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

DENIED

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: Strata Production OGRID #: 21712

Address: PO Drawer 1030, Roswell, NM 88202

Facility or well name: Sandy Federal #4H

API Number: 30-015-41042 OCD Permit Number:

U/L or Qtr/Qtr L Section 24 Township 23S Range 30E County: Eddy

Center of Proposed Design: Latitude 500 ft FWL Longitude 2180 FSL 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 44,774 bbl Dimensions: L 210 x W 210 x D 6-10 ft Drilling Pit

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. - ☐ 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 **See Figures 1 & 2**	☐ Yes ☒ No
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_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. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	☐ Yes ☒ No ☐ 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	☐ Yes ☒ No ☐ 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	☒ Yes ☐ No ☐ 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	☐ 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	☐ 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. - 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. 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. - Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☒ No
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	☐ Yes ☒ No
Within an unstable area. - 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. - 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): Paul Ragsdale Title: Operations Manager

Signature: Paul Ragsdale Date: April 21, 2014

e-mail address: pragsdale@stratanm.com Telephone: 575-622-1127

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

OCD Representative Signature: DENIED **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: _____

April 2014

C-144 Permit Package for
Sandy Federal 4H
Temporary Pit
Section 24 T23S R30E, Eddy NM

View southeast at sunset showing topography and vegetation near proposed location.

Prepared for
Strata Production
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

April 21, 2014

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

RE: Strata Production Sandy Federal 4H

Dear Mike:

Enclosed is a C-144 permit application for the above-referenced well. Please note the following elements of this application:

1. Except for the Closure Plan, the Generic Plans included in this submission have been recently approved by OCD. We are currently working with OCD Hobbs to gain approval of the generic closure plan.
2. Plates 1 and 2 are based on a previously-approved C-144 application with similar dimensions and volumes. A north arrow is not shown in the figure as the layout of the pit (north or east) will be conducted with the contractor and/or BLM to determine the best location for the least environmental impact.
3. We anticipate "in place" burial of stabilized solids.
4. I certify that I performed a visual inspection of the site.
5. Appendix A provides a detailed discussion of the geology, geomorphology and karst potential of the area surrounding area of the proposed pits. We conclude that unstable ground does not exist in this area.
6. BLM is revising their map to correct the classification of the area as "high karst potential".
7. This application is copied to the BLM as the surface owner's representative, to provide notice of the intent of on-site burial of drilling waste.

Please contact me if you have any questions concerning this application.

Sincerely,
R.T. Hicks Consultants

Randall Hicks

Copy: Strata Production
BLM Carlsbad Office

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

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 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 in-place closure.

Figure 1 is a geologic/ topographic map that shows:
1. The location of the staked well locations as hexagons with the surface elevation.
2. Water wells from the OSE database are plotted as a blue triangle inside colored circles that indicate well depth, if such wells exist within the area of the map. 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.
3. Water wells from the USGS database as large green triangles, if such wells existed.
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.

Our examination of the geology of the area near the proposed temporary pits (See Appendix A and the hydrogelogic discussion below) caused us to conclude that the uppermost water-bearing zone lay in the Dewey Lake Formation. Thus, we truncated the western extent of Figure 1 at the location of the contact between the Rustler Formation and the overlying Dewey Lake Formation. West of this contact, the Dewey Lake Formation has been removed by erosion. We allowed the presence of Dewey Lake wells to define northern and eastern boundaries of Figure 1. The southern boundary of Figure 1 is defined by the extent of the USGS detailed geologic map for the area (Vine, 1961, http://ngmdb.usgs.gov/Prodesc/proddesc_20861.htm).

Figure 2 is an area topographic map that shows:
1. The location of the staked locations as hexagons.
2. Water wells measured by the USGS or other parties, the total depth of the well and the calculated elevation of the groundwater surface.
3. Isocontour lines displaying the elevation of the groundwater surface of the Dewey Lake Formation.

Hydrogeology and Depth to Groundwater

As discussed in Appendix A, the Dewey Lake Formation underlies the location of the proposed pit. Beneath the Dewey Lake is the Rustler Formation. Both of these units contain groundwater for beneficial use and both units are separate aquifers with different recharge areas and different groundwater elevations. As shown in the graphic below extracted from the base map for Figure 1, the geologic contact between the Dewey Lake and underlying Rustler Formation lies about 2 miles west of the proposed pit locations and is represented by a dashed turquoise line on the western quarter of the graphic. West of this dashed line, the Rustler is exposed at the surface and the Dewey Lake has been removed by erosion. East of the dashed line, the Dewey Lake is

present and can contain groundwater for beneficial use. Section 23, where the Sandy Federal 4H is located, is identified on the graphic by a turquoise circle.

To create Figure 2, we relied upon the data measured by the USGS from 1959-1971 during their investigation of the Gnome Site (http://pubs.usgs.gov/pp/0712a/report.pdf) and some wells measured by others and published in Open File Report 95 (https://geoinfo.nmt.edu/publications/openfile/downloads/OFR014-99/76-99/95/ofr_95.pdf). We used only wells that we believed tapped the Dewey Lake Formation.

For Figure 2 we did not use any data from the OSE database as this data relies 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 from Dewey Lake wells that we know are accurate to the best of our knowledge. For reasons presented below, we did not employ data from the following wells shown on Figure 2:

- The wells listed below from the west portion of Figure 2 do not tap the Dewey Lake Formation as the Dewey Lake has been removed by erosion in this area: Misc–154, -164, -147, -9, -155, -10, -7, -164, and Misc-142
- The wells listed below are drilled to a total depth that suggests completion in the Magenta Dolomite or another Rustler Formation water-bearing zone: Misc-139, 160, -161,-162, -163, and Misc- 143.
- Because we could find no data from Misc-142, except the location, we could not use this well to assist us in creating Figure 2

Thus, a total of 13 wells shown on Figure 2 are completed in the Dewey Lake Formation and provide measured water levels from various dates (see Table 1). From these data we conclude:

- Beneath the proposed pit, the elevation of the uppermost water bearing zone (Dewey Lake Formation) is approximately 3030.

- Given the surface elevation of the well (3263) and a 10-foot deep temporary pit, the distance between the bottom of the pit and the groundwater surface is about 220 feet (3263-10-3030=)

Misc #	Well Type	Name of Well	Date Measured	TRSQQQ	Elevation	DTW FT	TD FT	GW Eleve	Source	Comments/Verified
7	Stock Well		No Date		3030.0				WAIDS	
8	Stock Well		04/20/1959		3250.0	260.5	318.4	2931.6	OFR-93	
9	Stock Well		12/22/1948	23.30.6.110	3000.0	110.0	200.0	2890.0	OFR-94	
10	Stock Well		10/20/1977	23.30.19.123	3036.0	54.9	59.6	2981.1	OFR-95	Aerial Photo
11	Stock Well		12/19/1977	23.30.11.222	3248.0	262.8	284.0	2985.0	OFR-95	
138	Stock Well	Indian Well	04/06/1959	23.30.21.122	3165.0	179.2	203.6	2985.8	USGS Gnome Site	Topo
139	Not Recorded		No Date	23.30.4.144	3065.0		1053.0		OFR-95	Not located on topo or aerial
141	Not Recorded		03/09/1976	23.31.5.324	3325.0	126.4	231.0	3198.6	OFR-95	Not located on topo or aerial
140	Stock		No Date	23.31.7.220	3310.0	140.0	180.0	3170.0	OFR-95	Not located on topo or aerial
142	Not Recorded	James	No Date	23.30.24.130	3258.0				OFR-95	
143	Stock Well		10/19/1977	23.31.29.113	3333.0	139.0	144.0	3194.1	OFR-95	Topo
142	Stock Well		12/19/1977	24.30.19.421	3169.0	229.9	279.8	2939.1	OFR-95	Topo and Aerial Photo
143	Stock, Windmill	New Windmill	10/19/1977	24.30.19.314	3437.0	448.3	450.3	2988.7	OFR-95	Topo and Aerial Photo
145	Not Recorded	Twin Wells Ranch/Snyder Wells	12/19/1977	24.31.17.111	3521.0	78.9	153.7	3442.1	OFR-95	Aerial Photo
146	Unused		10/19/1977	22.31.15.131	3460.0	126.9	170.0	3333.1	OFR-95	
147	Observation		11/09/1977	22.30.32.114	3024.0	22.4	92.0	3001.6	OFR-95	
148	Domestic/Stock		02/19/1959	22.30.10.310	3135.0	60.7	66.7	3074.3	USGS Gnome Site	Aerial Photo
154	Well		04/14/1959	22.30.8.241	3155.0	104.8	180.3	3050.2	USGS Gnome Site	
155	Stock Well	Nash Well	08/19/1958	23.30.2.424	2980.0	6.5	30.0	2973.5	USGS Gnome Site	
156	Domesitc Well		02/04/1959	23.31.6.320	3300.0	144.7	212.9	3155.3	USGS Gnome Site	Aerial Photo
158	Domestic Well		05/04/1959	23.31.6.444	3310.0	105.6	166.4	3204.4	USGS Gnome Site	Aerial Photo
159	Domestic Well		02/04/1959	23.31.7.222	3300.0	94.4	122.4	3177.6	USGS Gnome Site	Aerial Photo
161	Stock Well		02/04/1959	23.31.26.340	3480.0		361.3		USGS Gnome Site	Aerial Photo
160	Stock Well	Unger well	03/27/1959	23.31.17.310	3305.0	109.4	354.0	3195.6	USGS Gnome Site	Aerial Photo
162	Stock Well	Engles well	03/13/1959	24.31.4.430	3420.0	423.6	626.5	2996.4	USGS Gnome Site	Aerial and Topo
163	Domestic well	Ranch Headquarters well	03/25/1959	24.31.17.111	3510.0	68.4	85.0	3425.0	USGS Gnome Site	
163	Stock Well	Poker Well	06/14/1961	24.30.12.430	3510.0	367.1	500.0	3142.9	USGS Gnome Site	
164	Stock Well	Two mile mill	03/19/1959	24.30.18.231	3200.0	227.8	451.6	2972.2	USGS Gnome Site	Wel cased to 229 feet.
164	Stock Well		02/19/1959	22.30.20.120	3070.0	73.0	128.7	2997.0	USGS Gnome Site	

Table 1: Data from nearby wells with yellow highlight showing data used in Figure 2.

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 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 is a dune field with no established drainage
- Ephemeral watercourses are mapped about 1 mile northeast of the location

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 in-place closure.

- The nearest structures are oil and gas wells and tank batteries.

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 in-place closure.

- Figure 1 shows the locations of all area water wells, active or plugged.
- The nearest active water well is located approximately 2 miles west at the Mobley Ranch Headquarters.
- 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 in-place closure.

- The closest municipality is Loving, NM approximately 15 miles due west.
- The closest public well field is located approximately 30 miles to the west.

Distance to Wetlands

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

- The nearest designated wetlands are "freshwater pond" located approximately 2.5 miles southwest 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 3 miles south
- The pit lies within the potash main district, but active subsurface mining is more than 1 mile north.

Distance to High or Critical Karst Areas

Figure 8 shows the location of the temporary pits with respect to current 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

Appendix A presents a discussion of the geology, geomorphology and unstable ground within the area of the proposed pit. The evidence presented in the study, which included research of

published documents and a field survey concluded that no karst or unstable ground existed within the area of the proposed pit.

