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

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

Form C-144
July 21, 2008

For temporary pits, closed-loop systems, and below-grade tanks, submit to the appropriate NMOCD District Office.
For permanent pits and exceptions submit to the Santa Fe Environmental Bureau office and provide a copy to the appropriate NMOCD District Office.

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

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

Instructions: Please submit one application (Form C-144) per individual pit, closed-loop system, 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: 1100 Mira Vista Blvd., Plano, Texas 75093-4698
Facility or well name. Mudcat 2H
API Number: 30-015-40617 OCD Permit Number: ~~31436~~ DENIED
U/L or Qtr/Qtr P Section 11 Township 17S Range 28E County: Eddy
Center of Proposed Design: Latitude 32 50 46.247 Longitude -104 8 20.833 NAD: ☐1927 ☒ 1983
Surface Owner: ☐ Federal ☐ State ☒ Private ☐ Tribal Trust or Indian Allotment

RECEIVED
AUG 13 2012
NMOCD ARTESIA

2.
☒ **Pit:** Subsection F or G of 19.15.17.11 NMAC
Temporary: ☐ Drilling ☐ Workover XX Drying Pad
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A
☒ Lined ☐ Unlined Liner type: Thickness 20 mil ☒ LLDPE ☐ HDPE ☐ PVC ☐ Other
☒ String-Reinforced
Liner Seams: ☒ Welded ☒ Factory ☐ Other Volume: bbl Dimensions: L x W x D

3.
☒ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC
Type of Operation: ☐ P&A ☐ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent)
☐ Drying Pad ☐ Above Ground Steel Tanks ☐ Haul-off Bins ☒ Other Temporary Pit used as a Drying Pad
☐ Lined ☐ Unlined Liner type: Thickness mil ☐ LLDPE ☐ HDPE ☐ PVC ☐ Other
Liner Seams: ☐ Welded ☐ Factory ☐ Other

4.
☐ **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

5.
☐ **Alternative Method:**
Submittal of an exception request is required. Exceptions must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

6.

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_____

7.

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

☐ Screen ☐ Netting ☐ Other Not Applicable

☐ Monthly inspections (If netting or screening is not physically feasible)

8.

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 ~~19.15.3.103 NMAC~~ 19.15.16.8 NMAC

9.

Administrative Approvals 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:

☒ Administrative approval(s): Requests must be submitted to the appropriate division district or the Santa Fe Environmental Bureau office for consideration of approval.

☐ Exception(s). Requests must be submitted to the Santa Fe Environmental Bureau office for consideration of approval.

10.

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. Requests regarding changes to certain siting criteria may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Applicant must attach justification for request. Please refer to 19.15.17.10 NMAC for guidance. **Siting criteria does not apply to drying pads or above-grade tanks associated with a closed-loop system.**

Ground water is less than 50 feet below the bottom of the temporary pit, permanent pit, or below-grade tank. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells **SEE FIGURE 2**	☐ Yes ☒ No
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 **SEE FIGURE 3**	☐ Yes ☒ No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. *(Applies to temporary, emergency, or cavitation pits and below-grade tanks)* - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image **SEE FIGURE 3**	☐ Yes ☒ No ☐ NA
Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. *(Applies to permanent pits)* - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image **SEE FIGURE 3**	☐ Yes ☐ No ☒ NA
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 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application. - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site **SEE FIGURE 2**	☐ 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. **SEE FIGURE 4** - Written confirmation or verification from the municipality; Written approval obtained from the municipality	☐ Yes ☒ No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site **SEE FIGURE 5**	☐ Yes ☒ No ☐ Yes ☒ No
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division **SEE FIGURE 6**	☐ Yes ☒ No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map **SEE FIGURE 7**	☐ Yes ☒ No
Within a 100-year floodplain. - FEMA map **SEE FIGURE 8**	

11.
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: _____

12.
Closed-loop Systems 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.

- ☐ Geologic and Hydrogeologic Data (only for on-site closure) - based upon the requirements of Paragraph (3) of Subsection B of 19.15.17.9
- ☐ Siting Criteria Compliance Demonstrations (only for on-site closure) - 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: _____

☐ Previously Approved Operating and Maintenance Plan API Number: _____ *(Applies only to closed-loop system that use above ground steel tanks or haul-off bins and propose to implement waste removal for closure)*

13.
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

14.
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 ☒ Closed-loop System ☐ 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 (Exceptions must be submitted to the Santa Fe Environmental Bureau for consideration)

15.
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 F 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 I of 19.15.17.13 NMAC
- ☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

16.

Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only: (19.15.17.13.D NMAC)

Instructions: Please indentify the facility or facilities for the disposal of liquids, drilling fluids and drill cuttings. Use attachment if more than two facilities are required.

Disposal Facility Name: _____ Disposal Facility Permit Number. _____

Disposal Facility Name: _____ Disposal Facility Permit Number. _____

Will any of the proposed closed-loop system operations and associated activities occur on or in areas that *will not* be used for future service and operations?

☐ Yes (If yes, please provide the information below) ☐ No

Required for impacted areas which will not be used for future service and operations:

☐ 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 I of 19.15.17.13 NMAC

☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

17.

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 may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17.10 NMAC for guidance.

Ground water is less than 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 between 50 and 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
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 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 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 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 1000 horizontal feet of any other fresh water well or spring, 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
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 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	☐ 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

18.

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 F of 19.15.17.13 NMAC

☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements 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 Subsection F of 19.15.17.13 NMAC

☒ Waste Material Sampling Plan - based upon the appropriate requirements of Subsection F 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 I of 19.15.17.13 NMAC

☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

19.
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): Gregg Boans Title: Production Superintendent

Signature: [signature] Date: 8-10-2012

e-mail address: Gboans@jdmii.com and r@rthicksconsult.com Telephone: 575-361-4962 – (Hicks 505-266-5004)

20.
OCD Approval: ☐ Permit Application (including closure plan) ☐ Closure Plan (only) ☐ OCD Conditions (see attachment)

OCD Representative Signature: _____ **Approval Date:** _____

DENIED 8/16/12

Title: _____ **OCD Permit Number:** _____

21.
Closure Report (required within 60 days of closure completion): Subsection K of 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:** _____

22.
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.

23.
Closure Report Regarding Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:
Instructions: Please indentify the facility or facilities for where the liquids, drilling fluids and drill cuttings were disposed. Use attachment if more than two facilities were utilized.

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Disposal Facility Name: _____ Disposal Facility Permit Number: _____

Were the closed-loop system operations and associated activities performed on or in areas that *will not* be used for future service and operations?
☐ Yes (If yes, please demonstrate compliance to the items below) ☐ No

Required for impacted areas which will not be used for future service and operations:
☐ Site Reclamation (Photo Documentation)
☐ Soil Backfilling and Cover Installation
☐ Re-vegetation Application Rates and Seeding Technique

24.
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)
☐ 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

25.
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.

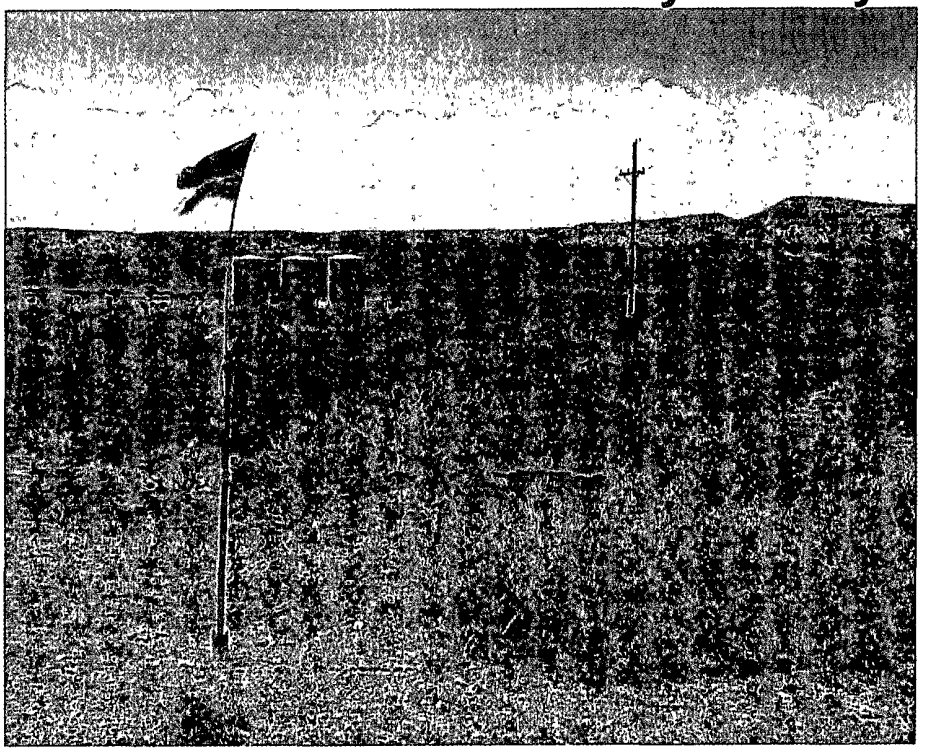
Name (Print): _____ Title: _____

Signature: _____ Date: _____

e-mail address: _____ Telephone: _____

August 2012

C-144 Permit Package for Mudcat 2H Well Drying Pad (Temporary Pit) Section 11 T17S R28E Eddy County NM



Prepared for Murchison Oil & 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

August 11, 2012

Mr. Mike Bratcher
NMOCD District 2
811 South First Street
Artesia, New Mexico 88210
Via E-mail

RE: Mudcat 2H
Unit P Section 11 T17S R28E

Dear Mike:

For the above-referenced temporary pit, attached are:

1. A C-144 Form (a modification of an existing EZ Permit)
2. Supplemental information to support the C-144

Please note that this submittal:

A. Uses the term temporary pit/drying pad to signify that Murchison will
   a. use the sub-grade "pit" as a drying pad that receives only cuttings and mud from the closed loop system
   b. will not store liquids in the temporary pit/drying pad – except for up to 500 gallons of fluid that may drain to the sump
B. Proposes to close the temporary pit/drying pad "in place"

As shown below, we are sending a copy of this application to the Concho Resources to serve as notice to the surface owner of the intention to dispose of drilling waste on-site. The BLM is also copied on this application as Federal minerals will be extracted from this well.

As always, thanks for your help.

Sincerely,
R.T. Hicks Consultants

Randall Hicks

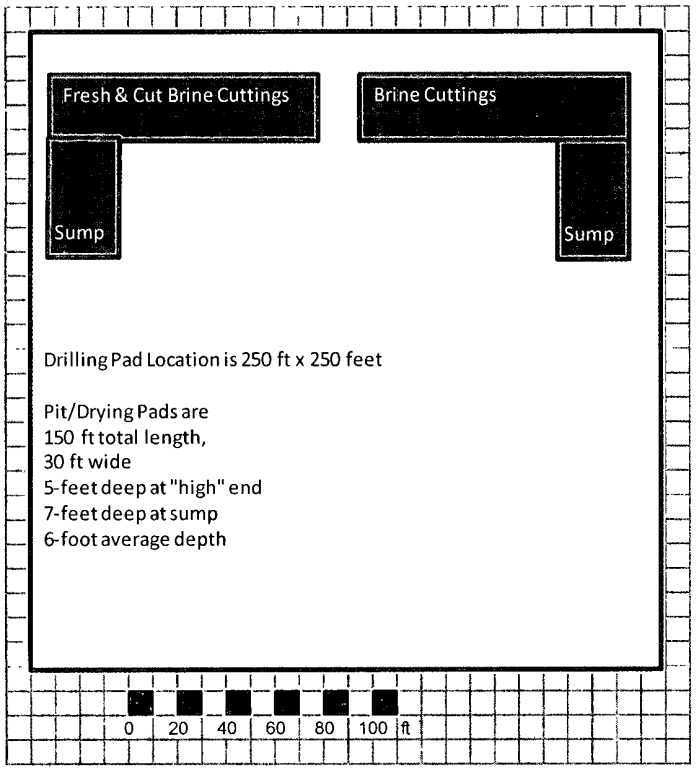
Copy: Murchison Oil and Gas, Inc.
Rand French, Concho Resources, Artesia
Jim Amos, BLM Carlsbad

C-144 and
Site Specific Information for
Drying Pad (Temporary Pit)

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

Site Specific Information

Figure 1 shows the location of the proposed temporary pit/drying pad location on a USGS topographic map. The Design and Construction Plan is included with this submission. Figure 1 presents a schematic layout of the temporary pit/drying pad. .



Sketch of temporary pit/drying pad

Hydrogeologic Report Demonstrating Compliance With Depth to Water Criteria

Figure 2a, 2b and 2c and the discussion presented below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 50 feet beneath the temporary pit/drying pad.

Figure 2a is an area geologic map that shows:

1. The location of the temporary pit/drying pad as a red rectangle.
2. Water wells in the OSE database as blue circles with a corresponding permit number. 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 in Open File Report 95 (OFR-95[1]) or wells with water data collected by Hicks Consultants as yellow squares and are labeled as "Misc." with wells numbers assigned in the RT Hicks GIS database.

[1] http://geoinfo.nmt.edu/publications/openfile/downloads/OFR014-99/76-99/95/ofr_95.pdf

4. Water wells from the USGS database with a red triangle.

Figure 2b is a groundwater elevation contour map showing our interpretation of the groundwater elevation data, which also appears next to each well. Groundwater data from the OSE database are not included on this map because of location errors, which are discussed below.

Figure 2c is a 1:24,000 scale map of the area near the temporary pit/dryingpad that uses the same dataset as Figure 2a.

