

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

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

Form C-144  
Revised August 1, 2011

**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: Polar Bear 5H  
API Number: 30-015-40585 OCD Permit Number: \_\_\_\_\_  
U/L or Qtr/Qtr \_\_\_\_\_ Section 8 Township T17S Range R28E County: Eddy  
Center of Proposed Design: Latitude 32 52 09.095 Longitude 104 07 19.566 NAD: ☐ 1927 ☒ 1983  
Surface Owner: ☐ Federal ☒ State ☐ Private ☐ Tribal Trust or Indian Allotment

2.  
☒ **Pit:** Subsection F or G of 19.15.17.11 NMAC  
Temporary: ☐ Drilling ☐ Workover ☒ 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: NA bbl Dimensions: L \_\_\_\_\_ x W \_\_\_\_\_ x D \_\_\_\_\_

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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 \_\_\_\_\_  
☒ Lined ☐ Unlined Liner type: Thickness 20 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 \_\_\_\_\_, 6-inch lift and automatic overflow shut-off  
☐ Visible sidewalls and liner ☐ Visible \_\_\_\_\_  
Liner type: Thickness \_\_\_\_\_ ☐ LLDPE ☐ 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 19.15.16.8 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.<br>- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells <b>SEE FIGURE 2</b>   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> 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).<br>- Topographic map; Visual inspection (certification) of the proposed site <b>SEE FIGURE 3</b>   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |
| Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.<br>(Applies to temporary, emergency, or cavitation pits and below-grade tanks)<br>- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image. <b>SEE FIGURE 3a</b>  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No<br><input type="checkbox"/> NA |
| Within 1000 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.<br>(Applies to permanent pits)<br>- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image. <b>SEE FIGURE 3</b>  | <input type="checkbox"/> Yes <input type="checkbox"/> No<br><input checked="" type="checkbox"/> 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.<br>- NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site. <b>SEE FIGURE 2a</b> | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |
| Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. <b>SEE FIGURE 4</b><br>- Written confirmation or verification from the municipality; Written approval obtained from the municipality  | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |
| Within 500 feet of a wetland.<br>- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site<br>- <b>SEE FIGURE 5</b>   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |
| Within the area overlying a subsurface mine.<br>- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division. <b>SEE FIGURE 6</b>   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |
| Within an unstable area.<br>- Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map. <b>SEE FIGURE 7</b>   | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No                                |
| Within a 100-year floodplain.<br>- FEMA map. <b>SEE FIGURE 8</b>   | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No                                |

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<sub>2</sub>S, Prevention Plan  
☐ Emergency Response Plan  
☐ Oil Field Waste Stream Characterization  
☐ Monitoring and Inspection Plan  
☐ Erosion Control Plan  
☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

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 identify 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 &amp; 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: \_\_\_\_\_

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 identify 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: \_\_\_\_\_

