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: JC Williamson OGRID #: 011158
Address: 214 West Texas, Suite 1250, Midland Texas, 79701
Facility or well name: Ross Draw Unit #31
API Number: 30-015-38371 OCD Permit Number: 211040
U/L or Qtr/Qtr Section 33 Township 26S Range 30E County: Eddy
Center of Proposed Design: Latitude N 32.001899 Longitude W -103.879295 NAD: ☐1927 ☒ 1983
Surface Owner: ☒ Federal ☐ State ☐ Private ☐ Tribal Trust or Indian Allotment

RECEIVED
DEC 15 2010
NMOCD ARTESIA

2.
☒ **Pit:** Subsection F or G of 19.15.17.11 NMAC
Temporary: ☒ Drilling ☐ Workover
☐ Permanent ☐ Emergency ☐ Cavitation ☐ P&A
☒ Lined ☐ Unlined Liner type: Thickness 20 mil ☒ LLDPE ☐ HDPE ☐ PVC ☐ Other
☒ String-Reinforced
Liner Seams: ☒ Welded ☒ Factory ☐ Other Volume: 23,547 bbl Dimensions: L 115' x W 110' x D 8'-10'

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 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	☐ 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	☐ 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	☐ 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	☐ 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	☐ 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 - 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	☐ 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	☐ 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	

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): Darell Folmer Title: Agent

Signature: Darell Folmer Date: 10/29/10

e-mail address: dwfcrw@yahoo.com Telephone: 575-361 4962

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

OCD Representative Signature: ~~Signed By~~ Mike Bratcher **Approval Date:** 1/5/2011

Title: Environmental Specialist **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:

RALPH E. WILLIAMSON
Attorney in and for
Lois Geraldine Williamson
Trustee of the J.C. Williamson Trust and J.C. Williamson
FROST BANK WINDSOR PARK BUILDING
8202 IH-35 NORTH, SUITE 490
SAN ANTONIO, TEXAS 78239
TELEPHONE: (210) 590-4700
FACSIMILE: (210) 590-4705

October 26, 2010

RE: J.C. Williamson Ross Draw #31, Ross Draw #32, T-26S R30 E, Eddy County, New Mexico.

TO WHOM IT MAY CONCERN:

I, RALPH E. WILLIAMSON, do hereby authorize DARELL FOLMAR to sign on my behalf and as agent or subagent for the above trust and estate, to the extent that he is authorized. Overall, to sign on the application for a pit permit pursuant to Rule 144 of the New Mexico Oil Conservation Commission on the above wells located in Eddy County, New Mexico.

Very Truly Yours,

RALPH E. WILLIAMSON
Agent and Attorney in and For J.C. Williamson

REW/rlh

C-144 Supplemental Documentation

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 ▲ 505.266.5004 ▲ Fax: 505.266-0745

December 23, 2010

Mr. Mike Bratcher
NMOCD District 2
1301 West Grand Ave.
Artesia, NM 88210
Via E-Mail and US Mail

RE: JC Williamson Ross Draw Unit 31 C-144 Supplemental Documentation

Dear Mike:

This letter provides clarification of some information presented in the C-144 for the Ross Draw 31 well. As you know, Brad Jones devoted a significant amount of time in his review of the NMOCD-approved Ross Draw 32 C-144. Mr. Jones provided good input and we believe the final product was improved as a result or our coordinated efforts. With respect to the information you discussed with me on the phone:

1. The drawings of the pit drainage system show that the drainage mats will be secured with sand bags to the bottom of the pit. Securing all of the drainage components is critical – especially since the flow of mud and cuttings can cause these components to move. We will use sand bags to secure all of the drainage system to the bottom of the pit flow - the drainage mats, the connector pipes between the drainage mats and the risers that house the pumping system.
2. Secondary containment for the proposed temporary tanks for short-term storage of fluid removed from the pit by the drainage system is addressed on page 4 of the Supplemental Documentation (reproduced below). At this time, we are unsure what type of tanks will be employed.

The language approved by NMOCD for the Ross Draw 32 permit is:

"For any temporary storage of fluids derived from the drilling pit in above-ground tanks:

1. Construction, operation and maintenance of the temporary storage tank(s) will adhere to all applicable NMOCD Rules including but not limited to:
   a. Safety stipulations
   b. Protection from hydrogen sulfide mandates
   c. Signage and identification requirements
   d. Secondary containment requirements for temporary tanks
   e. Applicable netting requirements
2. Any cleaning of the temporary tank will adhere to NMOCD Rules relating to tank cleaning.
3. Transportation of water or drilling fluids derived from the drilling pit will adhere to all applicable NMOCD Rules relating to transportation.
4. Storage of water or drilling fluids in temporary above-ground tanks will also adhere to all applicable Federal mandates."

We conducted a word search of "secondary containment" and we found one provision in the NMOCD Rules that applies to above-ground tanks. However, this provision does not apply to the Ross Draw wells nor does it apply to temporary tanks:

> **19.15.39.8 SPECIAL PROVISIONS FOR SELECTED AREAS OF SIERRA AND OTERO COUNTIES:**
> **A.** The selected areas comprise:...
> **B.** The division shall not issue permits ...
> **C.** *Produced water injection wells* located in the selected areas are subject to the following requirements in addition to ...
> **(7)** The operator shall place tanks on impermeable pads and surround the tanks with lined berms or other impermeable secondary containment device having a capacity at least equal to one and one-third times the capacity of the largest tank, or, if the tanks are interconnected, of all interconnected tanks.

The above-ground temporary storage tanks at the Ross Draw 31 and the Ross Draw 32 sites will be present for less than six months and operation and construction of these tanks will comply with all applicable NMOCD Rules, as stated in the permit applications. If a release from the temporary tank occurs, JC Williamson will address the release under NMOCD Rules.

Following removal of the tank from the location, J.C. Williamson will examine the soils beneath the temporary tank to determine whether a reportable release has occurred. If we observe moisture beneath the tank that suggests that a release has occurred, the operator and/or qualified contractor will:

- Collect a five point, composite sample from beneath the tank footprint;
- Collect an individual grab sample from any area that is wet, discolored or showing other evidence of a release
- Cause a laboratory to analyze these samples for chloride

If sampling the pit contents pursuant to the Waste Sampling Plan in the permit application determines that petroleum hydrocarbons exceed the standards for in-place burial, the samples obtained from beneath the tank will be evaluated for regulated petroleum constituents in addition to chloride. The results of the sampling will be included in the pit closure report to NMOCD or, if necessary, a release notification pursuant to Part 29 of the Rules.

Drilling of Ross Draw 32 is planned for soon after the first week in January. If this clarification is not satisfactory, please contact me as soon as possible when you return from your holiday.

Sincerely,
R.T. Hicks Consultants

Principal

Copy: Darell Folmar, JC Williamson
Brad Jones, NMOCD

THE OPERATOR, JC WILLIAMSON, WILL ADHERE TO THE APPROPRIATE MANDATES OF NMOCD RULES INCLUDING:

- Using appropriate engineering principles and practices
- Following applicable liner manufacturers' requirements.

This plan includes:

- Operating and maintenance procedures,
- A closure plan, and
- Hydrogeologic data that provides sufficient information and detail on the site's topography, soils, geology, surface hydrology and ground water hydrology to enable the appropriate division district office to evaluate the actual and potential effects on soils, surface water and ground water and compliance with the siting criteria of 19.15.17.10 NMAC.

The closure plan describes the proposed closure method and the proposed procedures and protocols to implement and complete the closure. Because the operator proposes an on-site closure method, this plan also proposes other methods to be used if the initial method does not satisfy the on-site closure standards specified in Subsection F of 19.15.17.13 NMAC or, if applicable, other on-site closure standards that the environmental bureau in the division's Santa Fe office approves.

Because the operator plans to use a temporary pit, the operator is submitting the enclosed application, form C-144, and all required attachments as well as the proposed pit location on form C-102 (attached).

Hydrogeologic Data

The information identified in item 10, "Siting Criteria" of the C-144 is attached. These are:

1. Figure 1 –presents data from the Office of the State Engineer (OSE) database and USGS database. This figure shows the location of the nearest registered water supply wells and available depth to ground water data.
2. Figure 1b – Ground water elevation data from the *Collection of Hydrologic Data – Eastside Roswell Range EIS Area – New Mexico* (Geohydrology Associates, Inc., 1978)
3. Figure 2- USGS topographic map of the area. These maps show locations of any significant watercourse and the locations of windmills and other wells that may not be registered with the OSE.
4. Figure 3 – 2008 aerial photograph showing the presence of structures, which in this area are oil wells and tank batteries
5. Figure 4 - is a map that also shows the location of the nearest incorporated municipal boundary
6. Figure 5 – shows that no wetlands are identified in the area directly surrounding the site
7. Figure 6 – shows the location of the nearest identified subsurface mine

8. Figure 7 – shows the area in relation to identified unstable areas
9. Figure 8 - geologic map of the area
10. Figure 9 FEMA map – shows the site is located in Zone X, unshaded, indicating the area is determined "to be outside of the 500-year flood and protected by levee from 100-year flood"

Siting Criteria Compliance Demonstration

As designated in the C-144 the location of the pit and in-place burial meet the criteria of NMOCD Rules. We believe the data presented in Figures 1-9 demonstrate that:

Ground water is GREATER than 100 feet below the bottom of the temporary pit, on-site closure method, here in place burial
Figure 1 shows all wells in the OSE database, wells with depth to water data from the USGS database and information on well depths and aquifers from the Petroleum Recovery Research Center (PRRC). The map confirms information typically employed by NMOCD to determine the depth to water.

