note the following:

1. This application is for a single-well temporary pit.
2. The location meets the setback distance to groundwater and nearby watercourses. I performed a recent site inspection and the site showed no signs of unstable ground within this low cave/karst potential area.
3. The temporary pit generic plans are verbatim from previously-approved C-144 drilling pit permits. The pit design is identical to most other Murchison pits; the most recently-approved permit is referenced.
4. This letter and application are copied to the surface owner (State Land Office) as notification of the intent to bury drilling solids on-site.

This site shares the same environmental setting as many other previously-approved Murchison temporary pits. As shown on Figure 4, the #27H lies between two facilities that both included permitted temporary pits, Jackson Unit #18H (300 feet west) and Jackson Unit #19H (600 feet east). Additionally, I logged the cuttings from the conductor pipe drilling at the Bettis 20 State Com #2H (2,000 feet west) in 2014 and they were observed to be dry at 120 feet. This elevation was used as the projected groundwater depth in the calculation of groundwater depth below the pit in this application, thus presenting a very conservative estimation.

If you have any questions or concerns regarding this application, please contact me.

Sincerely,
R.T. Hicks Consultants

Kristin Pope

Kristin Pope
Project Geologist

Copy: Murchison Oil and Gas, Ed Martin (NM 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: Murchison Oil & Gas, Inc. OGRID #: 15363

Address: 7250 Dallas Parkway, Suite 1400, Plano, TX 75024

Facility or well name: Jackson Unit #27H

API Number: 30-025-41847 OCD Permit Number:

U/L or Qtr/Qtr M Section 21 Township 24S Range 33E County: Lea

Center of Proposed Design: Latitude 32°11'48.48"N Longitude 103°34'56.23"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: 23,712 bbl Dimensions: L 150 x W 170 x D 10 ft

**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.

**Variances 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.**<br>- ☐ 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 .**<br>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**<br>- 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**<br>- 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**<br>- 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**<br>- 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).<br>- 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;.<br>- 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.)<br>- Topographic map; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| Within 300 feet from a occupied permanent residence, school, hospital, institution, or church in existence at the time of initial application.<br>- 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.<br>NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |

| | |
|---|---|
| Within 100 feet of a wetland.<br>- 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**<br>- 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.<br>- 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;<br>- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site **See Figures 1 & 2** | ☐ Yes ☒ No |
| Within 300 feet of a wetland. **See Figure 6**<br>- 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).<br>- 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.<br>- 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.<br>- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site | ☐ Yes ☐ No |
| Within 500 feet of a wetland.<br>- 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: 30-025-41787, Mogi 9 St Com #11H or Permit Number: P1-06562 approved 10/6/14_

**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 $H_2S$, 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.<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells | ☐ Yes ☒ No<br>☐ NA |
| Ground water is between 25-50 feet below the bottom of the buried waste<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells | ☐ Yes ☒ No<br>☐ NA |
| Ground water is more than 100 feet below the bottom of the buried waste.<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells | ☒ Yes ☐ No<br>☐ 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).<br>- 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.<br>- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image | ☐ Yes ☒ 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.<br>- NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site | ☐ Yes ☒ No |
| Written confirmation or verification from the municipality; Written approval obtained from the municipality | ☐ Yes ☒ No |
| Within 300 feet of a wetland.<br>US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site | ☐ Yes ☒ 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.<br>- Written confirmation or verification from the municipality; Written approval obtained from the municipality | ☐ Yes ☒ No |
| Within the area overlying a subsurface mine.<br>- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division | ☐ Yes ☒ No |
| Within an unstable area.<br>- 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.<br>- FEMA map | ☐ Yes ☒ 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.***

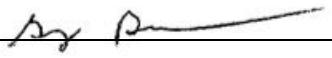
- ☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC
- ☒ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection E of 19.15.17.13 NMAC
- ☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate 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 H 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): Greg Boans Title: Production Superintendent

Signature:  Date: June 30, 2015

e-mail address: gboans@jdmii.com Telephone: (575) 361-4962

**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

22.

**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 presented in Appendix A demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 100 feet beneath the temporary pit that will contain fluids that cannot be classified as "low-chloride." Groundwater will be more than 100 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 (approximately 65-feet south from proposed temporary pit) as a pink hexagon with the surface elevation.
2. The locations of the Mogi 9 State 1H (Misc-69), Brinninstool 4 State 3H (Misc-70), Jackson Unit 15H (Misc-98), Atoka Bank BDJ State Com 2H (Misc-136), and Bettis 20 State Com 2H (Misc-137) where we evaluated cuttings during the 120-foot casing borings.
3. 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.
4. Water wells from the USGS database as large colored triangles that represent the unit in which the well was completed.
5. Water wells, which are not documented in the public databases but were identified by field inspection or other published reports as colored squares.
6. The depth-to-water from the most recent available measurement for each well is provided adjacent to the well symbol.

Figure 2 is an area geologic/topographic map that shows:
1. The location of the temporary pit as a hexagon.
2. Water wells measured by the USGS or other professionals and the date of the observation.
3. Isocontour lines displaying the elevation of the groundwater surface.

We relied upon the most recent data measured by the USGS and other professionals to create the water table elevation map shown in Figure 2. While the "Misc" OSE 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 Bell Lake area 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. For example, data from Misc-62, located about 2.25 miles south of the proposed pit is a windmill with a measured depth to water by Hicks Consultants in 2013.

From these data and the discussion in Appendix A, we conclude:

- The elevation of the groundwater surface beneath the proposed pit is less than 3,411 feet above mean sea level. R.T. Hicks Consultants logged a borehole at the Bettis 20 State Com #2H location (approximately 2,000 feet west of the subject site) in 2014 to 120 feet below ground surface and dry returns were observed.

- The perched, shallow groundwater zones present within the Bell Lake Sink and the area of Misc-14, about 3 miles north and 5 miles east of the location respectively (see Appendix A), do not extend to the area beneath the proposed pit.
- The distance between the bottom of a 10-foot deep temporary pit and the potentiometric surface of the regional aquifer is greater than 110 feet (3,530.9-10-3,411.1).

## 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 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 nearest mapped surface water features are "intermittent streams" located approximately 1 mile east and, in our opinion, do not meet the definition of a watercourse under OCD Rules. Field inspection reveals that these features do not exhibit a defined bed or bank.

## 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 operated by Murchison Oil and Gas, Inc. The subject site lies between two facilities that both included permitted temporary pits, Jackson Unit #18H (300 feet west) and Jackson Unit #19H (600 feet east).
- The Double X Ranch headquarters and residence is approximately 2 miles southeast of the staked well.

## 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 north near highway 128 and 2 miles southeast at the ranch headquarters.

- There are no known domestic water wells located within 1,000 feet of the proposed pit.
- 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 Jal, NM approximately 28 miles to the southeast.
- The closest public well field is located approximately 50 miles to the west and/or 50 miles north.

## 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 a "freshwater pond" located approximately 3 miles to the east and a "freshwater emergent wetland" located 2.75 miles north.

## 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 mapped caliche pit is located approximately 1.5 mile to the northwest.

## 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 located within a "low" potential karst area.
- The nearest "high" or "critical" potential karst area is located approximately 26 miles northwest of the site.
- No evidence of solution voids were observed near the site during the field inspection.
- No evidence of unstable ground was observed in the area.

## 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.**

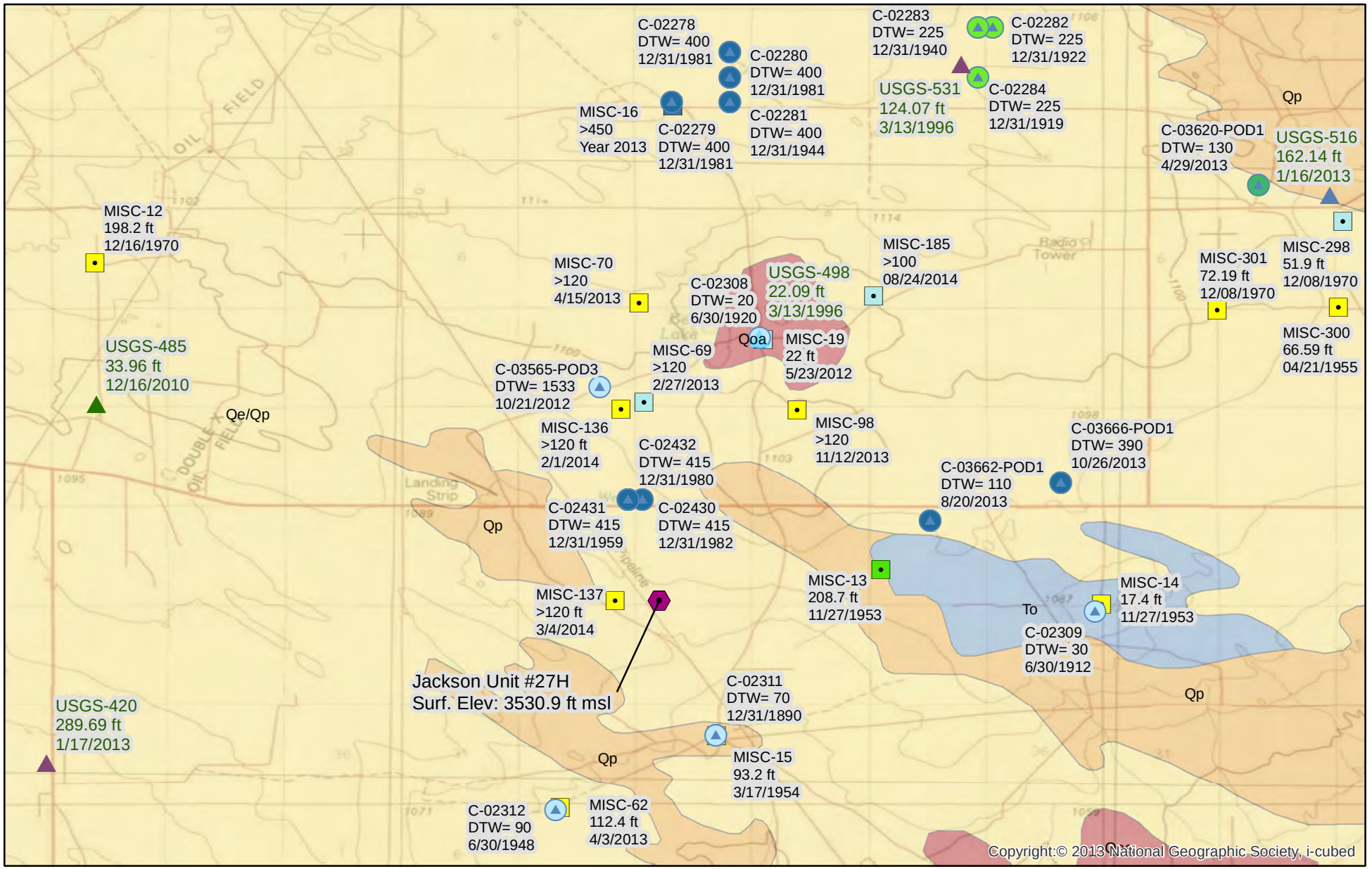
- Zone D is described as areas with possible but undetermined flood hazards. No flood hazard analysis has been conducted.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for flooding.

## Temporary Pit Design

Please refer to Plate 1 for the design of the temporary pit and the Design and Construction Plan at the end of this application.