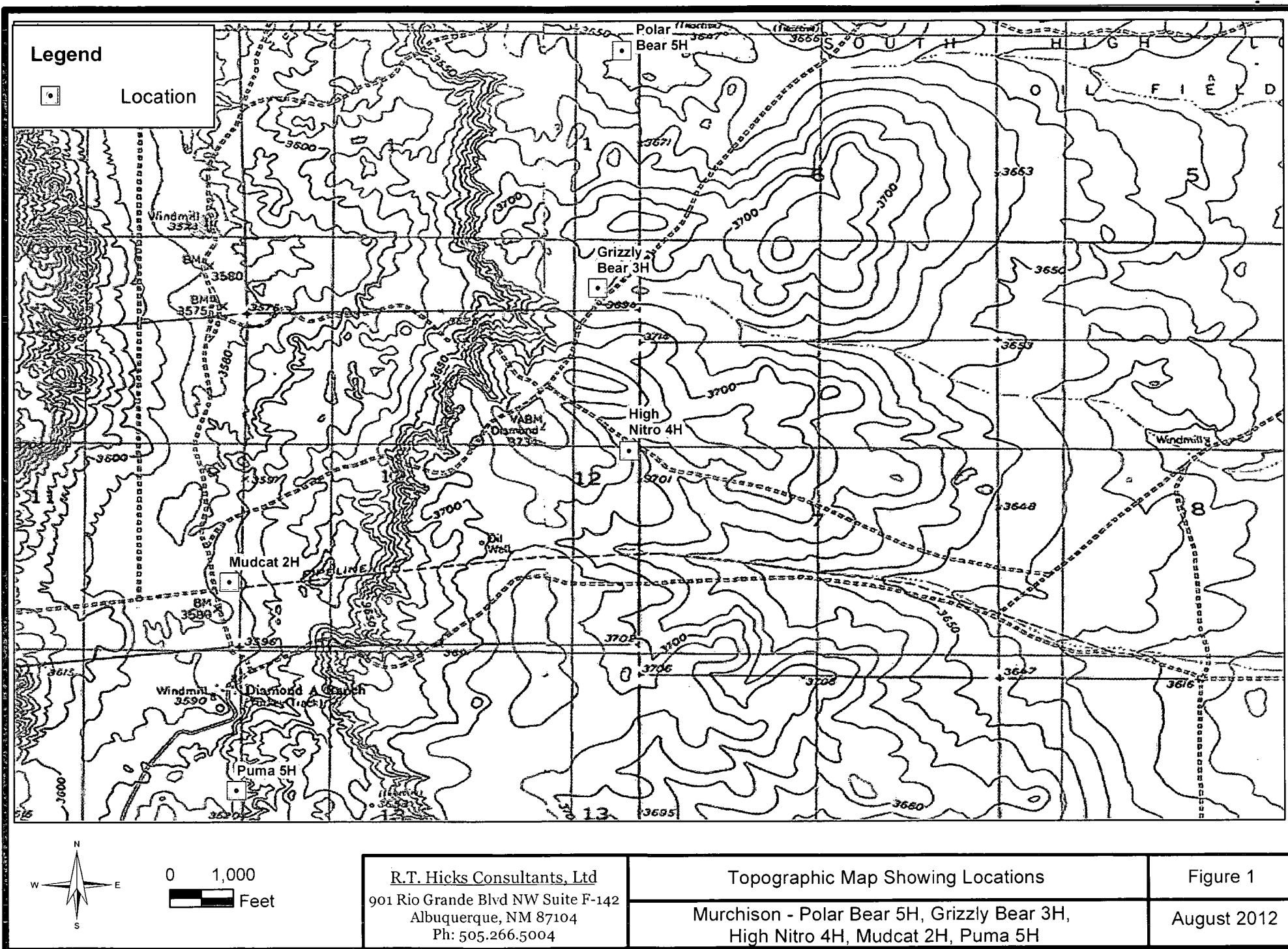
Signature: \_\_\_\_\_ Date: \_\_\_\_\_

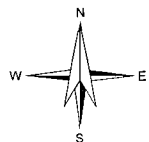
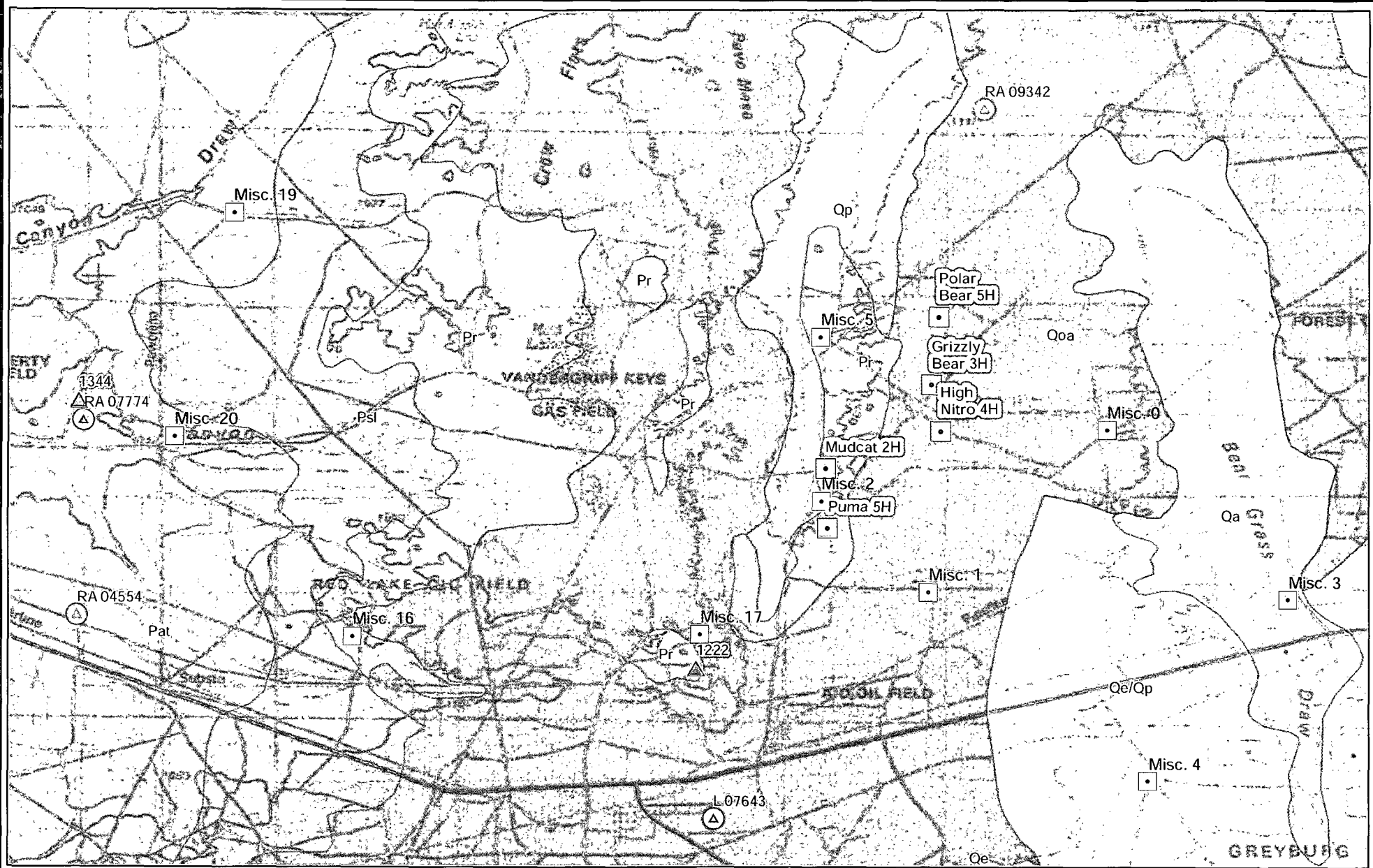
e-mail address: \_\_\_\_\_ Telephone: \_\_\_\_\_

# **Site Specific Information Figures**

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

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





0 1  
Miles

R.T. Hicks Consultants, Ltd

901 Rio Grande Blvd NW Suite F-142

Albuquerque, NM 87104

Ph: 505.266.5004

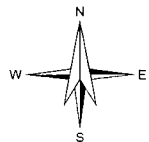
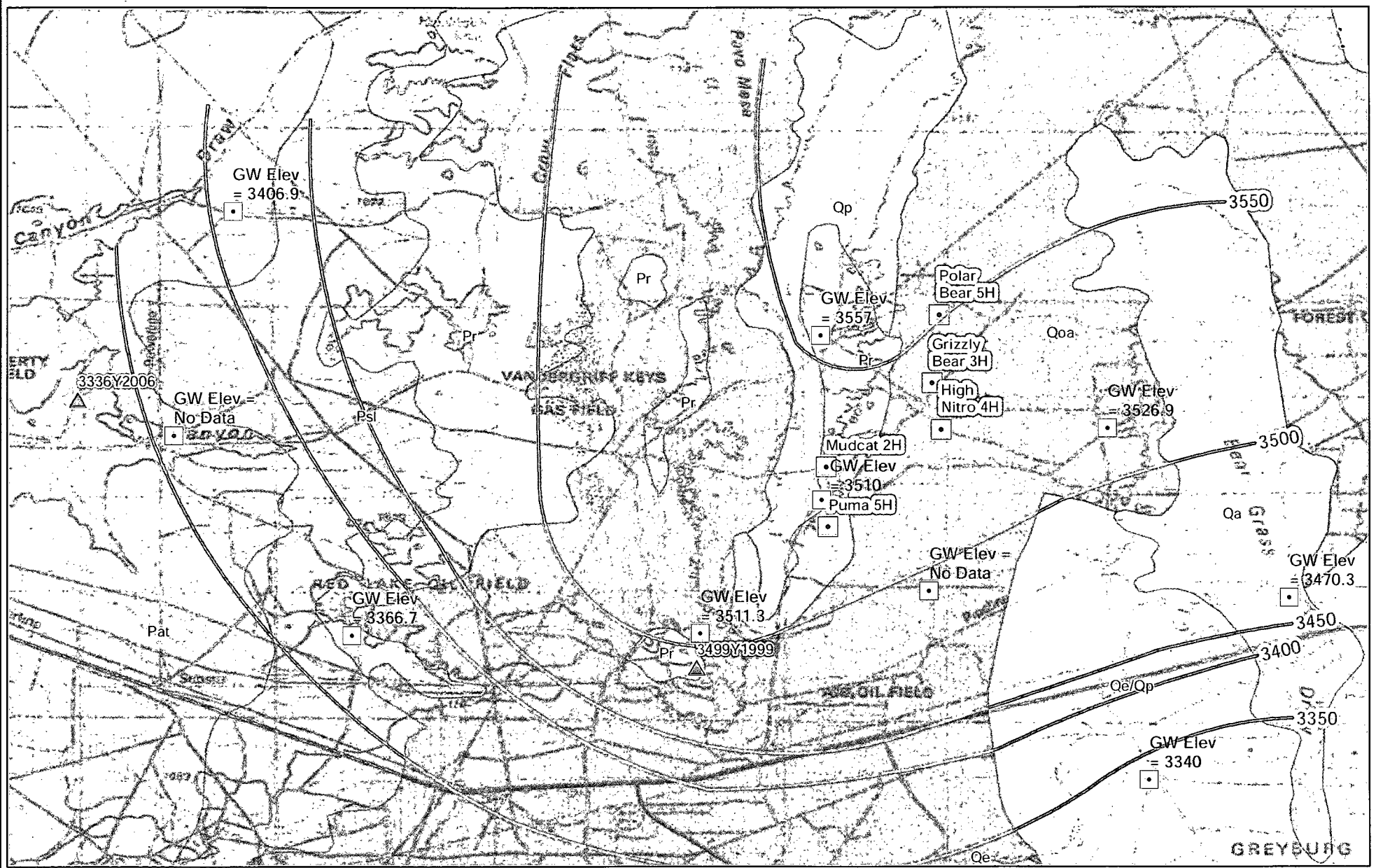
Geology and Nearby Water Wells