Geology and Hydrogeology

The proposed temporary pit/drying pad is located on an outcrop of the Permian Rustler Formation (Pr on Figure 2a, 2c). Topographically, the site is on the west-facing slope of a north-south trending escarpment, approximately 20 feet above the valley floor of the large closed depression to the west. The Rustler is probably more than 100 feet thick at this site and consists of siltstone, gypsum, sandstone, and dolomite, which provides fresh water to nearby wells. The underlying Permian Salado Formation (Psl on Figure 2a) is comprised of evaporite sequence rocks (gypsum, shale, salts) and is not considered a source for fresh water. Salado Formation rocks are exposed several miles to the west. The Permian-Artesia Group (Pat on Figure 2a) crops out approximately 5 miles to the west of the site and extends in the subsurface to the east, underlying the Salado Formation. These formations are comprised of more clastic (shelf facies) rocks that are capable of producing fresh water when located near the surface and below the water table elevation. To the east of the site the Rustler Formation is covered by a thin layer of Quaternary (older) alluvium (Qoa) and piedmont alluvium (Qp). The alluvial sediments can provide fresh groundwater locally, but in the area of the temporary pit/drying pad, the alluvium lies above the water table and is not a place of withdrawal for use.

Water Table Elevation

Ten water wells were identified in the area surrounding area to determine the water table elevation below the temporary pit (Figure 2b). They include two wells from the USGS database, and eight wells from the Open File Report No. 95 (OFR-95). A summary of the available water well data, with respect to groundwater elevation, is provided on the table below. The table also includes information on wells from the OSE WATERS database.

	Well Location						Well Source Information						Groundwater Elevation Data						
Well Numbers	Township (south)	Range (east)	Section	Quarter Section (64,	16,	4)	NM-OSE Database	USGS Database	Open File Rpt. 95	USGS Topo Sheet	Aerial Photograph	Field Verification	Surface Elevation (published)	Surface Elevation (Topo Sheet)	Well Total Depth (published)	Depth to Water (published)	Groundwater Elev (published)	Groundwater Elev. (using topo elev)	Gauging Date
Misc - 19	16	27	36	2	1	2			✓	✓	--	--	3,454	3,454	61.4	47.1	3,407	3,407	10/13/1977
RA 07774	17	27	11	3	2	1	✓			✓	✓	✓		3,401	100	50		3,351	12/20/1989
USGS-1344	17	27	11	2	2	1		✓		✓	✓	✓	3,390		100	56.26	3,334		2/7/2007
Misc - 20	17	27	12	3	1	4			✓				3,472		250	115	3,357		4/1/1954
RA 04554	17	27	23			1	✓												
Misc - 5	17	28	2		2	4			✓	✓	✓	--		3,574		27.6	3,560	3,546	1/1/1948
Misc - 2	17	28	14		2	2			✓	✓	✓	--		3,590		80	3,540	3,510	unkn
Misc - 16	17	28	19			2			✓	✓	✓	✓		3,591		224.3	3,380	3,367	1/2/1948
Misc - 17	17	28	22		3	2			✓	✓	✓	✓	--	3,579		45 5	3,520	3,534	1/1/1948
USGS-1222	17	28	22	4	2	4		✓		✓	✓	✓	3,578		95	78.55	3499		1/13/1999
L 07643	17	28	34	2	4	4	✓					--							
Misc - 1	17	28	24	2	2	2			✓										
Misc - 3	17	29	22	1	1	1			✓	✓	✓	✓	3,550	3,545		79.7	3,470	3,465	11/29/1948
Misc - 4	17	29	29	4	4	4			✓	✓	✓	--		3550		210		3340	12/3/1948
Misc - 0	17	29	8	2	3	1			✓	✓	✓	✓	3617	3617	92 7	90.13	3526.9		10/14/1977

✓ Indicates well was verified, (blank) indicates well not verified, and -- indicates no attempt to verify

Visual inspections of questionable wells were performed to verify the information provided by the public records and published reports. We also contacted the OSE for records on certain wells. Initially, an attempt was made to identify each well using USGS topographic maps. The surface elevations of wells identified on the maps were compared to the published surface elevation, if available. Wells that could not be verified using maps were searched on current and historic satellite photographs in an effort to identify windmills, tanks, or roads associated with the well. Locations that could not be verified by maps, photographs or an OSE records search were verified in the field. Attempts were also made to gauge wells during the field investigation, when access to the casing was permitted. The results of the field inspections are summarized as follows:

- Wells No. Misc-17 and USGS-1222 are the same well based on similar locations and surface elevations
- Well No. Misc-20 and Misc-0 could not be located by map, photograph, or field inspection; therefore the groundwater elevation data should be discounted
- Well No. RA 04554 could not be located by map, photograph, or field inspection; therefore the depth to water data should be discounted
- Well L 07643 is a well located in the Lea County Basin of the OSE and is mis-located in the WATERS database.
- Well RA 09342 is mis-located in the WATERS database and lies 3 townships west (see Appendix A)

Figures 2b and 2c were prepared with data published in OFR-95 and USGS data. RT Hicks Consultants believes that Figure 2b is the most complete interpretation of the groundwater gradient available. Based on this map the groundwater elevation at the temporary pit location

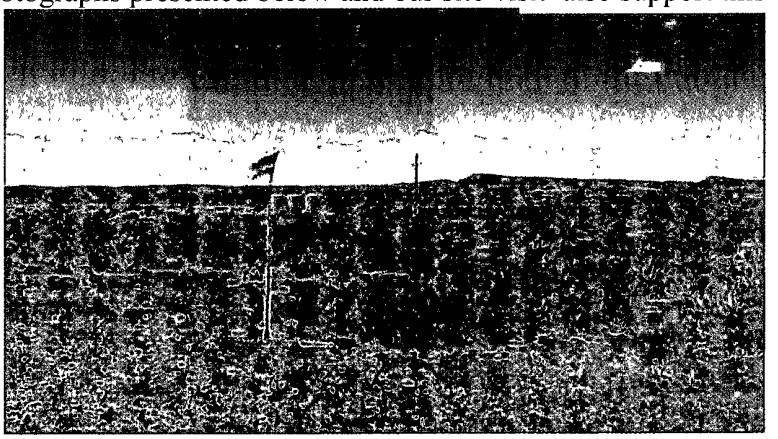
was approximately 3510 feet above sea level in 1948. The well survey (Appendix B) indicates that the surface elevation of the location is 3591.6 feet above sea level; therefore the depth to groundwater was approximately 81 feet in 1948. Considering a 10-foot (maximum) depth for the temporary pit/drying pad, the distance from the bottom of the temporary pit/drying pad to the water table is 71 feet.

Additional Sitting Criteria Compliance Demonstration

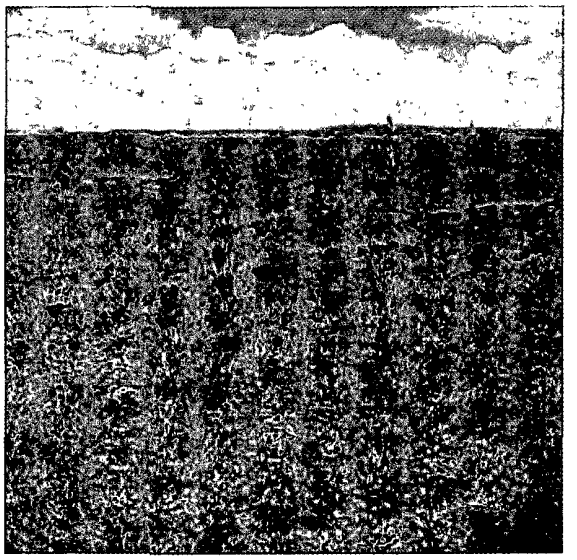
The information identified in Item 10, "Siting Criteria" of the C-144 is presented below. The descriptions below are associated with the maps presented in Figures 2-7, attached.

Figure 3 and the site visit demonstrates that the location is not 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).

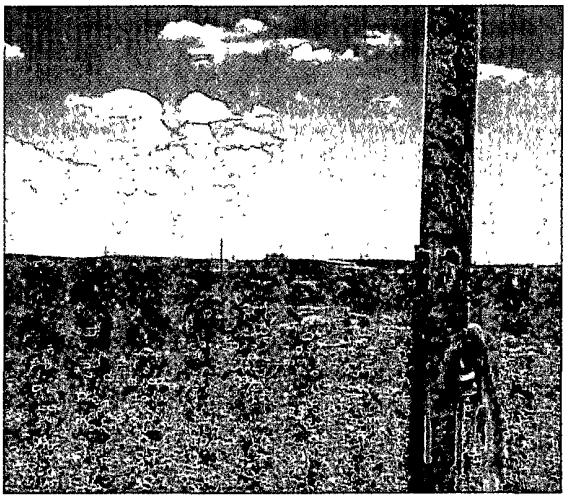
- Data from the USDA's National Hydraulic Dataset shows surface water body (shown as a light blue circle) approximately 2000 feet south of the temporary pit. This is a stockpond associated with a nearby windmill .
- No other watercourses, as defined by NMOCD Rules, or water bodies exist with 300-feet of location.
- Photographs presented below and our site visit also support this conclusion



View to west-northwest from location



View to north-northeast from location



View to south toward Ranch Headquarters

Figure 3 and the site visit demonstrates that the location is not within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. No nearby structures exist within 300 feet of location.

- Figure 3 shows oil and gas facilities east and west of the location and the Ranch Headquarters to the south
- Our site visit identified no permanent structures within 300 feet of the site

Figure 3 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 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application.

- Figure 3 shows the locations of all surface water; including springs
- The nearest active water well is located more than 1000 feet to the south, at the Ranch Headquarters (Misc-2) and additional un-mapped wells within the Headquarters
- No springs were identified within the mapping area during our site visit

Figure 4 demonstrates that the location is not within incorporated municipal boundaries or defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- The closest municipality is Artesia, NM approximately 6 miles to the west
- The closest public well field is located approximately 12 miles to the east

Figure 5 demonstrates the location is not within 500 feet of wetlands.

Figure 6 and our general reconnaissance of the area demonstrates that the nearest mines are caliche pits

Figure 7 shows the location of the temporary pit/drying pad with respect Karst areas identified in the most recent Caves and Karst Map published by the BLM

- According to our interpretation of a recent conversation with Mr. James Goodbar of BLM, the Cave Karst Map is
  i. Based upon decades of field inspections and geologic reasoning
  ii. A work-in-progress and is continually updated as new data are reviewed
  iii. Accurate on a regional scale but site visits by trained professionals are often necessary to determine the existence/potential of karst features within small areas (e.g. a drilling pad)
- The legend for Figure 7 is explained below (personal communication with Mr. Goodbar)
  i. Critical Karst Areas: Areas that contain a high density of significant caves and karst features and/or provide important karst groundwater recharge for domestic drinking water supplies and springs.
  ii. High Karst Areas: Areas of known karst geology that contain high density of significant caves and karst features.
  iii. Medium Potential Karst Areas: Areas of known karst geology that contain dispersed caves and karst features.
  iv. Low Potential Karst Areas: Areas of questionable karst geology and few if any known caves or karst features.
- Although the site is located within a "Low Potential Karst Area" the thin-bedded gypsum at the surface (see photographs above) exhibits some solution voids. Because of the presence of solution features in the gypsum combined with a documented water table aquifer, Murchison will cause the contractor to compact the earth material that forms the foundation for the pit liners to an expected proctor density of greater than 90% by:
  i. adding water as appropriate,
  ii. compacting the earth by walking a crawler-type tractor down the sides and bottom of the pit, and
  iii. repeating this process with a second 6-inch lift of earth material if necessary.
- Murchison
  i. Will employ the temporary pit/drying pad as drying pad
  ii. Will not store drilling fluids in the temporary pit/drying pad but will remove any fluids as they accumulate in the sumps of the temporary pitdrying pad
  iii. Will close the temporary pit/drying pad containing the relatively dry cuttings/mud "in-place" in a manner consistent with the attached closure plan
- A Professional Geologist will witness the excavation of the temporary pit/drying pad and collect additional information pertaining to Karst for possible submission to NMOCD
- Although karst features (large voids) create preferential pathways for downward saturated flow (e.g. free liquids flowing into a void from a pit/pipeline rupture), large voids represent a barrier to unsaturated flow (e.g. very slow seepage from dried cuttings/mud). This phenomenon is the reason that capillary barriers are used to prevent seepage into restored uranium tailings piles, landfills and like features (see http://www.epa.gov/superfund/accomp/news/pdfs/evapo.pdf and

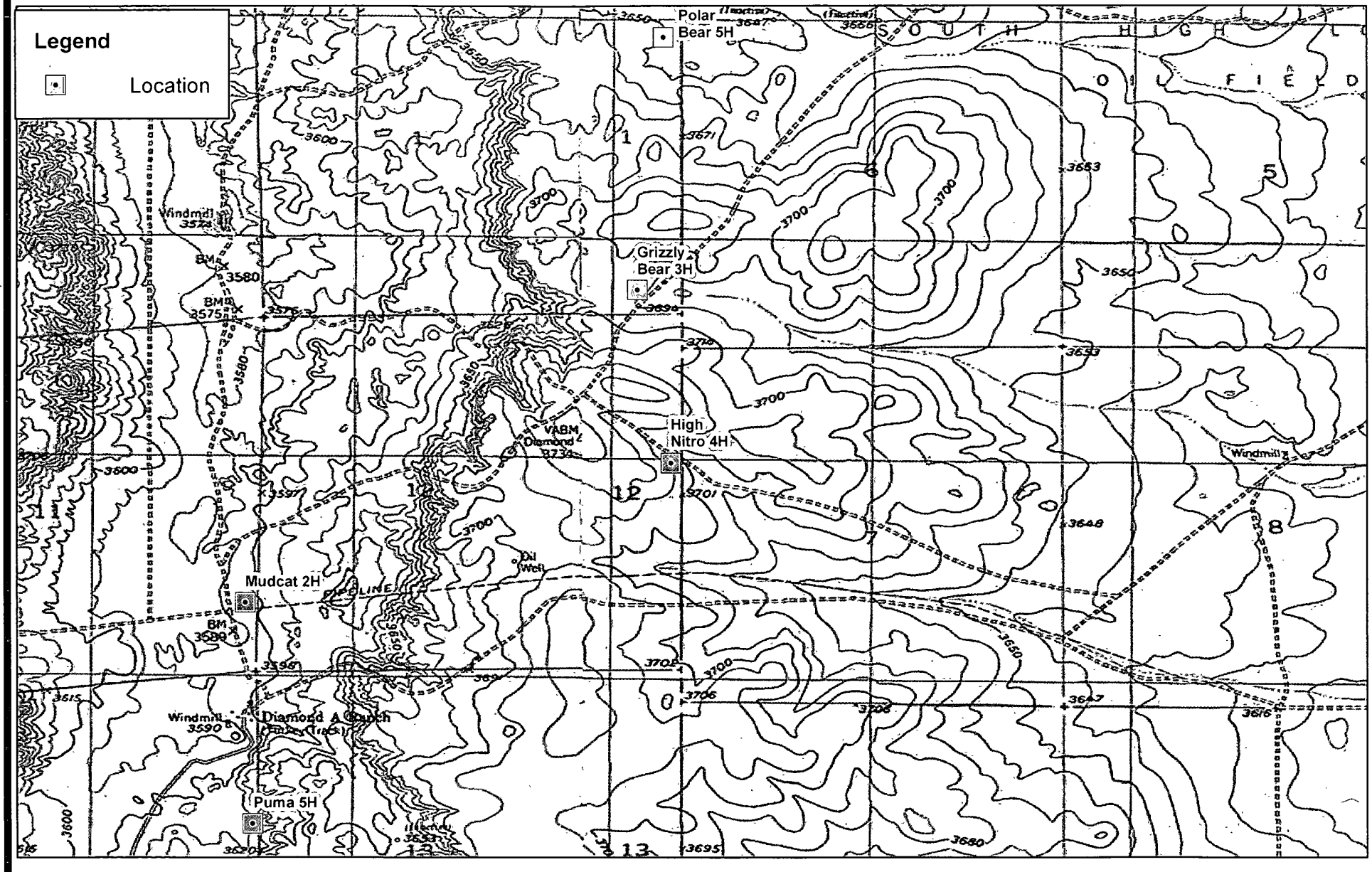
http://www.beg.utexas.edu/staffinfo/pdf/scanlon_vadosezj.pdf) . As the large voids in a gravel layer beneath a fine-grained layer significantly minimize seepage, solution cavities and tubes create the same effect.