Because the surface owner is the Federal Government, the BLM is responsible for evaluating APDs and approving surface pits, such as the proposed drilling pit. Prior to submitting a Sundry Notice to the BLM to change the drilling plan from closed loop/haul-off to drilling pits with on-site closure, we submitted a DRAFT of Appendix A to the BLM. The response from BLM is presented at the end of Appendix A and says in part:

> …As I mentioned to you a while back on the phone, we have been planning a revision of the Karst map. Well, that finally happened and we are getting ready to put the new map into use. On the new map, the proposed locations fall under low karst occurrence potential, just barely out of medium. In this area, medium buffers high by 1 mile based on the average dip of the rustler formation. So in summary, this project is in Low, roughly one mile from High. Although this new map is not in use yet, I would not have a problem with a reserve pit from a karst standpoint…

Distance to 100-Year Floodplain

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

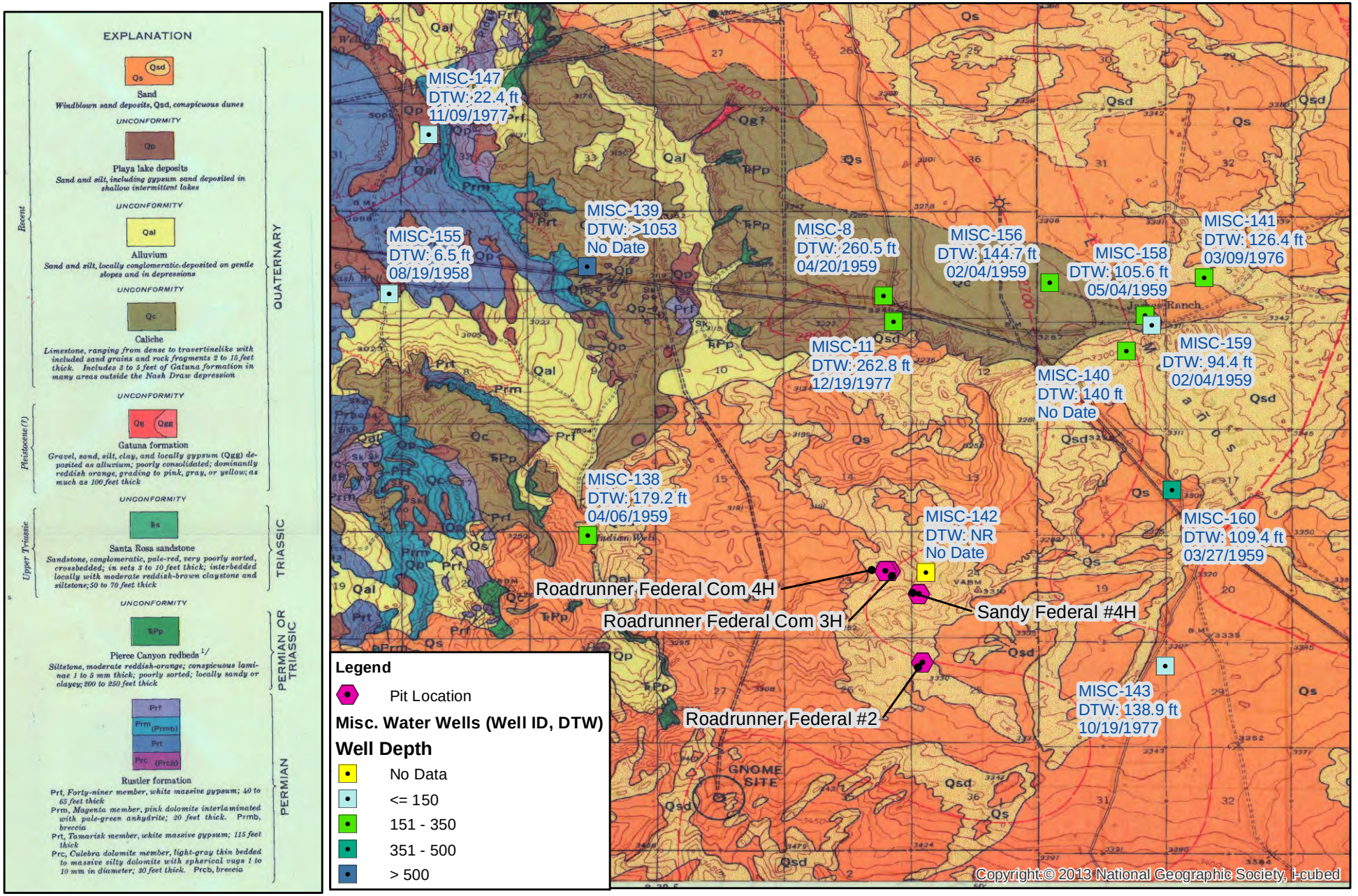
- Zone X for this map is described as areas with minimal flood hazards. However, no flood hazard analysis has been conducted.
- Our field inspection and examination of the topography permits a conclusion that the location is not within any floodplain and has low risk for flooding.

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



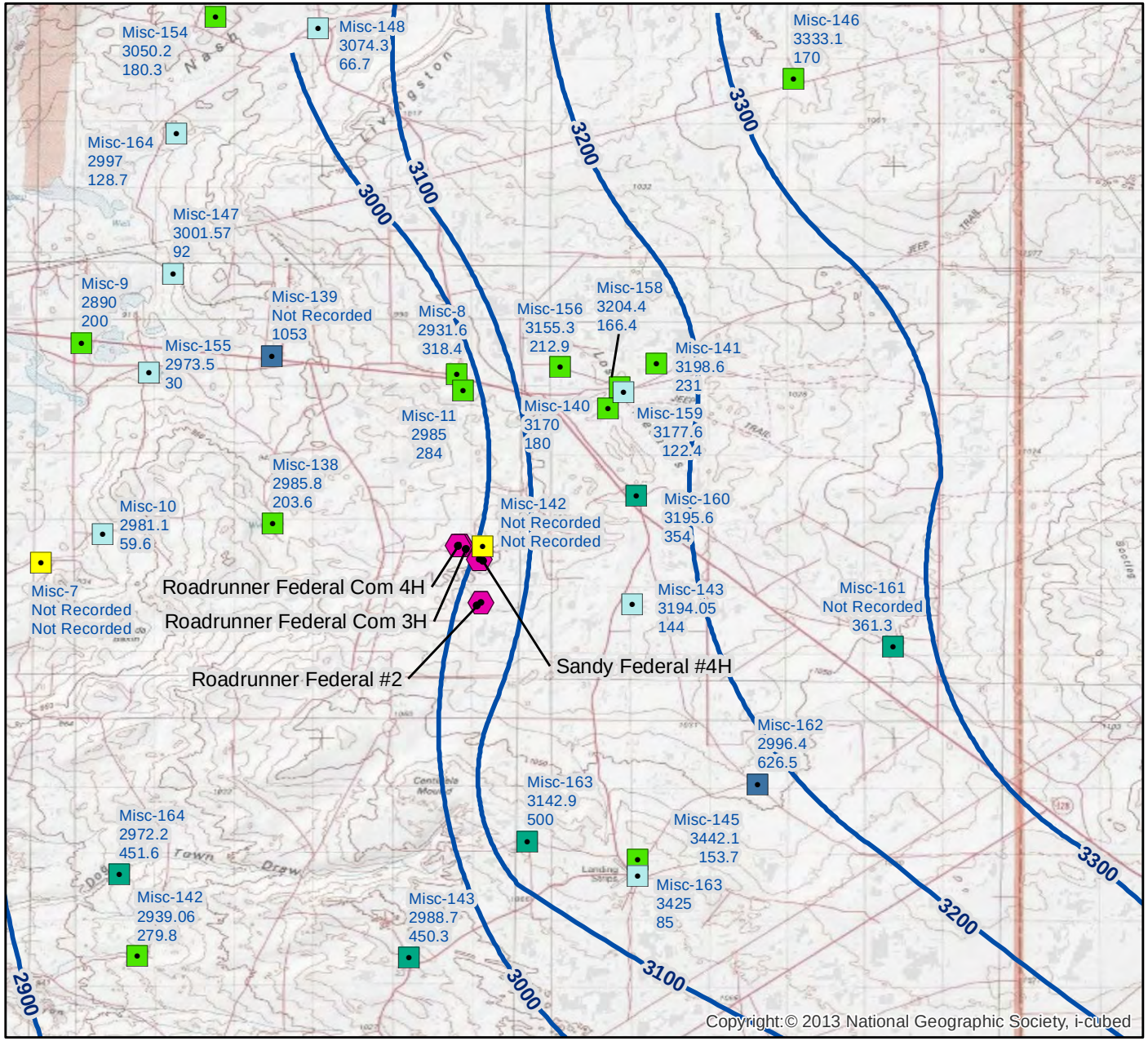
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Depth To Water and Geology

Figure 1

Strata Production Company, Inc
Forty Niner Ridge

April 2014



Legend

Pit Location

Misc. Water Wells (Well ID, GW Elev, TD)

Total Depth (ft)

- No Data
- <= 150
- 151 - 350
- 351 - 500
- > 500

Potentiometric Surface (ft msl)

- Isocontour

N W E S

0 1 2 Miles

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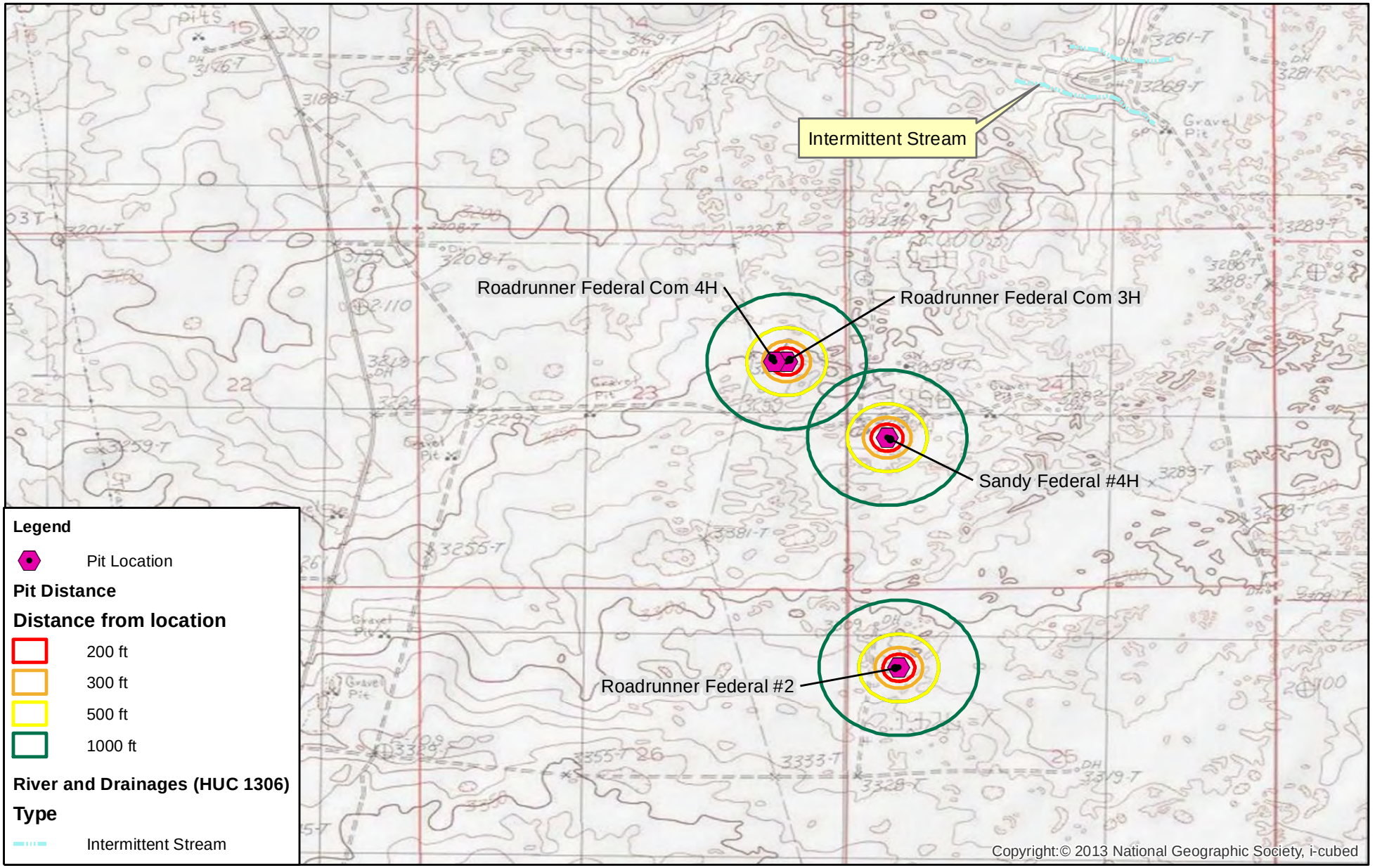
Potentiometric Surface of Dewey Lake Formation