# Site Specific Information
# Figures

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




N
W E
S

0 1 2 Miles

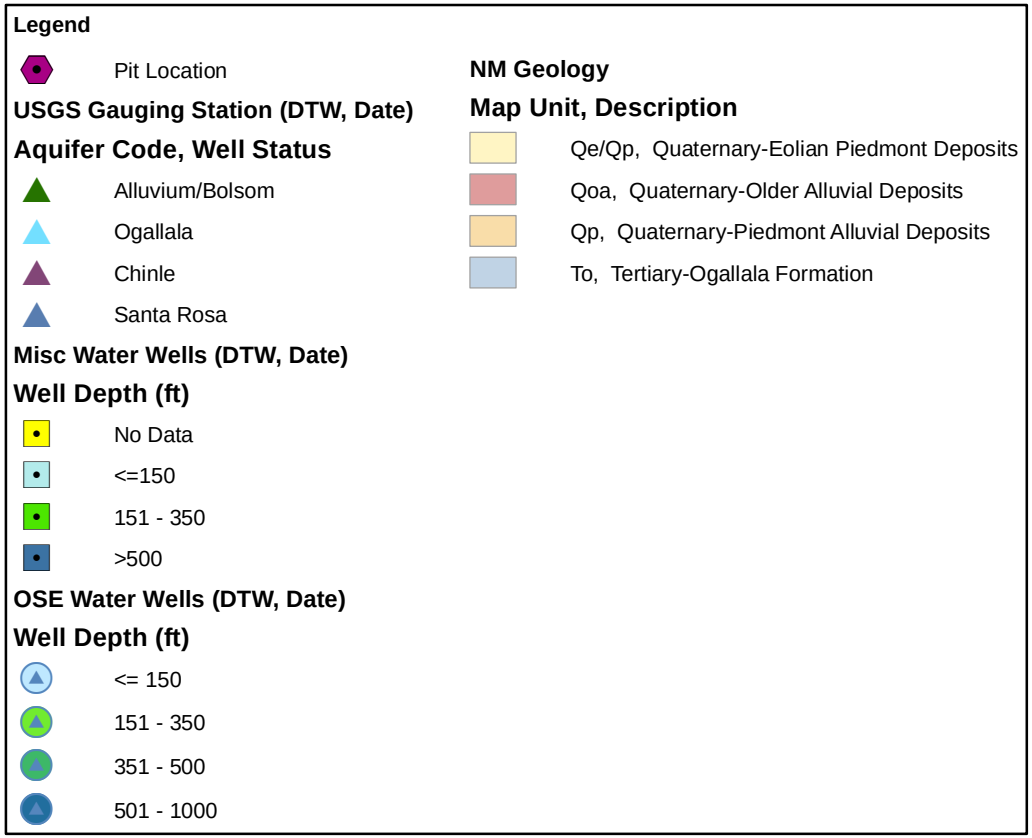
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Depth To Water and Geology

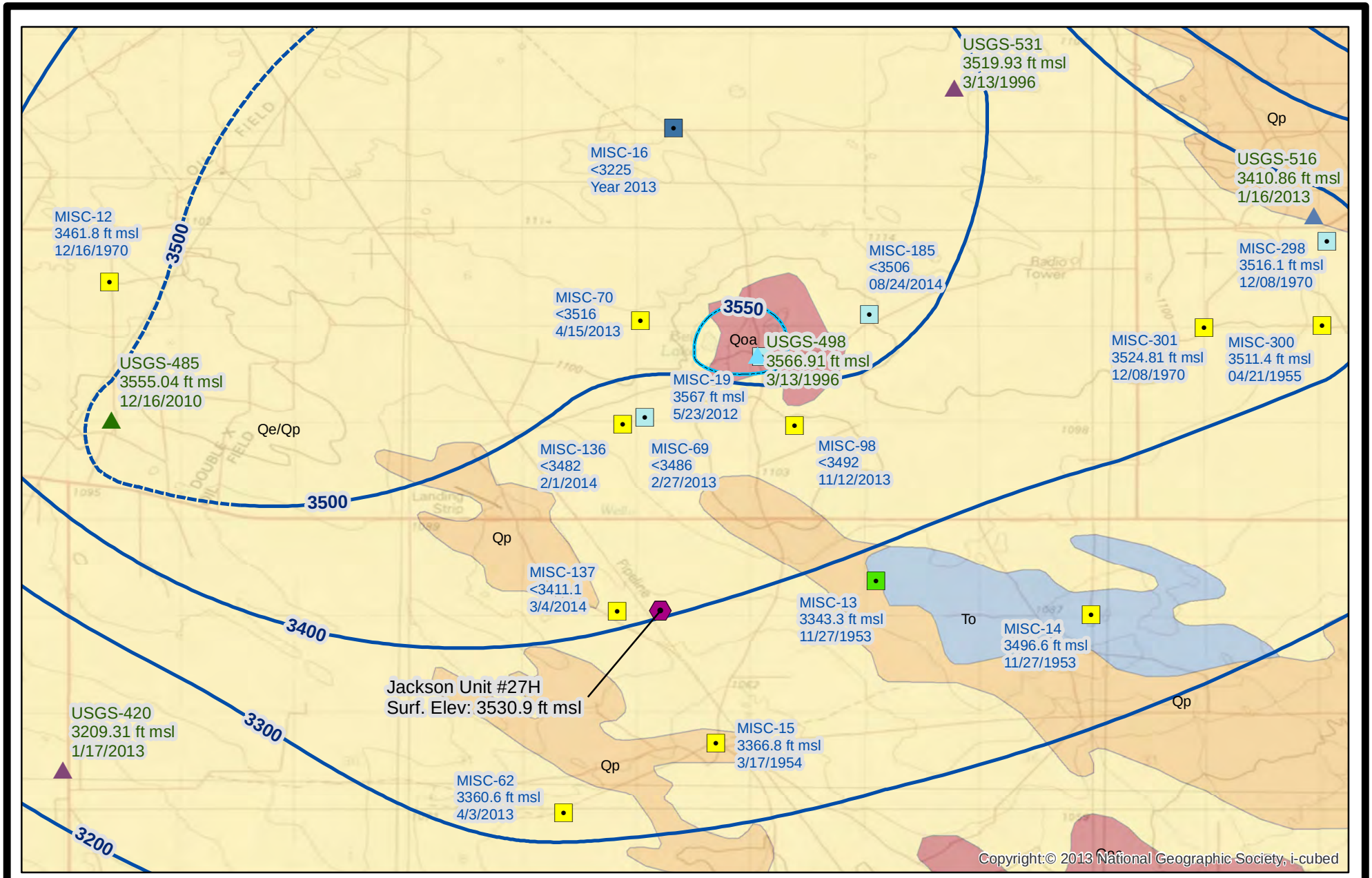
Figure 1

Murchison Oil & Gas
Jackson Unit #27H

June 2015




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Depth To Water and Geology | Figure 1<br>Legend |
| | Murchison Oil & Gas<br>Jackson Unit #27H | June 2015 |

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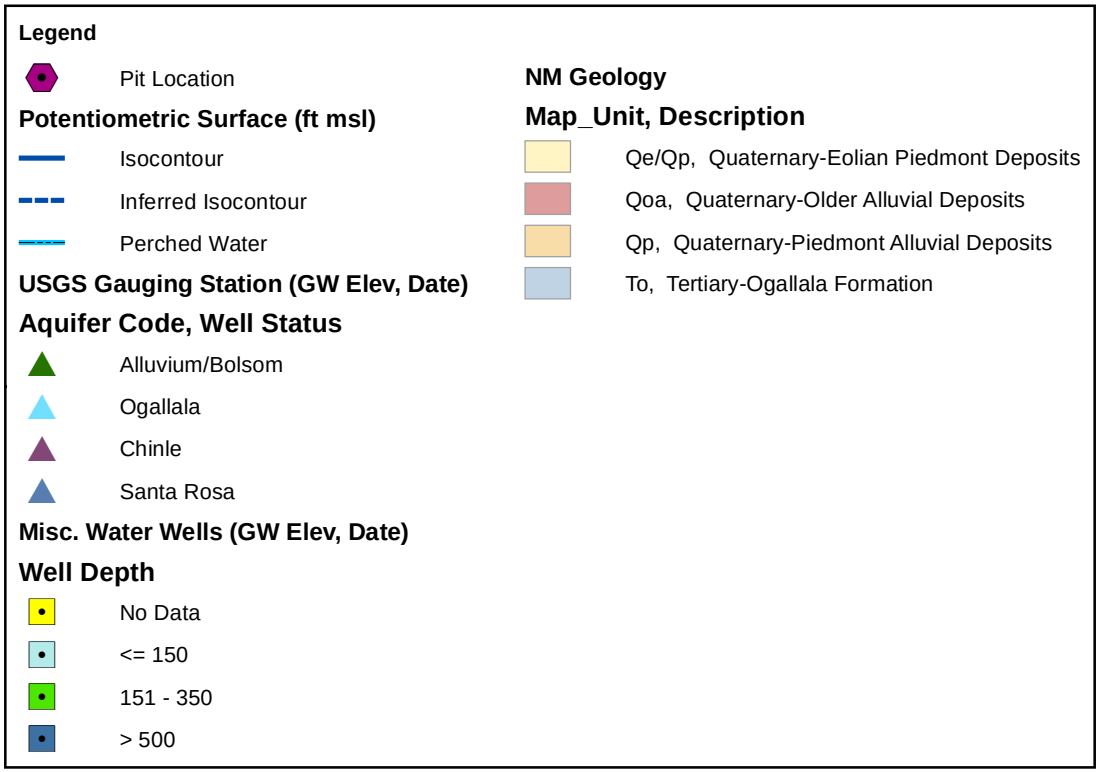
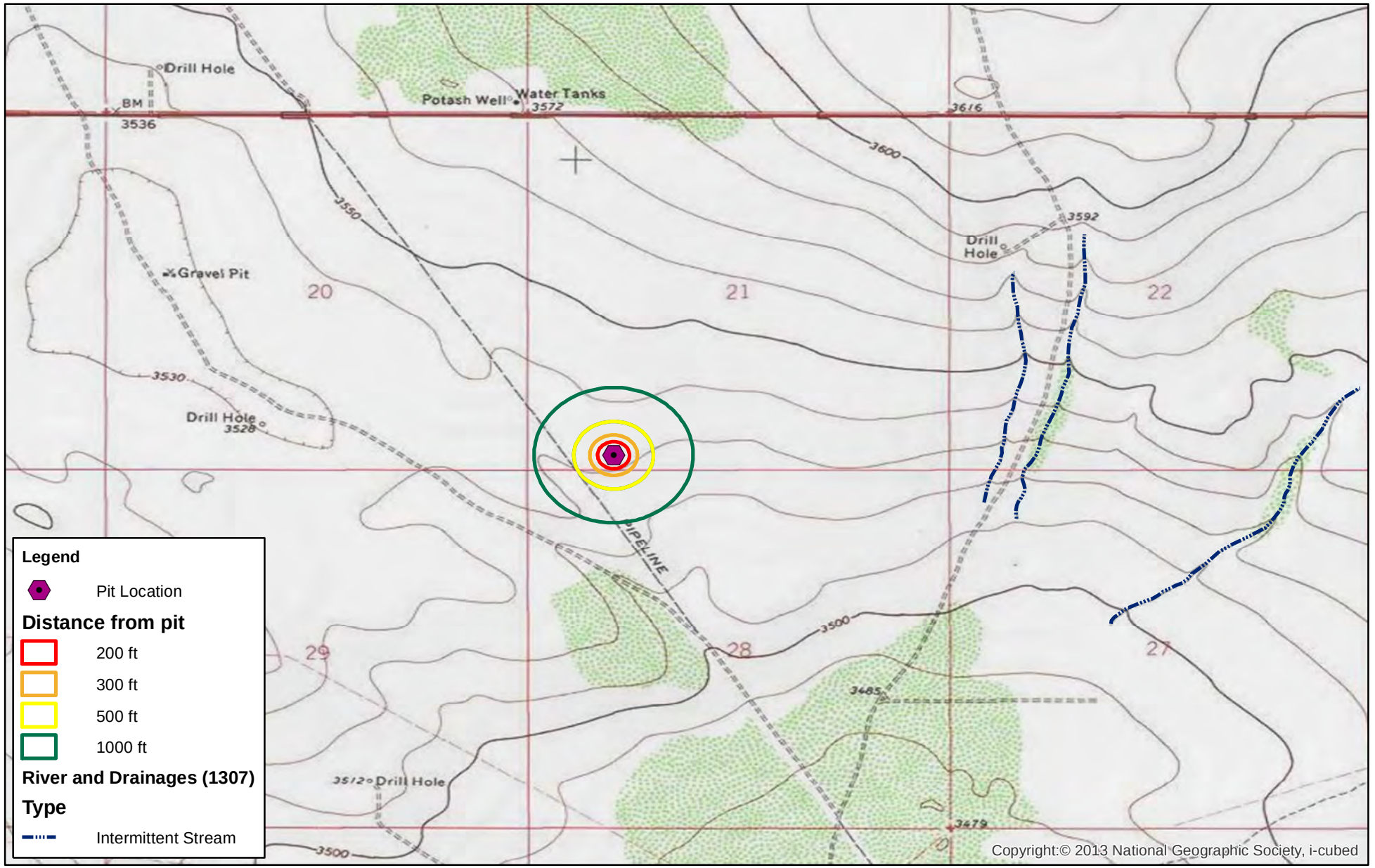
0 1 2 Miles

| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Potentiometric Surface and Groundwater Elevation at Nearby Water Wells<br>Murchison Oil & Gas<br>Jackson Unit #27H | Figure 2<br>June 2015 |




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Potentiometric Surface and Groundwater Elevation at Nearby Water Wells | Figure 2<br>Legend |
| | Murchison Oil & Gas<br>Jackson Unit #27H | June 2015 |