Figure 8 demonstrates that the location is not within a 100-year floodplain.

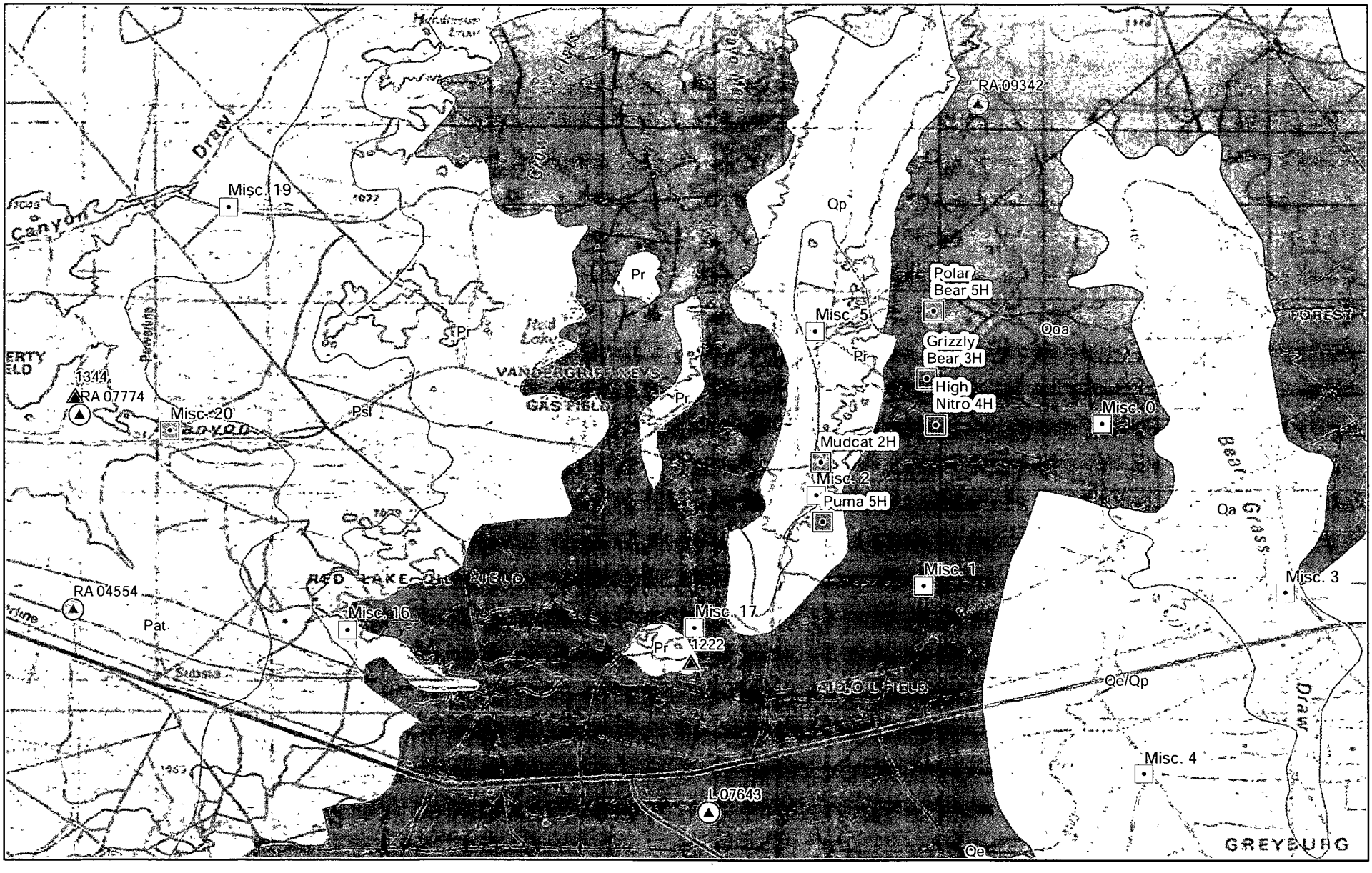
- The location is within Zone X of FEMA Flood Zone Designation. Zone X is defined as an area of minimal flood hazard and above the 500-year (0.2% annual chance) flood level.

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	Topographic Map Showing Locations	Figure 1
	Murchison - Polar Bear 5H, Grizzly Bear 3H, High Nitro 4H, Mudcat 2H, Puma 5H	August 2012



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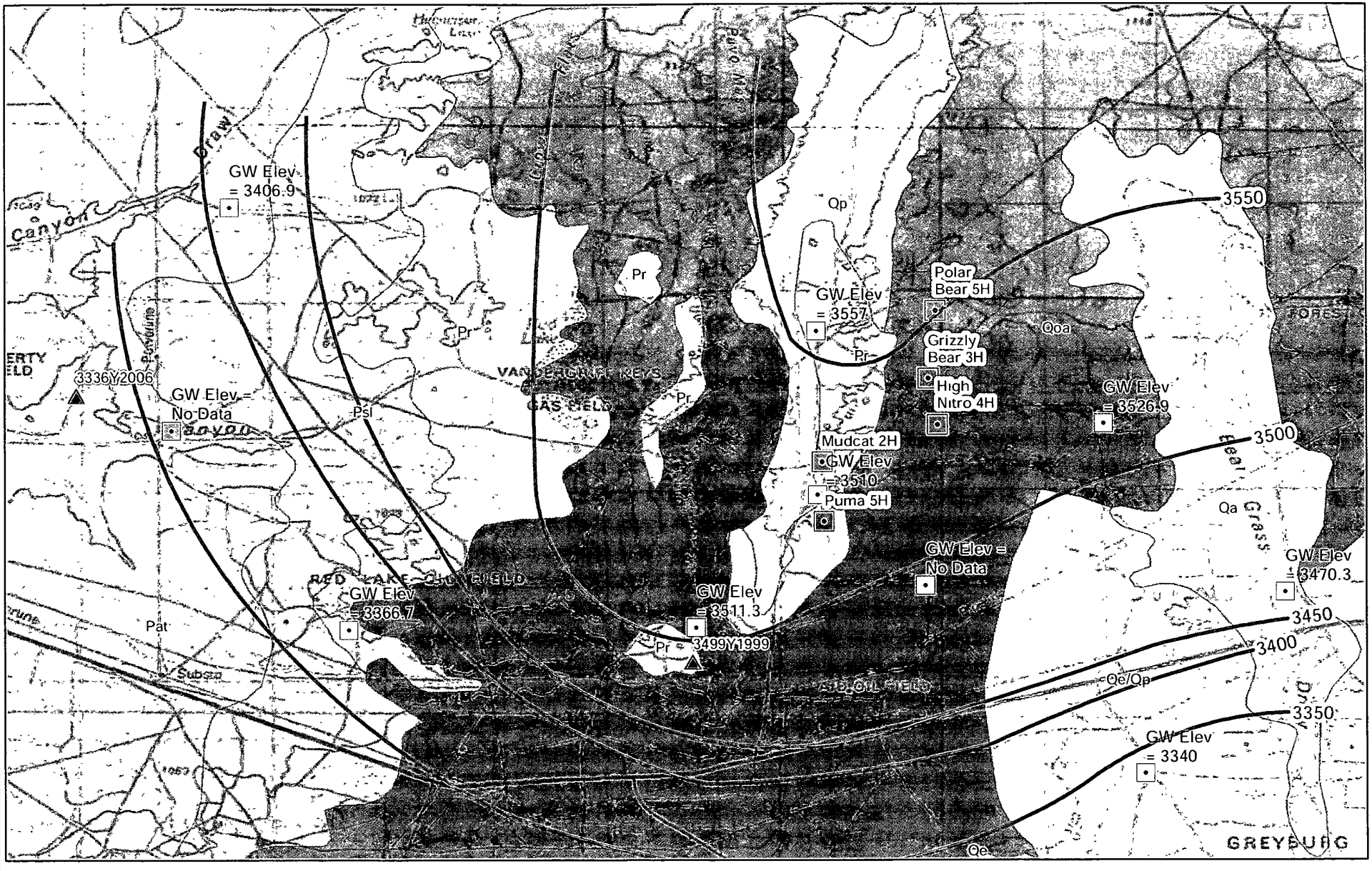
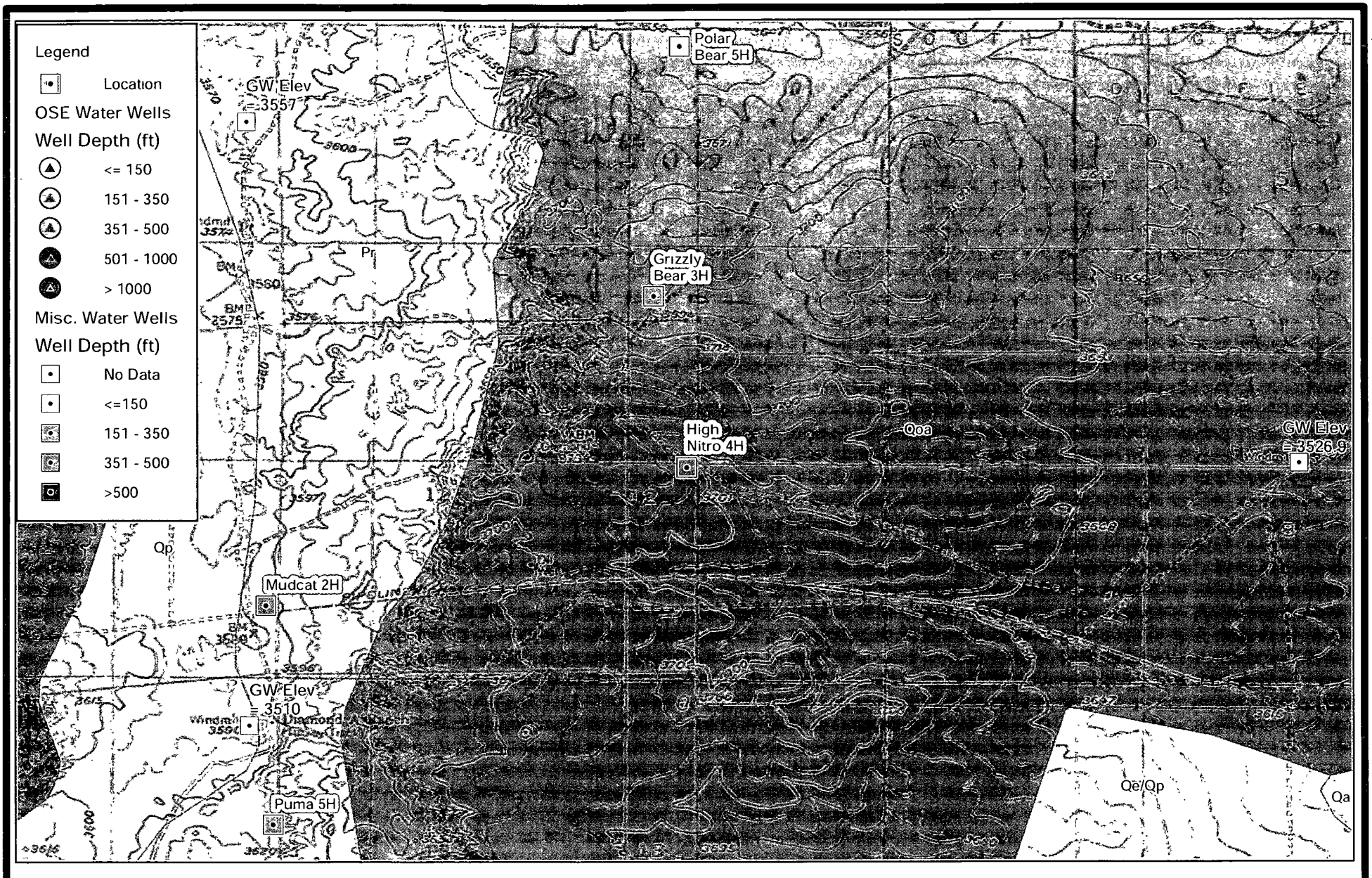
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Geology and Nearby Water Wells	Figure 2a
	Murchison - Polar Bear 5H, Grizzly Bear 3H, High Nitro 4H, Mudcat 2H, Puma 5H	August 2012



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Groundwater Elevation Contour Map	Figure 2b
	Murchison - Polar Bear 5H, Grizzly Bear 3H, High Nitro 4H, Mudcat 2H, Puma 5H	August 2012