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

Figure 2a

August 2012



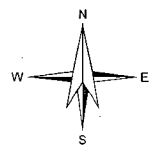
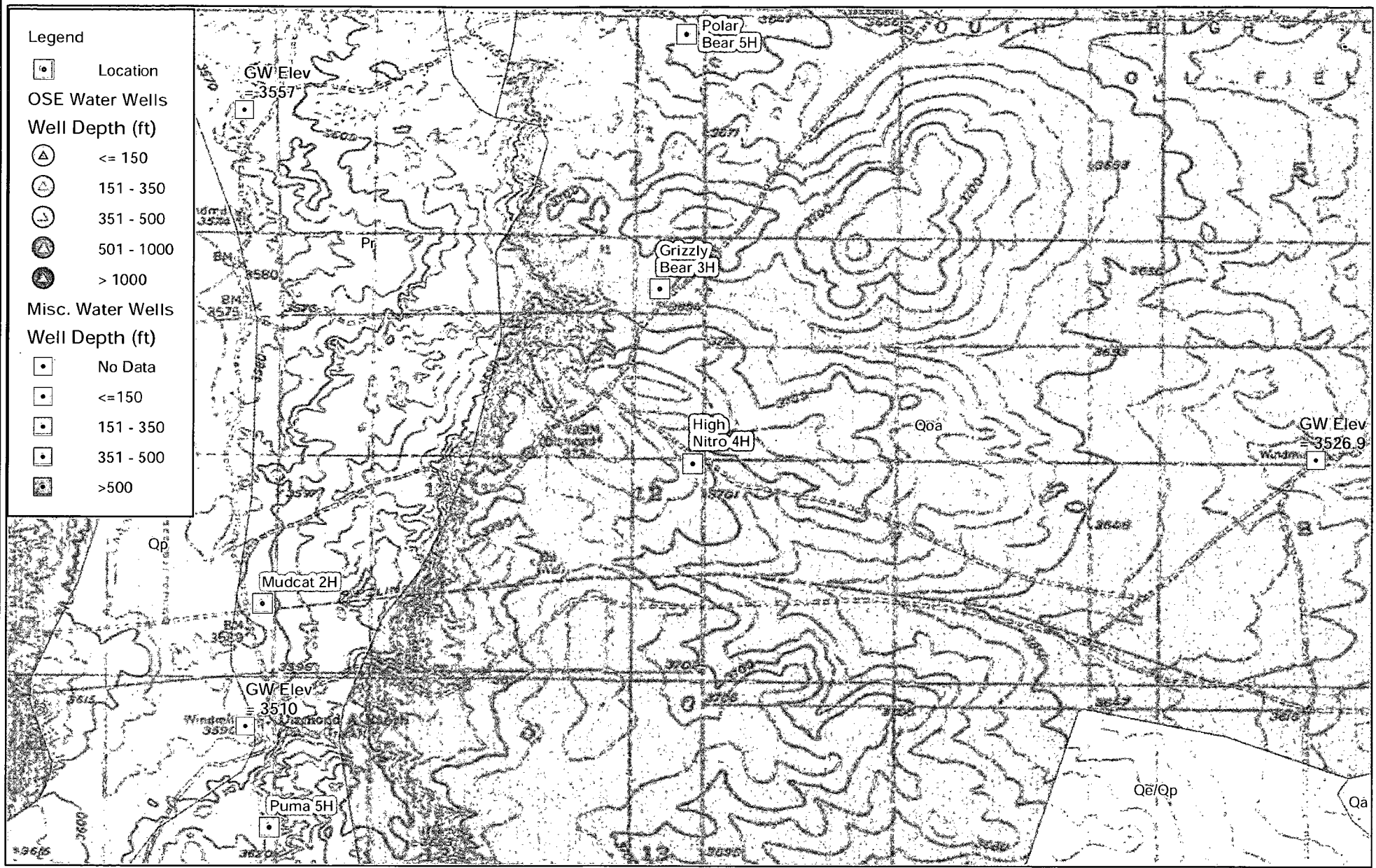


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Miles

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Ph: 505.266.5004

Groundwater Elevation Contour Map  
Murchison - Polar Bear 5H, Grizzly Bear 3H,  
High Nitro 4H, Mudcat 2H, Puma 5H

Figure 2b  
August 2012



0 2,000  
Feet

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Albuquerque, NM 87104  
Ph: 505.266.5004






Groundwater Elevation Data and Geology

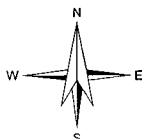
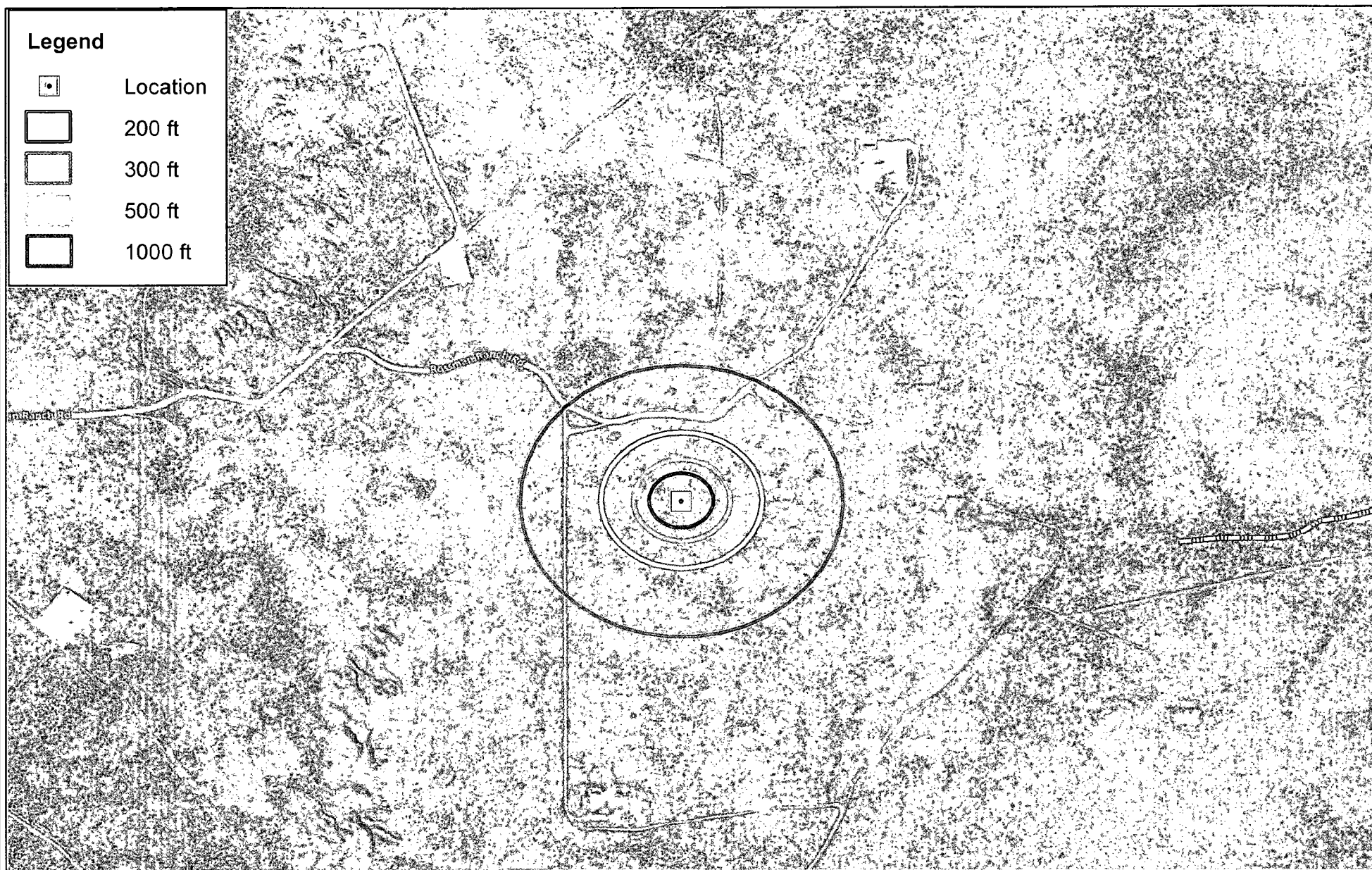
Murchison - Polar Bear 5H, Grizzly Bear 3H,  
High Nitro 4H, Mudcat 2H, Puma 5H

Figure 2c

August 2012

# Legend

-  Location
-  200 ft
-  300 ft
-  500 ft
-  1000 ft



0 1,000  
Feet

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Albuquerque, NM 87104  
Ph: 505.266.5004