Note that some wells in the OSE database do not have data for depth to water and these registered wells might be applications for wells that were not drilled, wells drilled prior to requirements to submit information to the OSE or drilled wells where the applicant did not submit data.

As ground water data for this area is limited, we have elected to provide a map noting the site area on Figure 1b from the *Collection of Hydrologic Data – Eastside Roswell Range EIS Area – New Mexico* (Geohydrology Associates, Inc., 1978) to further demonstrate that the depth to ground water at the site is greater than 100 feet below the bottom of buried waste.

The pit and excavated material and in place burial is NOT within 300 feet of a continuously flowing watercourse, or within 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).
Figures 2-3 and Appendix A confirm this statement. The 2008 aerial photograph shows only tank batteries and well locations in this area as does the photographic documentation in Appendix A.

The pit and excavated material and in place burial is NOT within 300 feet of a permanent residence, school, hospital, institution, or church in existence at the time of initial application.
Figures 2-3 and Appendix A confirm this statement.

The pit and excavated material and in place burial is NOT within 500 feet of a private, domestic fresh water well or spring used by less than five households for domestic or stock watering purposes, it is NOT within 1,000 feet of any other fresh

water well or spring.
Figures 1-3 and Appendix A support this statement.

The pit and excavated material and in place burial is NOT 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.
Figure 4 confirms this statement.

The pit and excavated material and in place burial is NOT within 500 feet of a wetland.
Figure 5 and Appendix A confirm this statement.

The pit and excavated material and in place burial is NOT within an area overlying a subsurface mine.
Figure 6 confirms this statement. All of the mines shown on Figure 6 are surface mines and are typically caliche pits.

The pit and excavated material and in place burial is NOT within an unstable area.
Figure 7 shows that the area is not within any karst area, which is a strong indicator of unstable areas (note area plotted as white is "no karst"). Our site visit and our examination of the geology and topography of the area (see Figures 2 and 8) allow us to provide a professional opinion that the site is not in an unstable area – which is consistent with the findings shown in Figure 7.

The pit and excavated material and in place burial is NOT within a 100-year floodplain.
The FEMA map presented in Figure 9 and our site visit confirm this statement. The FEMA map shows the site is located in Zone X, unshaded, indicating the area is determined "to be outside of the 500-year flood and protected by levee from 100-year flood"

Temporary Pit Design Plan

Figures 10-12 show the design of the temporary pit. Field conditions will determine the final configuration of the pit. In addition to the commitments listed below, the operator will install a system that drains water entrained in the drilling waste (Figure 12 and Appendix B). This system of perforated pipe and drainage mats that cover about 40% of the bottom of the pit. The drainage mats drain to a small depression (2-feet deep by about 10 feet wide) in the bottom of the lined pit. A standpipe rises from the depression and houses a solar-powered pump that removes the water from the drilling waste to an above-ground tank for temporary storage before re-use or disposal. Both temporary storage of fluids from the pit and reuse or disposal will be conducted a manner approved by division rules that prevents the contamination of fresh water and

protects public health and the environment. This design allows the operator to reduce the time required for closure, recover clear water for possible re-use, and reduce the concentration of constituents of concern in the drilling waste. Precipitation and the possible addition of fresh water combined with continued removal (and possible re-use) of water will rinse the drilling waste, causing additional reduction in the constituents of concern.

For any temporary storage of fluids derived from the drilling pit in above-ground tanks:

1. Construction, operation and maintenance of the temporary storage tank(s) will adhere to all applicable NMOCD Rules including but not limited to:
    a. Safety stipulations
    b. Protection from hydrogen sulfide mandates
    c. Signage and identification requirements
    d. Secondary containment requirements for temporary tanks
    e. Applicable netting requirements
2. Any cleaning of the temporary tank will adhere to NMOCD Rules relating to tank cleaning.
3. Transportation of water or drilling fluids derived from the drilling pit will adhere to all applicable NMOCD Rules relating to transportation.
4. Storage of water or drilling fluids in temporary above-ground tanks will also adhere to all applicable Federal mandates.

Construction/Design Plan of Temporary Pit

1. The operator or qualified contractor will design and construct the pit to contain liquids and solids and prevent contamination of fresh water and protect public health and the environment.
2. Prior to constructing the pit the operator or qualified contractor will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.
3. 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.
4. The operator will fence the pit in a manner that prevents unauthorized access and will maintain the fences in good repair. The operator will fence the pit 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. The pit will be completely fenced at all times excluding drilling and workover operations.
5. The operator will design and construct the temporary pit to prevent unauthorized releases and ensure the confinement of liquids.
6. The temporary pit will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.

7. The operator will construct the temporary pit so that the slopes are no steeper than two horizontal feet to one vertical foot (2H:1V).
8. Pit walls will be walked down by a crawler type tractor following construction.
9. The operator will design and construct the temporary pit with a geomembrane liner. The geomembrane liner will consist of 20-mil string reinforced LLDPE 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.
10. The operator will minimize liner seams and orient them up and down, not across a slope. The operator will use factory welded seams where possible. Prior to any field seaming, the operator 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 operator will minimize the number of field seams in corners and irregularly shaped areas. Qualified personnel will perform field seaming.
11. Construction will avoid excessive stress-strain on the liner.
12. Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity.
13. The operator and/or qualified contractor retained by the operator will 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.
14. The operator and/or qualified contractor retained by the operator will 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.
15. The operator and/or qualified contractor retained by the operator will design and construct the temporary pit to prevent run-on of surface water. As necessary, a berm or ditch will surround the temporary pit to prevent run-on of surface water.
16. The volume of the temporary pit does not exceed 10 acre-feet, see Figures 10-11

Operating and Maintenance Plan

The operator will operate and maintain the pit to contain liquids and solids and maintain the integrity of the liner, liner system or secondary containment system, 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 of all drilling fluids and recovered water in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. Specifically, drilling fluids and reclaimed water will be transferred to other drilling operations for use.

2. If re-use is not possible, fluids will be sent to disposal at the CRW-SWD disposal well Ross Draw SWD #1 (API 30-015-23680).
3. Reuse or disposal of fluids from the pit will be conducted a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment.
4. The operator will not discharge into or store any hazardous waste in the pit.
5. If any pit liner's integrity is compromised, or if any penetration of the liner occurs above the liquid's surface, 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.
6. If the pit develops a leak or if any penetration of the pit liner occurs below the liquid's surface, then the operator will remove all liquid above the damage or leak line within 48 hours, notify the Artesia district office within 48 hours (phone or email) of the discovery and repair the damage or replace the pit liner.
7. The injection or withdrawal of liquids from the pit will be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.
8. The operator will install diversion ditches and berms around the pit as necessary to prevent the collection of surface water run-on.
9. The operator will immediately remove any visible layer of oil for the surface of the temporary pit and maintain on site an oil absorbent boom to contain and remove oil from the pit's surface.
10. Only fluids used or generated during the drilling or workover process will be discharged into the temporary pit.
11. The operator will maintain the temporary pit free of miscellaneous solid waste or debris.
12. Although hydrocarbon-based drilling mud is not anticipated for use, the operator will use a tank made of steel to contain hydrocarbon-based drilling fluids if need be.
13. Immediately after cessation of a drilling or workover operation, the operator will remove any visible or measurable layer of oil from the surface of a drilling or workover pit, in the manner described above.
14. The operator will maintain at least two feet of freeboard for the temporary pit.
15. The operator will inspect the temporary pit containing drilling fluids at least daily while the drilling rig is on-site to ensure compliance with this plan.
16. After drilling and workover operations, the operator will inspect the temporary pit weekly so long as liquids remain in the temporary pit.
17. The operator will maintain a log of such inspections and make the log available for the Artesia district office's review upon request.
18. The operator will file a copy of the log with the appropriate division district office when the operator closes the temporary pit.

19. The operator will remove all free liquids from the temporary pit within 30 days from the date that the operator releases the drilling or workover rig. The operator will note the date of the drilling or workover rig's release on form C-105 or C-103 upon well or workover completion.

Closure Plan- General Conditions

Protocols and Procedures

The operator will use the following procedures and protocols to implement the closure:

- The operator of the temporary pit will remove all liquids from the temporary pit prior to closure and either:
  a. Dispose of the liquids in a division-approved facility: CRW-SWD disposal well Ross Draw SWD #1 (API 30-015-23680) or
  b. Recycle, reuse or reclaim the liquids for use in drilling another well.
- Fluids on and entrained in the drilling waste will be removed from the pit for re-use or disposal.
- Precipitation and/or the addition of fresh water to the pit will cause rinsing of waste and removal of constituents of concern via the pit drainage system to the above-ground tank. Fluids removed from the pit are temporarily stored in the above-ground tank and are removed for re-use or disposal. Both temporary storage of fluids from the pit and reuse or disposal will be conducted in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment.
- In-place closure is the selected closure alternative.
- The operator will close the temporary pit within six months of the date that the operator releases the drilling or workover rig. An extension not to exceed three months may be requested of the Artesia district office.
- The operator will close the pit by an earlier date that the division requires because of imminent danger to fresh water, public health or the environment.
- The operator of the temporary will notify the Artesia 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 and 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.
- 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 within 60 days of closing the temporary pit.

If the standards for in-place closure are not met, the operator may elect to implement excavation and removal as described in this plan.

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, recontour 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 preferred closure option, 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 BLM mandates for the seed mixture (Appendix C) not including noxious weeds, 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

General Provisions

1. The operator has provided the surface owner notice of the operator's proposal of an on-site closure (see Appendix D for proof of notice to the landowner, BLM.)
2. The operator will report the exact location of the on-site burial on form C-105 filed with the division.
3. Because the surface is owned by the Federal Government and administered by the BLM, no deed exists. Therefore, the operator cannot file a deed notice identifying the exact location of the on-site burial with the county clerk in the county. The exact location of the on-site burial will be transmitted to the BLM by copy of the form C-105 discussed above.