Figure 2

Strata Production Company, Inc
Forty Niner Ridge

April 2014



N
W E
S

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Feet

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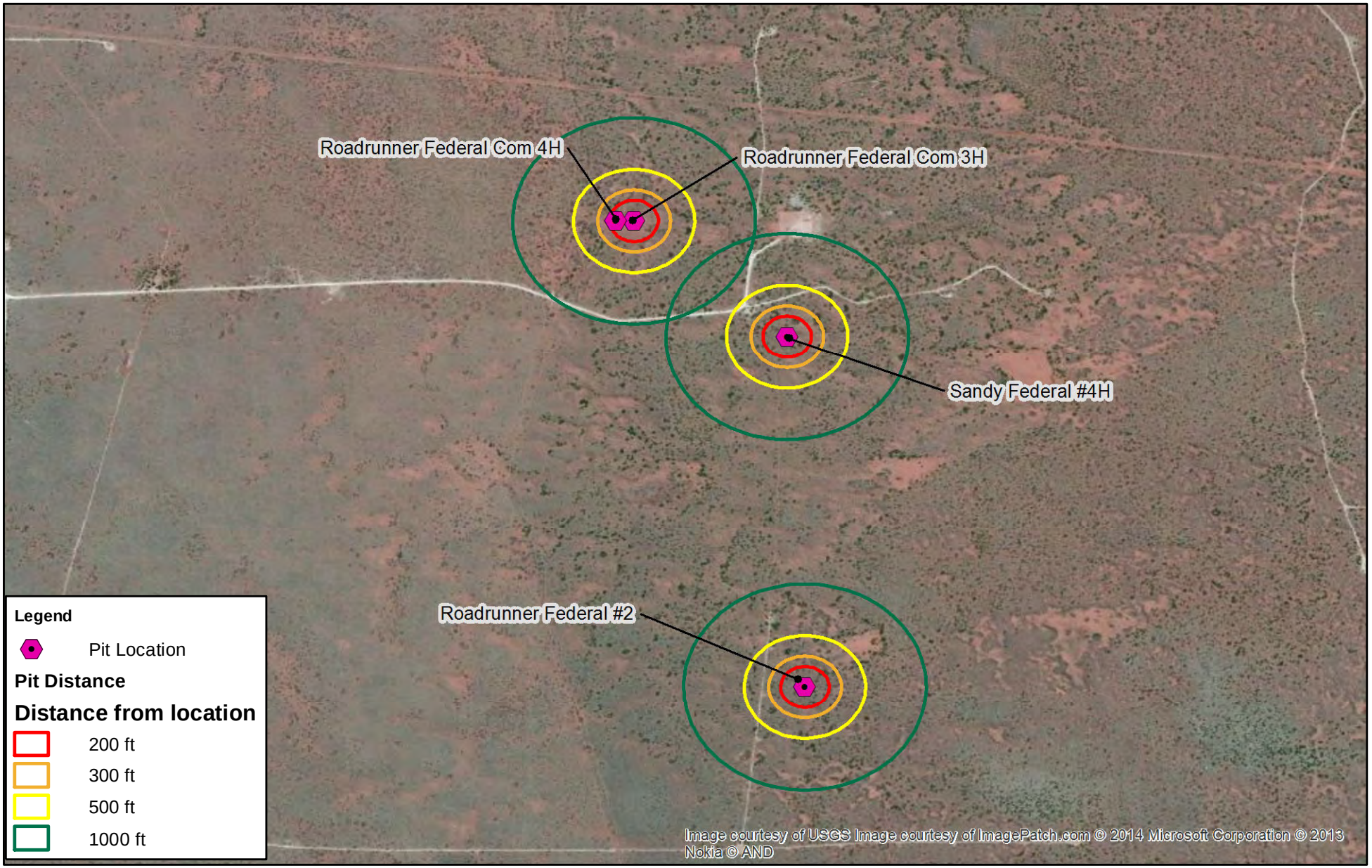
Surface Water and Topography

Figure 3

Strata Production Company, Inc
Forty Niner Ridge

April 2014

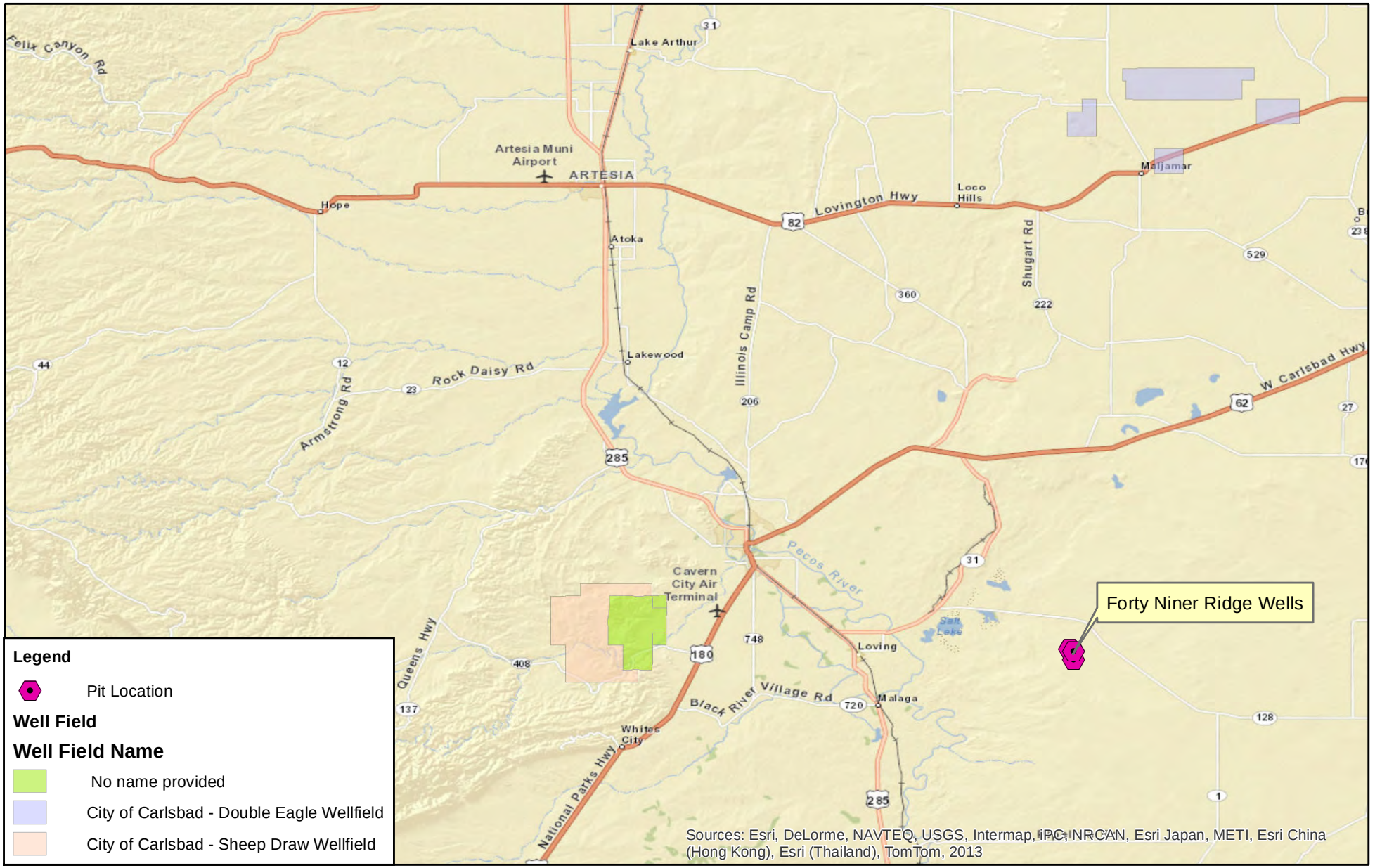


(aerial image c.2014)

N
W E
S

0 400 800
Feet

R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Structures	Figure 4
	Strata Production Company, Inc Forty Niner Ridge	April 2014



N
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0 6 12 Miles

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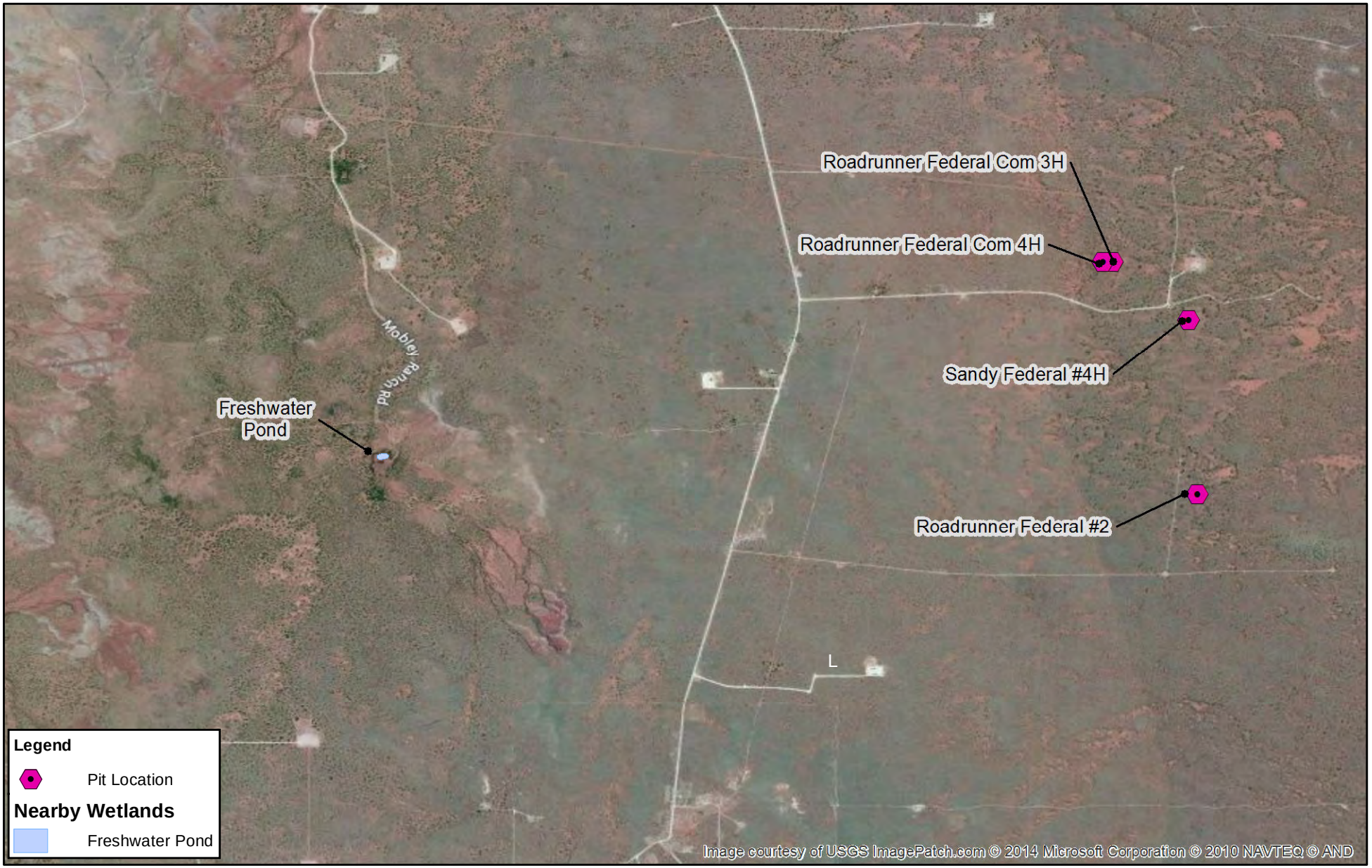
Albuquerque, NM 87104
Ph: 505.266.5004