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Feet

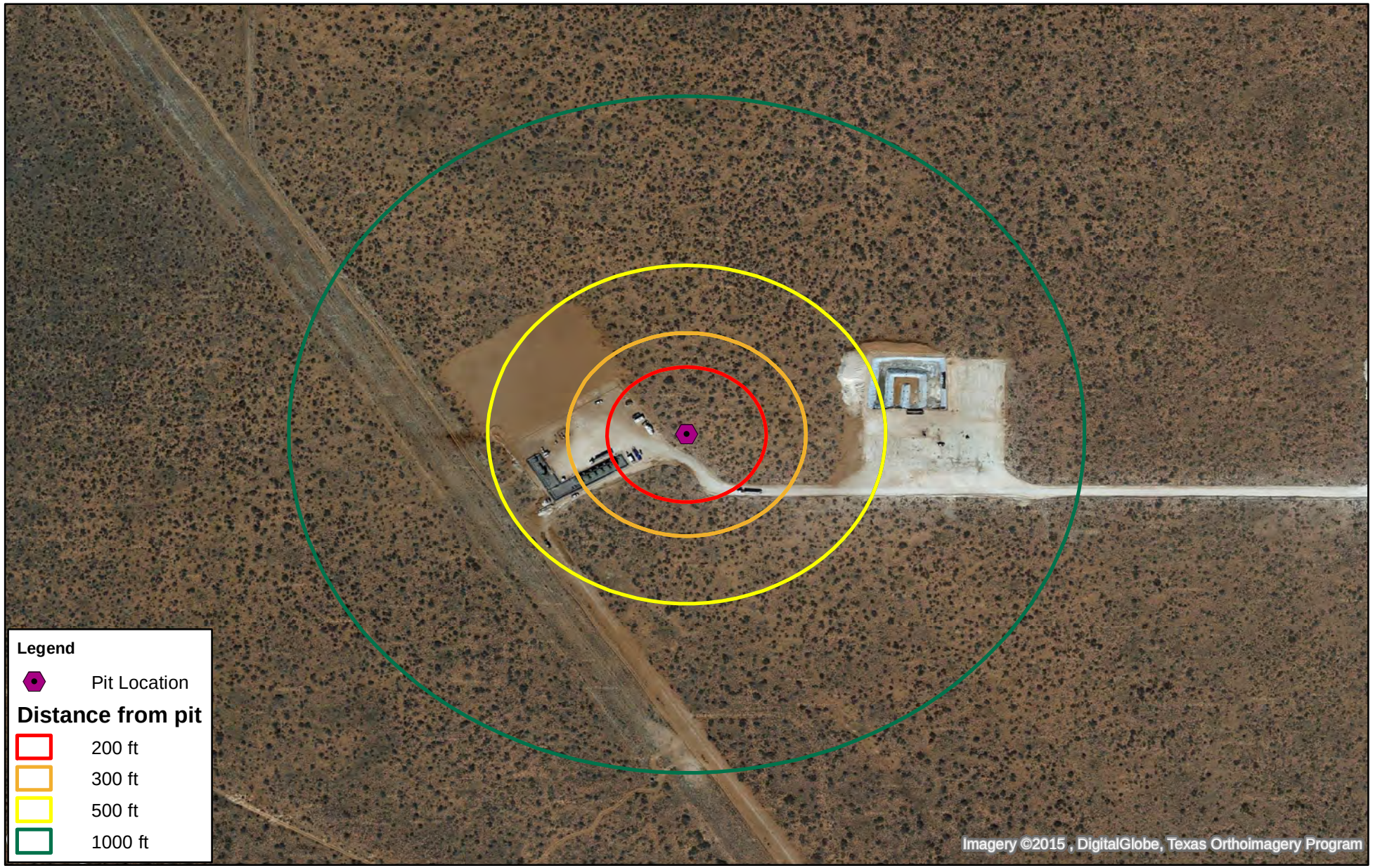
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Surface Water and Topography

Figure 3

Murchison Oil & Gas
Jackson Unit #27H

June 2015

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Feet

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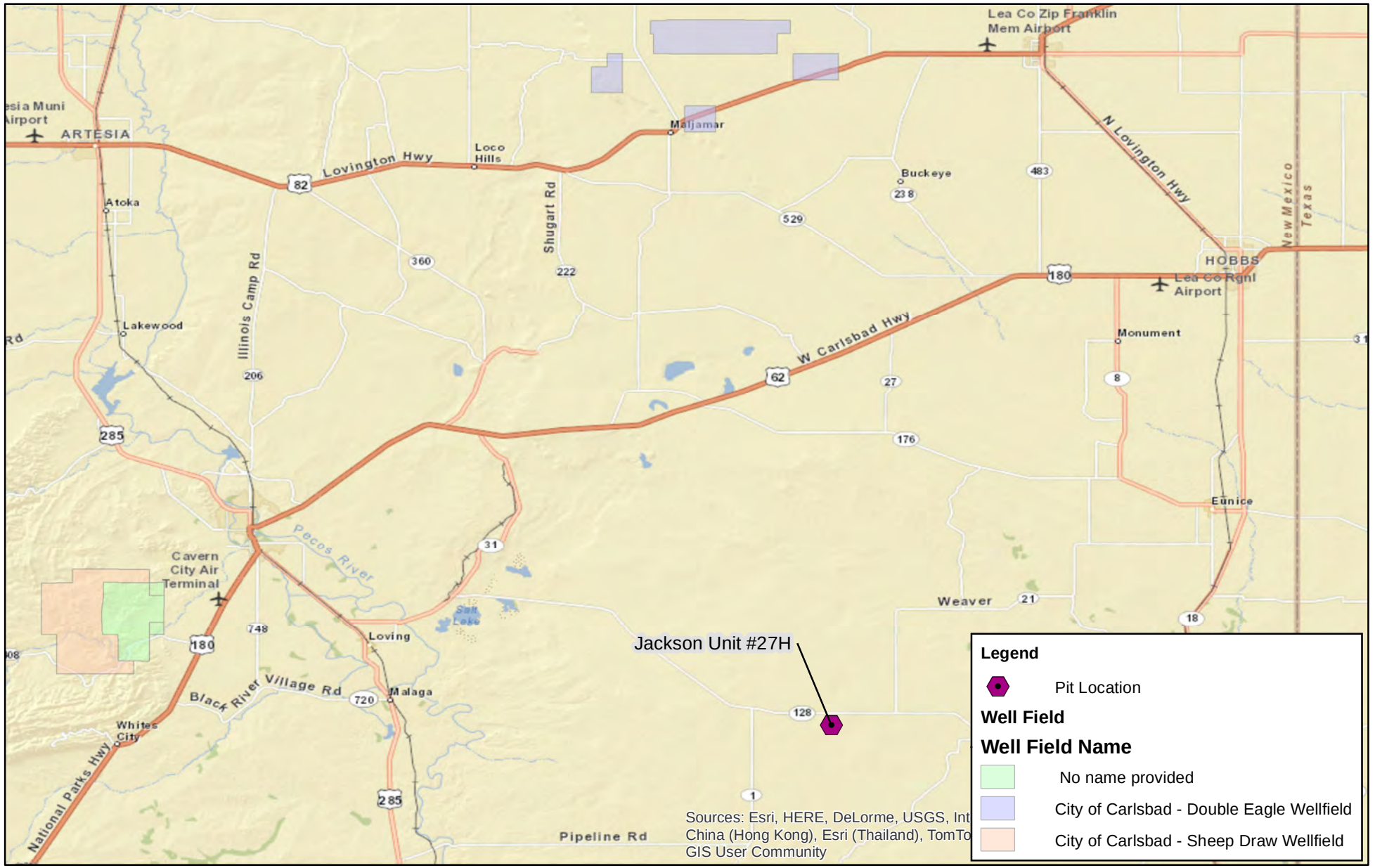
Albuquerque, NM 87104
Ph: 505.266.5004

Nearby Structures

Figure 4

Murchison Oil & Gas
Jackson Unit #27H

June 2015

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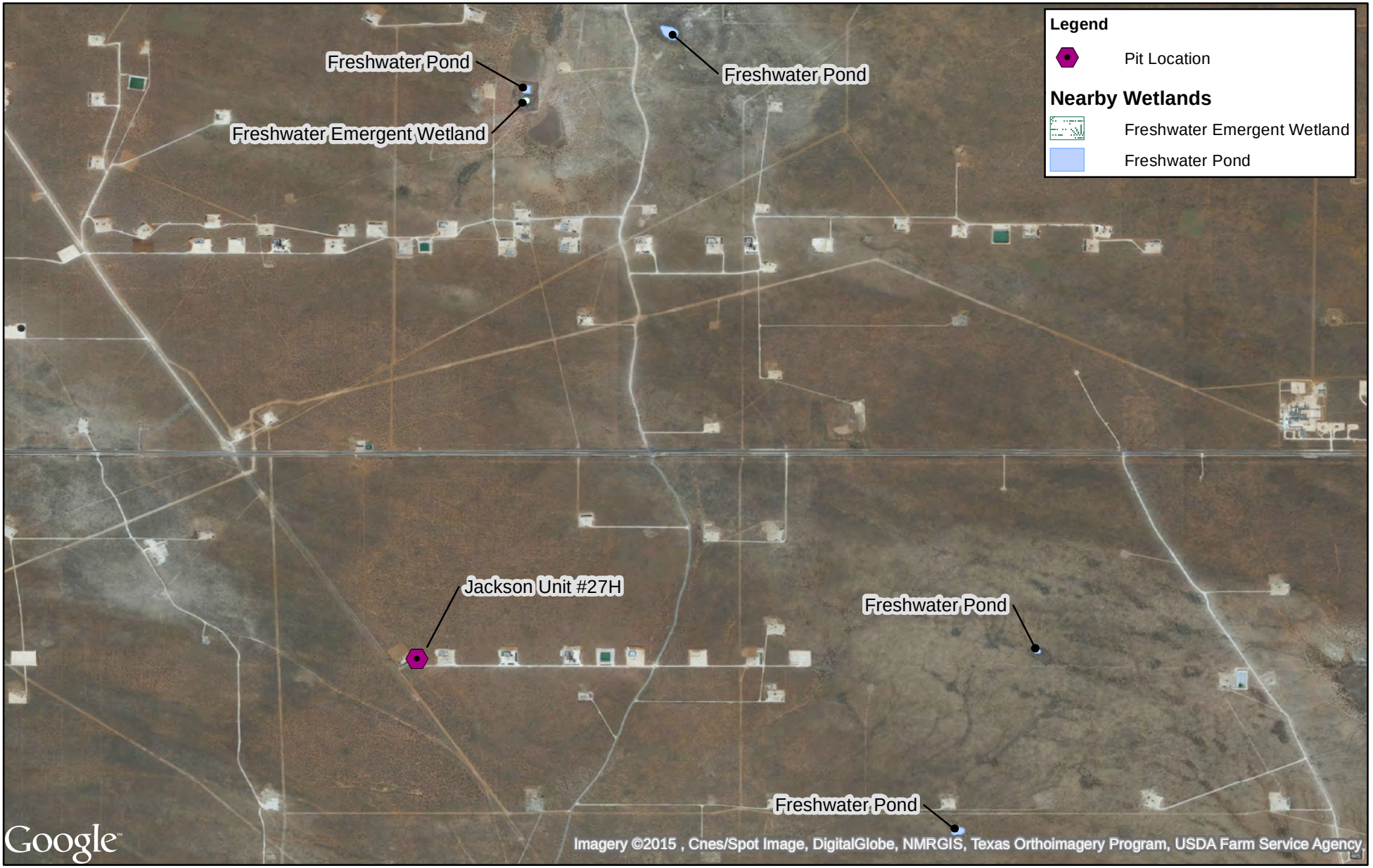
Albuquerque, NM 87104
Ph: 505.266.5004