Siting Criteria Compliance Demonstration for In-Place Burial

Based upon requirements of 19.15.17.10 NMAC, given above.

Protocols and Procedures for In-Place Burial

In addition to the General Conditions Protocols and Procedures listed above, the operator will follow the following steps for in-place closure of the pit.

A. The pit liner will be removed above the mud level and below the anchor for re-use if possible. We will use a utility knife and manual power to remove the liner.

B. The anchored liner will be removed with excavation equipment and placed in the pit.

C. The operator will stabilize or solidify the contents to a bearing capacity sufficient to support the temporary pit's final cover.

D. The operator will not mix the contents with soil or other material at a mixing ratio of greater than 3:1, (3 parts soil or other material to 1 part drilling waste). Specifically, the drilling waste will be stabilized in the pit by adding no more than 3 parts clean fill derived from the excavation of the pit to 1 part drilling waste.

E. After stabilization such that the waste material will support the soil cover, the mixture will be sampled pursuant to NMOCD Rules (see below).

F. Upon closure of the temporary pit, the operator will 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.

G. The operator will place a steel marker at the center of an on-site burial. 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.

Waste Material Sampling Plan for In Place Burial

Because the ground water 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 after the waste material is stabilized 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;
- TPH, as determined by EPA method 418.1 does not exceed 2500 mg/kg;
- Chloride, as determined by EPA method 300.1, does not exceed 1000 mg/kg or the background concentration, whichever is greater.

Proof of Surface Owner Notice

The operator will notify the surface owner (BLM) by certified mail, return receipt requested, that the operator plans to close the temporary pit. Evidence of mailing of the notice is sufficient to demonstrate compliance with this requirement.

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, synthetic pit liners and transferring those materials to one of the division-approved facilities listed below:

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

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) 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 as described in the Soil Cover Plan (above);
3. Recontour and re vegetate the site as described in the Revegetation 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. To determine if a release has occurred, the operator and/or qualified contractor will collect, at a minimum:

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

The operator or qualified contractor will analyze these samples for:

- Benzene,
- Total BTEX,
- TPH,
- The GRO and DRO combined fraction and
- Chloride

The purpose of this sampling is to demonstrate that:

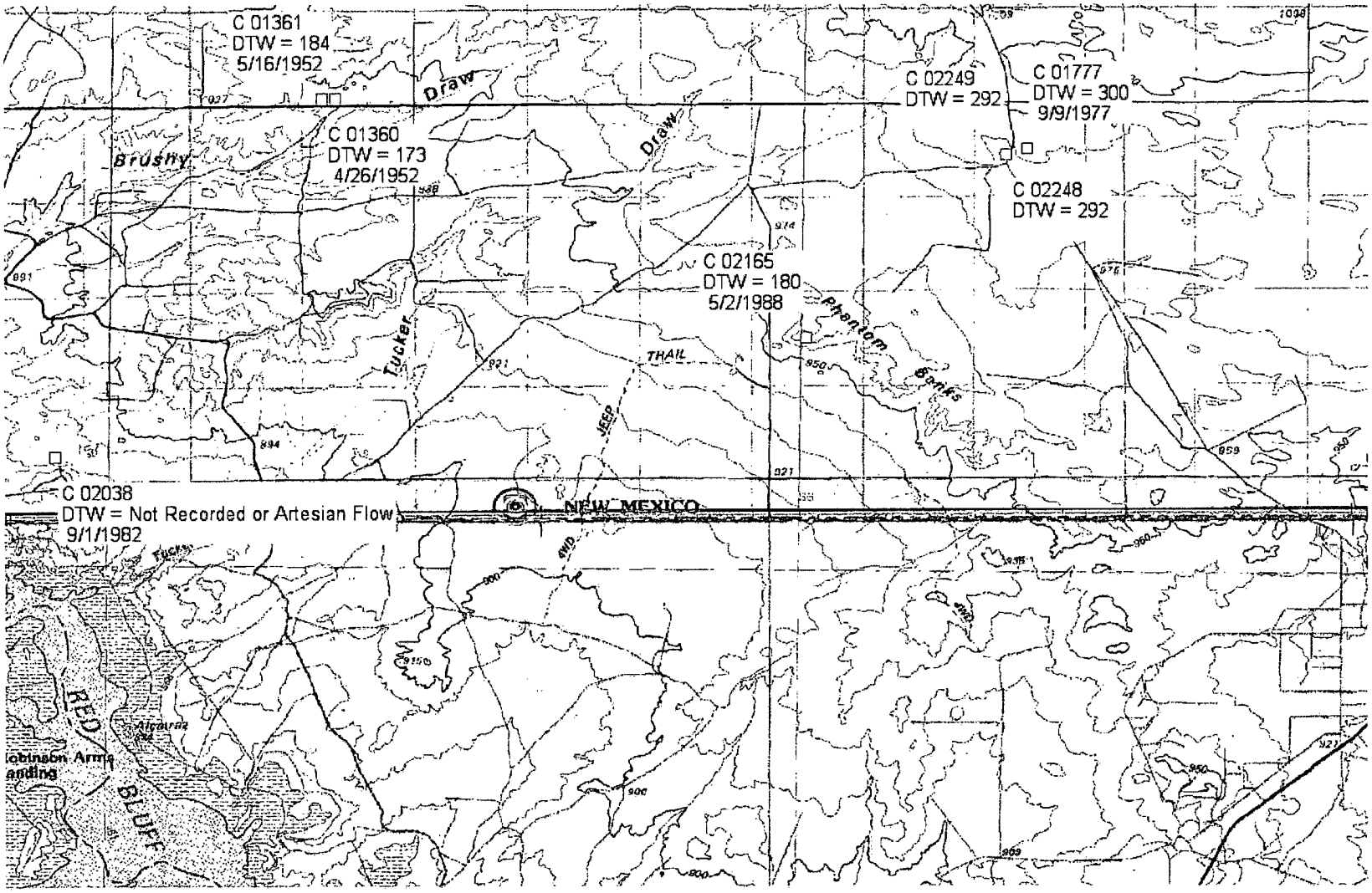
- Benzene, as determined by EPA SW-846 method 8021B or 8260B does not exceed 0.2 mg/kg;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B does not exceed 50 mg/kg;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed 500 mg/kg;
- The TPH, as determined 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

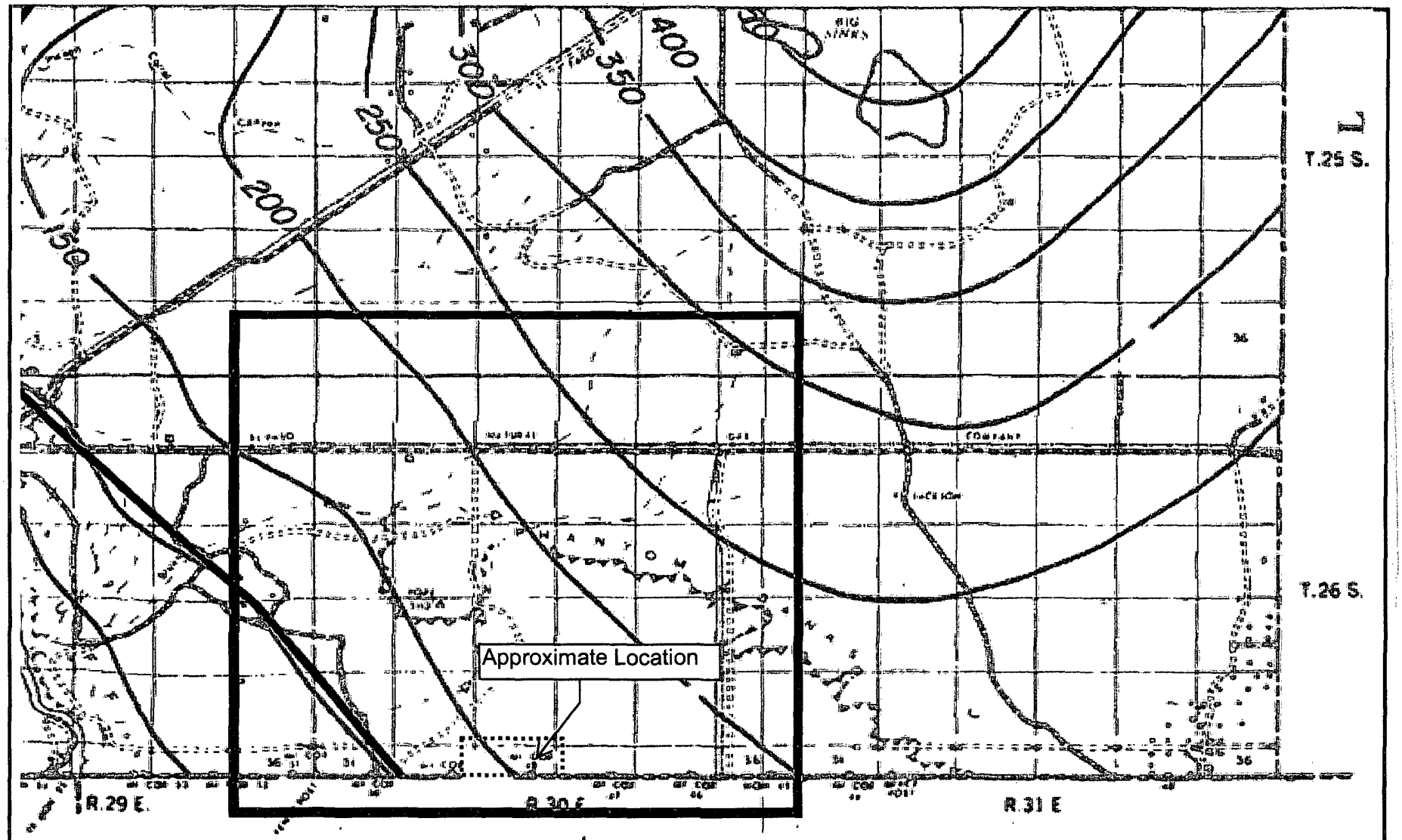
The operator shall notify the division of its results on form C-141. If the operator or the division determines that a release has occurred, then the operator will comply with 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.