Nearby Municipalities and Well Fields

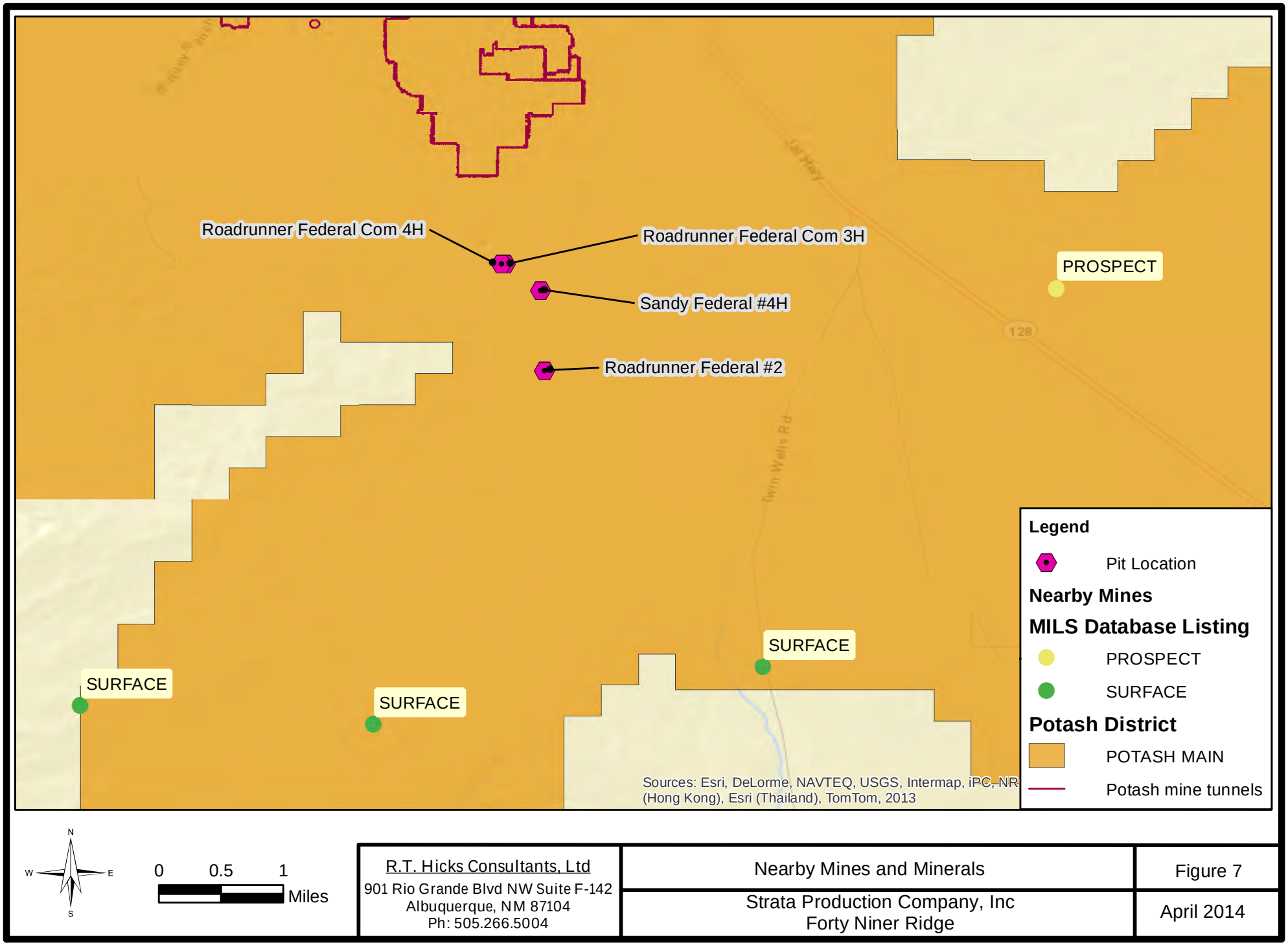
Figure 5

Strata Production Company, Inc
Forty Niner Ridge

April 2014



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearby Wetlands	Figure 6
	Strata Production Company, Inc Forty Niner Ridge	April 2014



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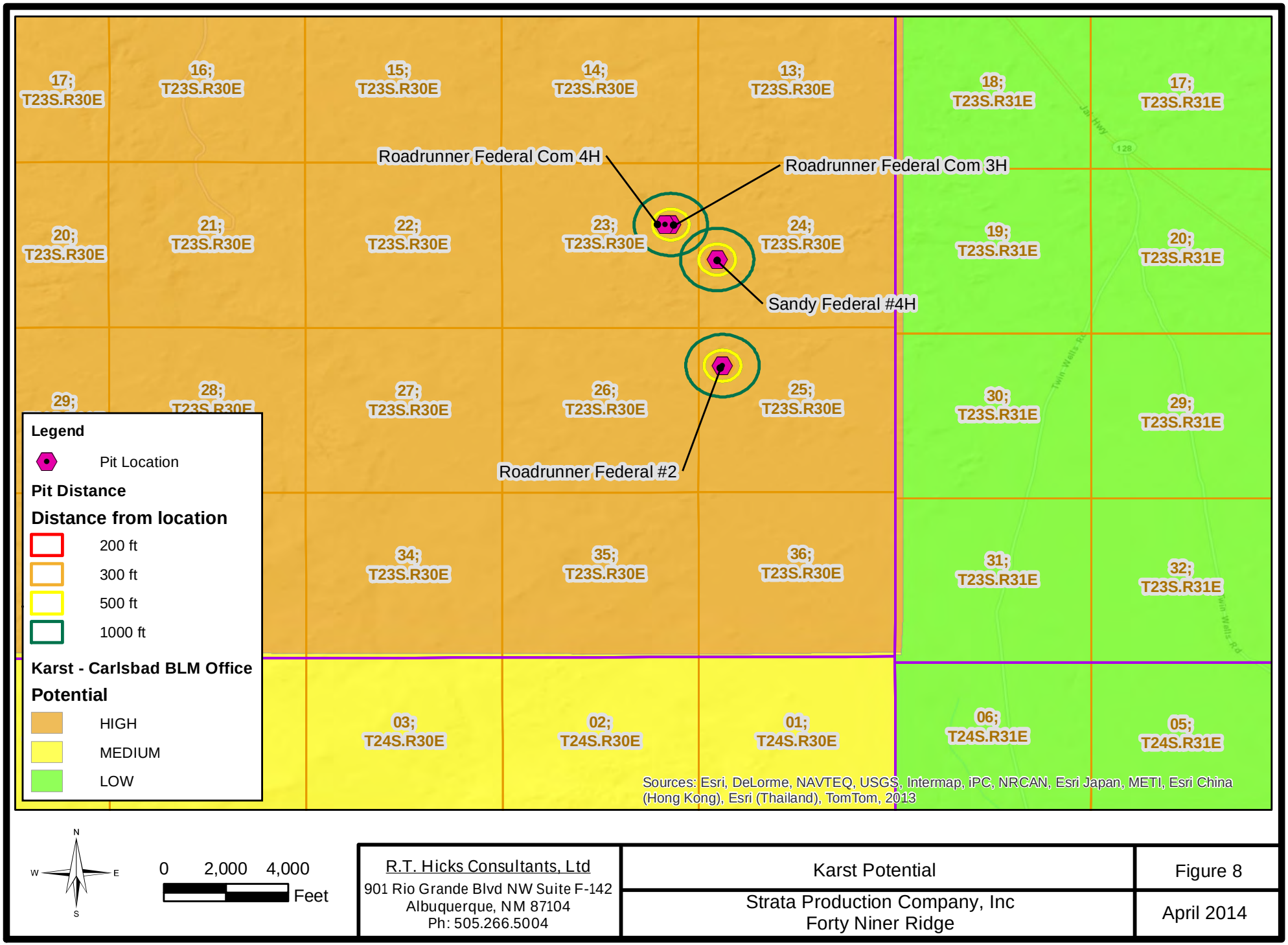
Nearby Mines and Minerals

Figure 7

Strata Production Company, Inc
Forty Niner Ridge

April 2014



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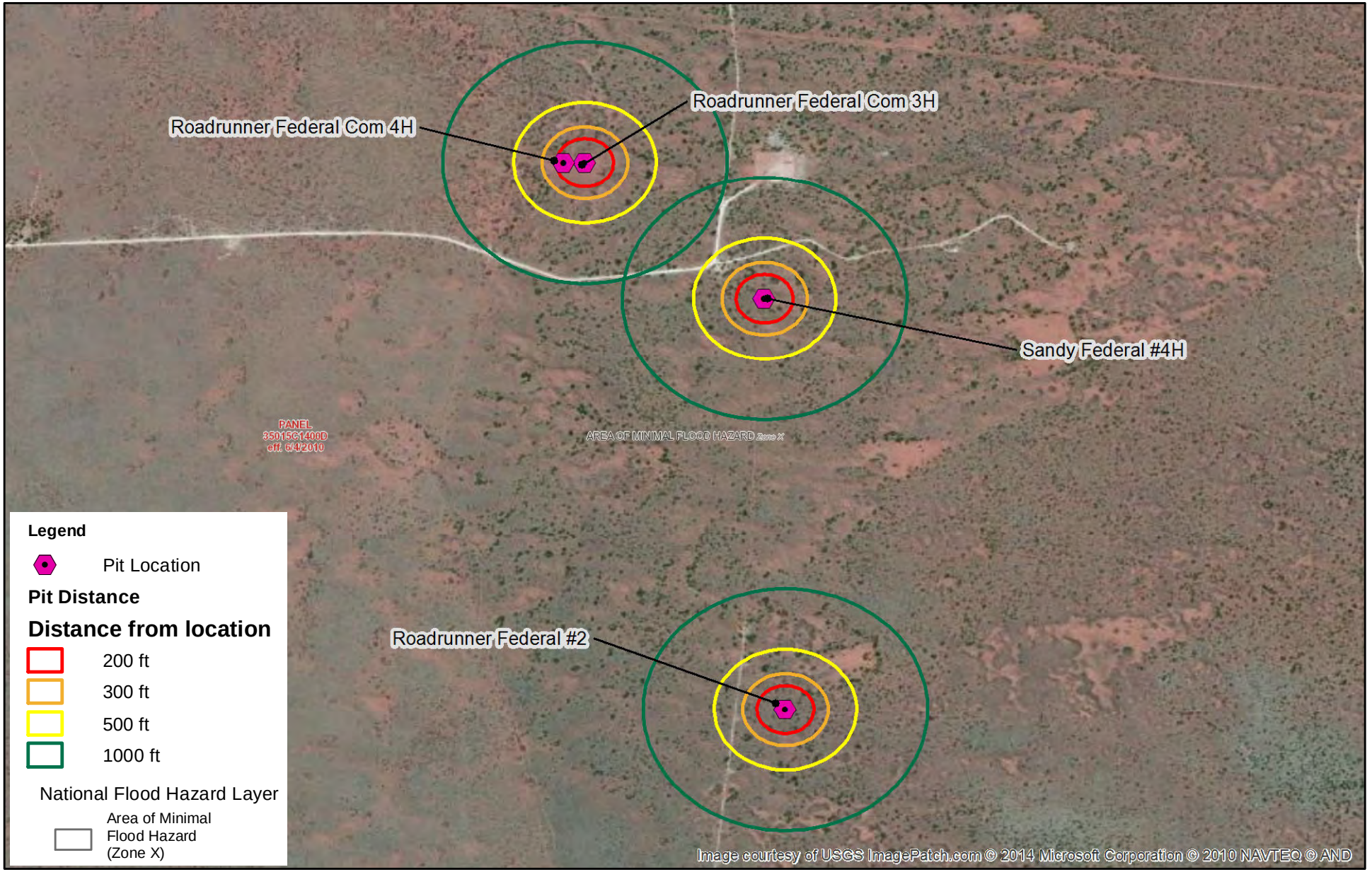
Karst Potential