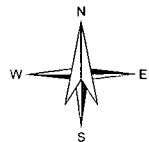
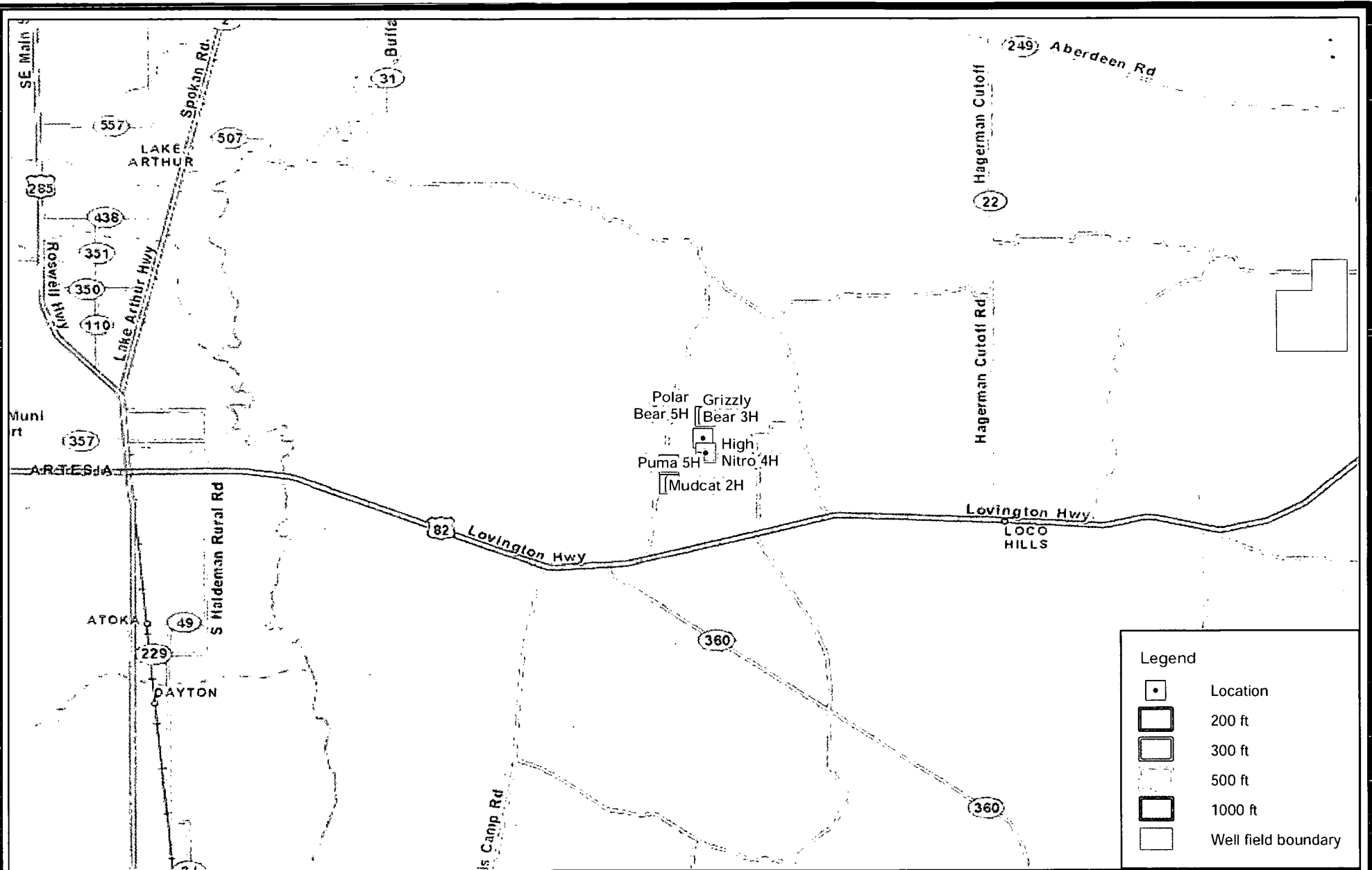
Residential Structures and Facilities

Murchison  
Polar Bear 5H

Figure 3a

August 2012





0 5  
Miles

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Albuquerque, NM 87104  
Ph: 505.266.5004