Figures

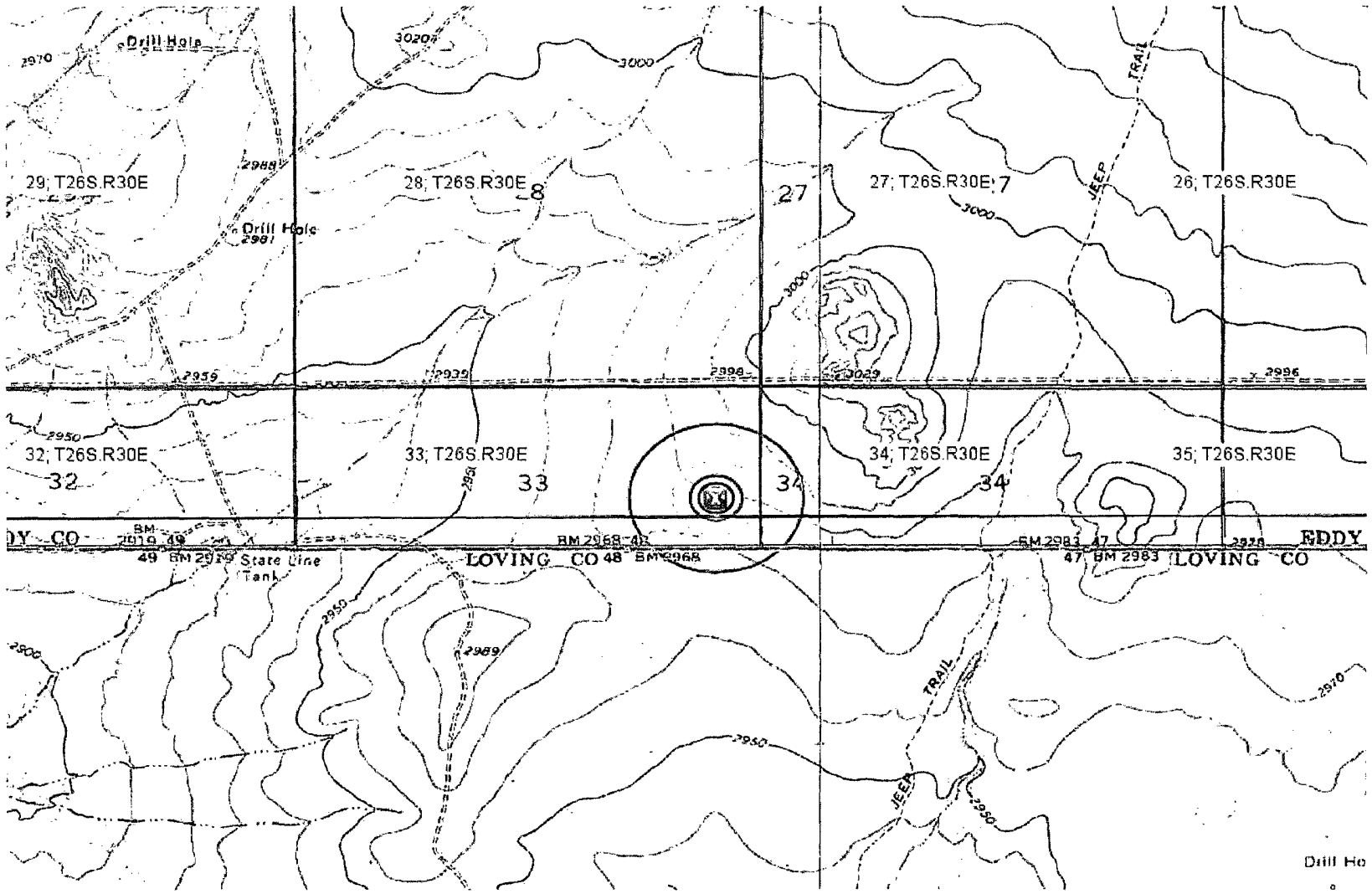
R.T. Hicks Consultants, Ltd.
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104



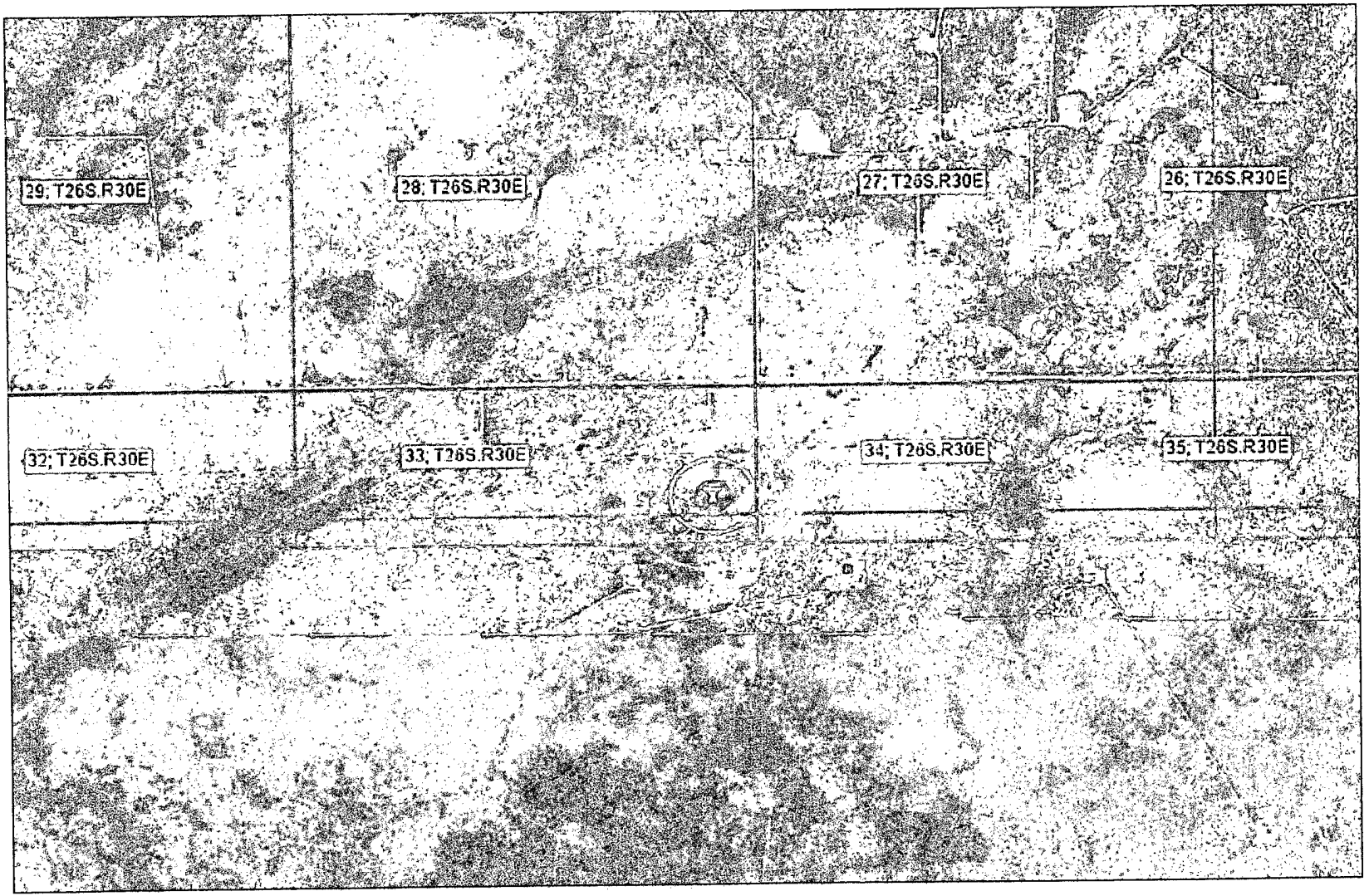
Petroleum Recovery Research Center	Depth to Water, OSE Well Data	Figure: 1
	J.C. Williamson - Ross Draw #31	Oct 25, 2010



R.T. Hicks Consultants, Ltd.	Depth to Ground Water - R30E T26S	Figure 1b
	J.C. Williamson - Ross Draw Unit #31, R30 E, T26S Sec 33	10/10/10



Petroleum Recovery Research Center	Topographic Map	Figure: 2
	JC Williamson - Ross Draw #31	Oct 22, 2010