Figure 8

Strata Production Company, Inc
Forty Niner Ridge

April 2014



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

N
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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

Strata Production Company, Inc
Forty Niner Ridge

April 2014

Site Specific Information Plates

R.T. Hicks Consultants, Ltd.
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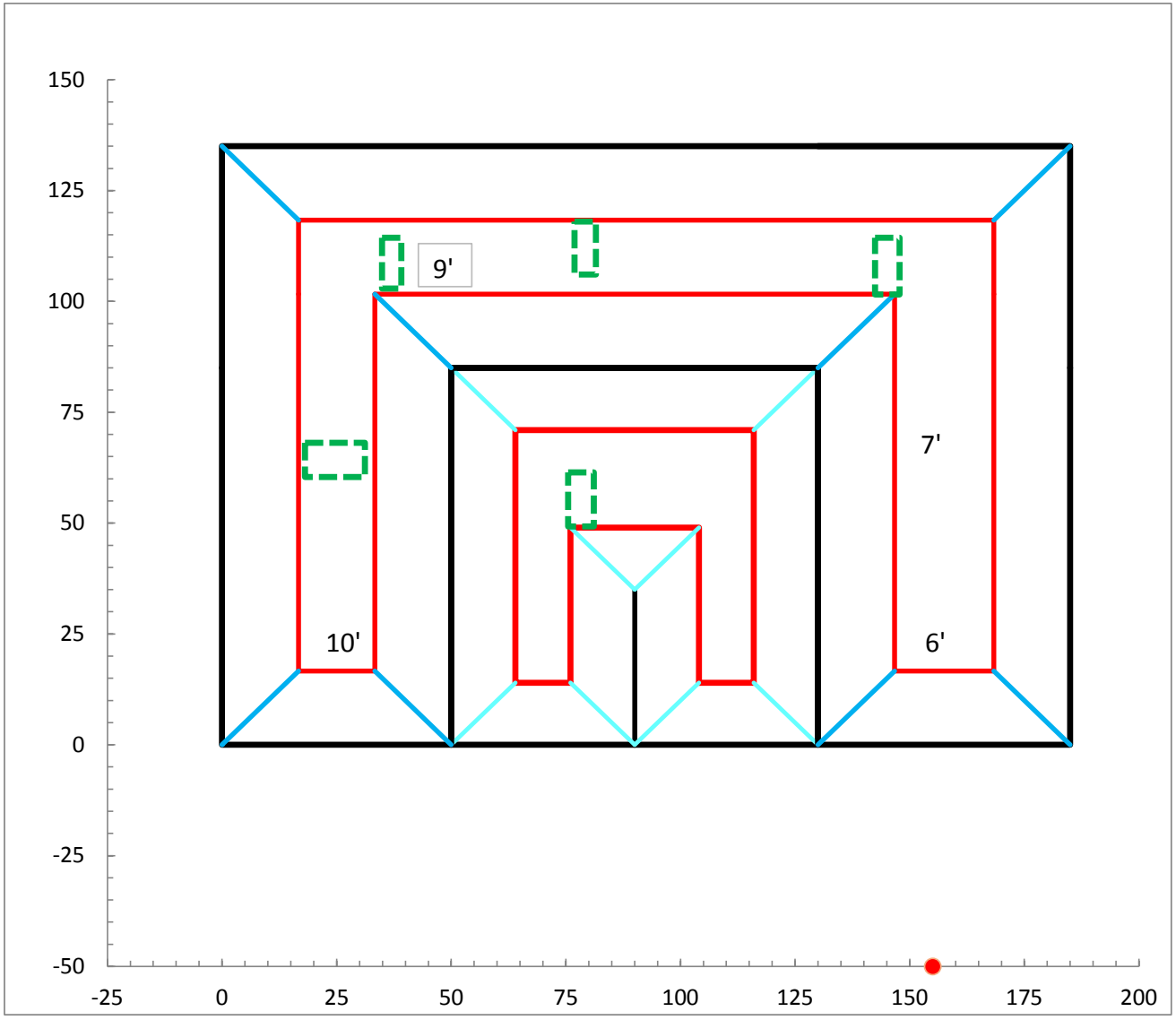
Albuquerque, NM 87104



Drilling Cell Dimensions

Drilling Cell Total Width	185.0
Drilling Cell Total Length	135.0
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)	85.0
Depth	7.0
Length of Divider	35.0
Divider Width	0.0
Width of discharge floor	12.0
Width of suction floor	12.0

Outer Horseshoe Dimensions

Width Discharge Side	55.0
Width Suction Side	50.0
Length Far Side (up down)	50.0
Width of discharge Floor	31.0
Width of Suction Floor	10.0
Width of Far Side Floor (right-left dimension)	111.0
Length of far side floor (Up-down dimension)	14.0
Depth of Discharge Side	6.0
Depth of Far Side	9.0
Depth of Suction Side	10.0

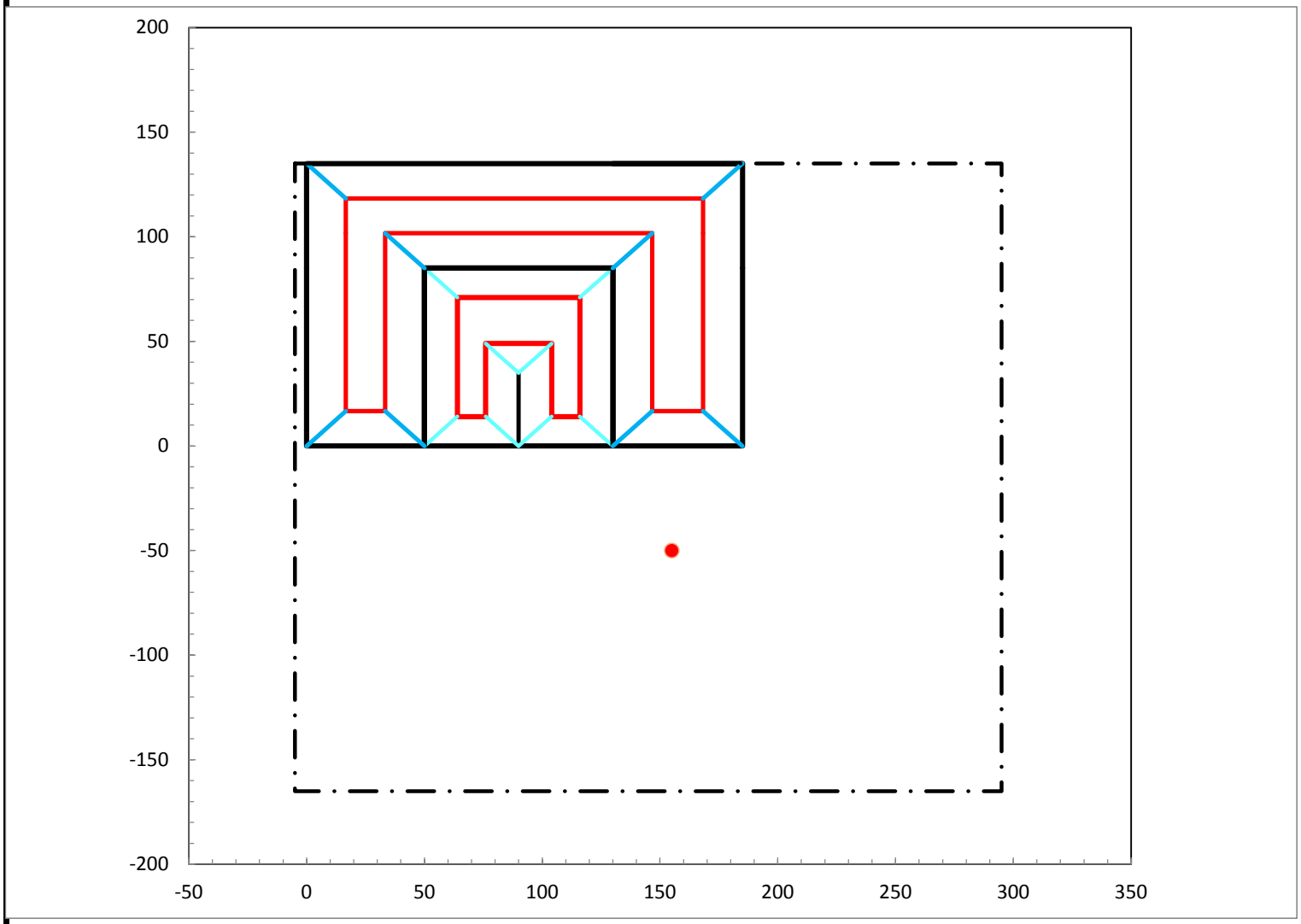
Speed Bump is 2-ft above Pit Floor

Inner Horseshoe Capacity 5313 bbl
Outer Horseshoe Capacity 18057 bbl

Fluid Cell Capacity 0 bbl
Total Capacity 23370 bbl

North

R.T. Hicks Consultants 901 Rio Grande Blvd. NW Suite F-142 Albuquerque, N. M. 87104	**Drawing of Drilling Cell** Bottom of Cell Not to Scale	**Plate 1**
	Strata Production - Sandy Federal 4H	**April 2014**



R.T. Hicks Consultants 901 Rio Grande Blvd. NW Suite F-142 Albuquerque, N. M. 87104	**Drawing of Temporary Pit and Well in Relation to Pad Boundary**	**Plate 2**
	Strata Production - Sandy Federal 4H	**April 2014**

Site Inspection Photographs

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

View north of staked location from about 50-feet south shows lease road in background.

View from about 250 feet east of location from top of dune.

Looking north from about 200 feet south of staked location

View east showing stabilized dune behind lease road and staked 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
District II
1301 W. Grand Avenue, Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

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 October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
	34750	FORTY NINER RIDGE DELAWARE

4 Property Code	5 Property Name	6 Well Number
	Sandy Federal	4

7 OGRID No.	8 Operator Name	9 Elevation
21712	Strata Production Company, Inc.	3263

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
L	24	23s	30e		2180	South	500	West	Eddy

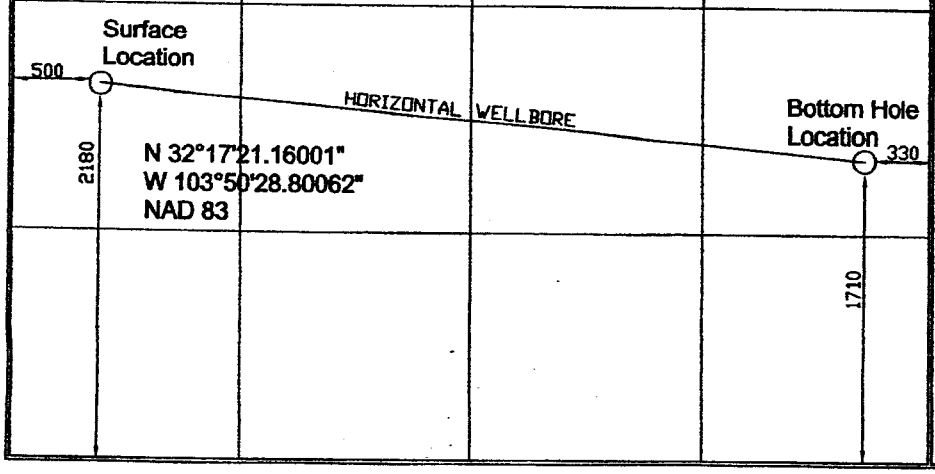
11 Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	24	23s	30e		1710	South	330	East	Eddy

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No.
160			

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.