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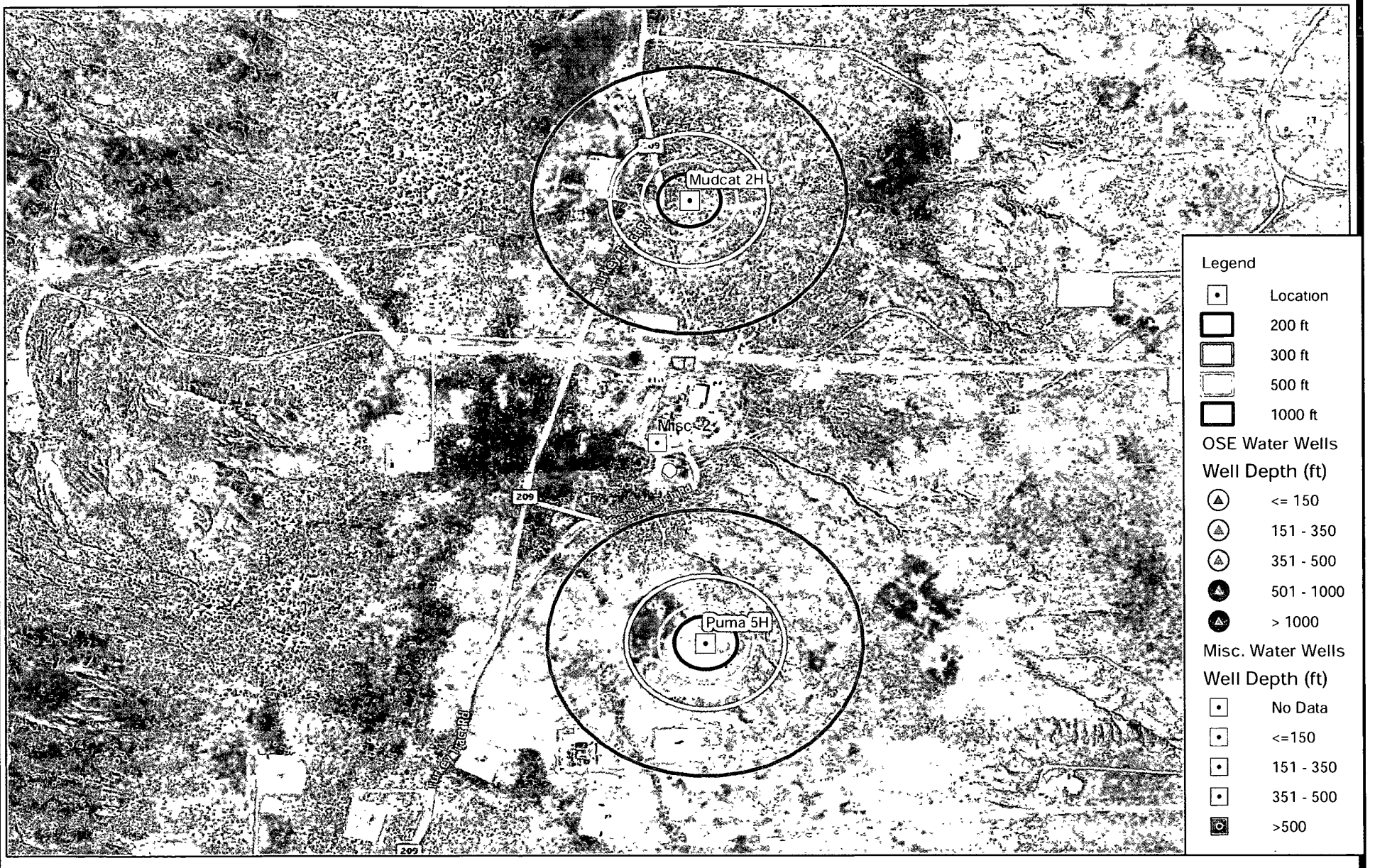
Albuquerque, NM 87104
Ph: 505.266.5004

Groundwater Elevation Data and Geology

Figure 2c

Murchison - Polar Bear 5H, Grizzly Bear 3H, High Nitro 4H, Mudcat 2H, Puma 5H

August 2012



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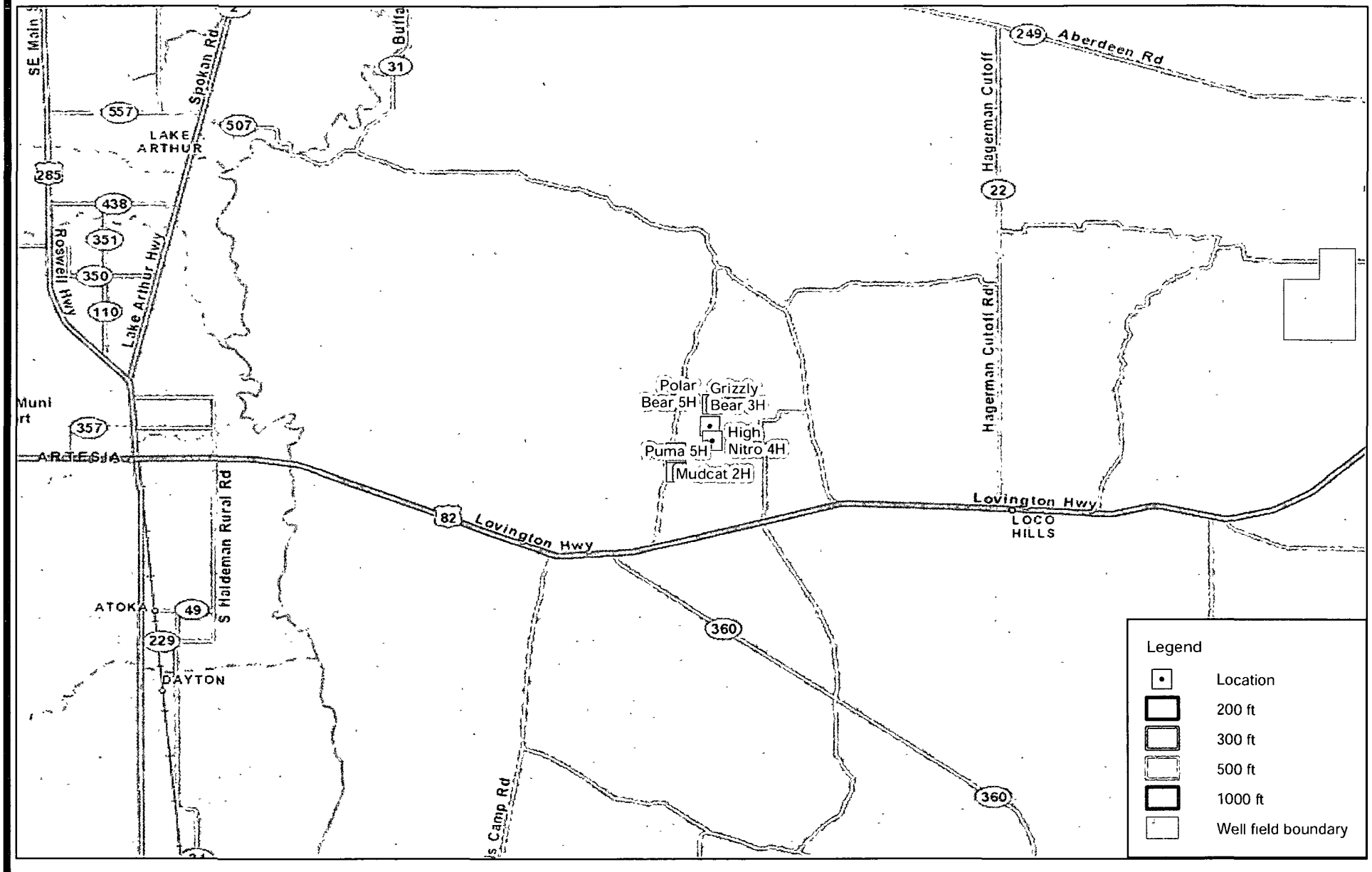
R.T. Hicks Consultants, Ltd
901 Rio Grande Blvd NW Suite F-142
Albuquerque, NM 87104
Ph: 505.266.5004

Air Photo Showing Surface Water and Wells

Figure 3

Murchison - Mudcat 2H, Puma 5H

August 2012



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

Nearest Munipalities and Wellfields

Figure 4

Murchison - Polar Bear 5H, Grizzly Bear 3H
High Nitro 2H, Mudcat 2H, Puma 5H

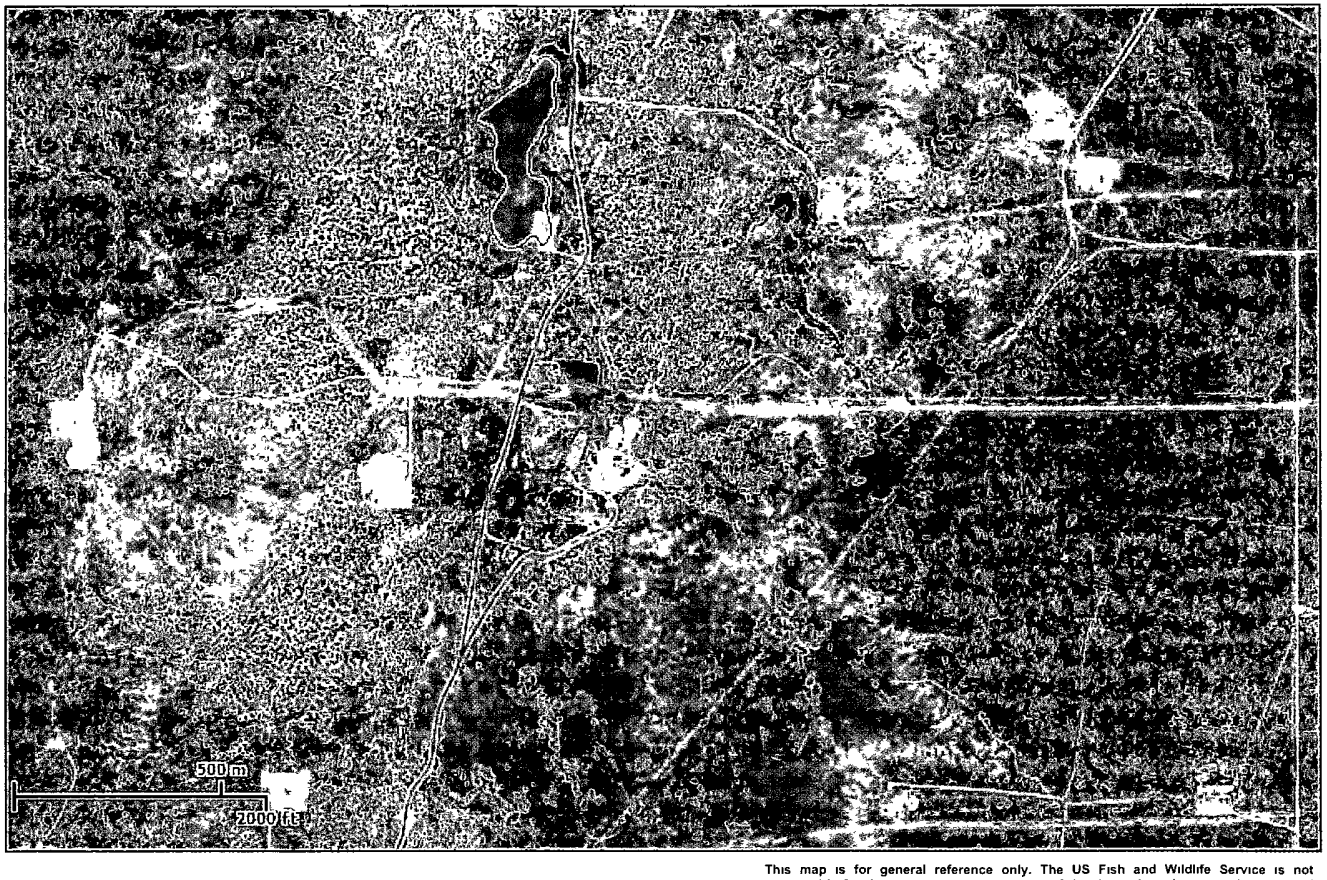
August 2012

U.S. Fish and Wildlife Service

National Wetlands Inventory

Figure 5

Aug 7, 2012



Wetlands

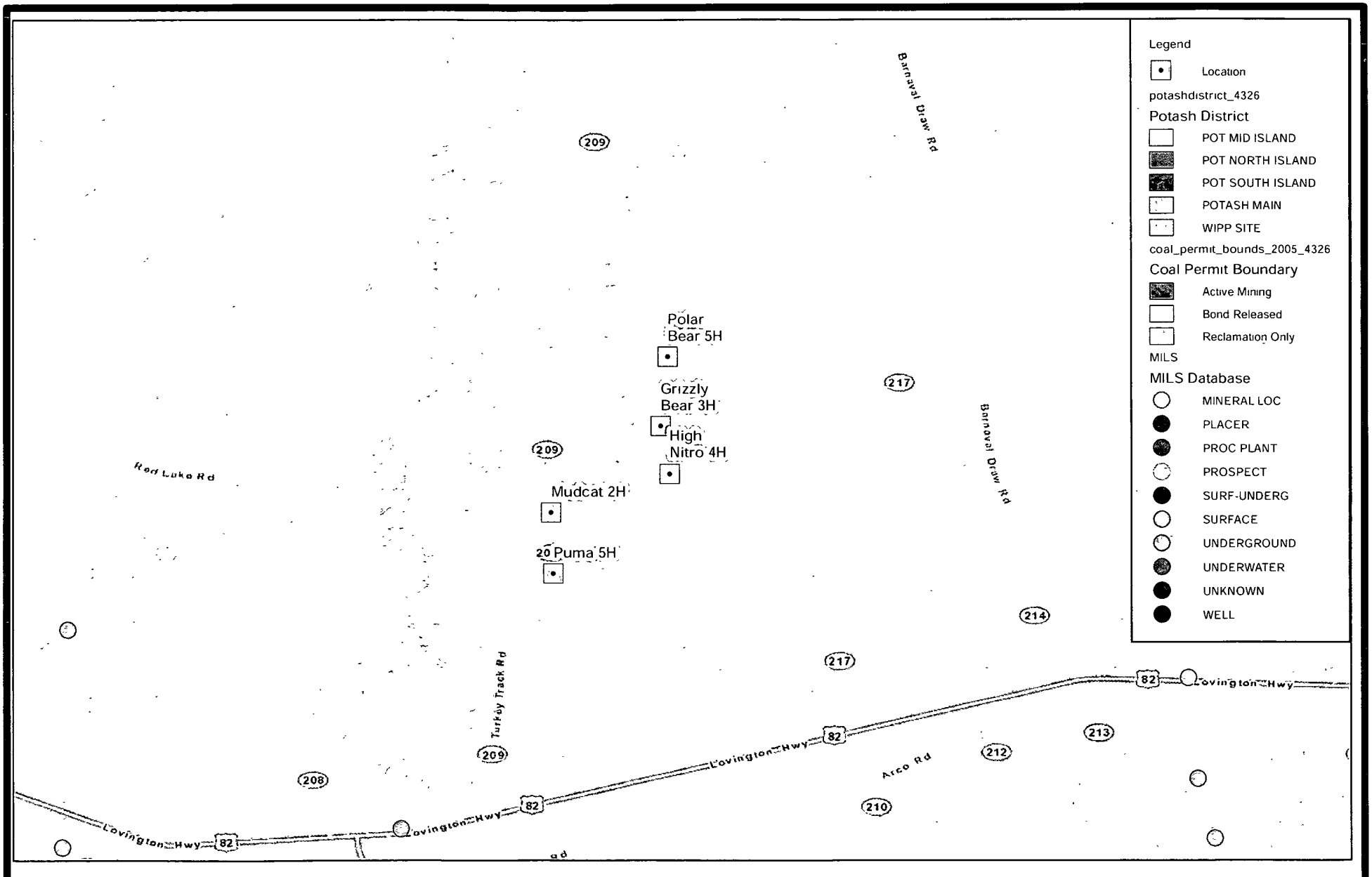
- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