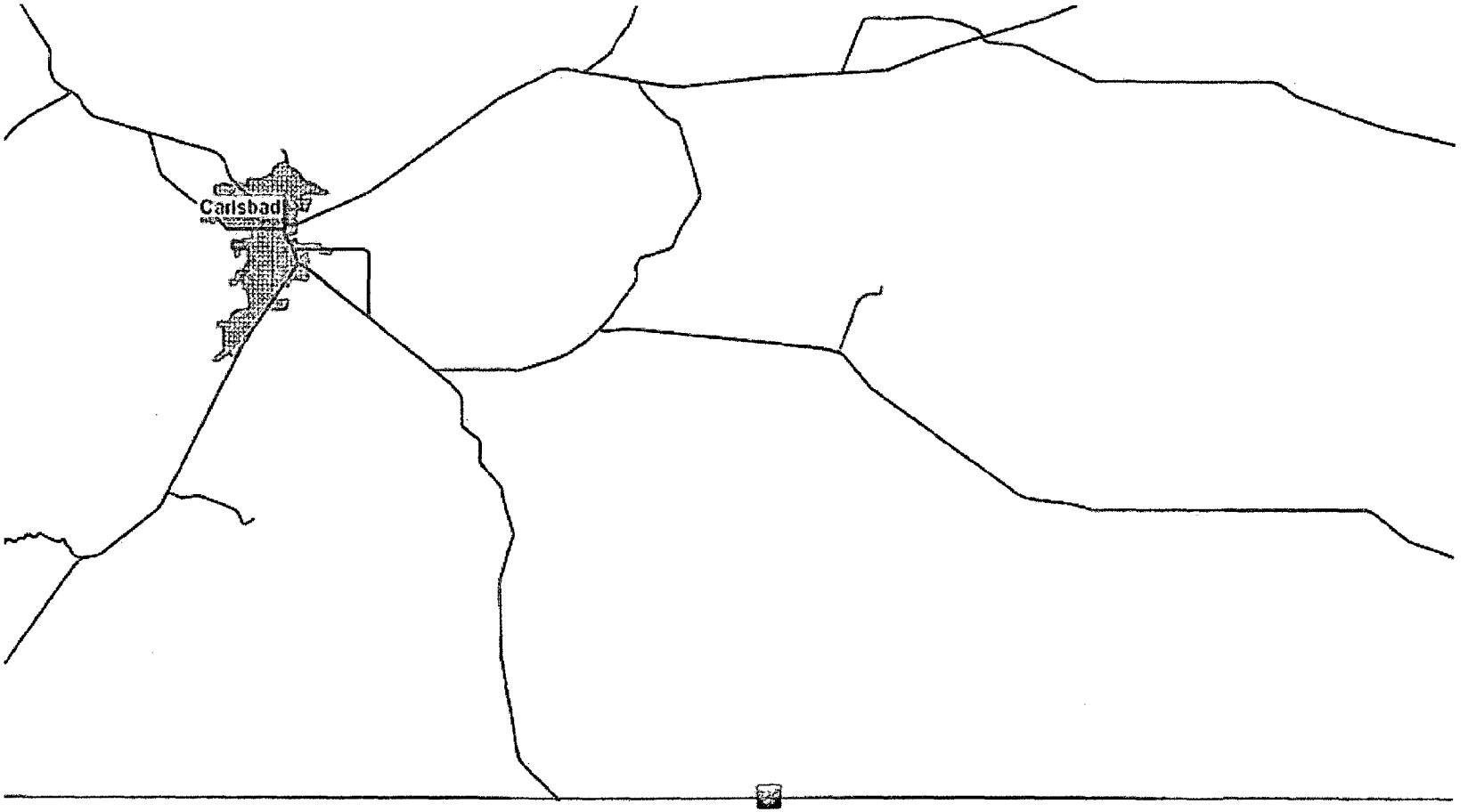


Distance (ft): 200 300 500 1000

0 1000 2000ft

N W E S

Petroleum Recovery Research Center	2008 Aerial Photograph	Figure: 3
	JC Williamson - Ross Draw #31	Oct 22, 2010



Distance (ft): 200 300 500 1000

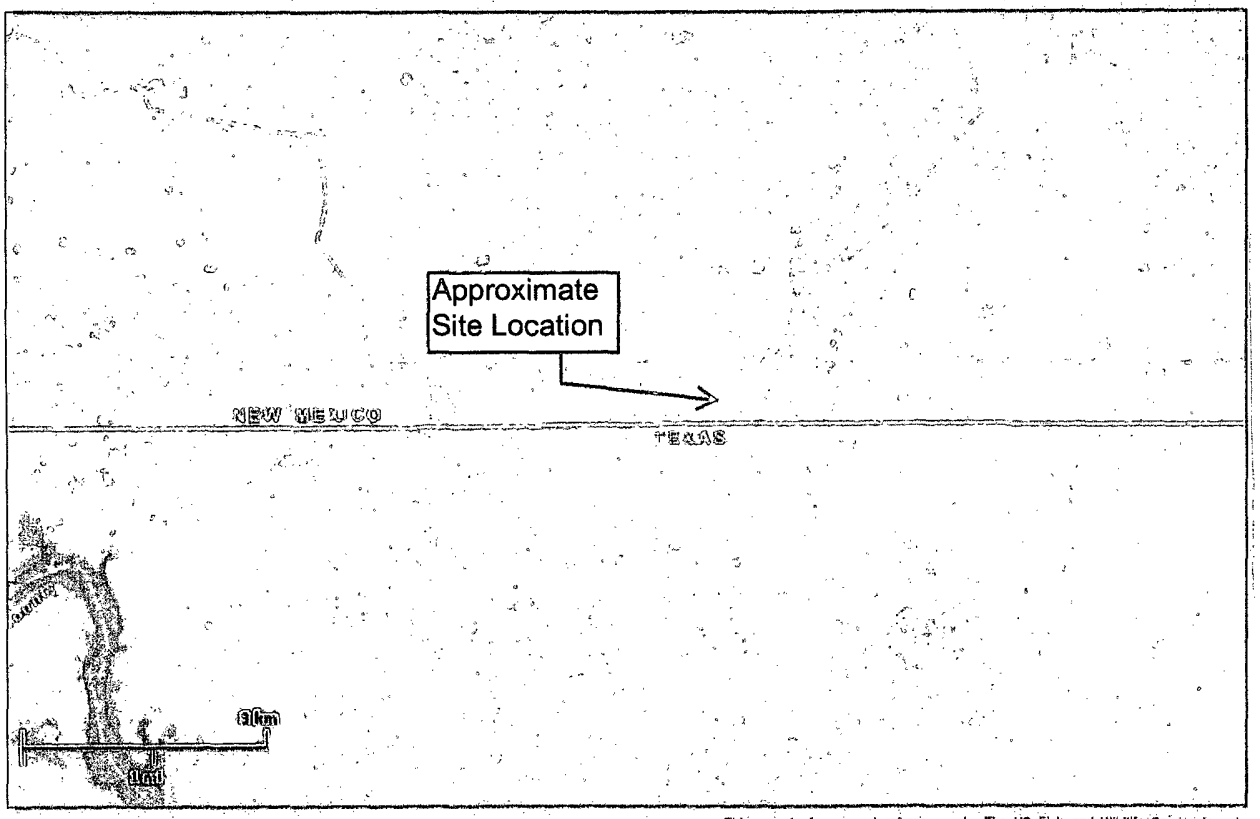
0 5 10mi

N W E S

Petroleum Recovery Research Center	Nearest Municipal Boundaries	Figure: 4
	JC Williamson - Ross Draw #31	Oct 22, 2010

U.S. Fish and Wildlife Service

National Wetlands Inventory



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.

Figure 5: Wetlands

Oct 22, 2010

Wetlands

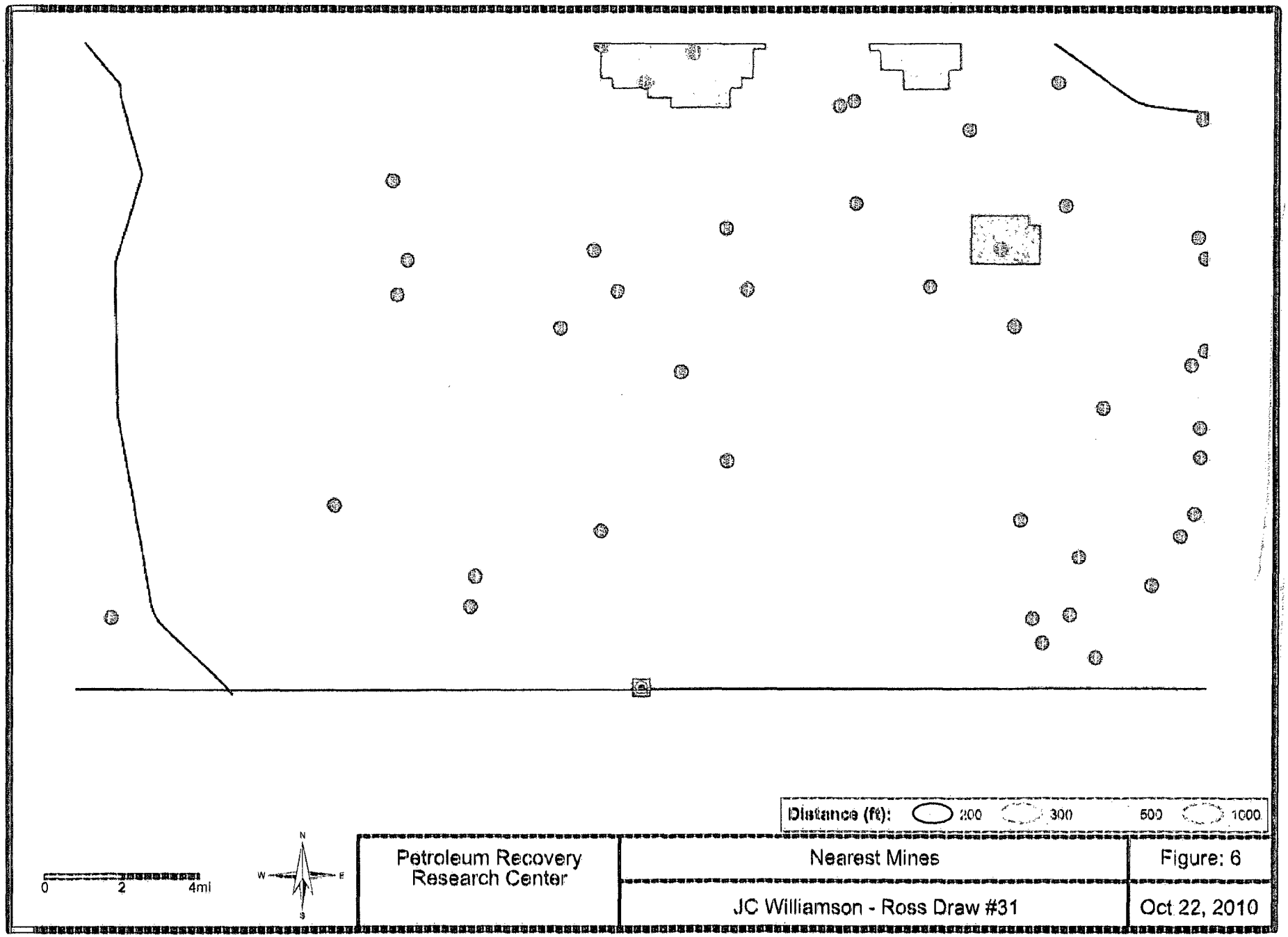
- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deelwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Status