16



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: 1-30-12

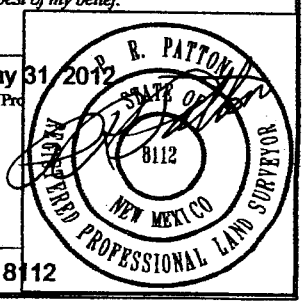
FRANK MORGAN
Printed Name

18 SURVEYOR CERTIFICATION

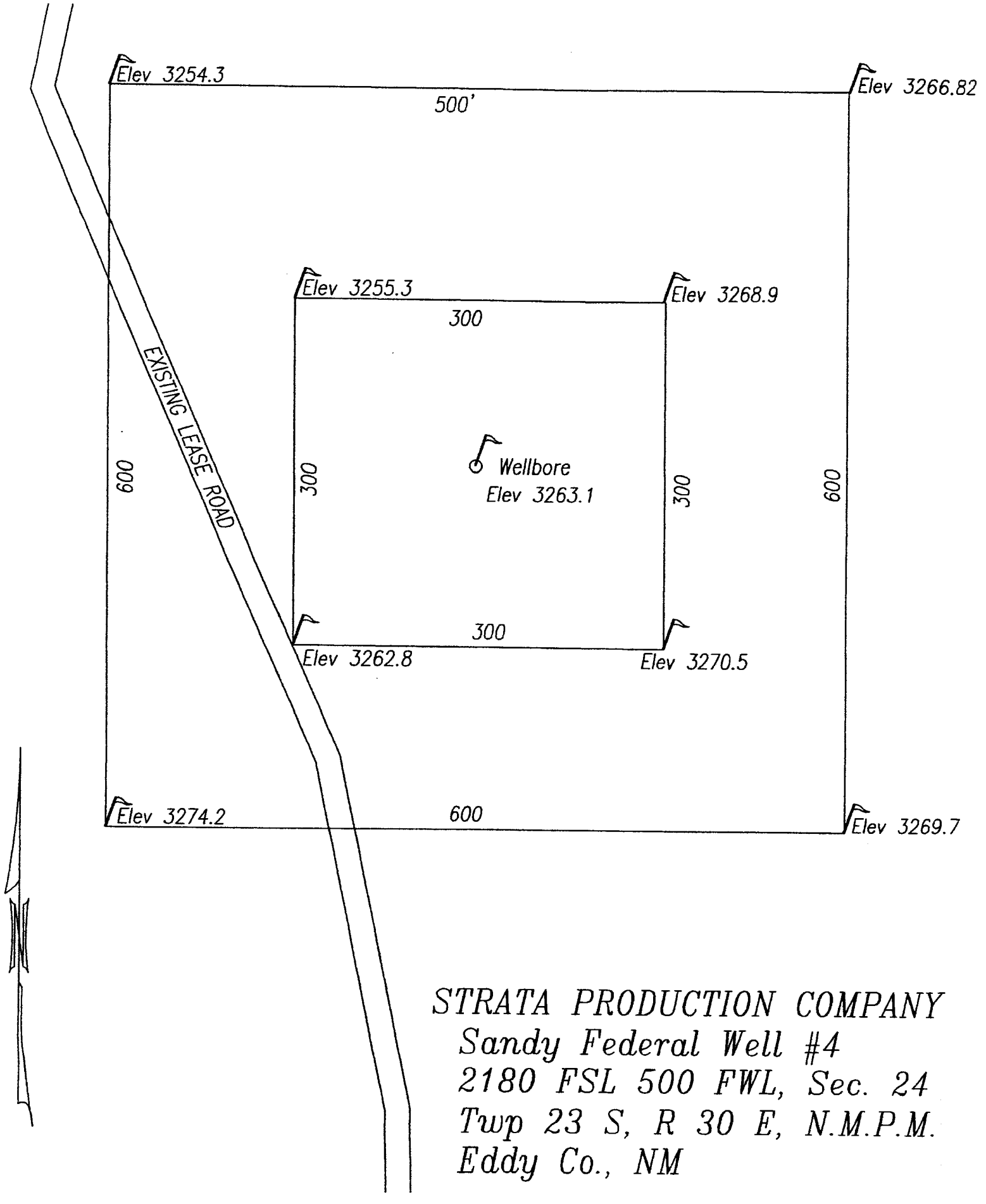
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date of Survey: May 31, 2012

Signature and Seal of Professional Surveyor



Certificate Number: 8112



STRATA PRODUCTION COMPANY
Sandy Federal Well #4
2180 FSL 500 FWL, Sec. 24
Twp 23 S, R 30 E, N.M.P.M.
Eddy Co., NM

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 consists 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 Plates 1-2. The optional drainage system described in the design and construction plan 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 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.

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

APPENDIX A: GEOLOGY, GEOMORPHOLOGY AND UNSTABLE GROUND OF T23S R30E SECTIONS 23, 24 AND 25 AND THE SURROUNDING AREA

The USGS has mapped the surface geology of the Nash Draw Area and characterized the subsurface geology at the nearby Gnome site, about 2 miles to the southwest of Sections 23, 24 and 25. The area of Nash Draw has also been studied extensively due to the proximity of the WIPP site; approximately 6 miles northeast of Sections 23, 24, and 25 (Plate A-1). All of the regional information in this Appendix was obtained from published sources. Specific information relating to Sections 23, 24 and 25 (the area of interest) also comes from Hicks Consultants observations in the field, which are noted in the text.

Geology

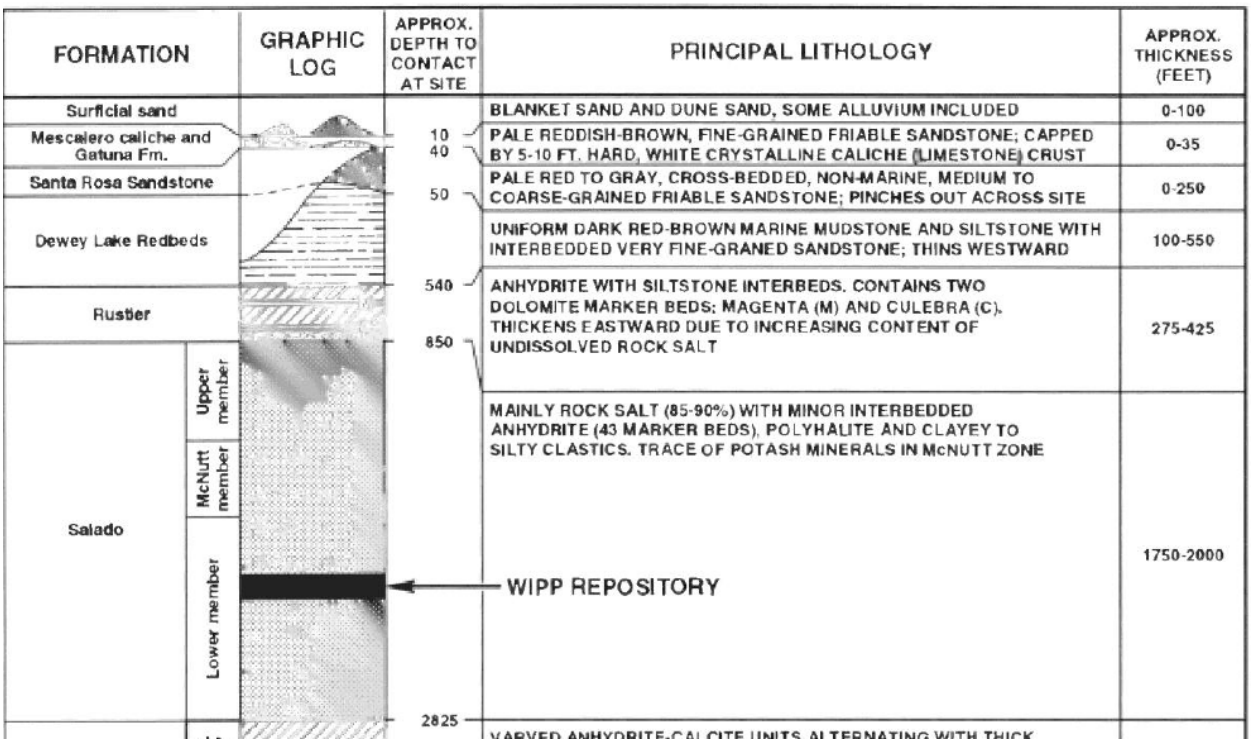
Sections 23, 24 and 25 T23S R30E (the area of interest) is located in southeastern New Mexico, in the Pecos Valley Section of the Great Plains Physiographic Province. The Great Plains are considered a Cenozoic depositional feature composed of erosional materials from the eastern front of the Rocky Mountains and similarly aligned Basin and Range mountain chains further to the south. In the area of interest, the Cenozoic alluvium and related deposits lay unconformably over Permian age marine and near-marine mudflat/salt pan sediments. Much of the Cenozoic material that comprises the surface was deposited between 50 and 40 million years ago (ma). With some uplift of the Great Plains, depositional rates ceased from 40 to 30 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 stratigraphic column for this north-central area of the Delaware Basin is presented below (Figure A-1) from an article on the WIPP site, which is located northeast of the area of interest. The stratigraphy of the area about 3 miles southwest of the area of interest is represented in a USGS publication on the Gnome Site, which is reproduced as Figure A-2. The Gnome Site data does not show the Santa Rosa Sandstone as being present in this area. From ground surface to the top of the Salado Formation, the column in Sections 23, 24 and 25 consists of:

1. Sand and Sand Dunes
2. Caliche (Mescalaro)
3. Gatuna Formation
4. Dewey Lake Redbeds
5. Rustler Formation

Of these five rock units, the Rustler Formation contains numerous horizons of anhydrite and gypsum horizons that are susceptible to karst formation (e.g. voids) and possible collapse at the surface. Sinkholes and other similar features are reported to be quite common several miles west of the area of interest where erosion has removed all or most the upper 4 units listed above and the Rustler is at or near the ground surface.

APPENDIX A: GEOLOGY, GEOMORPHOLOGY AND UNSTABLE GROUND OF T23S R30E SECTIONS 23, 24 AND 25 AND THE SURROUNDING AREA



FigureA-1 from https://nmgs.nmt.edu/publications/guidebooks/downloads/44/44_p0331_p0338.pdf shows the stratigraphic section at the WIPP site.