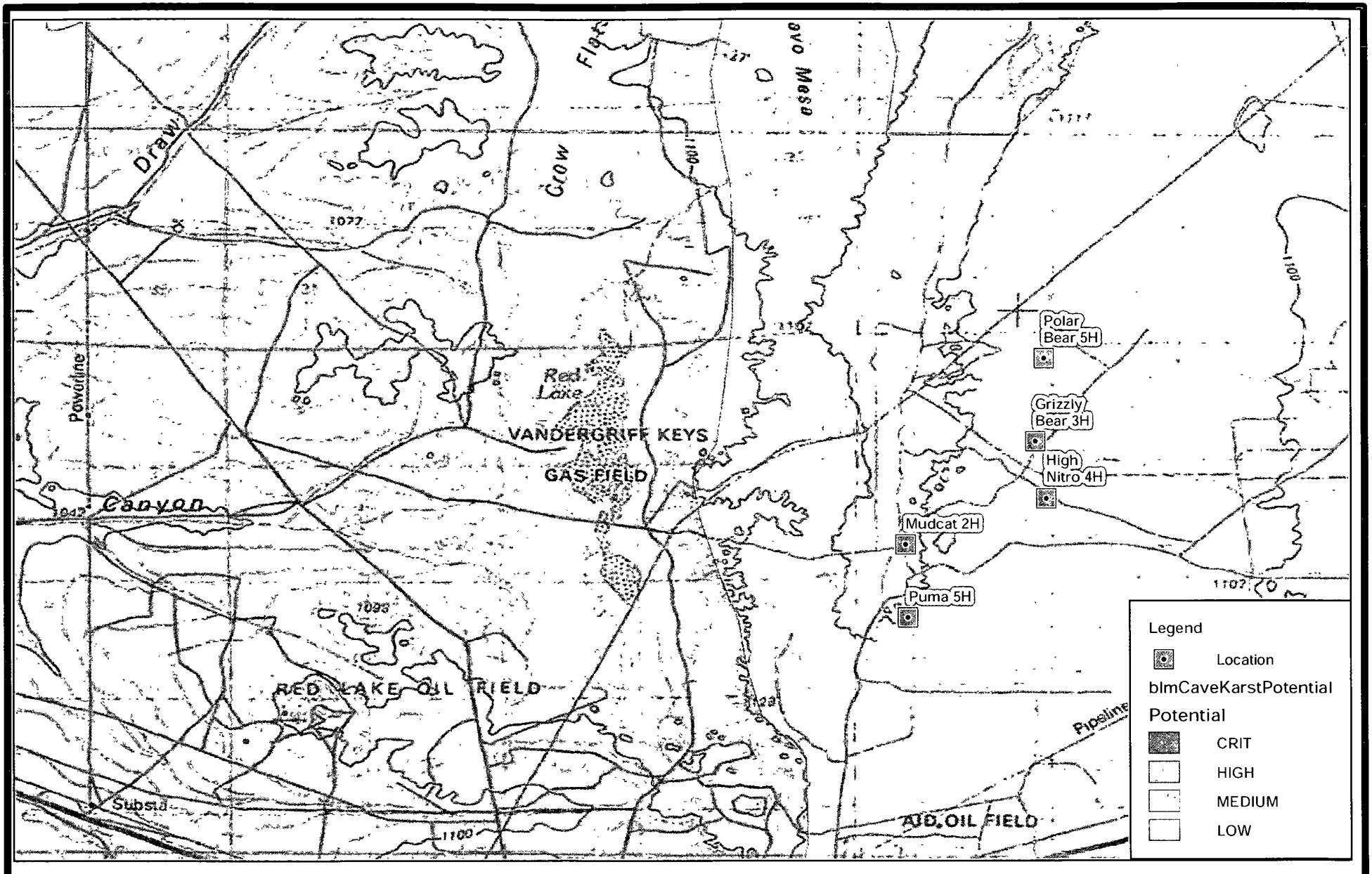
- Herbaceous
- Forested/Shrub

User Remarks:

Wetlands Near Puma 5H and Mudcat 2H



R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	Nearest Mines	Figure 6
	Murchison - Polar Bear 5H, Grizzly Bear 3H High Nitro 2H, Mudcat 2H, Puma 5H	August 2012



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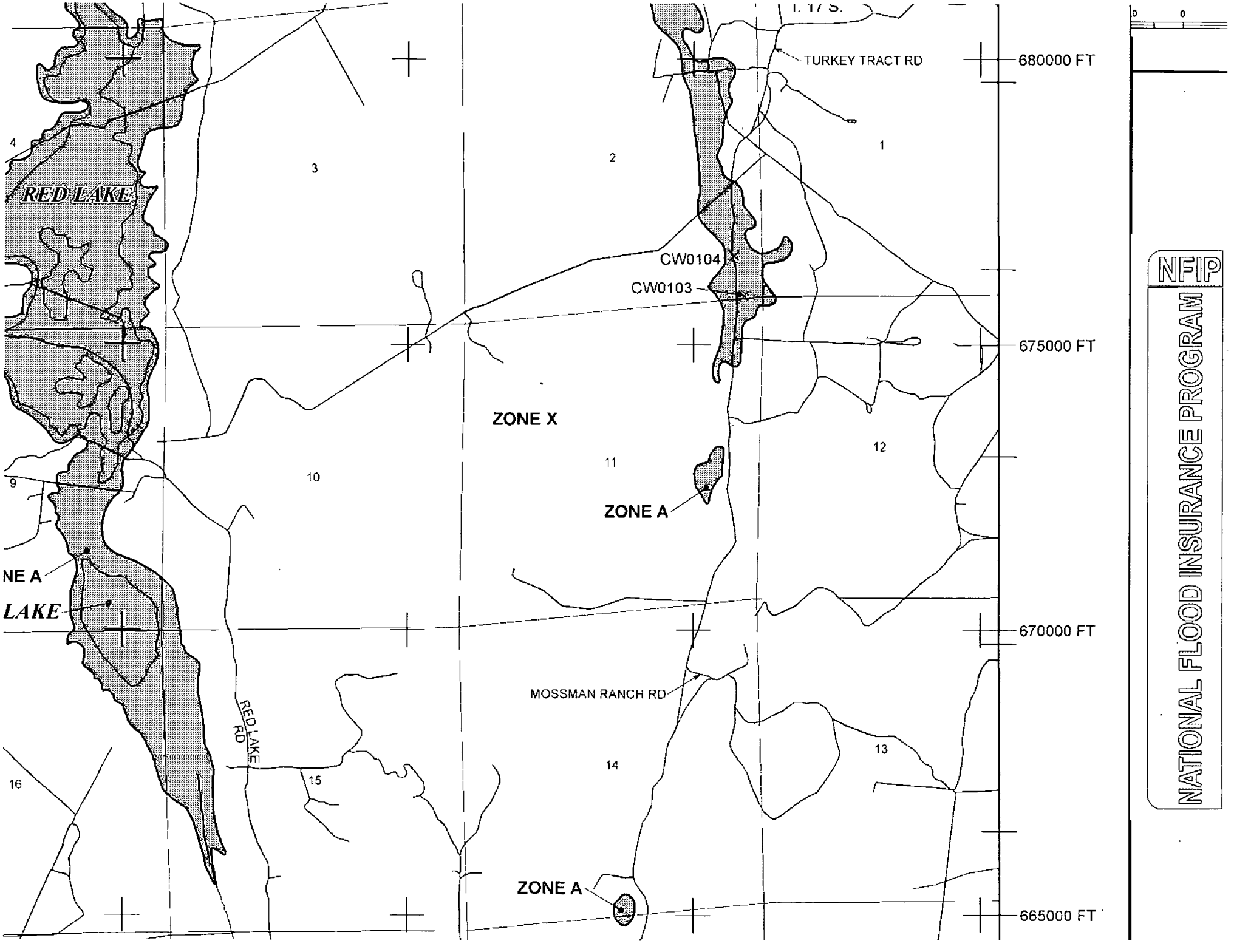
R.T. Hicks Consultants, Ltd 901 Rio Grande Blvd NW Suite F-142 Albuquerque, NM 87104 Ph: 505.266.5004	BLM Cave and Karst Potential Map	Figure 7
	Murchison - Polar Bear 5H, Grizzly Bear 3H High Nitro 2H, Mudcat 2H, Puma 5H	August 2012


TURKEY TRACT RD
680000 FT
RED LAKE
CW0104
CW0103
675000 FT
ZONE X
ZONE A
NE A
LAKE
670000 FT
MOSSMAN RANCH RD
RED LAKE RD
ZONE A
665000 FT
NFIP
NATIONAL FLOOD INSURANCE PROGRAM

Appendix SSI-A

Communication from OSE regarding RA-9342

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

Randall Hicks

From: Hernandez, Juan L., OSE <juan.hernandez1@state.nm.us>
Sent: Friday, July 27, 2012 1:55 PM
To: Randall Hicks
Subject: RE: Murchison - water well RA 9342
Attachments: DOC (152).pdf

Randall,

Attached is a copy of the permit which shows the well is in 16S 26E 19. There was a type on the well log and that is probably the location that was entered in the WATERS database. If you look at the permit, and the location entered on the well log by the driller it is in Range 26 E. The location entered at bottom of well log is incorrect.

I hope this helps.

Juan Hernandez
OSE DII
575-622-6521 ext 128

From: Randall Hicks [mailto:r@rthicksconsult.com]
Sent: Friday, July 27, 2012 10:57 AM
To: Hernandez, Juan L., OSE
Subject: Murchison - water well RA 9342

Juan

I attach a map showing the location of RA 9342 based upon the WATERS database – Section 19 16S 29E (see attached map). The on-line data confirm this location of a so-called domestic well drilled as shown on the attached data sheet.

The well does show up on the topographic map and the air photo does not suggest that this is the location of this well (see attached figures)

I tried to call the well owner – but found the husband died in 2008 and the wife is no longer listed in the phone books of NM.

I think the driller may have wanted to say 25 E rather than 29E for the Range.

I can walk the location next week to confirm it does not exist at this location – but if you have easy access to something that says this well does not exist here, it will save me about 3 hours of time.

No big hurry for this. Thanks

Randall T. Hicks
901 Rio Grande NW
F-142
Albuquerque, NM 87104

505-266-5004 - office

Thomas C. Turney
State Engineer

Roswell Office
1900 WEST SECOND STREET
ROSWELL, NM 88201

STATE OF NEW MEXICO
STATE ENGINEER OFFICE

Trn Nbr: 147633
File Nbr: RA 09342

Apr. 09, 1998

RUSTY AND JOSIE VAN CUREN
13 DIANE DRIVE
ARTESIA, NM 88210

Greetings:

Enclosed is your copy of the 72-12-1 Permit which has been approved. Your attention is called to the Specific and the General Conditions of Approval of this permit.

A well record shall be filed in this office within ten (10) days after completion of drilling.

This permit will expire, unless this well is drilled and the well driller files the well record in this office on or before 04/09/1999.

Sincerely,

Richard Cibak
(505)622-6467

Enclosure

cc: Santa Fe Office

wr_01app

NEW MEXICO STATE ENGINEER OFFICE
APPLICATION TO APPROPRIATE UNDERGROUND WATERS
IN ACCORDANCE WITH SECTION 72-12-1 NEW MEXICO STATUTES

GENERAL CONDITIONS OF APPROVAL

A The maximum amount of water that may be appropriated under this permit is 3 acre-feet in any year.

B The well shall be drilled by a driller licensed in the State of New Mexico in accordance with Section 72-12-12 New Mexico Statutes Annotated. A licensed driller shall not be required for the construction of a driven well, provided, that the casing shall not exceed two and three-eighths (2 3/8) inches outside diameter (Section 72-12-12).

C Driller's well record must be filed with the State Engineer within 10 days after the well is drilled or driven. Failure to file the well record within that time shall result in automatic cancellation of the permit. Well record forms will be provided by the State Engineer upon request.

D The casing shall not exceed 7 inches outside diameter except under specific conditions in which reasons satisfactory to the State Engineer are shown.

E If the well under this permit is used at any time to serve more than one household or livestock in a commercial feed lot operation, or for drinking and sanitation purposes in conjunction with a commercial operation, the permittee shall notify the State Engineer Office in writing.