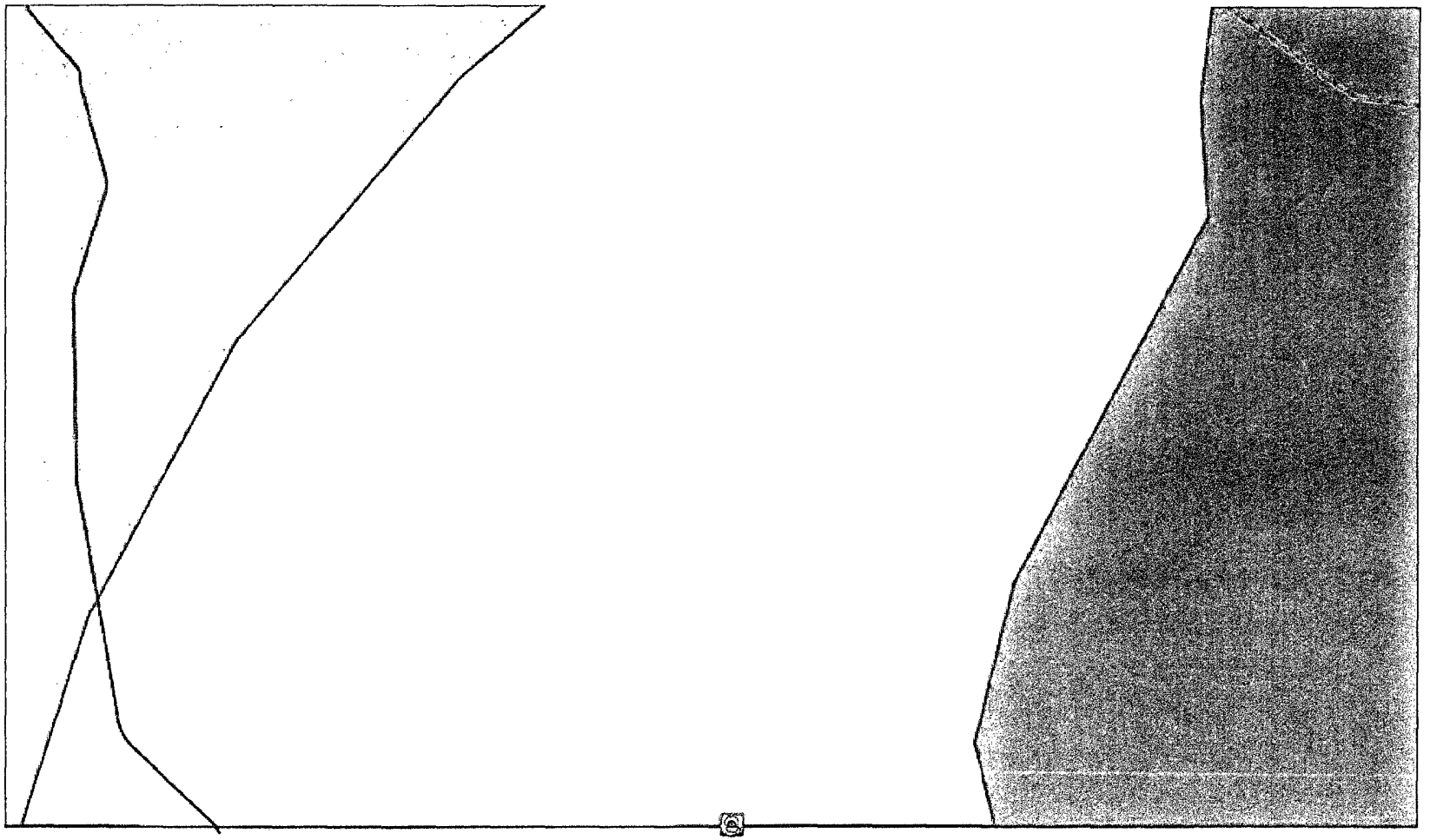
- Digital
- Scan
- Non-Digital
- No Data

User Remarks:

JC Williamson - Ross Draw Unit #31



Petroleum Recovery Research Center	Nearest Mines	Figure: 6
	JC Williamson - Ross Draw #31	Oct 22, 2010