Nearest Municipalities and Wellfields

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

Figure 4

August 2012



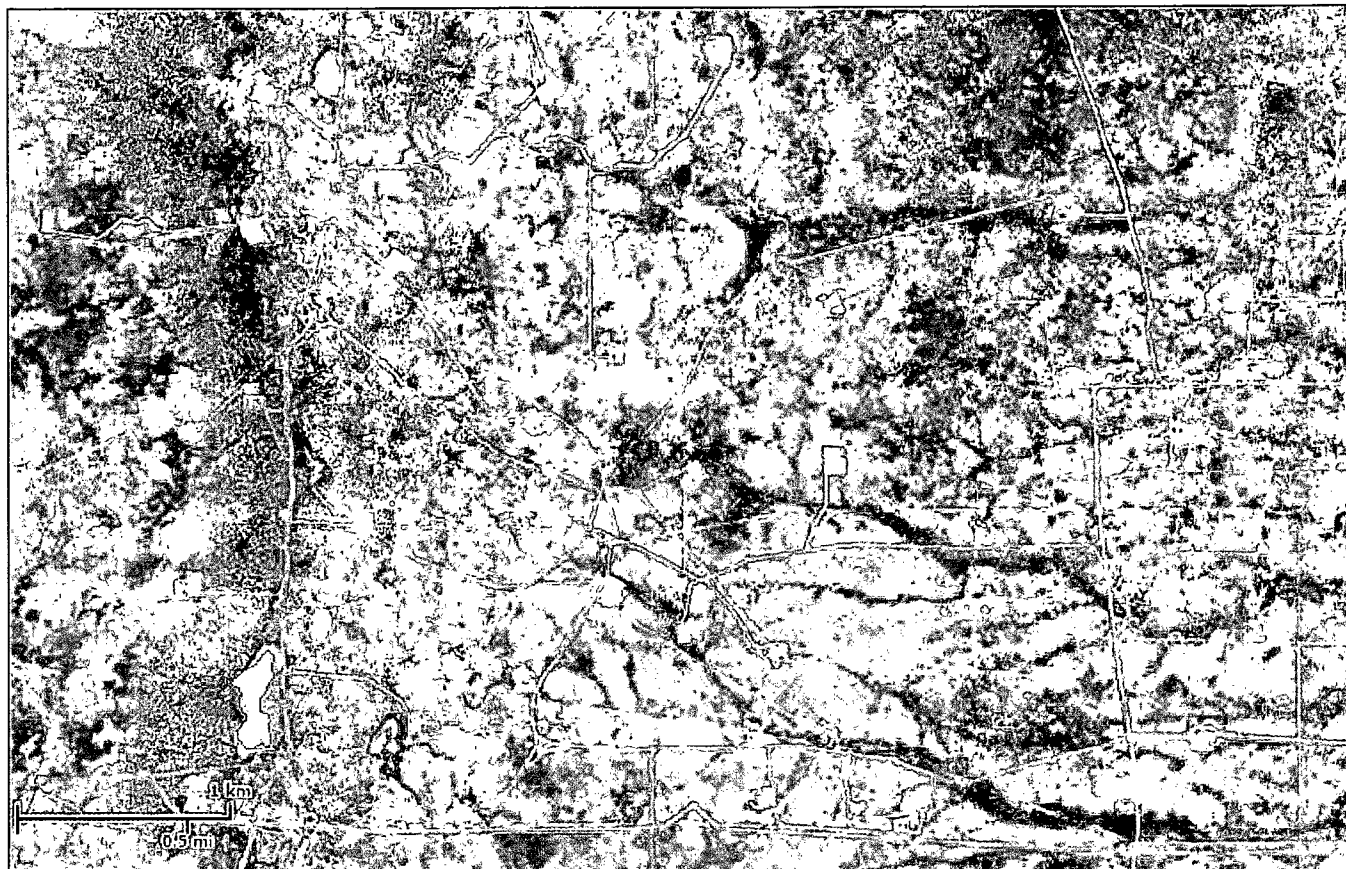


U.S. Fish and Wildlife Service

# 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

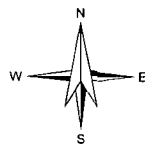
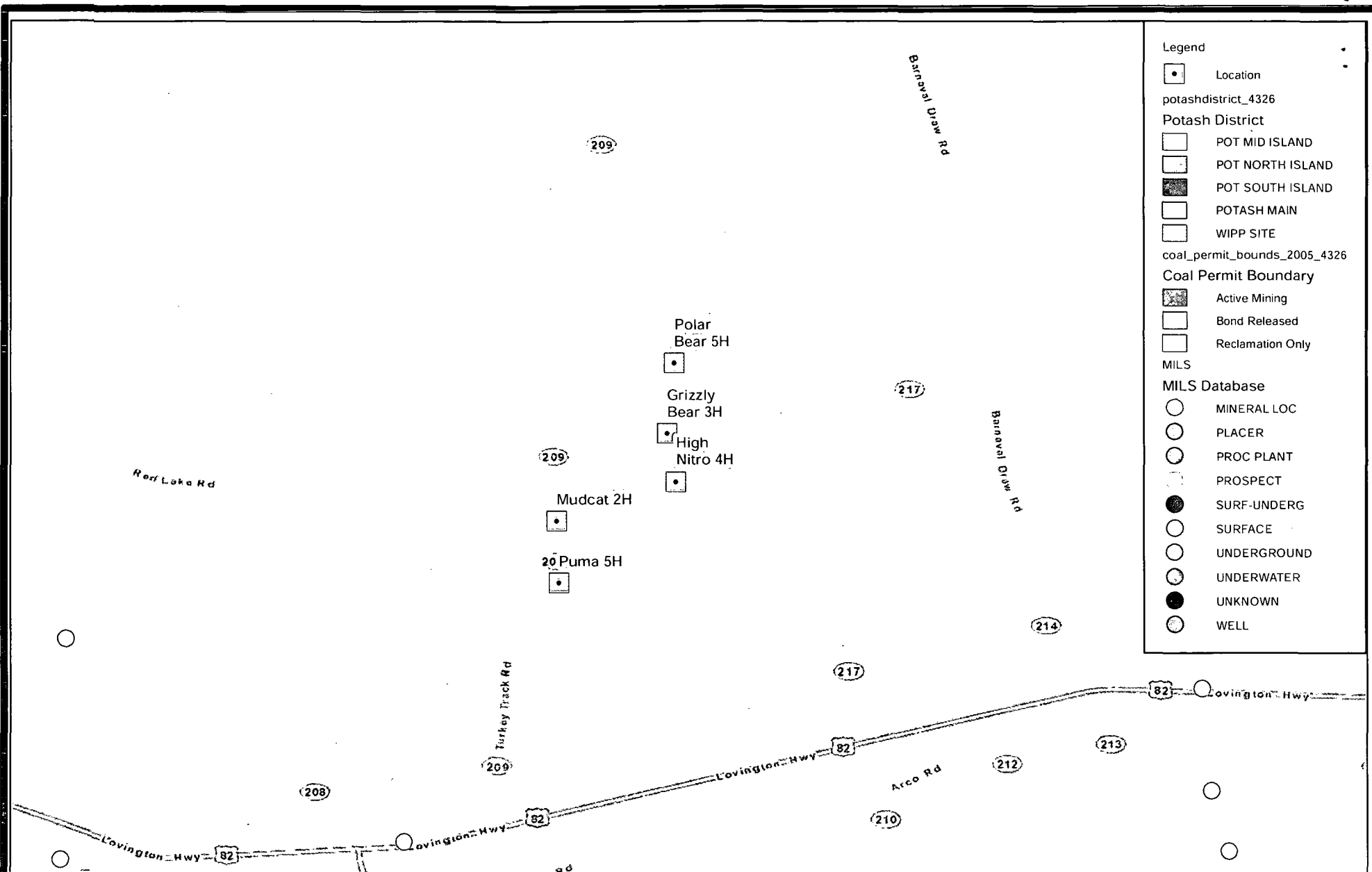
## Riparian

- ☐ Herbaceous
- ☐ Forested/Shrub

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

## User Remarks:

Wetlands Near High Nitro 4H, Grizzly Bear 3H and Polar Bear 5H



0 1  
Miles

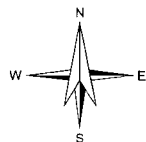
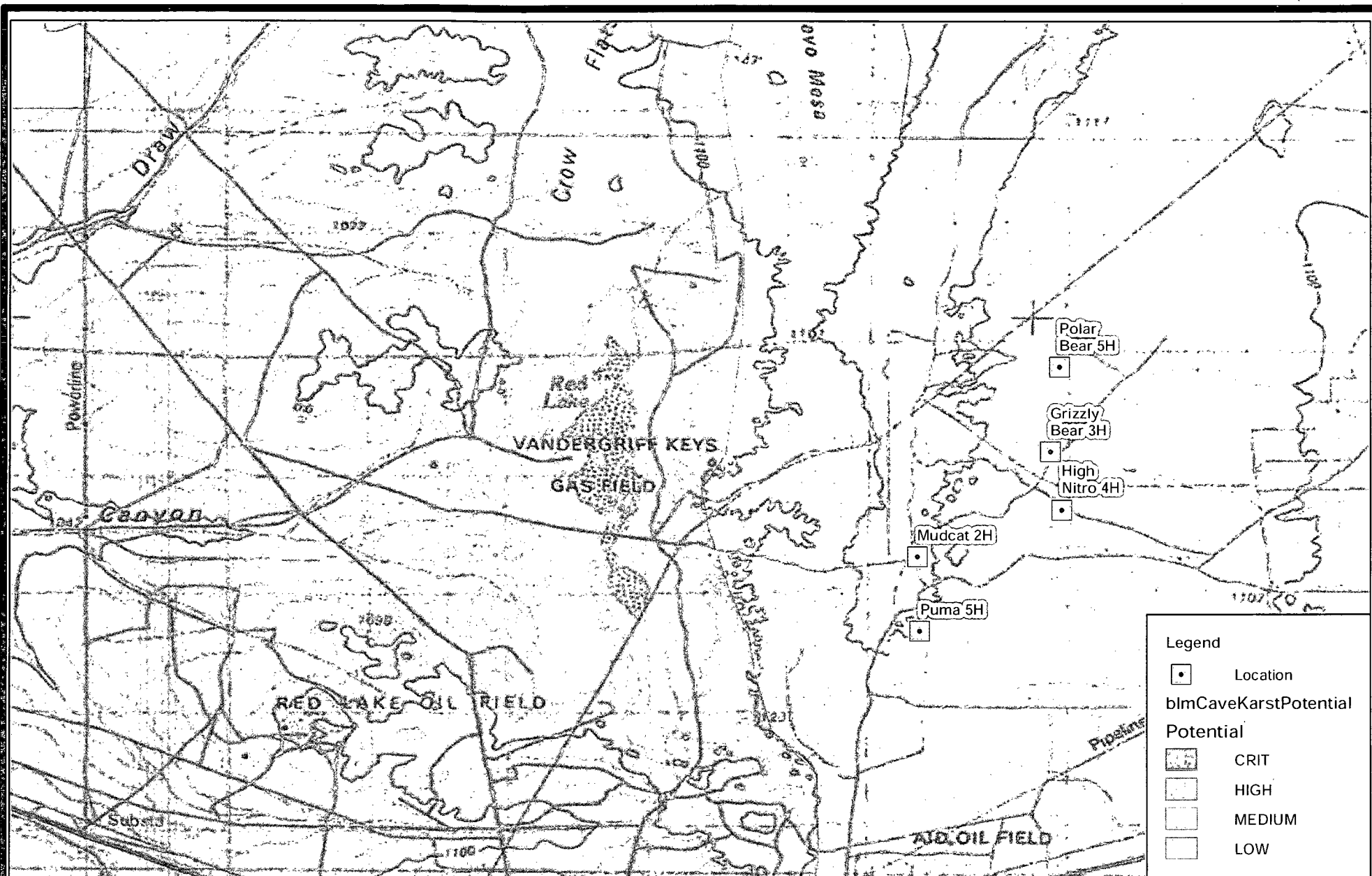
R.T. Hicks Consultants, Ltd  
901 Rio Grande Blvd NW Suite F-142  
Albuquerque, NM 87104  
Ph: 505.266.5004