Nearby Municipalities and Well Fields

Figure 5

Murchison Oil & Gas
Jackson Unit #27H

June 2015

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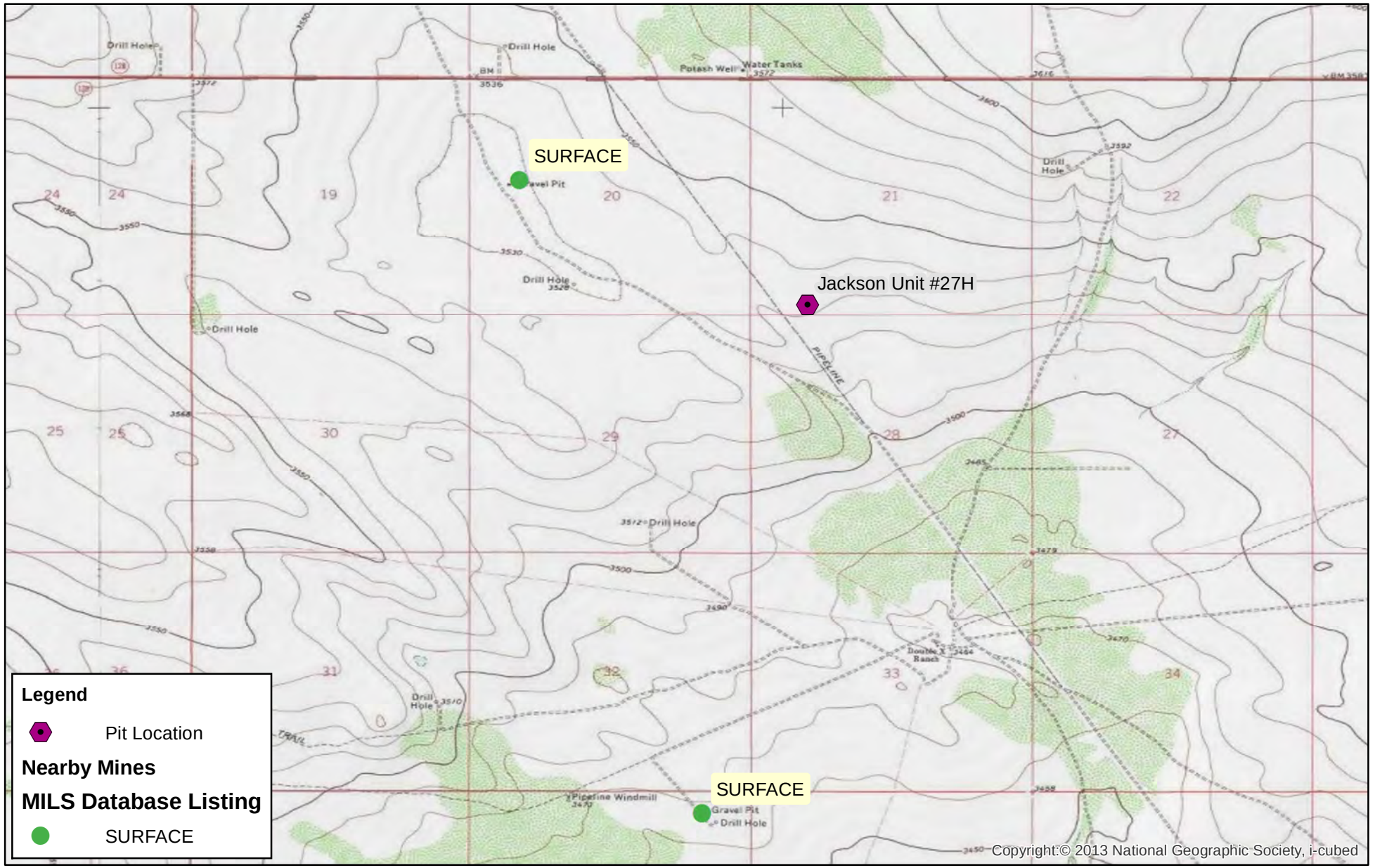
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Nearby Wetlands

Figure 6

Murchison Oil & Gas
Jackson Unit #27H

June 2015

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Albuquerque, NM 87104
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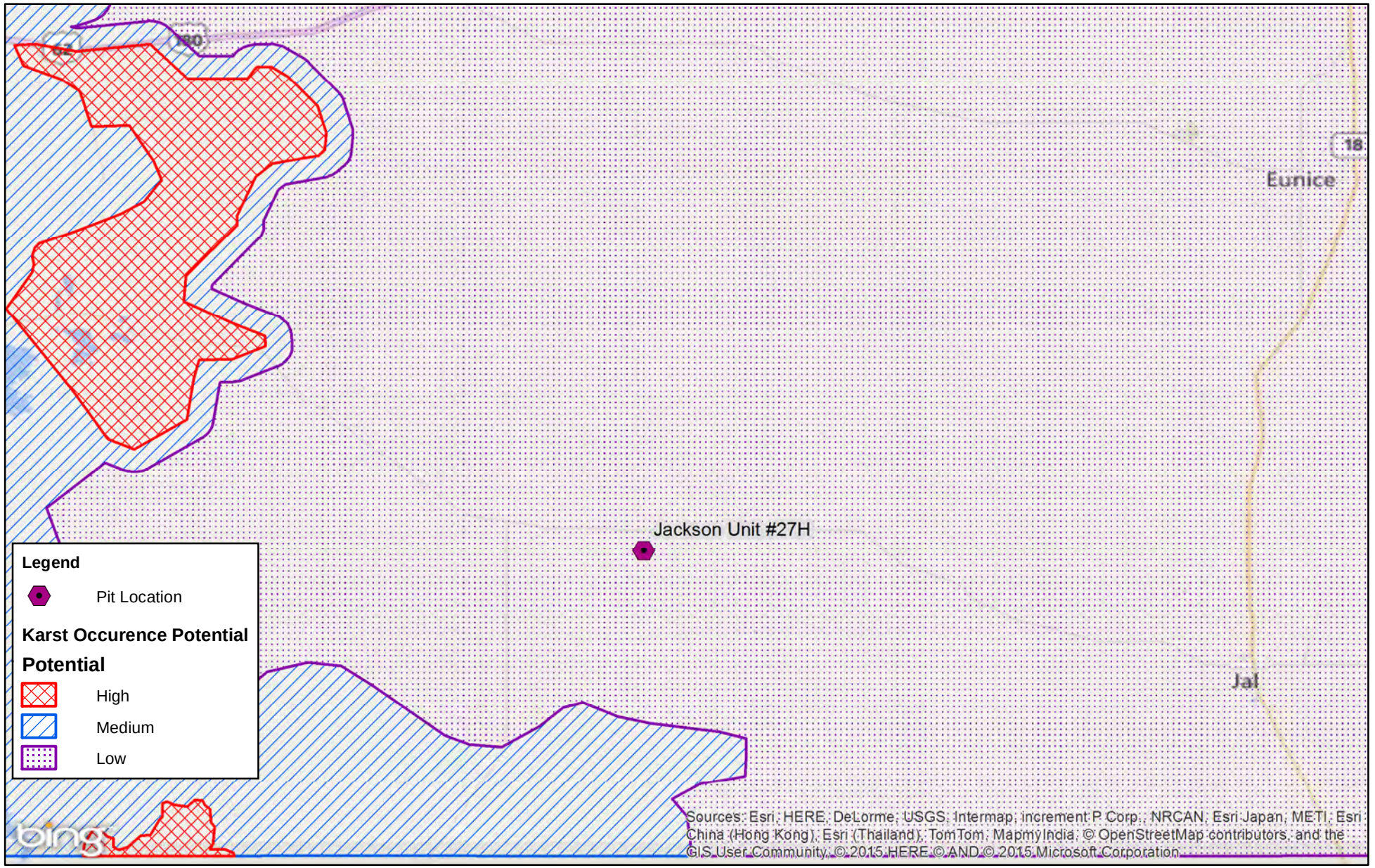
Nearby Mines and Minerals

Figure 7

Murchison Oil & Gas
Jackson Unit #27H

June 2015




N W E S

0 3 6 Miles

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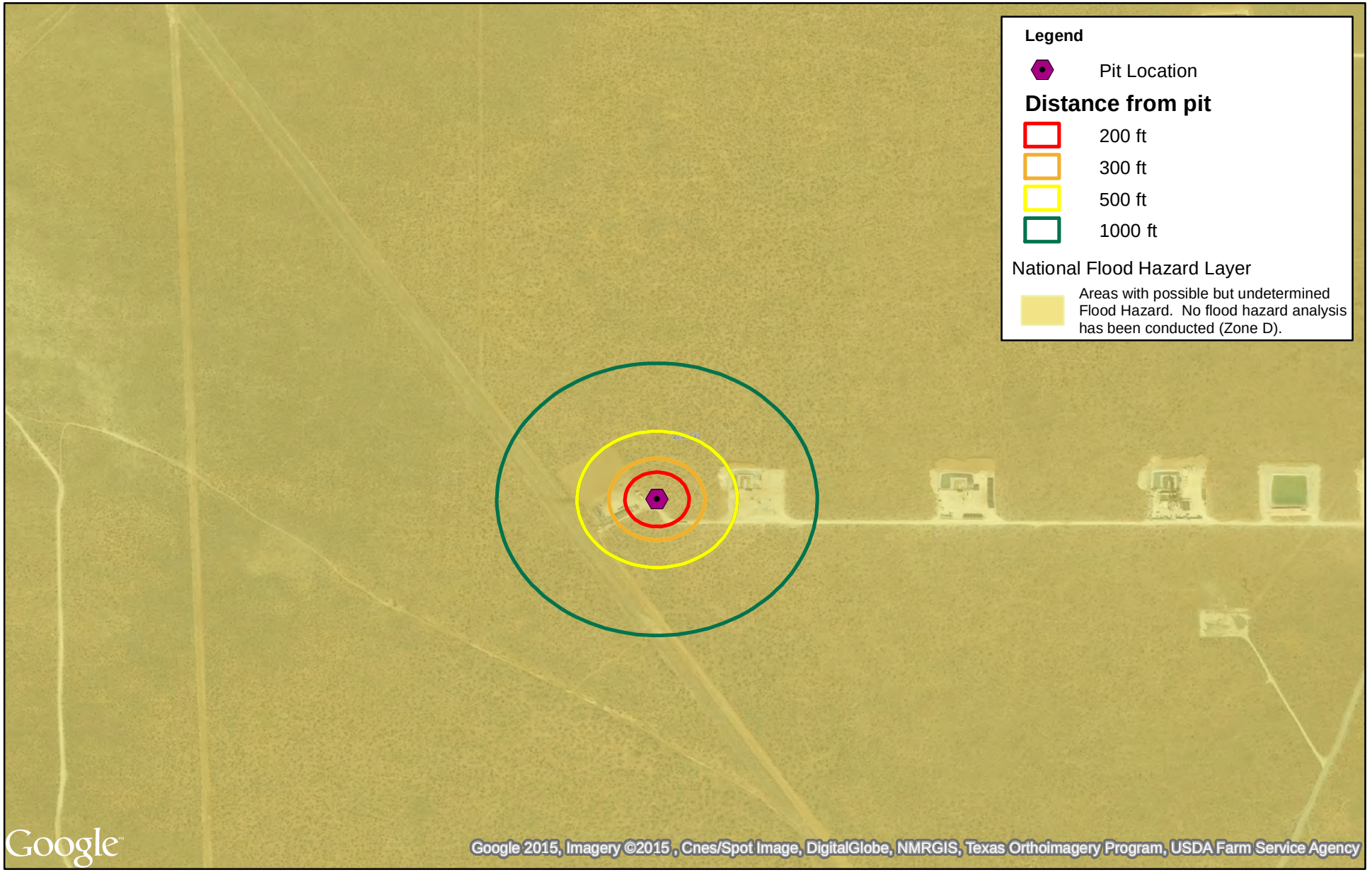
Albuquerque, NM 87104
Ph: 505.266.5004

Karst Potential

Figure 8

Murchison Oil & Gas
Jackson Unit #27H

June 2015




FEMA Source: https://hazards.fema.gov/gis/nfhl/services/public/NFHLWMS/MapServer/WMSServer