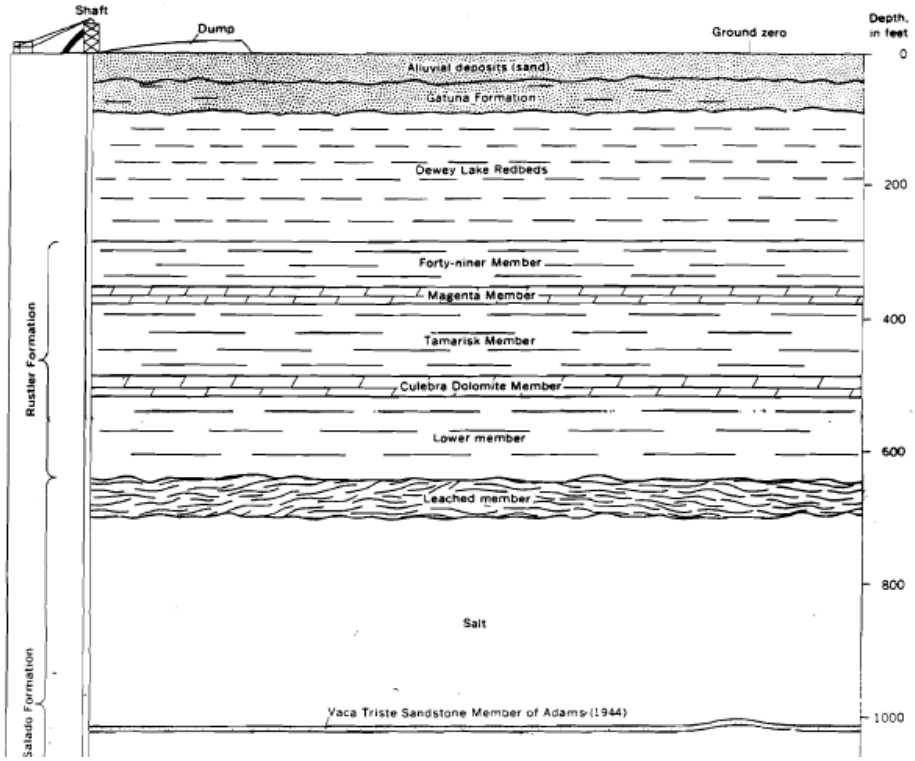


Figure A-2 – Stratigraphy of Gnome Site

Based upon the Gnome Site stratigraphic column (Figure A-2), the structural contours on the top of the Salado Formation (Plate A-2), and our site survey, we conclude that about 275 feet of sand, caliche and mudstone/siltstone (Dewey Lake) separate the ground surface from the soluble horizons of the Rustler Formation.

Geomorphology

The terrain throughout this area of the Great Plains Province varies from plains and lowlands to rugged canyons. Small erosion features (a gulley rather than a canyon) occur about 1.5 miles north and about 1 mile northeast of the area of interest. In Section 13, northeast of the subject area, Figure A-3 shows the nature of the features. A resistant caliche cap (between the truck and Ms. Pope) creates a flat bench to the east of the gulley. Stormwater channels in this area are eroding the underlying siltstone of the Rustler. West (to the right) of this photograph are blanket sand and dunes into which the water infiltrates. Plate 3 shows the locations of these mapped watercourses; all of which terminate in broad valleys filled with blanket sand and low dunes.

Figure A-3 – Gulley (mapped watercourse) in Section 13

In the immediate vicinity of the area of interest, dunes up to 30-feet high formed by wind-blown sand characterize the land surface (Figure A-4). Between some dunes are blow outs that are closed depression caused by wind erosion. Some blow outs are mapped on the USGS topographic map (see Plate A-2 3). We carefully examined one such blowout south and east of the Sandy Federal #4 staked location. This depression had more luxuriant vegetation with some limited mud cracks, demonstrating accumulation of stormwater. We found no evidence of collapse features or unstable ground that is typically associated with underlying voids/karst.

Figure A-4 – Photograph looking north near Sandy Federal #4.

Additional geomorphic features of interest are the rock benches formed by exposures of resistant caliche. One such bench, north and east of the area of interest is shown in Figure A-3. Another such bench defined by a caliche horizon is evident in Plate A-4 in the northern portion of Section 14, north of the subject area. The east-west change in slope in the northern portion of Section 14 and adjacent to the intermittent streams appear to coincide with these caliche horizons.

Finally, an examination of the area of interest shows that there are no watercourses or defined drainages in the dune field.

BLM Cave/Karst Potential Map and Unstable Ground

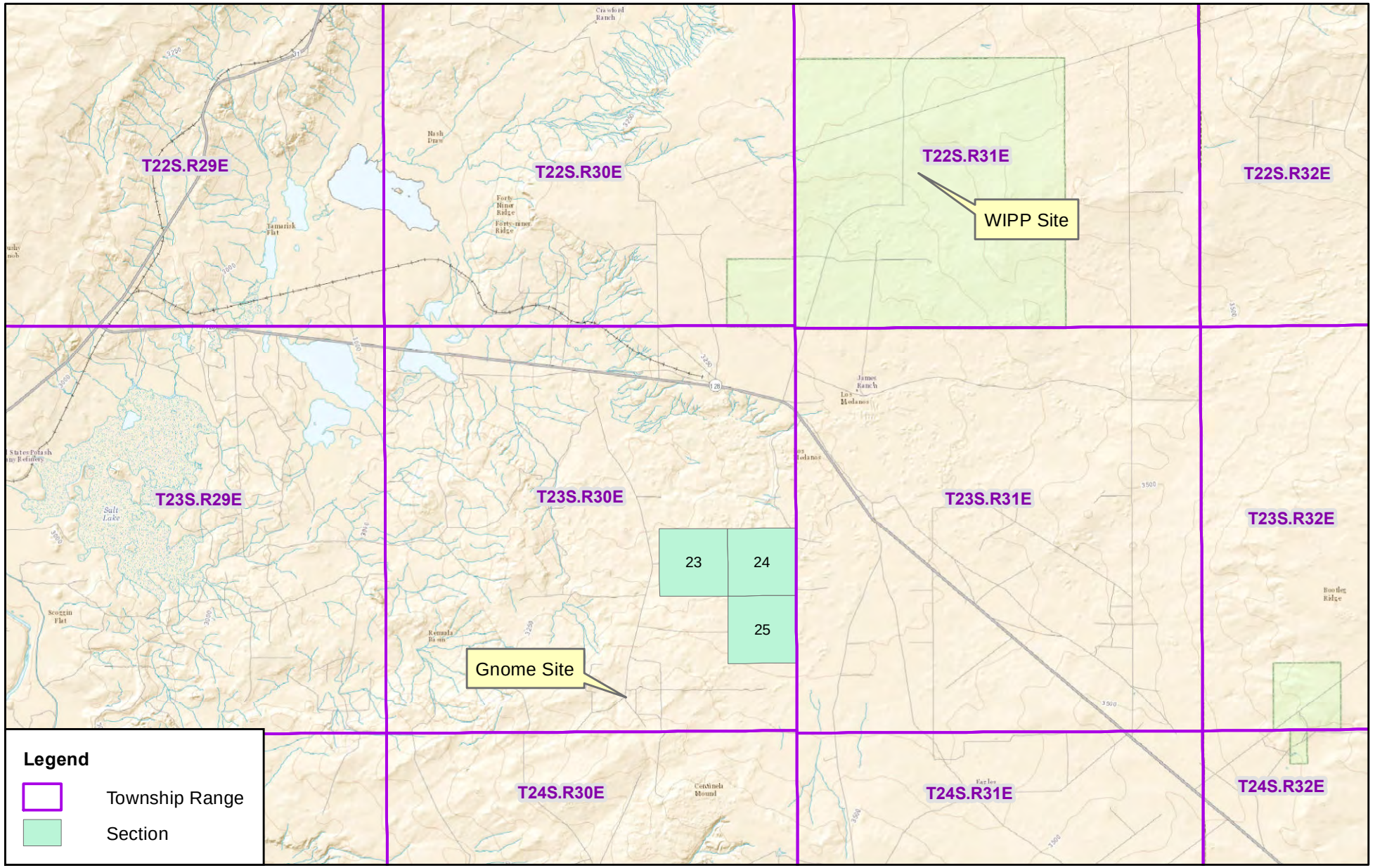
The BLM effort to define the area of critical cave/karst potential represents a careful and accurate depiction of the potential of unstable ground. Where the BLM map defines areas of low, moderate or high potential, the map represents a very good first step in determining if the ground is stable or unstable. But it is a coarse tool when compared to a field survey by a trained geologist or geotechnical engineer familiar with geomorphic processes. Examination of Figure 8 shows that the boundary between low and high potential is based upon the location of Section lines or highways, not geologic boundaries. Moreover, our field examination of many areas in the areas mapped as low potential has discovered active sinkholes and clearly unstable ground. The converse is also true: we have found very stable platforms of rock in areas mapped as high or moderate karst potential.

Our site visit, our examination of the geology and topography of the area of interest, and experience of Strata in drilling existing oil wells suggest that shallow karst features that could cause unstable ground is not in the area of interest.

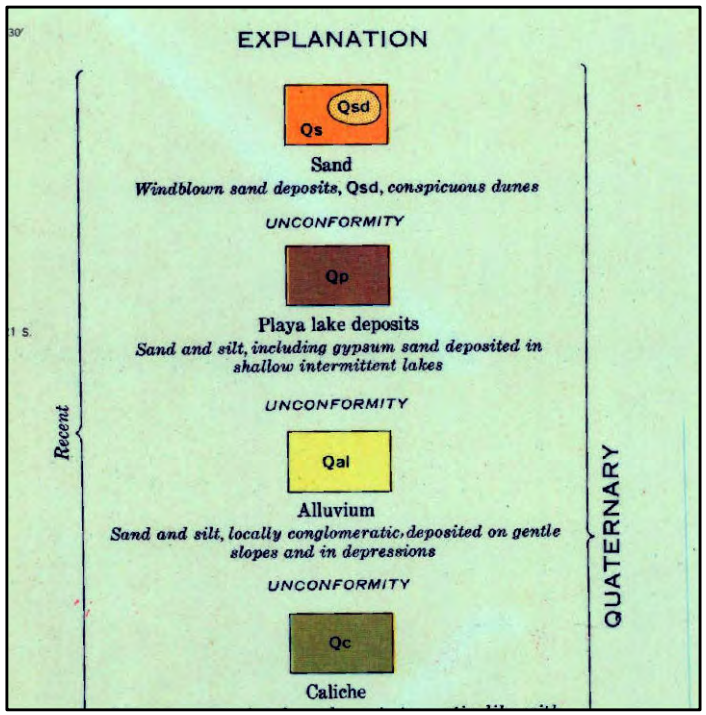
As discussed in previous sections of this Appendix, the closed depressions observed on the topographic map are dune blowouts and our investigation of these depressions did not reveal any evidence of recent subsidence or unstable ground.

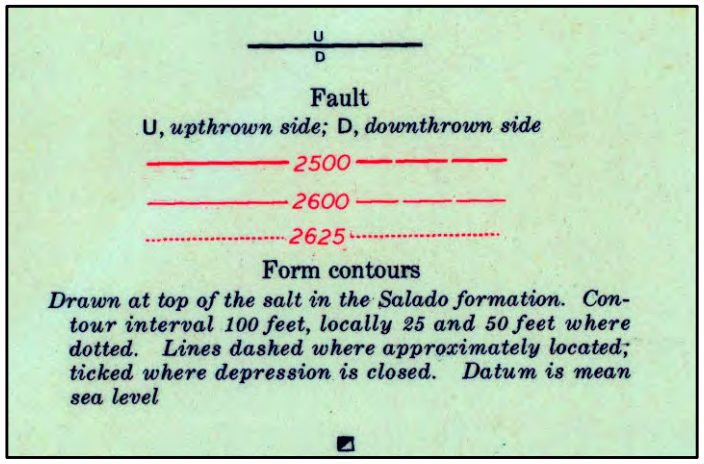
The mapping of “high potential” cave/karst features on the Figure 8 does not necessarily imply that that the ground near a drilling or workover pit is “unstable”. Moreover, in our investigation of the area, which included walking along the eastern portion of Section 23, the western portion of Section 24 and visiting several other locations, we found no evidence of recent (Quaternary) collapse or instability.