#### Nearest Mines

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

#### Figure 6

August 2012



0 1  
Miles

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

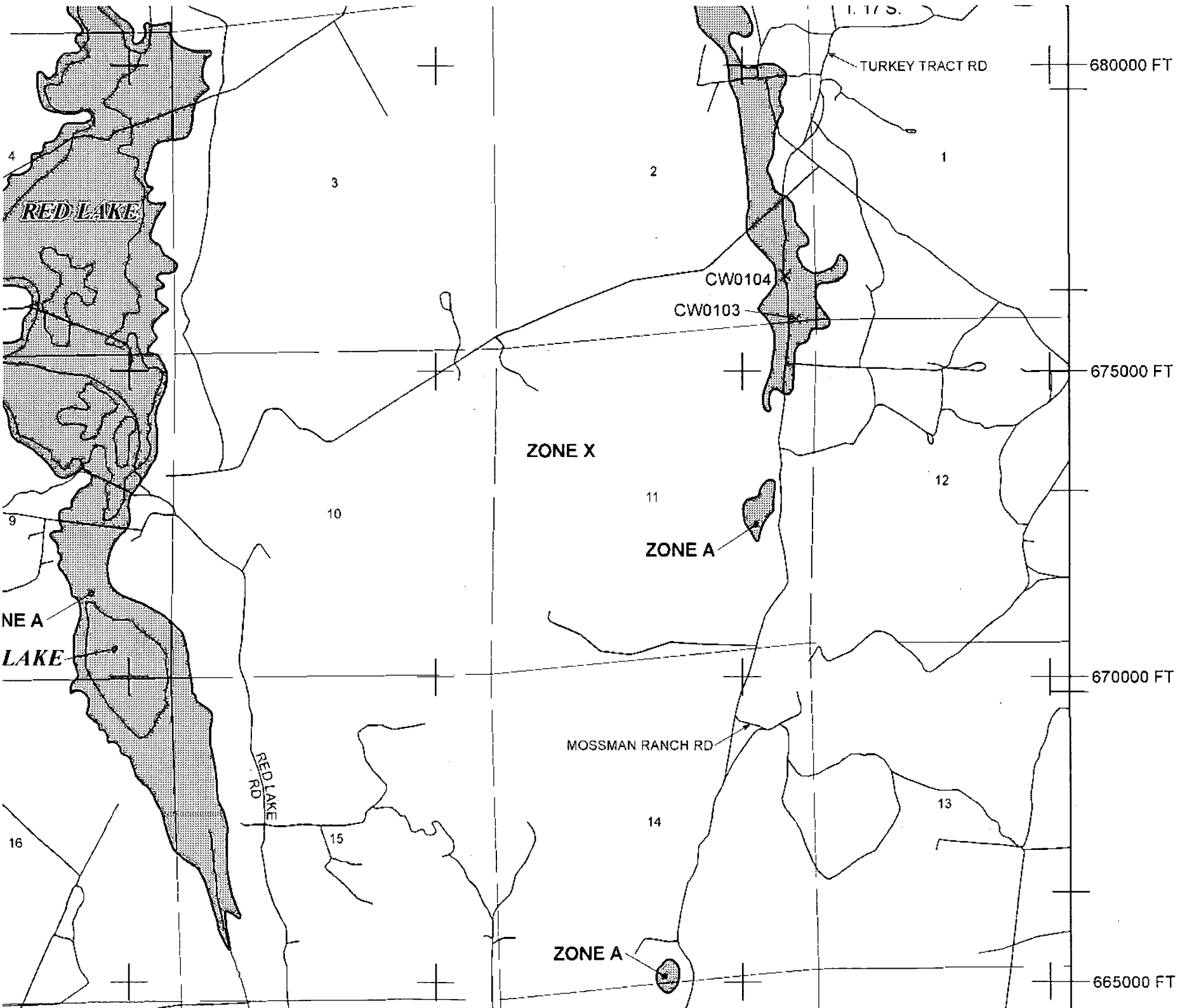
BLM Cave and Karst Potential Map

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

Figure 7

August 2012





# **Appendix 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:** Randall Hicks <r@rthicksconsult.com>  
**Sent:** Friday, July 27, 2012 1:59 PM  
**To:** 'Hernandez, Juan L., OSE'  
**Subject:** RE: Murchison - water well RA 9342

Thanks so much, you saved me 3 hours!

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

505-266-5004 - office  
505-238-9515 - cell

---

**From:** Hernandez, Juan L., OSE [<mailto:juan.hernandez1@state.nm.us>]  
**Sent:** Friday, July 27, 2012 1:55 PM  
**To:** Randall Hicks  
**Subject:** RE: Murchison - water well RA 9342

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  
505-238-9515 - cell

# **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  
Phone: (575) 393-6161 Fax: (575) 393-0720  
District II  
311 S. First St., Artesia, NM 88210  
Phone: (575) 748-1283 Fax: (575) 748-9720  
District III  
1000 Rio Bravos Road, Aztec, NM 87410  
Phone: (505) 334-6178 Fax: (505) 334-6170  
District IV  
1220 S. St. Francis Dr., Santa Fe, NM 87505  
Phone: (505) 476-3460 Fax: (505) 476-3462

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

|  |  |   |
|--|--|---|
| <sup>1</sup> API Number                | <sup>2</sup> Pool Code   | <sup>3</sup> Pool Name                  |
| <sup>4</sup> Property Code             | <sup>5</sup> Property Name<br><b>POLAR BEAR</b>                    | <sup>6</sup> Well Number<br><b>5H</b>   |
| <sup>7</sup> OGRID No.<br><b>15363</b> | <sup>8</sup> Operator Name<br><b>MURCHISON OIL &amp; GAS, INC.</b> | <sup>9</sup> Elevation<br><b>3647.8</b> |

<sup>10</sup> Surface Location

|                           |                     |                         |                      |         |                              |                                  |                             |                               |                       |
|---------------------------|---------------------|-------------------------|----------------------|---------|------------------------------|----------------------------------|-----------------------------|-------------------------------|-----------------------|
| UL or lot no.<br><b>1</b> | Section<br><b>1</b> | Township<br><b>17 S</b> | Range<br><b>28 E</b> | Lot Idn | Feet from the<br><b>1130</b> | North/South line<br><b>NORTH</b> | Feet from the<br><b>250</b> | East/West line<br><b>EAST</b> | County<br><b>EDDY</b> |
|---------------------------|---------------------|-------------------------|----------------------|---------|------------------------------|----------------------------------|-----------------------------|-------------------------------|-----------------------|

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

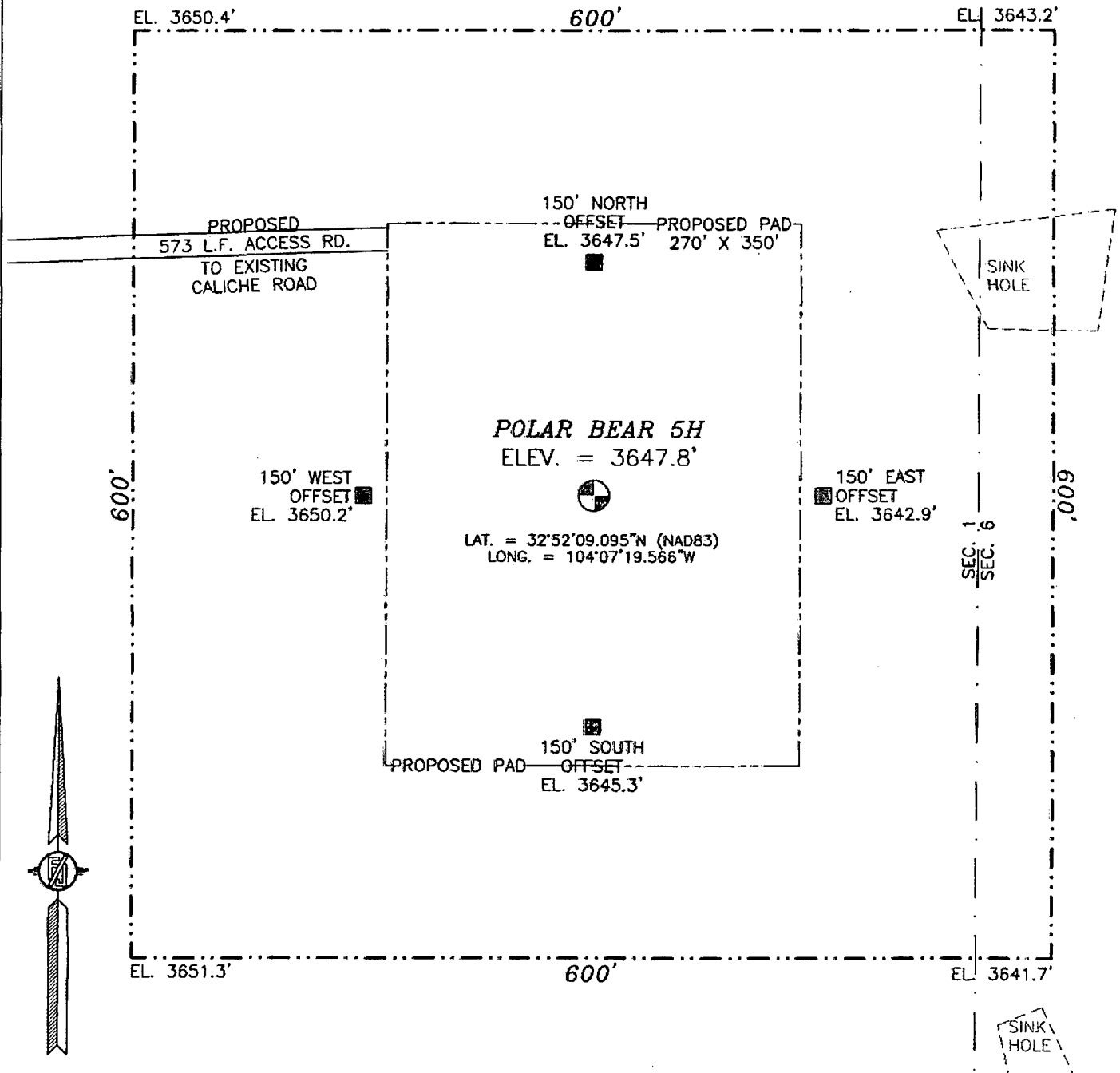
|                           |                     |                         |                      |         |                              |                                  |                             |                               |                       |
|---------------------------|---------------------|-------------------------|----------------------|---------|------------------------------|----------------------------------|-----------------------------|-------------------------------|-----------------------|
| UL or lot no.<br><b>4</b> | Section<br><b>1</b> | Township<br><b>17 S</b> | Range<br><b>28 E</b> | Lot Idn | Feet from the<br><b>1130</b> | North/South line<br><b>NORTH</b> | Feet from the<br><b>330</b> | East/West line<br><b>WEST</b> | County<br><b>EDDY</b> |
|---------------------------|---------------------|-------------------------|----------------------|---------|------------------------------|----------------------------------|-----------------------------|-------------------------------|-----------------------|