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Feet

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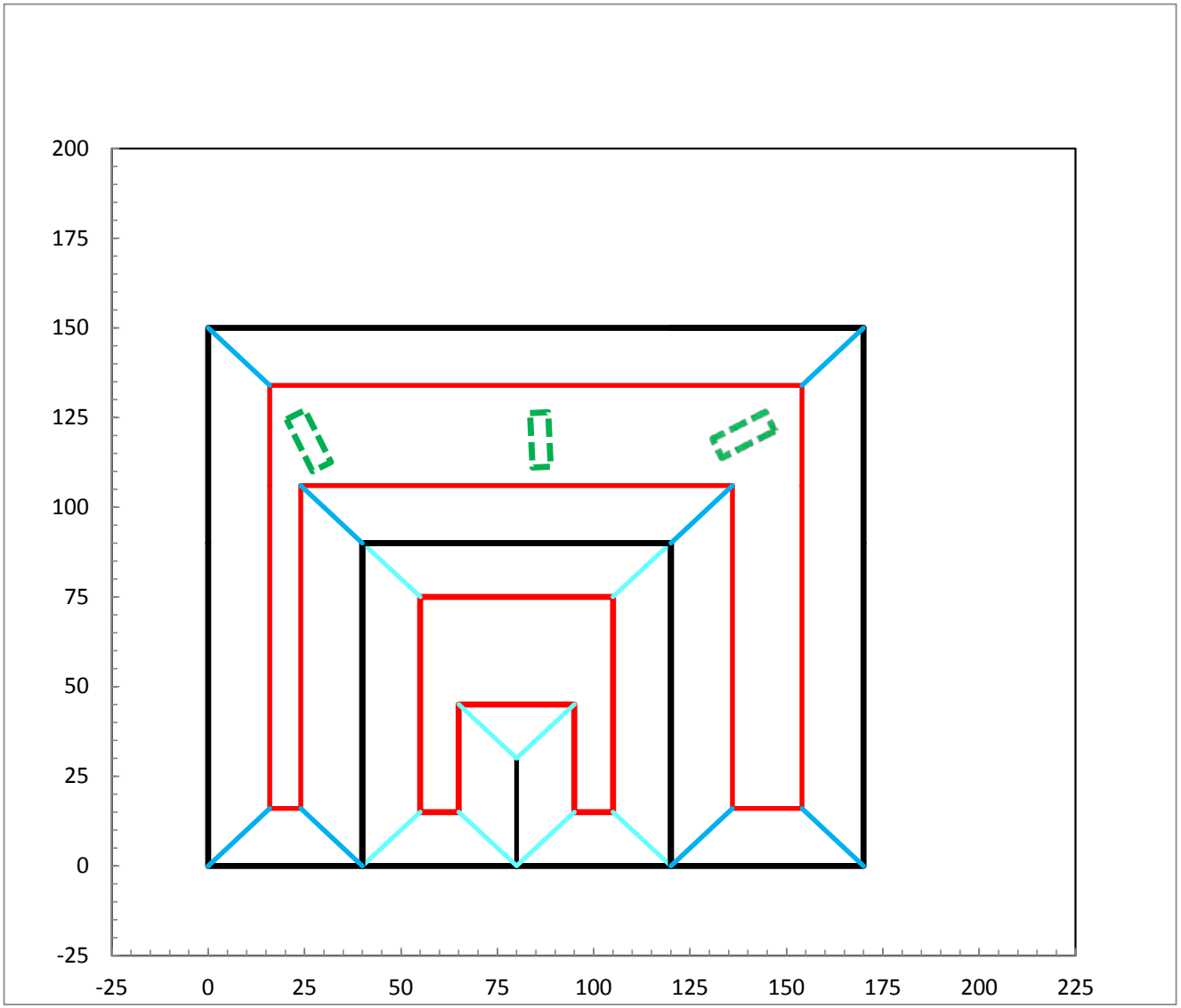
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

| | |
|---|---|
| FEMA Flood Map | Figure 9 |
| Murchison Oil & Gas<br>Jackson Unit #27H | June 2015 |

# Site Specific Information Plate

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




| Drilling Cell Dimensions | |
|---|---|
| Drilling Cell Total Width | 170.0 |
| Drilling Cell Total Length | 150.0 |
| | |
| Slopes of Pit Horizontal Distance | 2.00 |
| Slopes of Pit Vertical Distance | 1.00 |
| Horseshoe divider width at surface | 0.0 |

| Inner Horseshoe Dimensions | |
|---|---|
| Total Width (left right) | 80.0 |
| Total Length (up down) | 90.0 |
| Depth | 7.5 |
| Length of Divider | 30.0 |
| Divider Width | 0.0 |
| Width of discharge floor | 10.0 |
| Width of suction floor | 10.0 |

| Outer Horseshoe Dimensions | |
|---|---|
| Width Discharge Side | 50.0 |
| Width Suction Side | 40.0 |
| Length Far Side (up down) | 60.0 |
| Width of discharge Floor | 18.0 |
| Width of Suction Floor | 8.0 |
| Width of Far Side Floor (right-left dimension) | 126.0 |
| Length of far side floor (Up-down dimension) | 28.0 |
| Depth of Discharge Side | 6.0 |
| Depth of Far Side | 8.0 |
| Depth of Suction Side | 10.0 |

"Speed bumps" project 2 ft above pit floor

**Inner Horseshoe Capacity 6011 bbl**
**Outer Horseshoe Capacity 17701 bbl**

**Total Capacity 23712 bbl**

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

**Drawing of Drilling Cell**
(dimensions of pit floor are not to scale)

**Jackson Unit #27H**
*previously-approved design #P1-06562*

**Plate 1**

**June 2015**

# Site Inspection Photographs

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

250 feet north of well stake, view south from topsoil staging area

200 feet south of well stake; view north from caliche road

200 feet east of well stake; view west; Jackson Unit #18H location in background

View west from well flag to Jackson Unit #18H location

# Survey Information

**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
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

| [1] API Number | [2] Pool Code | [3] Pool Name |
|---|---|---|
| | | |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| | JACKSON UNIT | 27H |

| [7] OGRID No. | [8] Operator Name | [9] Elevation |
|---|---|---|
| 15363 | MURCHISON OIL & GAS, INC. | 3530.9 |

## [10] Surface Location

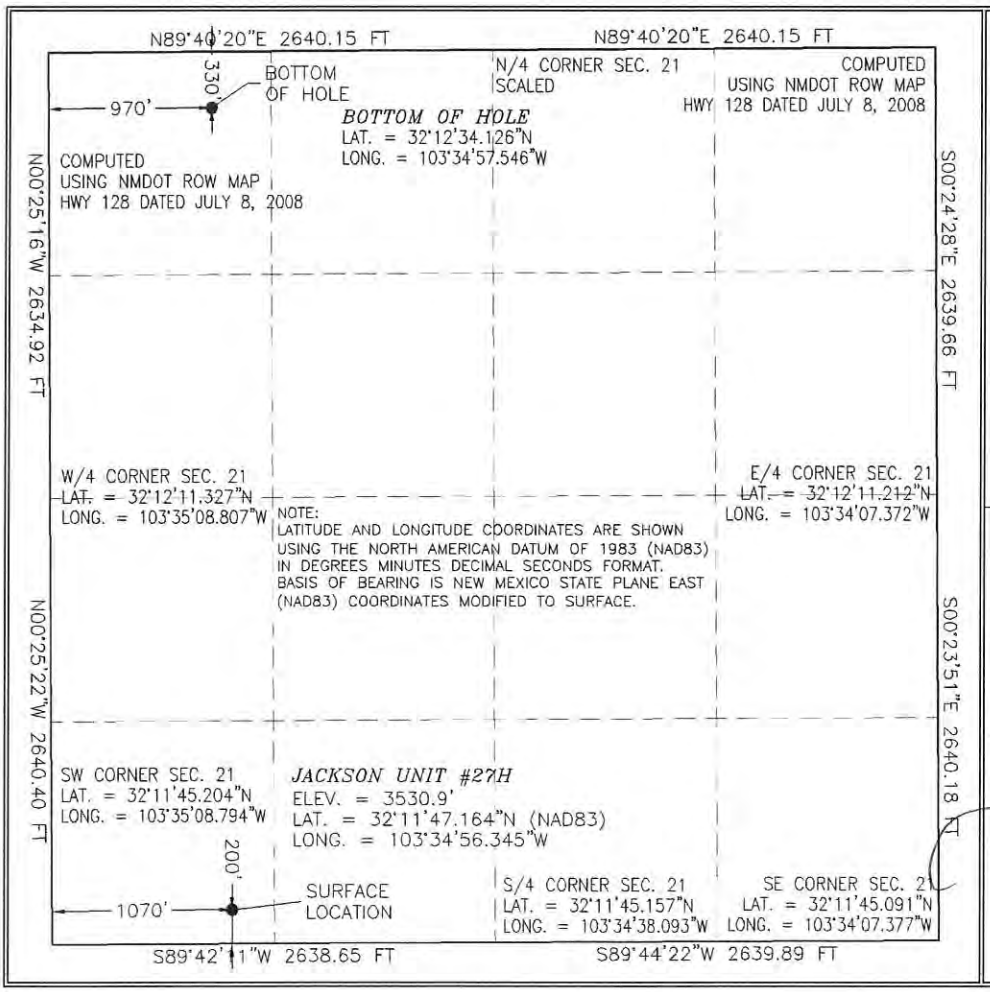
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| M | 21 | 24 S | 33 E | | 200 | SOUTH | 1070 | WEST | LEA |

## [11] 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 |
|---|---|---|---|---|---|---|---|---|---|
| D | 21 | 24 S | 33 E | | 330 | NORTH | 970 | WEST | LEA |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] 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.




## [17] OPERATOR CERTIFICATION

*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.*

Signature Date

Printed Name

E-mail Address

## [18] SURVEYOR CERTIFICATION

*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.*

MARCH 4, 2014
Date of Survey

Signature and Seal of Professional Surveyor

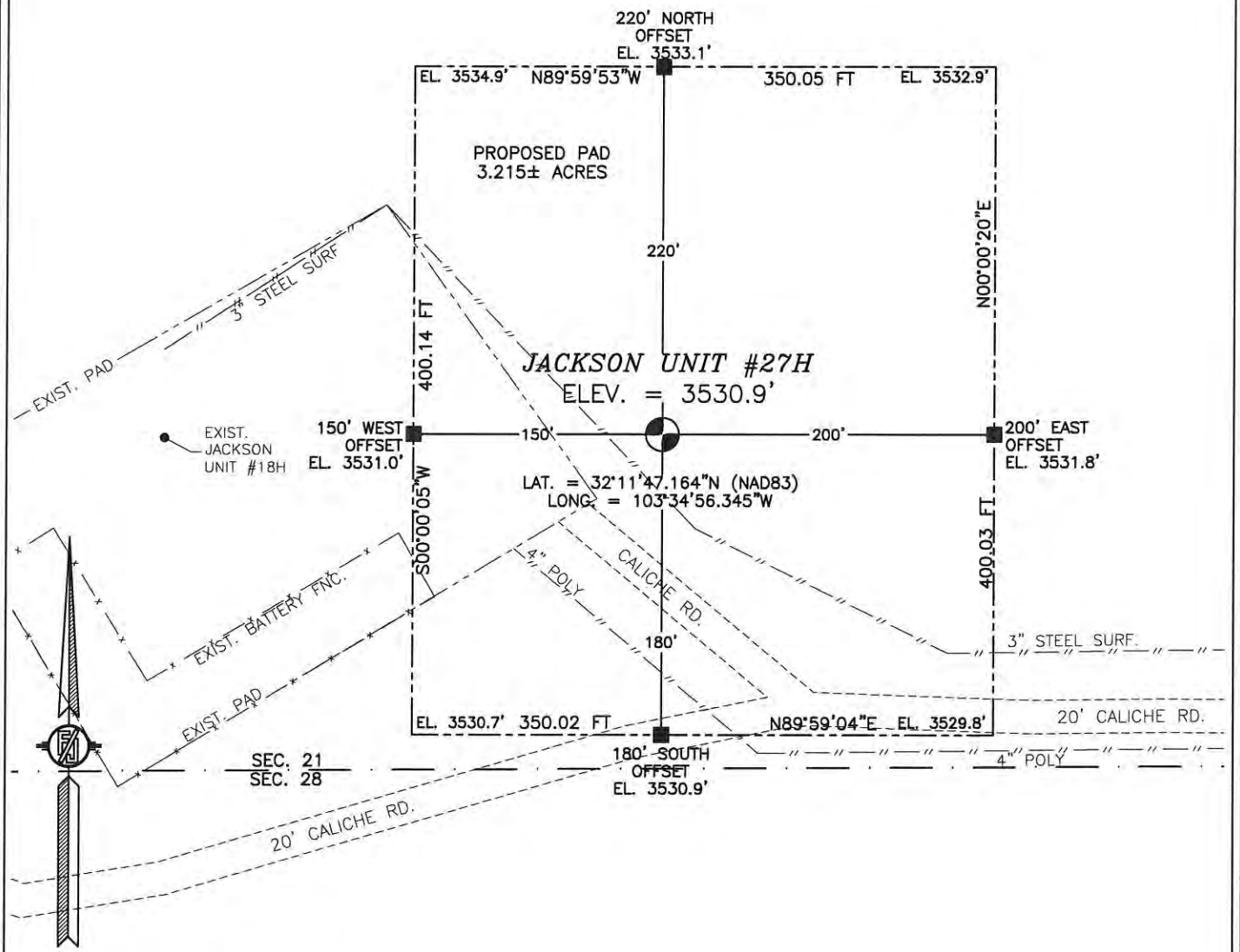
Certificate Number: FILIMON F. JARAMILLO, PLS 12797

SURVEY NO. 2572

FILIMON F. JARAMILLO
NEW MEXICO
12797
REGISTERED PROFESSIONAL LAND SURVEYOR

# SECTION 21, TOWNSHIP 24 SOUTH, RANGE 33 EAST, N.M.P.M.
# LEA 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 STATE HWY. 128 AND CR. J2 (DIAMOND RD.) GO SOUTH ON CR. J2 1.0 MILES, TURN RIGHT ON CALICHE ROAD AND GO WEST 1.0 MILES AND LOCATION IS ON THE RIGHT (NORTH) 170'.