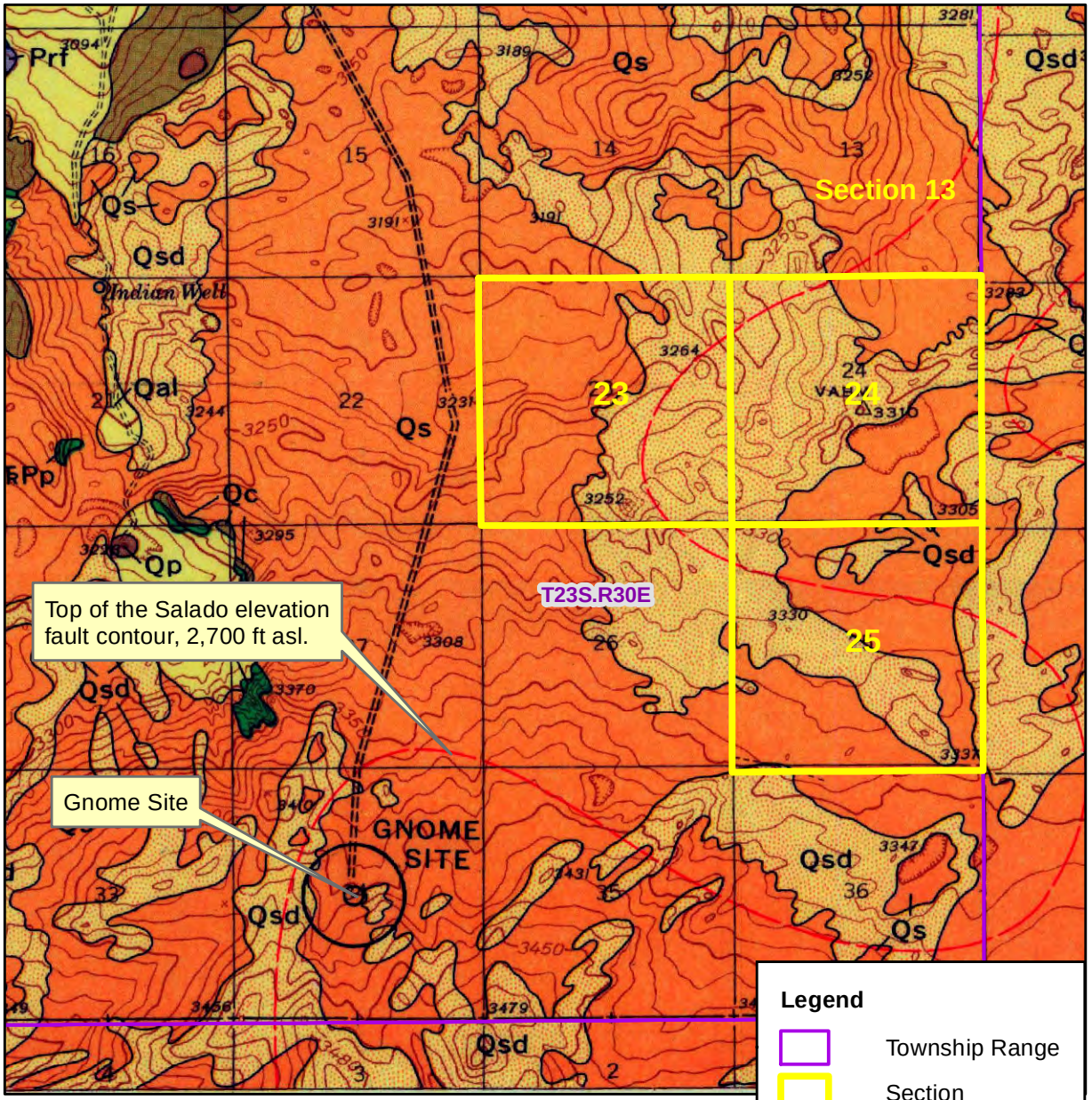
The facts presented in this Appendix and the observations of a professional geologist walking the areas where drilling and workover pits are proposed, allow a conclusion that while karst features are present in the deep subsurface west of the area of interest, the probability that “instability” precludes the use of a drilling pit in the area of interest is essentially nil. We conclude that the thickness of the Quaternary and Tertiary overburden (275 feet) provide a good buffer between the ground surface and possible voids that may exist within soluble units (gypsum or anhydrite) of the underlying Forty-Niner Member.



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Location Map Strata Production Company, Inc Forty Niner Ridge	Plate A-1 April 2014







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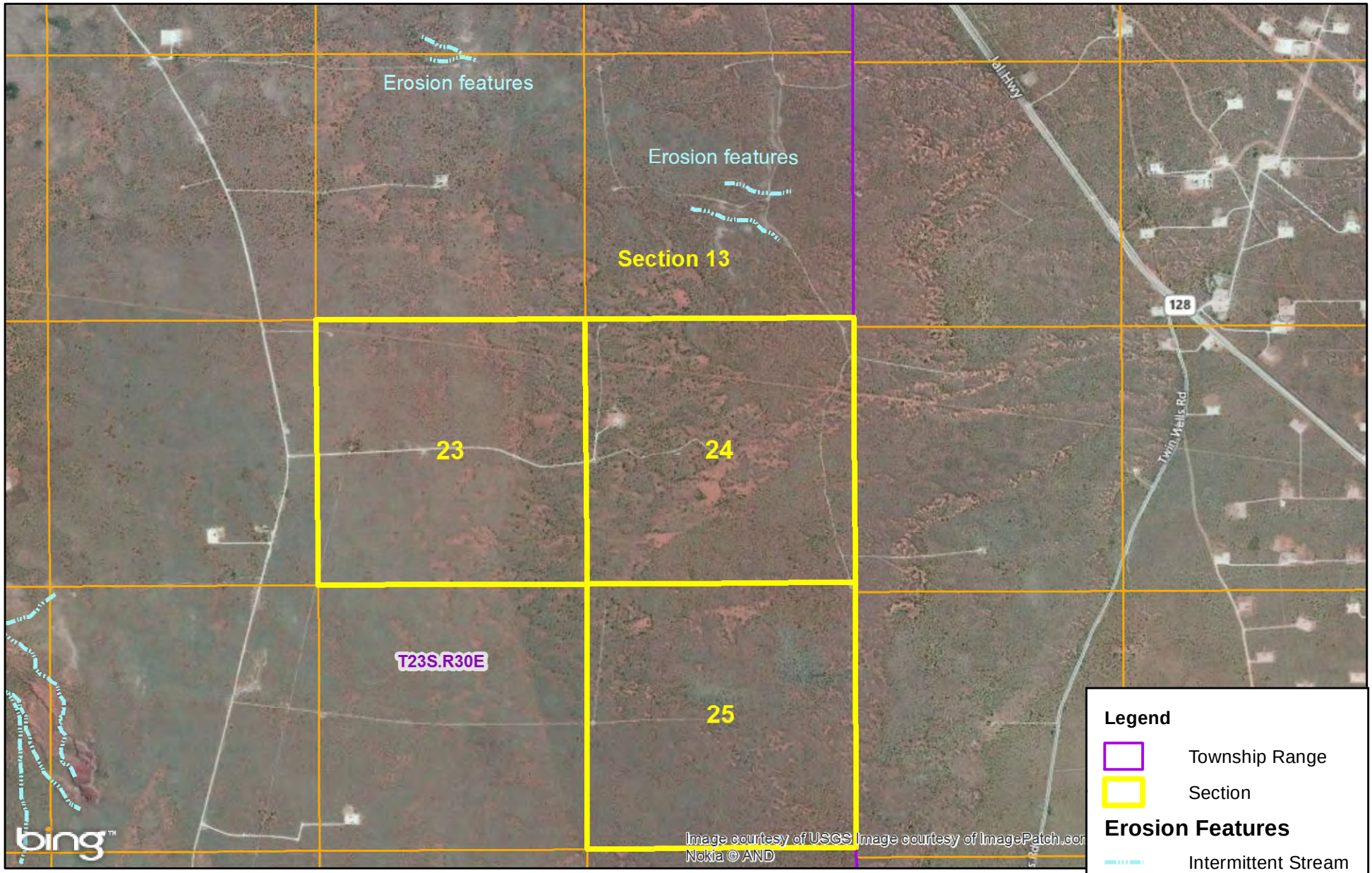
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Local Geology	Plate A-2
	Strata Production Company, Inc Forty Niner Ridge	April 2014



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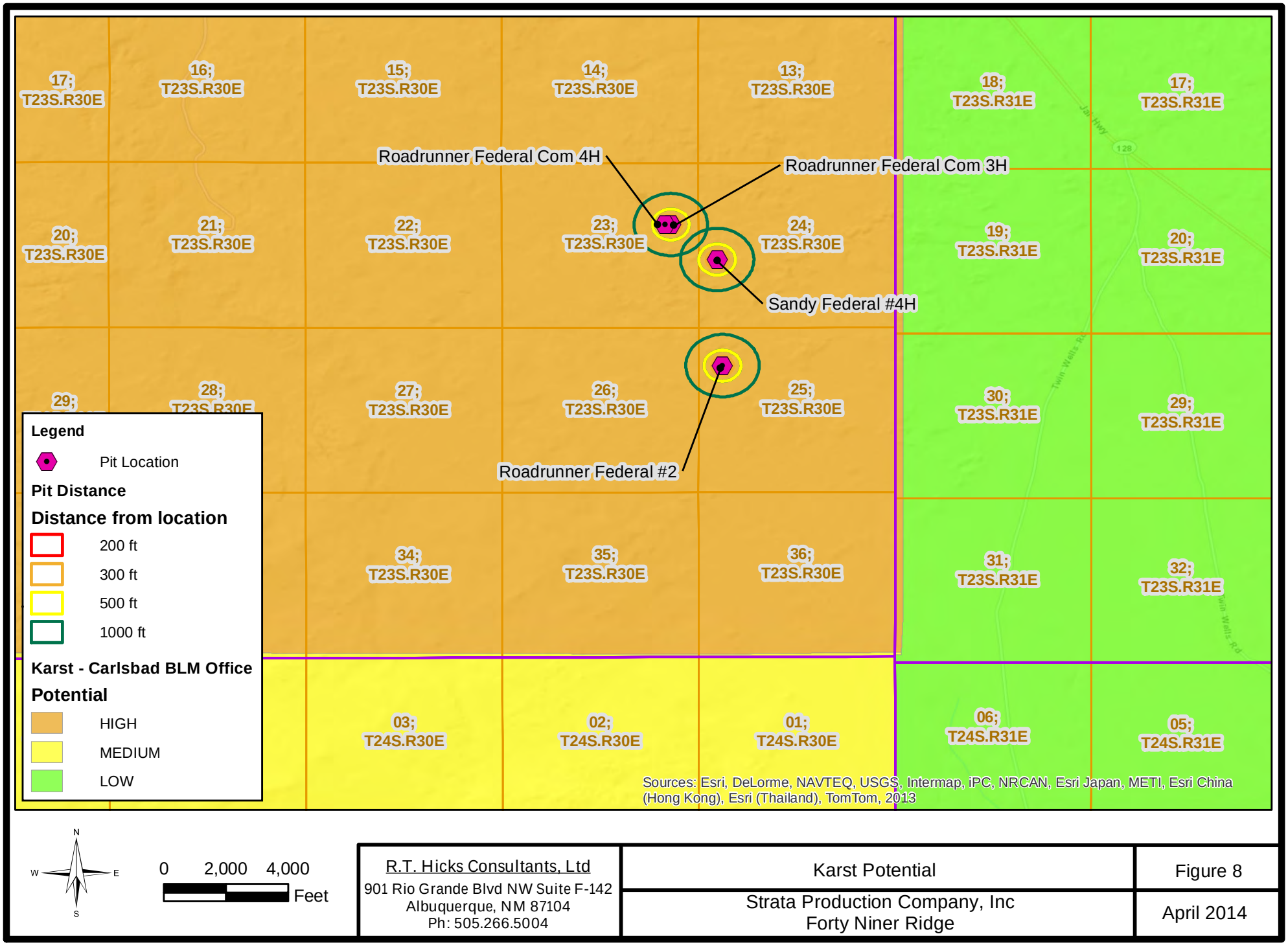
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Geomorphology	Plate A-3
	Strata Production Company, Inc Forty Niner Ridge	April 2014



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Karst Potential

Figure 8

Strata Production Company, Inc
Forty Niner Ridge

April 2014