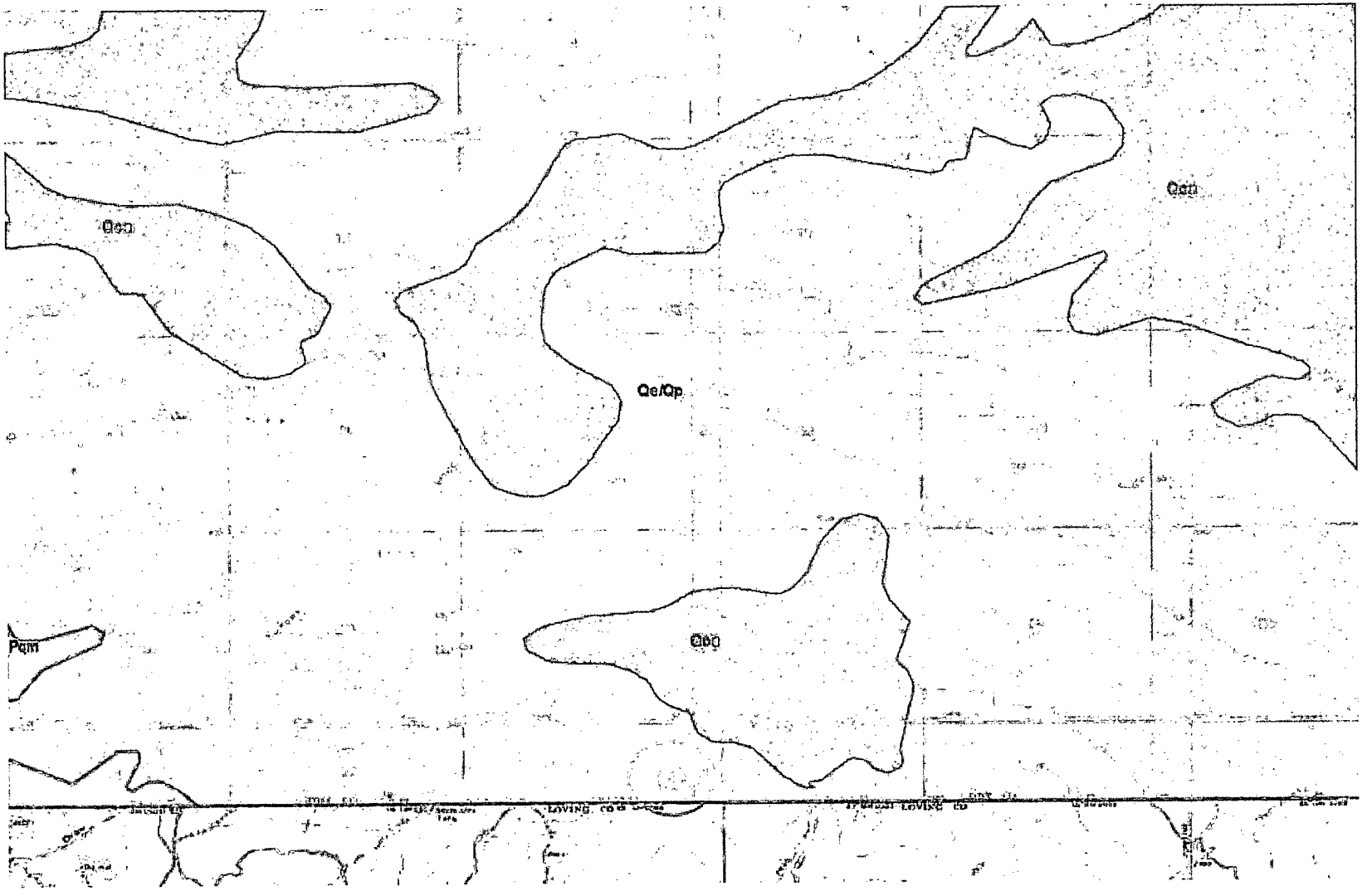


Distance (ft): 200 300 500 1000

0 2 4mi

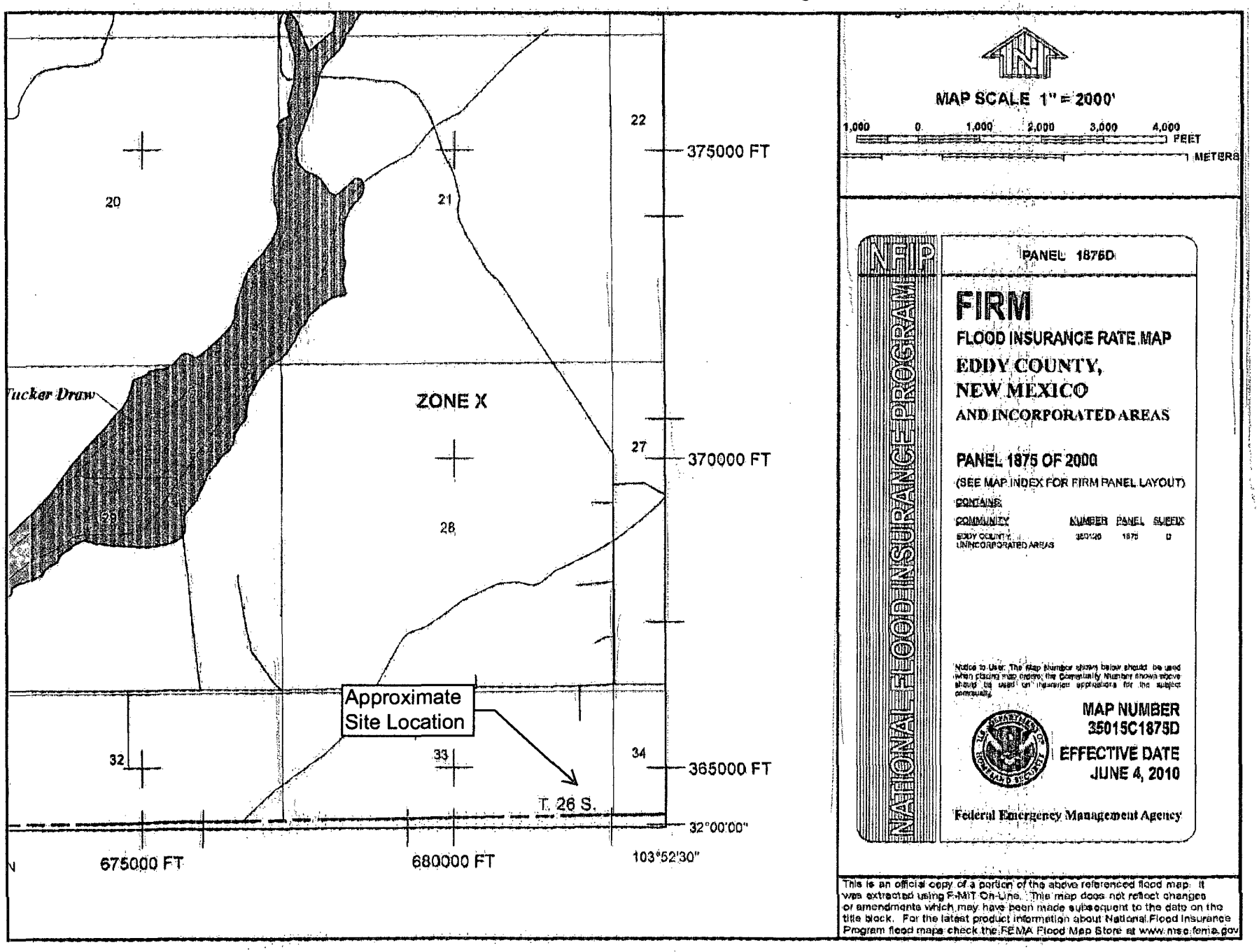
N W E S

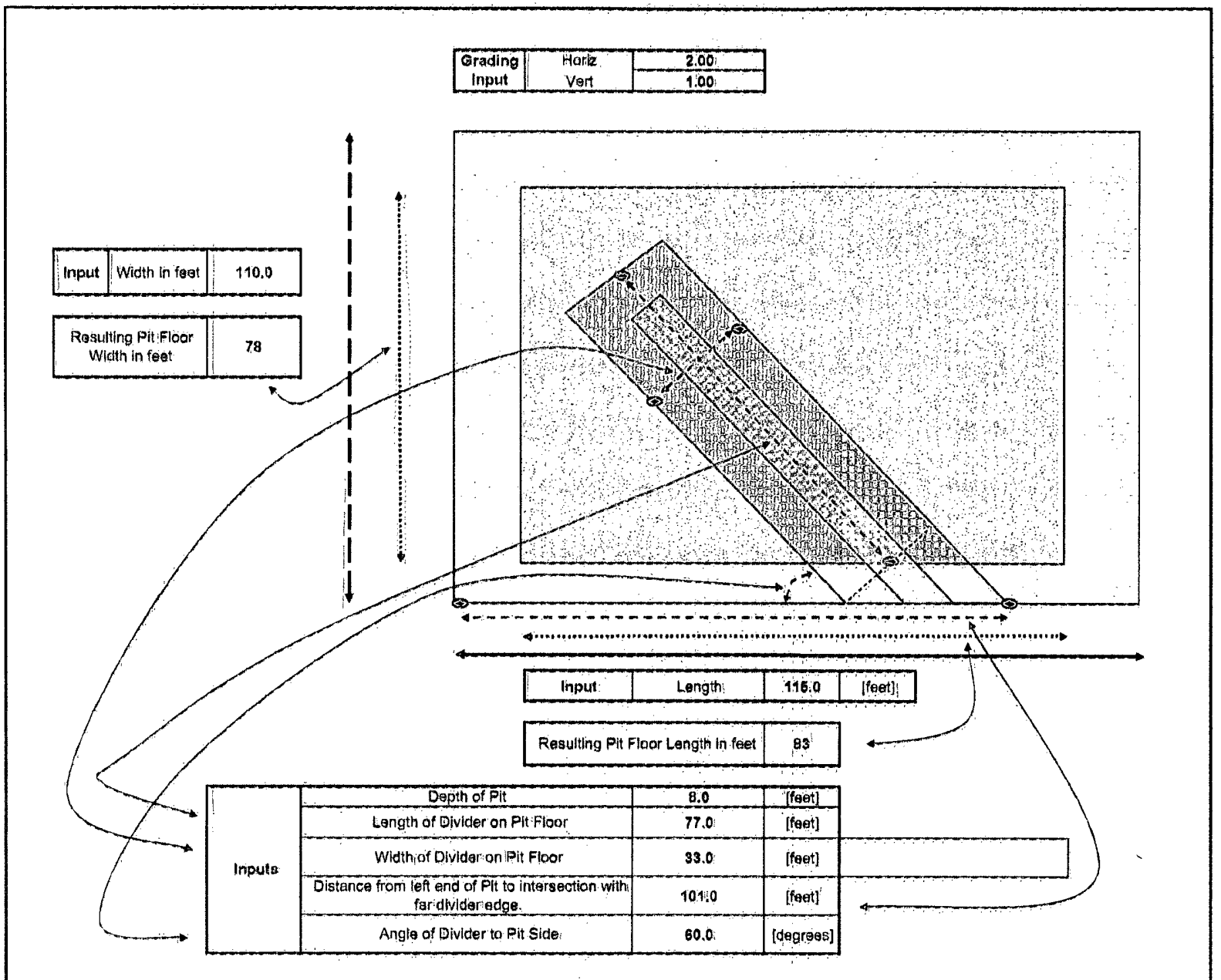
Petroleum Recovery Research Center	Karst Map	Figure: 7
	JC Williamson - Ross Draw #31	Oct 22, 2010



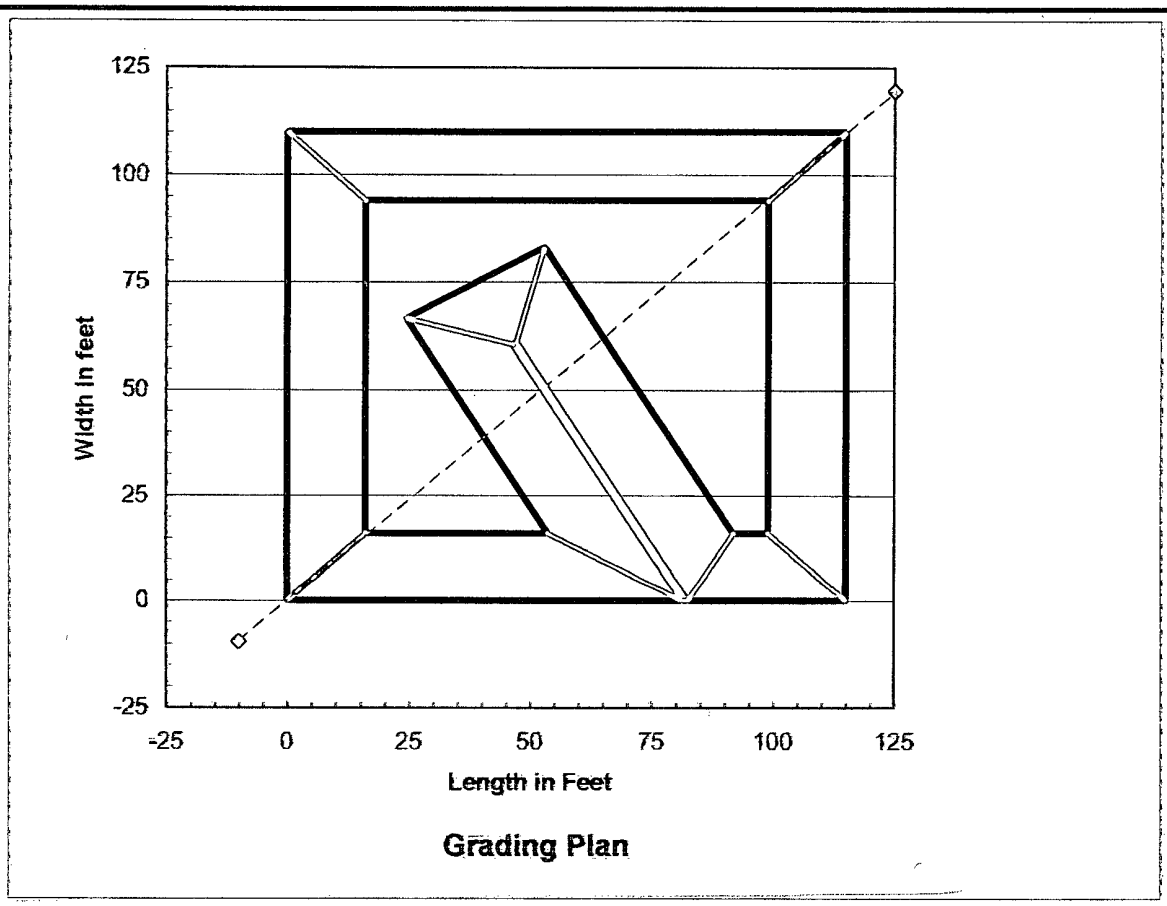
Petroleum Recovery Research Center	Surface Geology	Figure: 8
	JC Williamson - Ross Draw #31	Oct 22, 2010