*MURCHISON OIL & GAS, INC.*

***JACKSON UNIT #27H***

*LOCATED 200 FT. FROM THE SOUTH LINE AND 1070 FT. FROM THE WEST LINE OF SECTION 21, TOWNSHIP 24 SOUTH, RANGE 33 EAST, N.M.P.M. LEA COUNTY, STATE OF NEW MEXICO*

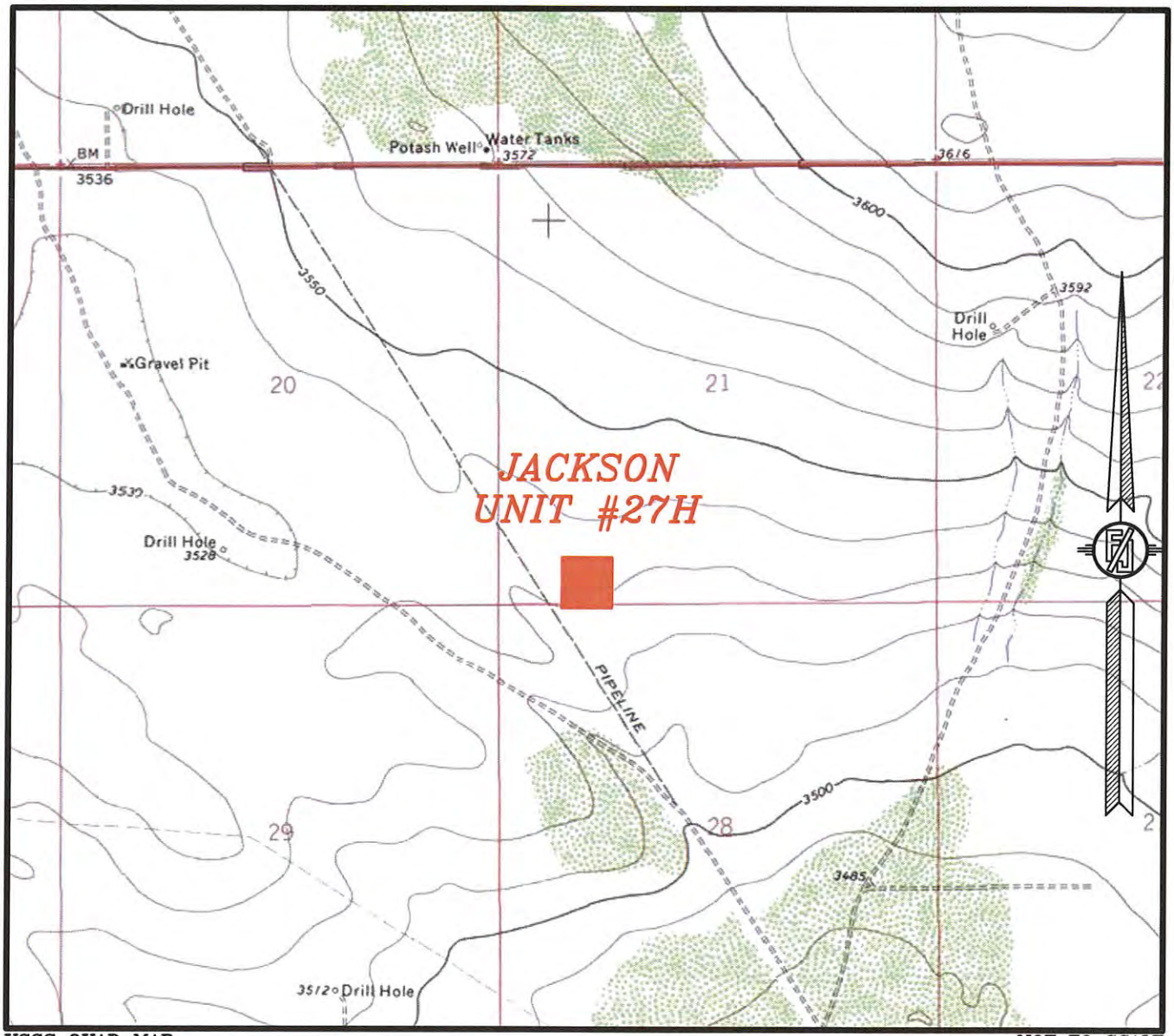
*MARCH 4, 2014*

*SURVEY NO. 2572*

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

SECTION 21, TOWNSHIP 24 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

# LOCATION VERIFICATION MAP




USGS QUAD MAP:
BELL LAKE

NOT TO SCALE

MURCHISON OIL & GAS, INC.

**JACKSON UNIT #27H**

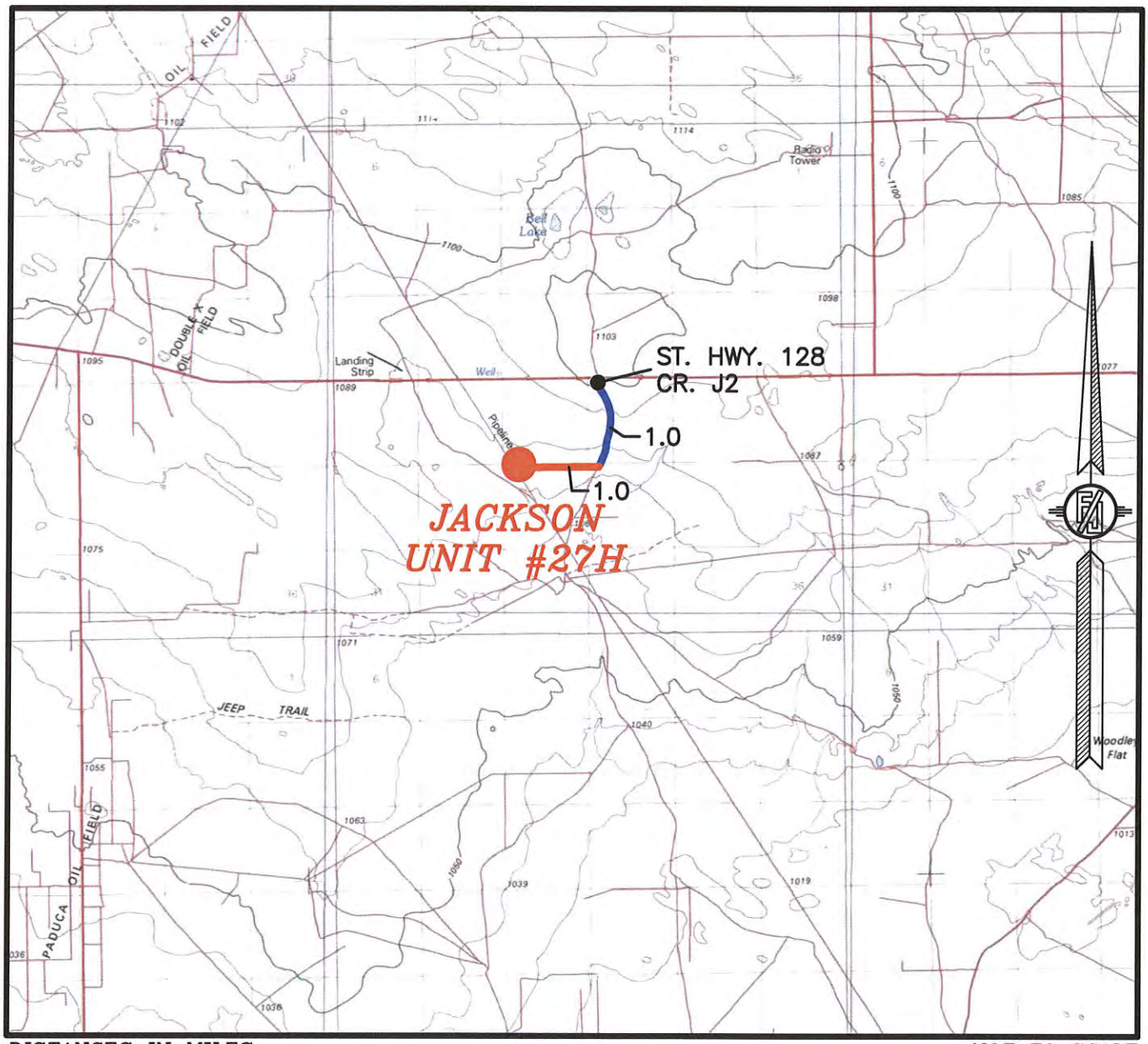
LOCATED 200 FT. FROM THE SOUTH LINE
AND 1070 FT. FROM THE WEST LINE OF
SECTION 21, TOWNSHIP 24 SOUTH,
RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

MARCH 4, 2014

SURVEY NO. 2572

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

# SECTION 21, TOWNSHIP 24 SOUTH, RANGE 33 EAST, N.M.P.M.
# LEA COUNTY, STATE OF NEW MEXICO
# VICINITY MAP




DISTANCES IN MILES

NOT TO SCALE

**DIRECTIONS TO LOCATION**
FROM STATE HWY. 128 AND CR. J2 (DIAMOND RD.) GO SOUTH ON CR. J2 1.0 MILES, TURN RIGHT ON CALICHE ROAD AND GO WEST 1.0 MILES AND LOCATION IS ON THE RIGHT (NORTH) 170'.

MURCHISON OIL & GAS, INC.
**JACKSON UNIT #27H**
LOCATED 200 FT. FROM THE SOUTH LINE AND 1070 FT. FROM THE WEST LINE OF SECTION 21, TOWNSHIP 24 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

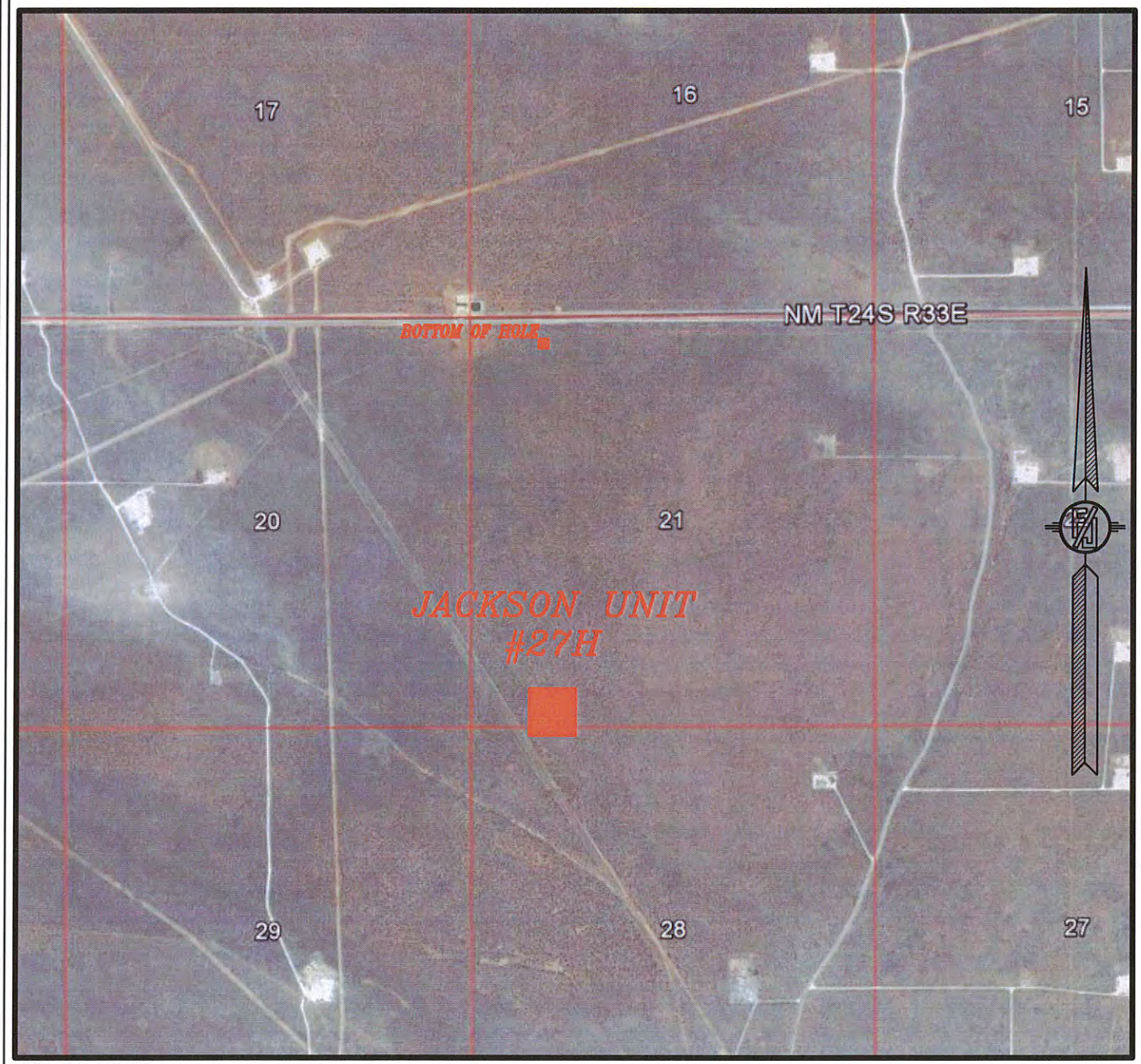
MARCH 4, 2014

SURVEY NO. 2572

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

SECTION 21, TOWNSHIP 24 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

# AERIAL PHOTO




NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
MARCH 2012

MURCHISON OIL & GAS, INC.