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

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

|   |  |   |  |   |
|---|--|---|--|---|
| <p>S89°10'36"W 2678.89 FT</p> <p>NW CORNER SEC. 1<br/>LAT. = 32°52'19.647"N<br/>LONG. = 104°08'19.413"W</p> <p>LOT 4 - 40.37 AC</p> <p>BOTTOM OF HOLE<br/>LAT. = 32°52'08.511"N<br/>LONG. = 104°08'15.242"W</p> <p>COMPUTED</p> <p>SW CORNER SEC. 1<br/>LAT. = 32°51'27.605"N<br/>LONG. = 104°08'18.002"W</p> <p>N89°38'07"E 2613.47 FT</p> |  | <p>S89°10'48"W 2681.02 FT</p> <p>N/4 CORNER SEC. 1<br/>LAT. = 32°52'19.977"N<br/>LONG. = 104°07'48.012"W</p> <p>LOT 1 - 40.65 AC</p> <p>SURFACE LOCATION<br/>250'</p> <p>POLAR BEAR 5H<br/>ELEV. = 3647.8'<br/>LAT. = 32°52'09.095"N (NAD83)<br/>LONG. = 104°07'19.566"W</p> <p>E/4 CORNER SEC. 1<br/>LAT. = 32°51'54.063"N<br/>LONG. = 104°07'16.701"W</p> <p>N89°38'18"E 2611.60 FT</p> |  | <p><sup>17</sup> OPERATOR CERTIFICATION</p> <p>I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or undivided mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.</p> <p>Signature _____ Date _____</p> <p>Printed Name _____</p> <p>E-mail Address _____</p> <p><sup>18</sup> SURVEYOR CERTIFICATION</p> <p>I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.</p> <p>JULY 12, 2012</p> <p>Date of Survey _____</p> <p>Signature and Seal of Professional Surveyor _____</p> <p>Certificate Number: ELEMOR-FAC-001100, PLS 12797</p> <p>SURVEY NO. 1213</p> |
|---|--|---|--|---|

SECTION 1, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO



0 10 50 100 200

SCALE 1" = 100'

**DIRECTIONS TO LOCATION**

FROM INTERSECTION OF U.S. HWY 82 (LOVINGTON HWY) AND CR 209 (TURKEY TRACK RD.) GO NORTH ON CR 209 5.1 MILES TO END OF PAVEMENT GO RIGHT (EAST) ON CALICHE LEASE RD. 0.5 MILES THEN TAKE RIGHT 0.35 MILES TAKE RIGHT GO SOUTH 0.2 MILES SITE IS 573 FT. ON LEFT (EAST)

**MURCHISON OIL & GAS, INC.**

**POLAR BEAR 5H**

**LOCATED 1130 FT. FROM THE NORTH LINE  
AND 250 FT. FROM THE EAST LINE OF**

**SECTION 1, TOWNSHIP 17 SOUTH,**

**RANGE 28 EAST, N.M.P.M.**

**EDDY COUNTY, STATE OF NEW MEXICO**

**SURVEY NO. 1213**

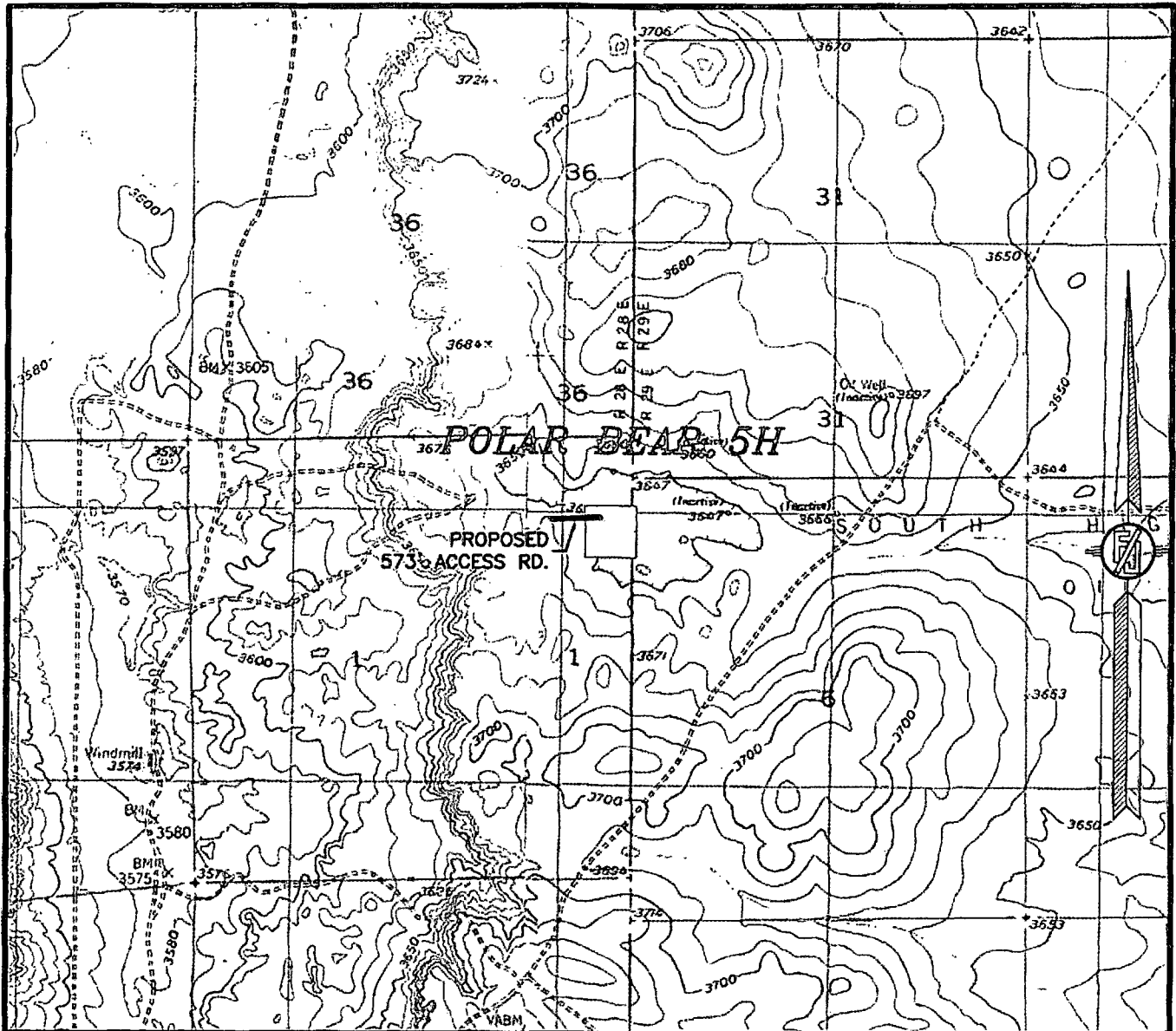
**JULY 20, 2012**

**MADRON SURVEYING, INC.**

301 SOUTH CANAL  
(575) 234-3341

**CARLSBAD, NEW MEXICO**

SECTION 1, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
LOCATION VERIFICATION MAP



USGS QUAD MAP:  
RED LAKE  
RED LAKE SE

NOT TO SCALE

MURCHISON OIL & GAS, INC.  
POLAR BEAR 5H  
LOCATED 1130 FT. FROM THE NORTH LINE  
AND 250 FT. FROM THE EAST LINE OF  
SECTION 1, TOWNSHIP 17 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