F In the event this well is combined with other wells permitted under Section 72-12-1 New Mexico Statutes Annotated, the total outdoor use shall not exceed the irrigation of one acre of non-commercial trees, lawn, and garden, or the equivalent outside consumptive use, and the total appropriation for household and outdoor use from the entire water distribution system shall not exceed 3 acre-feet in any year.

G If artesian water is encountered, all rules and regulations pertaining to the drilling and casing of artesian wells shall be complied with.

H The amount and uses of water permitted under this Application are subject to such limitations as may be imposed by the courts or by lawful municipal and county ordinances which are more restrictive than applicable State Engineer Regulations and the conditions of this permit.

NEW MEXICO STATE ENGINEER OFFICE
APPLICATION TO APPROPRIATE UNDERGROUND WATERS
IN ACCORDANCE WITH SECTION 72-12-1 NEW MEXICO STATUTES

SPECIFIC CONDITIONS OF APPROVAL

1A Depth of the well shall not exceed the thickness of the valley fill.

4 Use shall be limited to household, non-commerical trees, lawn and garden not to exceed one acre and/or stock use.

LOG This permit will automatically expire unless the well RA 09342 is completed and the well record filed on or before 04/09/1999.

ACTION OF STATE ENGINEER

This application is approved for the use indicated, subject to all general conditions and to specific conditions listed above.

Witness my hand and seal this 09 day of Apr A.D., 1998

Thomas C. Turney, State Engineer

By: Richard C. Cibak
Richard Cibak

Trn Desc: RA 09342 File Number: RA 09342
Log Due Date: 04/09/1999 Trn Number: 147633
Form: wr-01

1. Name and mailing address of applicant:

Rusty + Josie Van Curen
13 Diane Drive
Artesia, NM 88210

File No. RA 9342

Work Phone: Rusty 748-3156 Josie 746-9892
Home Phone: 365-2215

2. Describe well location under one of the following subheadings:

Lot 7, Block 5, Rock Farm Estates Subdivision

a. NE ¼ SE ¼ SW ¼ of Sec. 19 Twp. 16S Rge. 26E NMPM, in Eddy County.

b. X = _____ feet, Y = _____ feet, New Mexico Coordinate System _____ Zone in the _____ Grant.

3. Approximate depth (if known) 220 feet; outside diameter of casing 5½" inches.

Name of driller (if known) Martin, Delford; DBA Martin Water well Drilling

4. Use of water (check use applied for):

✓ One household, non-commercial trees, lawn and garden not to exceed one acre.

✓ Livestock watering. Non-commercial

___ More than one household, non-commercial trees, lawns and gardens not to exceed a total of one acre.

___ Drill and test a well intended to be used for domestic, drinking and sanitary or stock water purposes in conjunction with the building or dwelling unit.

___ Drinking and sanitary purposes and the irrigation of non-commercial trees, shrubs and lawns in conjunction with a commercial operation.

___ Prospecting, mining or drilling operations to discover or develop natural resources.

___ Construction of public works, highways and roads.

If any of the last three items were marked, give name and nature of business under Remarks (Item 5).

5. Remarks: _____

STATE ENGINEER OFFICE
RECEIVED
NEW MEXICO
'98 APR 8 PM 12 46

I, Josie Van Curen, affirm that the foregoing statements are true to the best of my knowledge and belief and that development shall not commence until approval of the permit has been obtained.

Josie Van Curen, Applicant

By: _____ Date: 04/06/98

ACTION OF STATE ENGINEER

This application is approved for the use indicated, subject to all general conditions and to specific conditions numbered _____ on the reverse side hereof. This permit will automatically expire unless this well is drilled or driven and the well record filed on or before _____.

Thomas C. Turney, State Engineer

Street or Post Office Address 13 Diane Drive
City and State Artesia NM 88210

Well was drilled under Permit No. RA-9342 and is located in the:
LOT 7, Block 3 Rock Farm Subdivision
a. ____ ¼ NE ¼ SE ¼ SW ¼ of Section 19 Township 16 S. Range 26 E. N.M.P.M.

b. Tract No. ____ of Map No. ____ of the ____

c. Lot No. ____ of Block No. ____ of the ____
Subdivision, recorded in ____ County.

d. X= ____ feet, Y= ____ feet, N.M. Coordinate System ____ Zone in the ____ Grant.

(B) Drilling Contractor Martin Water Well Drlg Co. License No. WD-1064

Address 9725 Hope Hwy Artesia, New Mexico 88210

Drilling Began May 2, 98 Completed May 3, 98 Type tools Rotary Size of hole 7 7/8 in.

Elevation of land surface or ____ at well is 0 ft. Total depth of well 220 ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 110 ft.

Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet From	Depth in Feet To	Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
143	204	61	Sand & Gravel	30+

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
5 1/2	PVC	Bell	0	220	220	———	140	220

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor ____
Address ____
Plugging Method ____
Date Well Plugged ____
Plugging approved by:

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			

Street or Post Office Address 13 Diane Drive
City and State Artesia NM 88210

Well was drilled under Permit No. RA-9342 and is located in the:
Lot 7, Block 3 Rock Farm subdivision
a. ____ ¼ NE¼ SE¼ SW¼ of Section 19 Township 16S. Range 26E. N.M.P.M.

b. Tract No. ____ of Map No. ____ of the ____

c. Lot No. ____ of Block No. ____ of the ____
Subdivision, recorded in ____ County.

d. X= ____ feet, Y= ____ feet, N.M. Coordinate System ____ Zone in the ____ Grant.

(B) Drilling Contractor Martin Water Well Drlg Co. License No. WD-1064

Address 9775 Hope Hwy Artesia, New Mexico 88210

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143	204	61	Sand & Gravel	30+

Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet Top	Depth in Feet Bottom	Length (feet)	Type of Shoe	Perforations From	Perforations To
5 1/2	PVC	Bell	0	220	220	—	140	220

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet From	Depth in Feet To	Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement

Section 5. PLUGGING RECORD

Plugging Contractor ____
Address ____
Plugging Method ____
Date Well Plugged ____
Plugging approved by:

No.	Depth in Feet Top	Depth in Feet Bottom	Cubic Feet of Cement
1			
2			

36	62	26	clay	Tan
62	90	28	sand	Tan
90	108	18	clay	Red
108	114	6	sand & Gravel	Tan - various
114	143	29	clay	Red
143	204	61	Sand & Gravel	Tan & various
204	220	16	clay	Red

Section 7. REMARKS AND ADDITIONAL INFORMATION

The undersigned hereby certifies that, to the best of his knowledge and belief, the foregoing is a true and correct record of the above

Appendix B

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 15,2009
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
	MUDCAT FEDERAL COM	2H

[7] OGRID No.	[8] Operator Name	[9] Elevation
15363	MURCHISON OIL & GAS, INC.	3591.1

[10] Surface Location

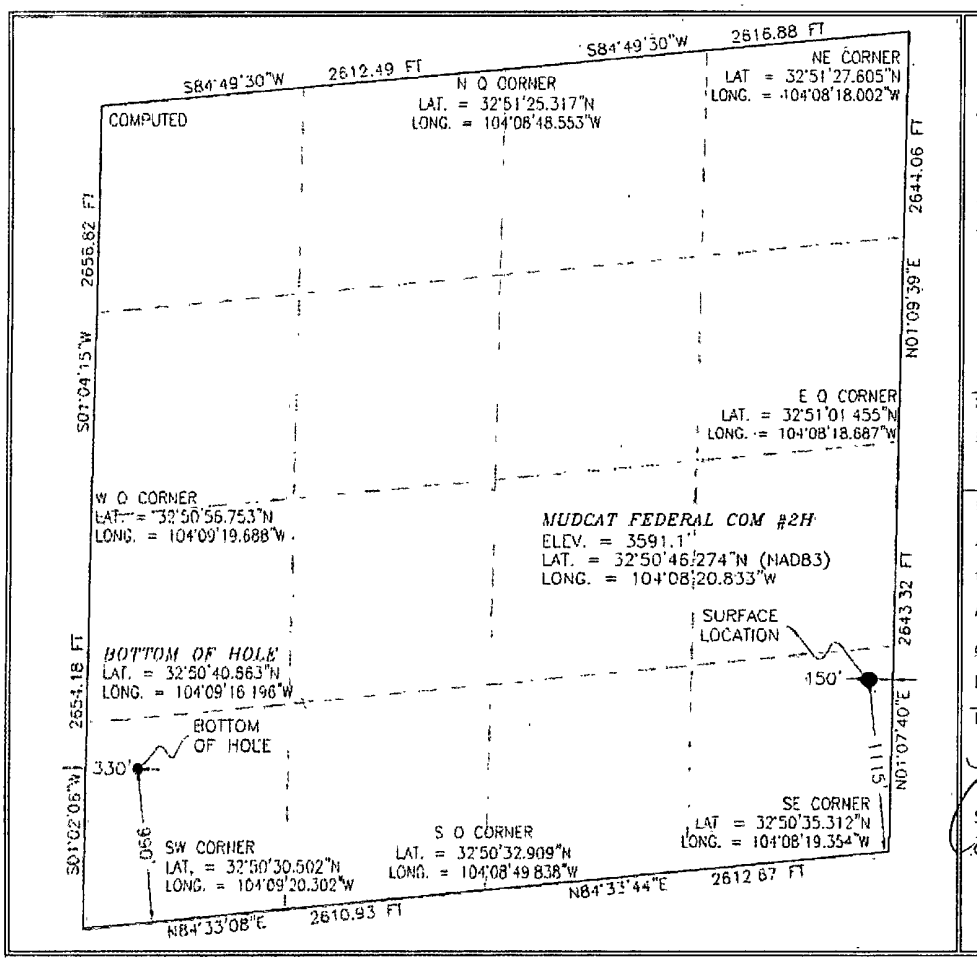
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	11	17 S	28 E		1115	SOUTH	150	EAST	EDDY

[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
M	11	17 S	28 E		990	SOUTH	330	WEST	EDDY

[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

[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.

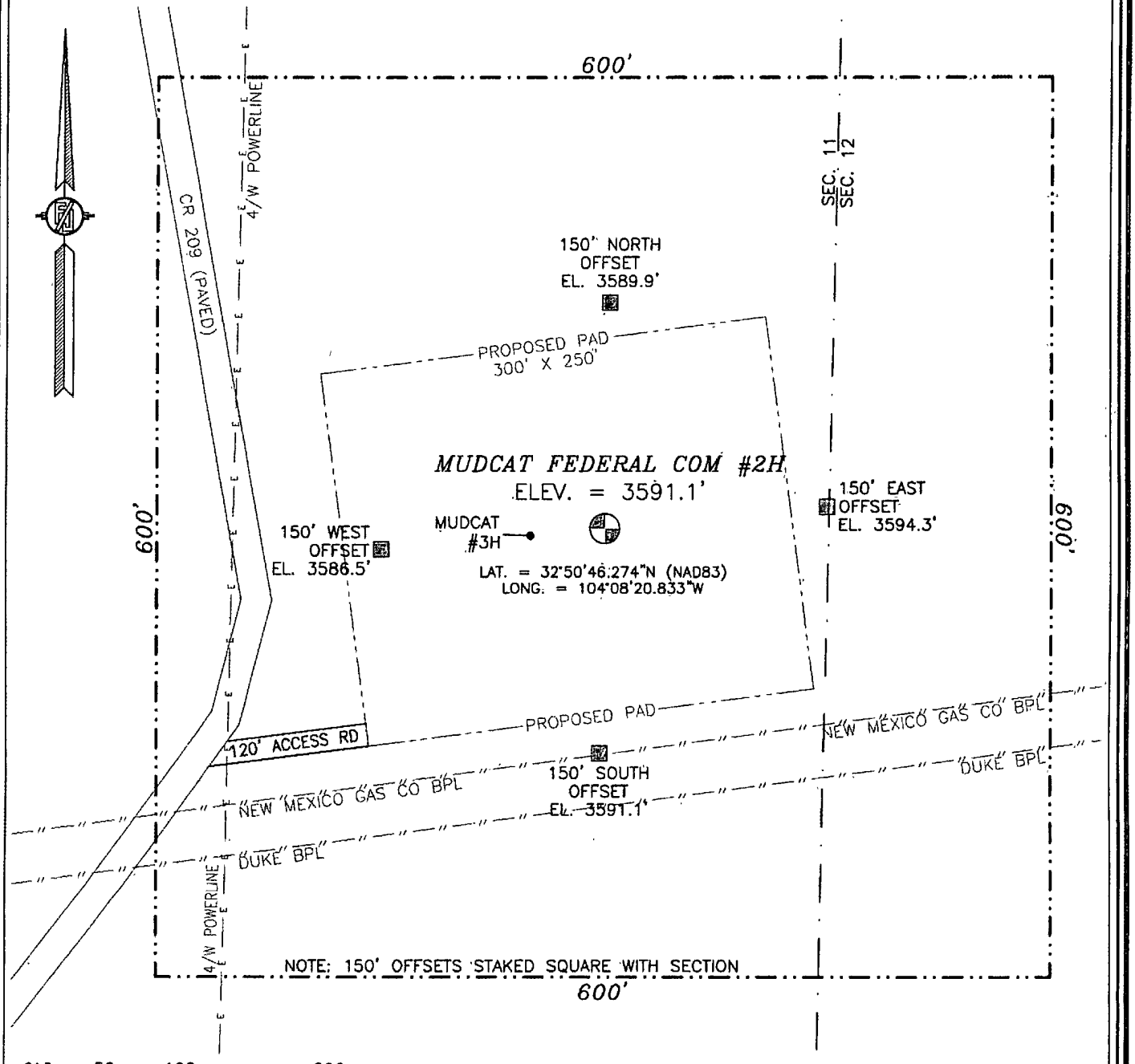
MARCH 5, 2012
Date of Survey

Signature and Seal of Professional Surveyor:

NEW MEXICO
FILEMON F. JARAMILLO
REGISTERED LAND SURVEYOR

Certificate Number: FILEMON F. JARAMILLO, PLS 12797 SURVEY NO. 803

SECTION 11, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO



010 50 100 200
SCALE 1" = 100'