**JACKSON UNIT #27H**

LOCATED 200 FT. FROM THE SOUTH LINE
AND 1070 FT. FROM THE WEST LINE OF
SECTION 21, TOWNSHIP 24 SOUTH,
RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

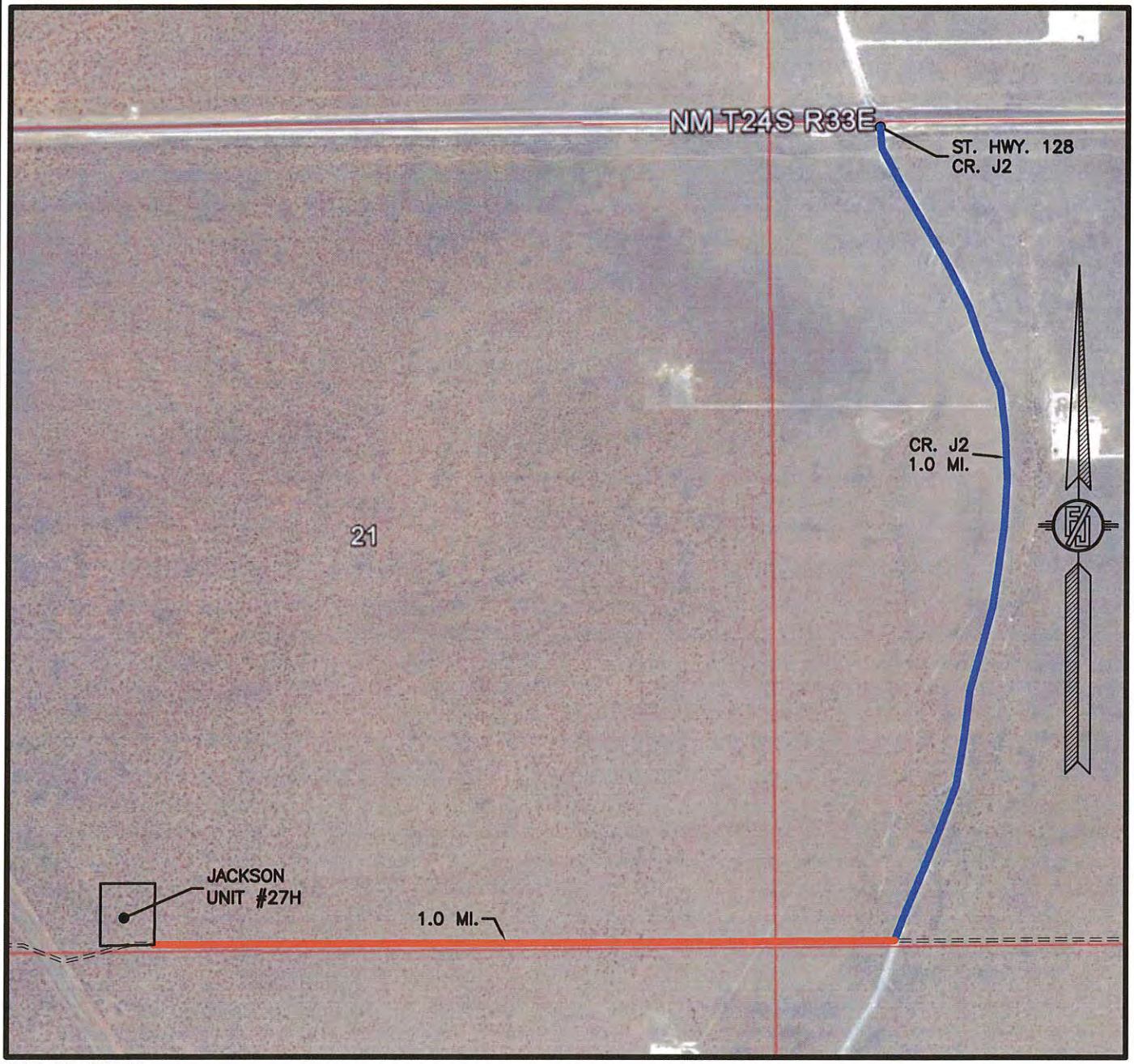
MARCH 4, 2014

SURVEY NO. 2572

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

SECTION 21, TOWNSHIP 24 SOUTH, RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

# AERIAL ACCESS ROUTE MAP




NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
MARCH 2012

MURCHISON OIL & GAS, INC.

**JACKSON UNIT #27H**

LOCATED 200 FT. FROM THE SOUTH LINE
AND 1070 FT. FROM THE WEST LINE OF
SECTION 21, TOWNSHIP 24 SOUTH,
RANGE 33 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

MARCH 4, 2014

SURVEY NO. 2572

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

Plate 1 shows 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 outer and inner drilling cells and an optional fluids cell as described below:

1. Drilling cells (reserve pit) consist of:
    a. An outer horseshoe for
        i. fresh water and cut-brine fluid and cuttings or
        ii. brine and cut-brine fluid and cuttings
    b. An inner horseshoe for
        i. brine and fluid and cuttings or
        ii. fresh water fluid and cuttings
2. The optional fluids cell may be used
    a. For storage of fresh water used in drilling or stimulation
    b. For storage of stimulation flow-back (fresh) water prior to re-use or disposal
    c. As an approved disposal site for drilling solids derived from a nearby well on the same lease. Prior to such disposal the operator will provide notice to OCD that
        i. Identifies the well(s) to be served by the fluids cell of the temporary pit
        ii. Provides the date that the drilling rig moved from the first well using the pit
        iii. Affirms that the fluids pit will be closed in conformance with the mandates of the Rule

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 or rinse the solids to remove salt and/or petroleum hydrocarbons. The drainage system may be installed in the entire drilling cell or only in one horseshoe (e.g. the inner horseshoe). As described in the closure plan, this system of fabric-wrapped perforated pipe and drainage mats lie on the bottom of the drilling cells of the pit. The system will drain to the lowest corner of horseshoe where a standpipe rises from the depression to the top of the berm. The drainage system can remove 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. After any rinsing process, the 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
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 any 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 LLDPE string-reinforced liner (that meets the requirements of OCD Rules for temporary pits) 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.

**Earthwork**

The temporary pit will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base that is 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 as specified by and meets all requirements of OCD Rules.

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.

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.

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. However, a transmittal letter may notify OCD that drilling waste from a nearby site on the same lease may be placed in the temporary pit (e.g. placed in the drilling or fluids cells of the temporary pit). A notice will include the name of the nearby well, the date that the drilling or workover rig moved from the temporary pit, an affirmation that the temporary pit will be closed in conformance with the mandates of the Rule, including the mandated lifetime of the pit.

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 via email, which serves as notification that the operator intends on-site burial of solids.

**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 Plate 1. The optional drainage system described in the design and construction plan is not shown on the Plate 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 last drilling or workover rig associated with the relevant pit permit.
- 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 the fluids cell of the temporary pit; thereby further rinsing the residual solids in the pit.
- 20-60 days after placement of fresh or 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, an eight-point composite sample of the residual solids in the drilling cell of the temporary pit and a five-point composite sample of any solids in the fluids cell of the temporary 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 after being mixed in a ratio of 3:1 with the earth material to be used for stabilization of the residual cuttings and mud. A volumetric average of the laboratory result from the drilling cell solids and any fluid cells solids will be used to determine compliance with the standards of Table II.

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 sloping surface of the stabilized waste material. It will be placed in a manner so as 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
3. Over the sloping, stabilized material and liner, place the **Soil Cover** of:
    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.

**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-l05
if burial includes solids derived from a nearby well on the same lease, the report will list the name, API # and location of the well(s) from which the solids originated

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 rig was released from the first well using the pit. This date will be noted on form C-105 or C-103 filed with the division upon the well's completion (or re-completion in the case of a workover).

**Reclamation and Re-vegetation Plan**

In addition to the area of the in-place burial, the operator will reclaim the surface impacted by the temporary pit, including access roads associated with the pit, to a safe and stable condition that blends with the surrounding undisturbed area including:

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. This includes the area of the temporary pit if a transmittal letter to OCD proposes an alternative to the re-vegetation or recontouring requirement with

- a demonstration that the proposed alternative provides equal or better prevention of erosion, and protection of fresh water, public health and the environment
- written documentation that the alternative is agreed upon by the surface owner.

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

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.

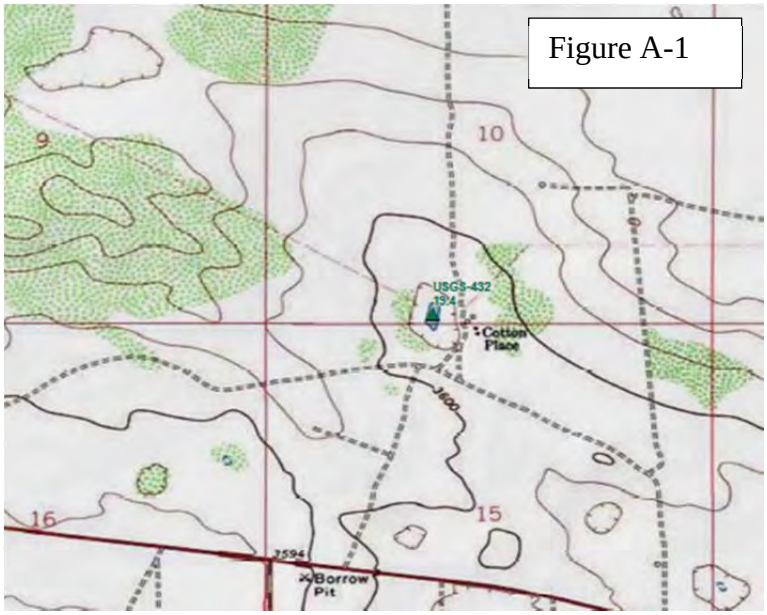
# Appendix A

## Hydrogeology of Bell Lake Area

## Geology and Topography of Bell Lake Area

Quaternary Age eolian and piedmont deposits (Qe/Qp on Figure 1) are the dominant exposed material in the area. These deposits are a thin covering of the underlying Tertiary Ogallala Formation or, in some places, the redbeds of the Dockum Group. The Ogallala Formation (To) is locally exposed and consists primarily of sand with some clay, silt and gravel, generally capped by caliche. Based on information from Ground-Water Report 6 (GWR-6) *Geology and Ground-Water Conditions in Southern Lea County, New Mexico* by Alexander Nicholson and Alfred Clebsch (1961), the top of the redbeds near Bell Lake is about 3500-3600 above sea level (see Plate 1 of GWR-6). Because the area outside of the Bell Lake Sink lies at an elevation of 3600 feet, the Ogallala Formation, if it is present, could be about 100 feet thick near Bell Lake. In other nearby areas, the thickness of the Ogallala could be more or less than 100 feet.

Topographically, the western three quarters of the area of interest slopes gently to the southeast or, locally in Figures 1 and 2, to the south. This sloping surface is punctuated by several closed depressions. The Bell Lake Sink (see Exhibits A and B; attached), a 2-mile wide circular depression is the most obvious of several. These depressions have been described as an ancient collapse feature (breccia pipes) associated with the removal of salt due to upward groundwater flow from the Capitan Reef[1]. One smaller depression exists about 5 miles west of the Bell Lake Sink in Section 10 T24S R32E, the Cotton Place (Exhibits A and B, also shown in Figure A-1).