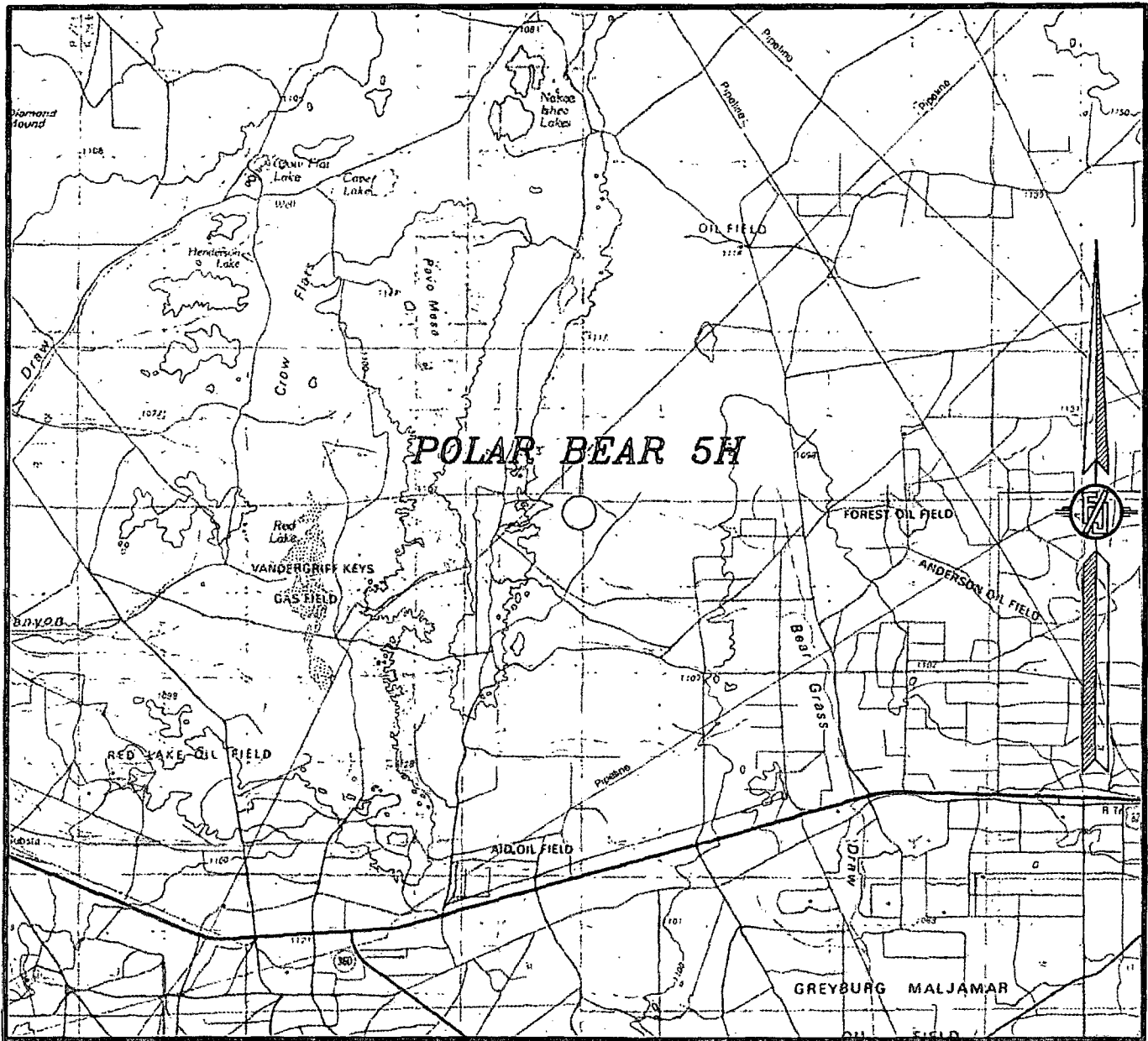
JULY 20, 2012

SURVEY NO. 1213

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



SECTION 1, TOWNSHIP 17 SOUTH, RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
VICINITY MAP



NOT TO SCALE

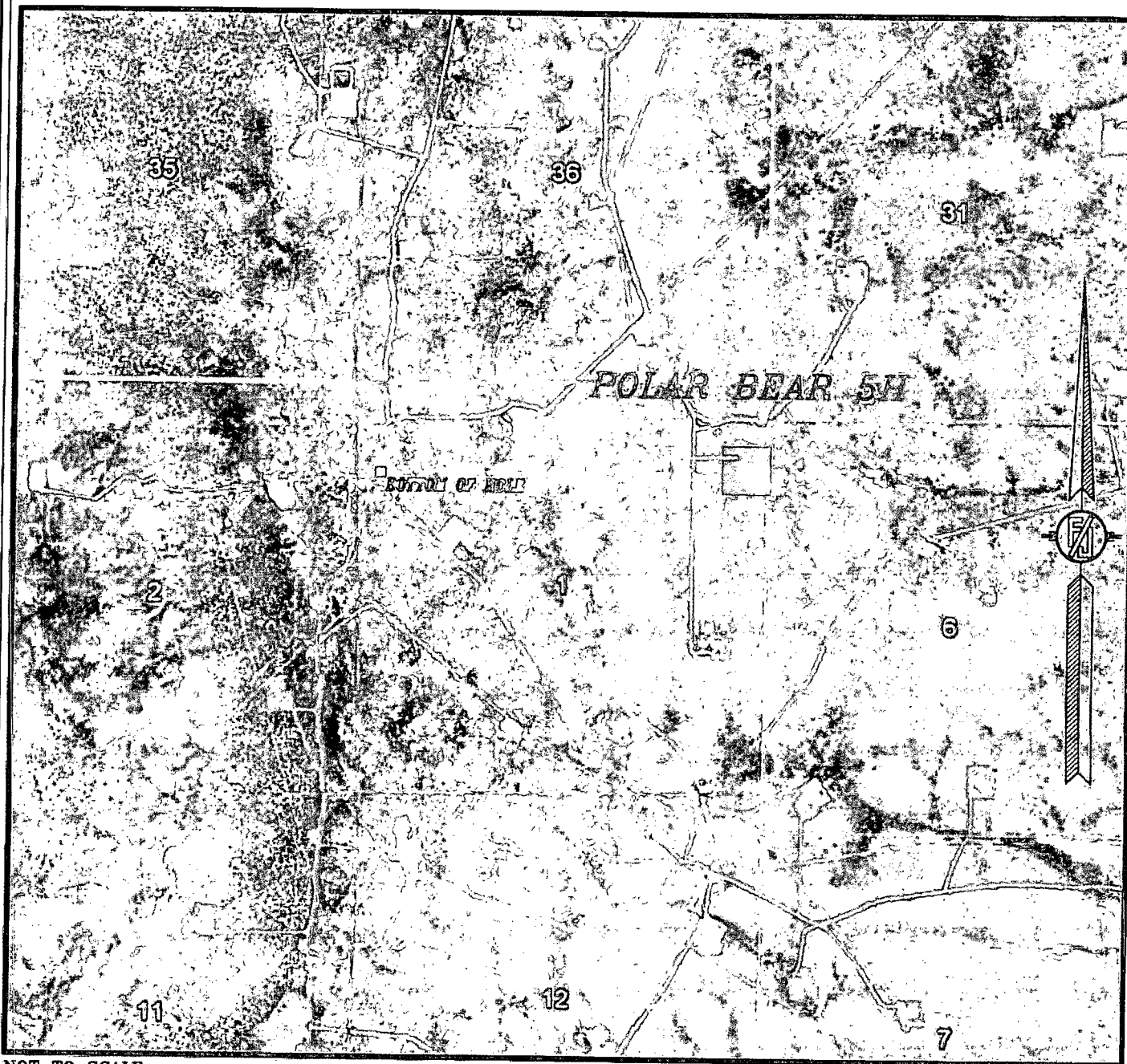
MURCHISON OIL & GAS, INC.  
**POLAR BEAR 5H**  
LOCATED 1130 FT. FROM THE NORTH LINE  
AND 250 FT. FROM THE EAST LINE OF  
SECTION 1, TOWNSHIP 17 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

JULY 20, 2012

SURVEY NO. 1213

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

SECTION 1, 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.  
POLAR BEAR 5H

LOCATED 1130 FT. FROM THE NORTH LINE  
AND 250 FT. FROM THE EAST LINE OF  
SECTION 1, TOWNSHIP 17 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

JULY 20, 2012

SURVEY NO. 1213

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.

## Temporary Pit/Drying Pad Design Plan

- 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.



## Temporary Pit/Drying Pad Closure Plan

- 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.

## Temporary Pit/Drying Pad Closure Plan

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.

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## Temporary Pit/Drying Pad Closure Plan

- 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-PLACE 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).

## Temporary Pit/Drying Pad Closure Plan

### 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.