DIRECTIONS TO LOCATION
FROM STATE HWY. 82 AND PAVED CR. 209 (TURKEY TRACK) GO NORTH ON CR. 209 3.2 MILES TO A PROPOSED ROAD SURVEY AND FOLLOW FLAGS EAST 120' TO THE SW. COR. OF PROPOSED PAD FOR THIS LOCATION

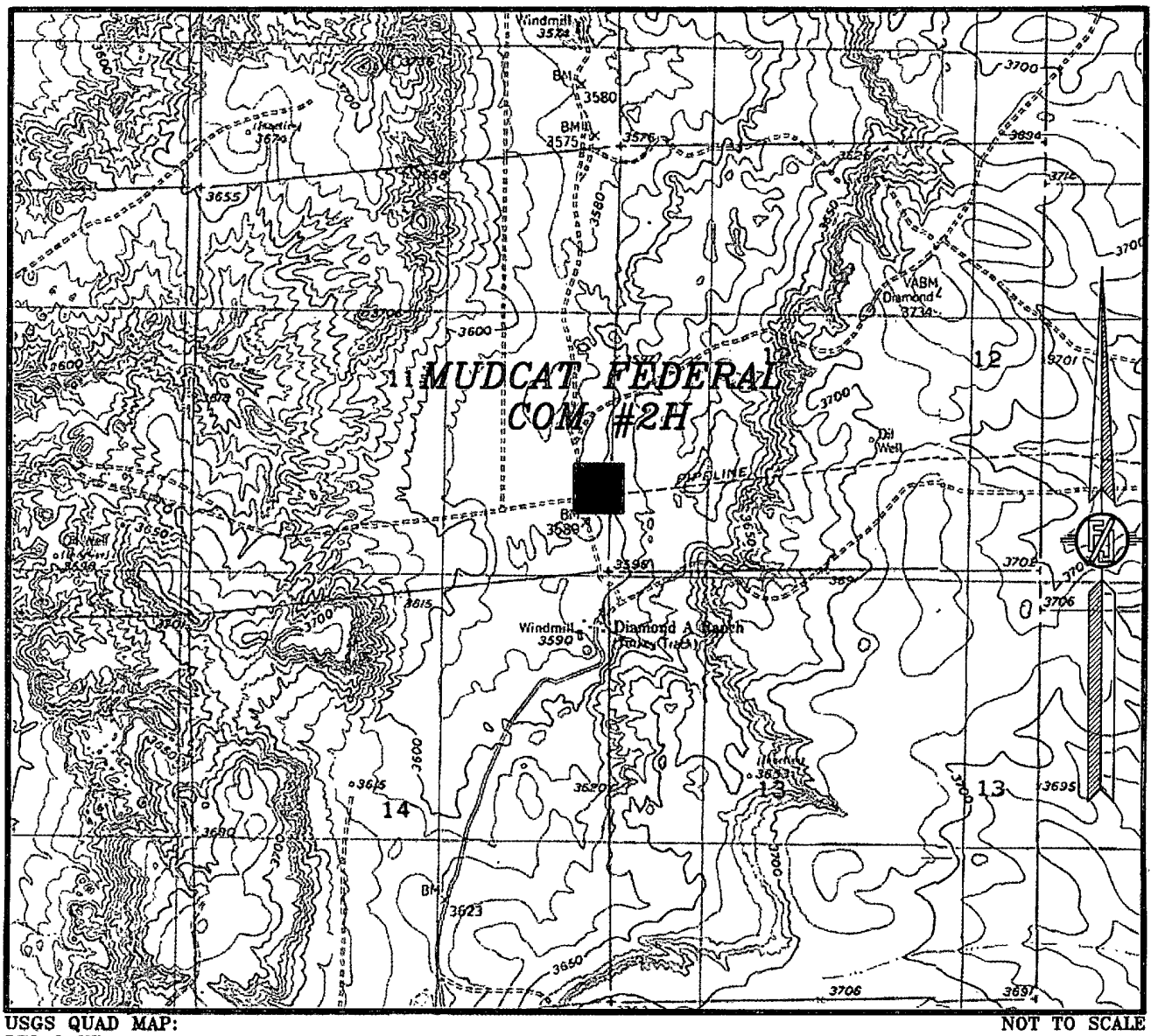
MURCHISON OIL & GAS, INC.
MUDCAT FEDERAL COM #2H
LOCATED 1115 FT. FROM THE SOUTH LINE AND 150 FT. FROM THE EAST LINE OF SECTION 11, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 5, 2012

SURVEY NO. 803
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 11, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
RED LAKE

NOT TO SCALE

MURCHISON OIL & GAS, INC.
MUDCAT FEDERAL COM #2H
LOCATED 1115 FT. FROM THE SOUTH LINE
AND 150 FT. FROM THE EAST LINE OF
SECTION 11, TOWNSHIP 17 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 5, 2012

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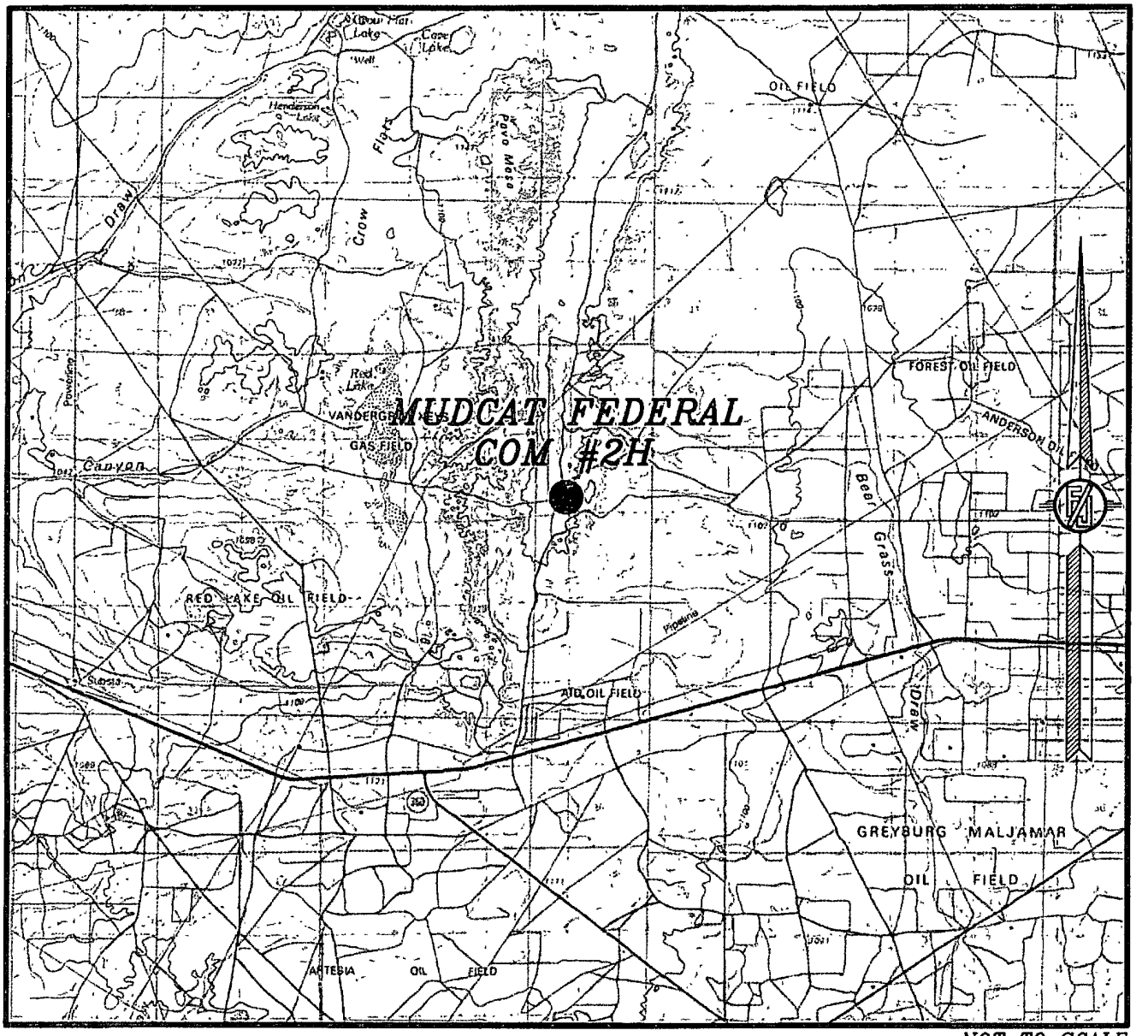
SECTION 11, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

VICINITY MAP



NOT TO SCALE

MURCHISON OIL & GAS, INC.
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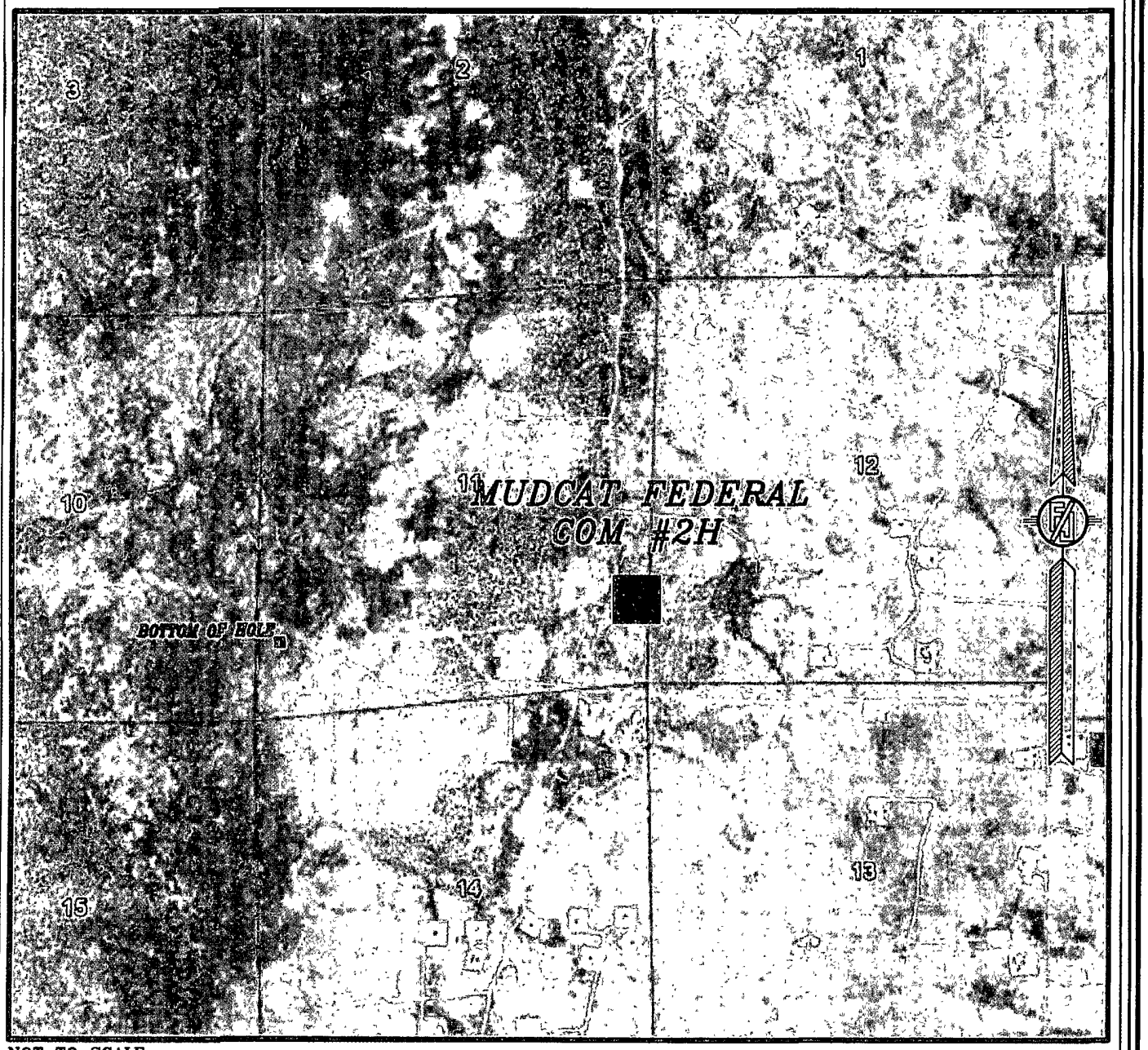
SECTION 11, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
JUNE 2011

MURCHISON OIL & GAS, INC.
MUDCAT FEDERAL COM #2H
LOCATED 1115 FT. FROM THE SOUTH LINE
AND 150 FT. FROM THE EAST LINE OF
SECTION 11, TOWNSHIP 17 SOUTH,
RANGE 28 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 5, 2012

SURVEY NO. 803

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

Generic Plans for Drying Pads (Temporary Pits)

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

Temporary Pit (Drying Pad) Design Plan

The operator will ensure that short-term storage of fluids, fluid reuse or fluid disposal in the temporary pit/drying pad/pit sump will be conducted in a manner approved by the division that prevents the contamination of fresh water and protects public health and the environment.

Design Plan- Operator Instructions

1. The design will contain liquids and solids and prevent contamination of fresh water and protect public health and the environment.
2. The design prevents run-on of surface water.
3. The design directs any fluid drainage from the cuttings/mud to a sump from which fluids will be removed prior to accumulation of 500 gallons.
4. The temporary pit/drying pad will receive only solids discharged from the closed loop system.
5. The operator will post an upright sign in compliance with 19.15.16.8 NMAC. The operator will post the sign in a manner and location such that a person can easily read the legend. The sign will provide the following information: the operator's name; the location of the site by quarter-quarter or unit letter, section, township and range; and emergency telephone numbers.
6. The temporary pit/drying pad will be completely fenced at all times excluding drilling and workover/stimulation operations. During drilling or workover operations, the operator is not required to fence the edge of the temporary pit/drying pad adjacent to the drilling or workover rig.
7. The operator will maintain the fences in good repair from beginning of temporary pit/drying pad use to the time of closure.
8. The operator will provide for devices to protect the liner from any force or mechanical damage at any point of discharge into the lined temporary pit/drying pad or suction from the sump.
9. The operator or operator's representative will inspect the temporary pit/drying pad before and after lining to ensure that construction of the temporary pit/drying pad
    a. Has not penetrated any solution features such as fissures, tubes or caves without implementing engineering controls to prevent undue stress on the liner
    b. Can prevent unauthorized releases and ensure the confinement of liquids
    c. Is consistent with the design criteria of Plate 1 or any agreed alteration to meet field conditions
    d. Meets the prescriptive mandates outlined below

Construction Plan- Construction Contractor Instructions

A. Prior to constructing the temporary pit/drying pad the qualified contractor will examine Plate 1 and provide the operator (or operator's representative) with an affirmation of their understanding of the design.
B. The contractor will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.
C. The temporary pit/drying pad will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.