The northeast quarter of Figure 1 and Figure 2 show Antelope Ridge grading northeast into the gently sloping surface described above and the topographic low of the San Simon Swale. As shown on Exhibit A and B, the San Simon Sink, is a collapse feature akin to the Bell Lake Sink.

Within the two Sinks mentioned above and a smaller closed depression associated with Red Tank in the southeastern portion of Figure 1, older alluvium (Qoa) is exposed at the surface.

## Groundwater Data

We relied upon the recent data from the USGS and other professionals to create the water table elevation map shown in Figure 2. The USGS data are based upon measured groundwater levels performed by professionals and we have identified few errors in their data. However, we also

[1] See http://nmgs.nmt.edu/publications/guidebooks/downloads/57/57_p 233-242.pdf

considered the data from the "Misc" water wells identified on Figure 1. The "Misc" well data are generally measured water levels, but this dataset contains errors (generally of location). Additionally, Hicks Consultants measured water levels in several wells to confirm or add to public data – these data are part of the "Misc" data set.

In general, we do not employ water level data from the OSE database as these data rely upon observed water levels by drillers during the completion of the water well. The OSE dataset can provide some useful data in certain areas.

For the potentiometric surface map (Figure 2), we honored all data that we know are true. For example, we employed data from the Jackson Unit 15H (Misc-98), Mogi 9 State 1H (Misc-69), Bettis 20 State Com 2H (Misc-137), Atoka Bank BDJ State Com 2H (Misc-136), and the Brinninstool 4 State 3H (Misc-70) ratholes located near Bell Lake. We personally logged the cuttings from these borings – these cuttings were dust/dry at a depth of 120 feet. While the borings terminated above the regional aquifer, they provide data that are useful for the mapping. It is these data from the ratholes that demonstrate the horizontal limits of water bodies that are perched within the Bell Lake Sink.

With respect to other "Misc." wells shown on Figure 1, below are the results of the field inspections:

- Water well Misc -16 (C2279) is a windmill at the Ranch Headquarters accessed on November 12, 2013 and the depth to water is greater than 454 feet.
- Water well Misc-19 (445, C2308) was accessed on October 10, 2012 and the depth-to-water was measured at 22 feet below ground surface.
- Depth to water in well Misc-62(C 2312) was measured on April 3, 2013 at 112.4.
- Well Misc-14 is plugged and abandoned.
- The Bell Lake Windmill, which is not labeled as a "Misc" well but is identified on the USGS topographic map, is plugged.

## Hydrogeology

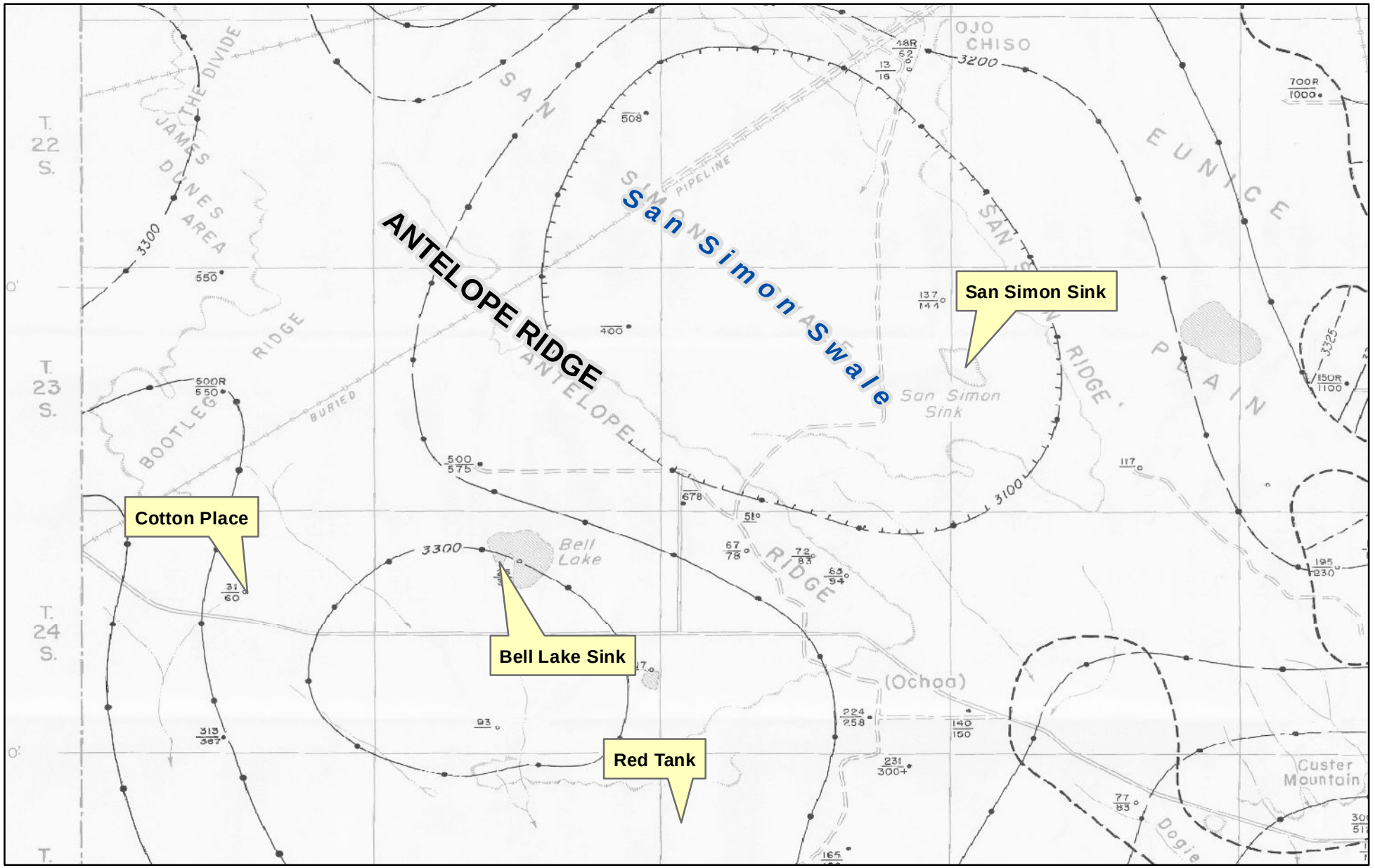
GWR-6 (1961) indicates that Ogallala groundwater is not present as a regional aquifer within the Bell Lake area. The lack of a regional water table aquifer described in GWR-6 is borne out in the data from well Misc-13, located about 2 miles east from the proposed pit. Here, the water supply well spuds on Ogallala Formation (To), is drilled to a total depth of 232 feet and records a water level of 208.7 feet below land surface. All wells outside of ancient collapse features record water levels below the projected base of the Ogallala and tap water bearing units within the red beds (Dockum Group). Based on the depth-to-water measurements (published and recent) the regional groundwater (Triassic Santa Rosa Formation) is present across the area at an elevation below 3,375 feet.

The Bell Lake Windmill and wells Misc-19/USGS-445 obviously tap a shallow water table associated with the collapse features described above. Within the Bell Lake Sink are two water supply wells (visible on USGS topographic maps), the plugged Bell Lake Windmill and the abandoned (but open casing) Bell Well. The water level in the abandoned Bell Well is 22 feet below grade at a projected elevation of 3,568 (3590-22). Obviously this water level is highly localized because the surface elevation at Bell Lake is 3,562 (about 5-feet lower than the Bell Lake Windmill) and the lake holds no water. The horizontal limit of groundwater within the Bell

Lake Sink is also documented by the hydrogeologic logging conducted at the Jackson Unit 15H (Misc-98), Mogi 9 State 1H (Misc-69), Bettis 20 State Com 2H (Misc-137), Atoka Bank BDJ State Com 2H (Misc-136), and the Brinninstool 4 State 3H (Misc-70) sites where the 120-foot deep borings were logged as dry sediments.

Because groundwater within the various depressions is shallow (i.e. less than 30 feet below surface) and limited in horizontal extent, we did not employ these data to determine the elevation of the regionally-extensive water table (Figure 2).

The potentiometric surface map displayed in Figure 2 is different from that in 1961 map published in GW Report 6 (Exhibit A) and the 1971 map published in Open File Report OF-95 (see Exhibit B). We believe the principal differences between Figure 2 and the potentiometric surface map in GW Report 6 are due to the fact that there are now significantly more data points available to create Figure 2. With respect to the map presented in Open File Report OF-95, more data also contributes to the differences. However, the 1961 and 1971 maps suggest that the perched, localized groundwater in Bell Lake Sink and similar depressions are representative of the underlying Dockum Group aquifer. Figure 2 distinguishes between the shallow (perched and Ogallala) and deep (Dockum) groundwater zones.

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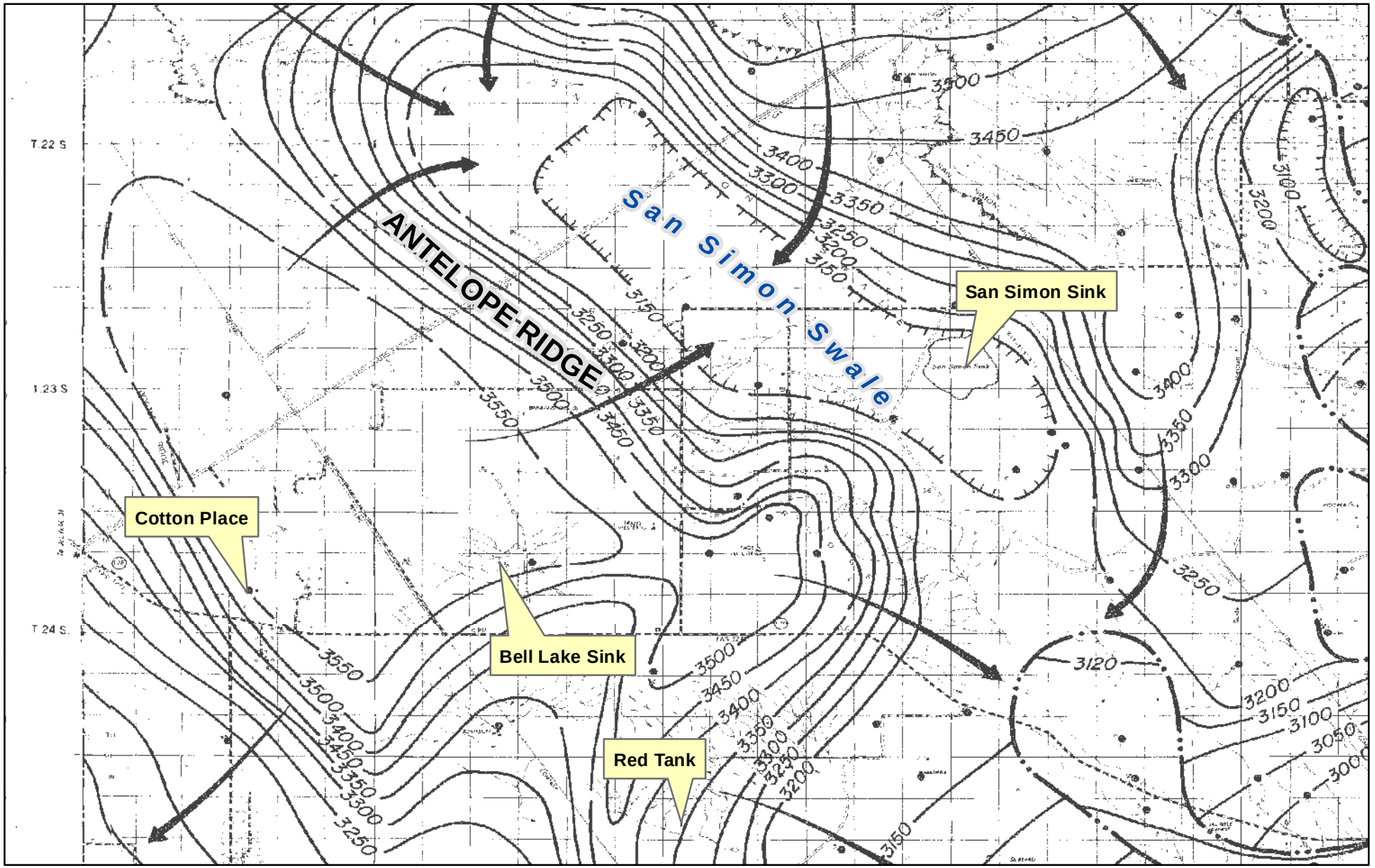
| Nichelson and Clebsch (1961) | Exhibit A |
| Appendix A Supplement Map | November 2013 |

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| Open File Report 95 (OF-95) | Exhibit B |
| Appendix A Supplement Map | November 2013 |