D. The interior slopes of the temporary pit/drying pad will be no steeper than 1.5 horizontal feet to 1 vertical foot (1.5H:1V) and interior berms will be no steeper than 1.5H:1V.
E. Temporary pit/drying pad walls will be walked down by a crawler type tractor following construction.
F. As necessary, a berm or ditch will surround the temporary pit/drying pad to prevent run-on of surface water.
G. The exterior walls of the temporary pit/drying pad will be two feet above the lowest natural grade before removal of topsoil and leveling the pad.

Construction Plan- Liner Contractor Instructions

I. Install a geomembrane liner.
II. The geomembrane liner will consist of 20-mil string reinforced HDPE or equivalent liner material that the appropriate division district office approves. The geomembrane liner will be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. The liner material will be resistant to ultraviolet light. Liner compatibility will comply with EPA SW-846 method 9090A.
III. Minimize liner seams and orient them up and down, not across a slope.
IV. Use factory welded seams where possible.
V. Prior to any field seaming, the contractor will overlap liners four to six inches and orient seams parallel to the line of maximum slope, *i.e.*, oriented along, not across, the slope. The contractor will minimize the number of welded field seams in corners and irregularly shaped areas. Field seams will be welded by qualified personnel.
VI. Avoid excessive stress-strain on the liner.
VII. Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity.
VIII. Anchor the edges of all liners in the bottom of a compacted earth-filled trench. The anchor trench will be at least 18 inches deep.
IX. Install any devices used 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/drying pad.
X. Fence the temporary pit/drying pad in a manner that prevents unauthorized access. The contractor will fence the temporary pit/drying pad to exclude livestock with a four foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level.

Operating and Maintenance Plan

The operator will operate and maintain the temporary pit/drying pad to contain solids and cause fluids entrained in the cuttings/mud to drain to the sump for removal. The operator will maintain the integrity of the liner to prevent contamination of fresh water and protect public health and the environment as described below.

1. If feasible, the operator will recycle, reuse or reclaim all fluids in the sump of the temporary pit/drying pad 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.
2. If re-use is not possible, fluids will be sent to disposal at a division-approved facility.
3. The operator will not discharge into or store any hazardous waste in the temporary pit/drying pad.
4. If the temporary pit/drying pad liner's integrity is compromised, or if any penetration of the liner occurs above the liquid's surface of the sump, then the operator will notify the appropriate division district office within 48 hours (phone or email) of the discovery and repair the damage or replace the liner.
5. If the temporary pit/drying pad develops a leak or if any penetration of the liner occurs below the liquid's surface in the sump, then the operator will remove all liquid above the damage or leak line within 48 hours, notify the district office within 48 hours (phone or email) of the discovery and repair the damage or replace the liner.
6. The operator will install diversion ditches and berms around the temporary pit/drying pad as necessary to prevent the collection of surface water run-on.
7. No fluids used or generated during the drilling or workover (stimulation) process will be discharged to the temporary pit/drying pad.
8. The operator will maintain the temporary pit/drying pad free of miscellaneous solid waste or debris.
9. The operator will inspect the temporary pit/drying pad at least daily during drilling and stimulation to ensure compliance with this plan.
10. After drilling and stimulation operations, the operator will inspect the temporary pit/drying pad weekly so long as free liquids drain to the sump.
11. The operator will maintain a log of such inspections and make the log available for the district office's review upon request.
12. The operator will file a copy of the log with the appropriate division district office when the operator closes the temporary pit/drying pad.
13. The operator will note the date of the drilling and stimulation rig's release on form C-105 or C-103 upon completion of applicable activities.

Operating and Maintenance Plan for Closed Loop System

- All drilling fluid circulated over shaker(s) with cuttings discharged into steel bin.
- Fluid and fines below shaker(s) are circulated with transfer pump through centrifuge(s) or solids separator with cuttings and fines discharged into steel bin.
- Fluid is continuously re-circulated through equipment with polymer added to aid separation of cutting fines.
- Steel bin is de-watered with fluids re-circulated into system.
- Additional tanks is used to capture used/unused drilling fluid
- Cement returns from casing jobs will be discharged to steel bin.
- This equipment will be maintained 24 hours/day by solids control personnel and/or rig crews that stay on location.
- De-watered cuttings and cement returns will be routinely transferred from the steel bin to the temporary pit/drying pad using a end-loader or similar equipment

Closure Plan- General Conditions

The preferred closure alternative is in-place closure.

Notifications and Reports

- The operator will notify the landowner by certified mail, return receipt requested, prior to closure, that the operator plans to close the temporary pits.
- The operator of the temporary pit will notify the division district office verbally or by email at least 72 hours, but not more than one week, prior to any closure operation. The notice will include the operator's name and the location to be closed by unit letter, section, township and range, well's name, number, the API number.
- Within 60 days of closure completion, the operator will submit a closure report on form C-144, with necessary attachments to document all closure activities including sampling results; information required by 19.15.17 NMAC; a plot plan; and details on back-filling, capping and covering, where applicable.

Protocols and Procedures

- The operator of the temporary pits will remove all liquids from each temporary pit prior to closure and either:
  - Dispose of the liquids in a division-approved facility, or
  - Recycle, reuse or reclaim the liquids in a manner approved by the district office.
- Except for liquids in the pit that are integral to the closure process, the operator shall remove all free liquids from the temporary pits within 30 days from the date that the operator released the rig. The operator shall note the date of the rig's release on form C-105 or C-103 upon well completion. The operator will request an extension of up to three months from the appropriate division district office if necessary to allow for water re-use.
- The operator will close the temporary pits within six months of the date that the operator releases the rig. An extension not to exceed three months may be requested of the district office.
- The operator will close the pits by an earlier date if the division requires, because of imminent danger to fresh water, public health or the environment.
- In the closure report, the operator will certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan.
- The operator will provide a plat of the pit location on form C-105 with the closure report within 60 days of closing the temporary pit.

Additional Protocols and Procedures for On-Site Closure

- The C-144 package has been provided to the surface owner as notice of the operator's proposal of an on-site closure as required in 19.15.17.13.F(1)(b).
- Upon receipt of NMOCD approval for on-site closure, the operator will notify the surface owner by certified mail, return receipt requested, that the operator plans to close the pits and where the operator has approval for on-site closure. Evidence of mailing of the notice will demonstrate compliance with this requirement.

- The operator will place a steel marker at the center of an on-site burial if on-site burial occurs for the temporary pits. The steel marker will be not less than four inches in diameter and will be cemented in a three-foot deep hole at a minimum. The steel marker will extend at least four feet above mean ground level and at least three feet below ground level. The operator name, lease name and well number and location, including unit letter, section, township and range, and that the marker designates an on-site burial location will be welded, stamped or otherwise permanently engraved into the metal of the steel marker.
- The operator will report the exact location of any on-site burial on form C-105 filed with the division.
- For temporary pits located on private property (not government land) the operator will file a deed notice identifying the exact location of any on-site burial with the county clerk in the county. The exact location of any on-site burial will be transmitted to the surface owner by copy of the form C-105 discussed above.

In-place closure is the preferred closure alternative for the temporary pits. If waste sampling results suggest that standards for in-place closure are not met, the operator will implement excavation and removal after notification to NMOCD.

Site Reclamation Plan

After the operator has closed the pit, the operator will reclaim the pit location and all areas associated with the pit, including associated access roads to a safe and stable condition that blends with the surrounding undisturbed area. The operator will substantially restore the impacted surface area to the condition that existed prior to oil and gas operations by placement of the soil cover as provided in Subsection H of 19.15.17.13 NMAC, re-contour the location and associated areas to a contour that approximates the original contour and blends with the surrounding topography and re-vegetate according to Subsection I of 19.15.17.13 NMAC.

Soil Cover Design Plan

If the operator removes the pit contents or remediates any contaminated soil to the division's satisfaction the soil cover will consist of the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.

The soil cover for the in-place burial will consist of a minimum of four feet of compacted, non-waste containing, earthen material. The soil cover will include either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.

The operator will construct the soil cover to the site's existing grade and prevent ponding of water and erosion of the cover material.

Re-vegetation Plan

1. The first growing season after the operator closes the pit, including access roads, the operator will seed or plant the disturbed areas.
2. The operator will accomplish seeding by drilling on the contour whenever practical.

3. The operator will obtain vegetative cover that equals 70% of the native perennial vegetative cover (un-impacted by overgrazing, fire or other intrusion damaging to native vegetation).
4. The operator will follow surface owner mandates for the seed mixture and maintain that cover through two successive growing seasons.
5. During the two growing seasons that prove viability, there will be no artificial irrigation of the vegetation.
6. The operator will repeat seeding or planting until it successfully achieves the required vegetative cover.
7. If conditions are not favorable for the establishment of vegetation, such as periods of drought, the operator may request that the division allow the operator to delay seeding or planting until soil moisture conditions become favorable or may require the operator to use additional cultural techniques such as mulching, fertilizing, irrigating, fencing or other practices.
8. The operator will notify the division when it has seeded or planted and when it successfully achieves re-vegetation.

In-place Closure Plan

In the event that sampling of the solids demonstrates that the pit meets the criteria for in-place closure, the operator will proceed with in-place closure.

Siting Criteria Compliance Demonstration for In-Place Burial

The Siting Criteria Compliance Demonstration for the temporary pit (see Site Specific Information) show that the requirements of 19.15.17.10 NMAC are met for in-place closure.

Waste Material Sampling Plan for In-place Burial

Because the groundwater is more than 100 feet below the bottom of the buried waste (see above), the operator will collect at a minimum, a five point, composite sample of the contents of the temporary pit after treatment or stabilization.

The purpose of the sampling the waste material is to demonstrate that after stabilization with three parts clean fill:

- Benzene, as determined by EPA SW 846 method 8021B or 8260B, does not exceed 0.2 mg/kg;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B, does not exceed 50 mg/kg;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg;
- TPH, as determined by EPA method 418.1 does not exceed 2,500 mg/kg;
- Chloride, as determined by EPA method 300.1, does not exceed 1,000 mg/kg or the background concentration, whichever is greater.

Protocols and Procedures for In-Place Burial

In addition to the General Conditions Protocols and Procedures and the Additional Protocols and Procedures for On-site Closure listed above, the operator will execute the following steps for in-place closure of the pits.

A. The initial water flow-back from the stimulation process will discharge to the temporary pit if pit volume is sufficient. This water is fresh or slightly brackish. When the flow-back increases in salinity, discharge to an alternate storage cell begins. If oil in the flow-back accumulates in the pit to a measurable thickness, the flow-back is routed to tanks for oil recovery. As the fresh/brackish water moves through the cuttings and residual mud in response to pumping from an under-drain system, this water displaces entrained brine in the cuttings and dissolves any rock salt cuttings, thereby reducing the salinity of these solids. Water pumped by the under-drain system discharges to a temporary above ground storage container for disposal or re-use in accordance with NMOCD Rules.
B. The operator will measure the distance between the top of any solids in the pit and existing grade to determine if stabilized waste (see stabilization methods, below) will be at least 4-feet below existing grade to allow installation of the soil cover (see soil cover design, above).
C. The operator will stabilize or solidify the contents of the pit to a bearing capacity sufficient to support the temporary pit's final cover. However, the operator will not mix the pit contents with soil or other material at a mixing ratio of greater than 3:1, (3 parts soil or other material to 1 part temporary pit solids) and,
D. Cover the geomembrane lined, filled, temporary pit with compacted, non-waste containing, earthen material; construct a division-prescribed soil cover; recontour and re-vegetate the site as described in this plan. Specifically, a 4-foot thick soil cover consistent with NMOCD Rules will be placed over the stabilized waste.
E. Any excess liner above the stabilized waste will be removed for re-use or disposal.

Excavation and Removal Closure Plan

IF THE CRITERIA FOR IN_PLACD CLOSURE ARE NOT MET, THE OPERATOR WILL ADHERE TO NMOCD RULES AND IMPLEMENT THE FOLLOWING ACTIONS:

Protocols and Procedures for Excavation and Removal

The operator will close the temporary pit by excavating all contents and any synthetic pit liners that cannot be re-used and transferring those materials to one of the division-approved facilities listed below:

Controlled Recovery, Inc.	NM-01-0006
Lea Land, LLC	NM-01-0035

If the sampling program described below demonstrates that a release has not occurred or that any release does not exceed the concentrations specified in Subparagraph (b.ii) of Paragraph (1) of Subsection B of 19.15.17.13 NMAC, then the operator will:

1. Backfill the temporary pit excavation with compacted, non-waste containing, earthen material;
2. Construct a division-prescribed soil cover to existing grade as described in the Soil Cover Plan (above);
3. Re-contour and re vegetate the site as described in the Re-vegetation Plan (above).

Confirmation Sampling Plan for Excavation and Removal

The operator will test the soils beneath the temporary pit after excavation to determine whether a release has occurred. At a minimum, the operator and/or qualified contractor will collect:

- A five point, composite sample and;
- Individual grab samples from any area that is wet, discolored or showing other evidence of a release

The purpose of this sampling is to demonstrate that:

- Benzene, as determined by EPA SW-846 method 8021B or 8260B does not exceed 0.2 mg/kg;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B does not exceed 50 mg/kg;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg;
- The TPH, as determined by EPA method 418.1 does not exceed 2,500 mg/kg; and
- Chloride, as determined by EPA method 300.1, does not exceed 1,000 mg/kg or the background concentration, whichever is greater.

Reporting

The operator shall notify the division of its results of on form C-141. If the operator or the division determines that a release has occurred, then the operator will comply with 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.