Figure 9 - Ross Draw #31

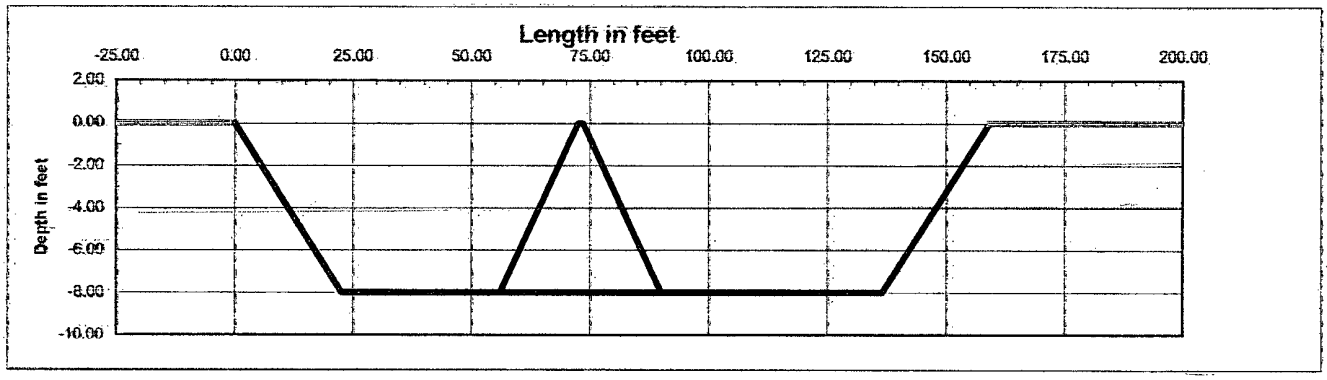




R.T. Hicks Consultants, Ltd.	Pit Design and Dimensions	Figure 10
	CRW - Ross Draw # 31	17-Nov-10



Grading Plan

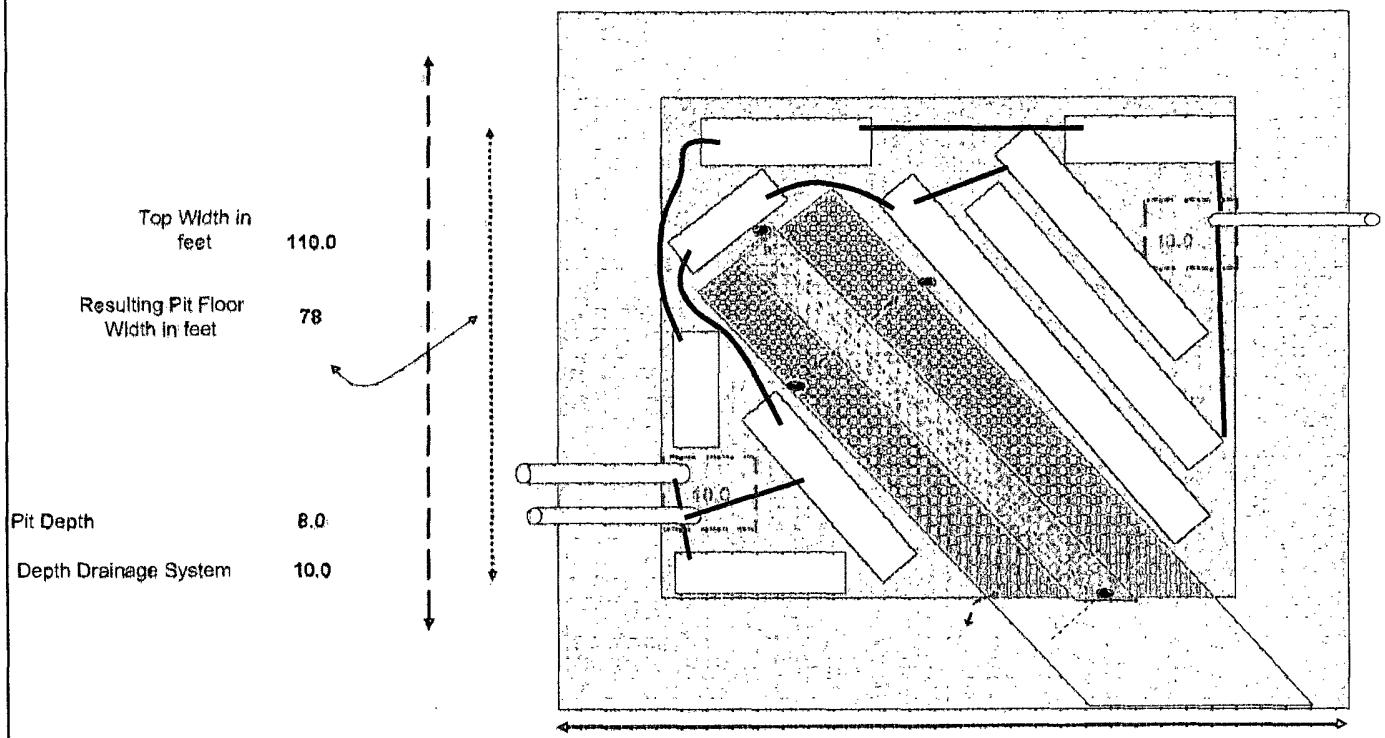


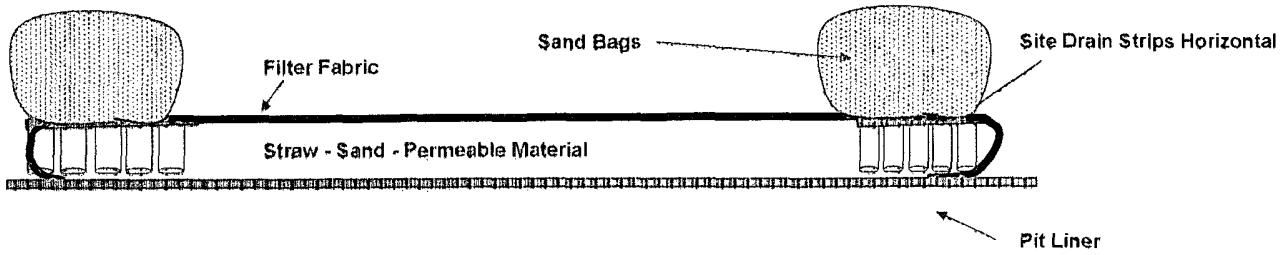
SW Corner of Pit **NE Corner of Pit**

The pit floor is uniformly 8 feet below grade, as shown in the cross section.
Two small depressions exist for the pit drainage system as shown in Figure 12

R.T. Hicks Consultants, Ltd.	Grading Plan and Cross Section	Figure 11
	CRW - Ross Draw # 31	17-Nov-10

Drainage System 1
Drainage System 2





R.T. Hicks Consultants, Ltd.	Schematic Drainage System and Grading Plan	Figure 12
	CRW - Ross Draw # 31	17-Nov-10

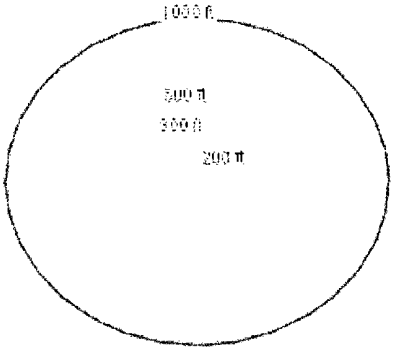
Legend

Petroleum Recovery Research Center
Pit Rule Web Mapping Portal
http://pitrule.source3.com

September 23, 2009

Site Marker

Distance Radii



Land Ownership

- Not Classified
- BLM, Bureau of Land Managment
- BOR, Bureau of Reclamation
- DOA, Department of Agriculture
- DOD, Department of Defense
- DOE, Department of Energy
- FS, U.S. Forest Service
- FWS, US Fish and Wildlife Service
- I, Indian/Tribal
- NPS, National Park Service
- Private
- State of New Mexico
- SGF, NM State Game and Fish
- SP, NM State Park
- VCNP, Valles Caldera National Preserve

100 – year Floodplain (partial coverage)

- *100-year Floodplain*

Mines and Minerals

Potash Boundaries

- POT MID ISLAND
- POT NORTH ISLAND
- POT SOUTH ISLAND
- POTASH MAIN
- WIPP SITE

Coal Boundaries

- Active Mining
- Bond Released
- Reclamation Only

MILS = Mineral Industry Location System

- MINERAL LOC
- PLACER
- PROC PLANT
- PROSPECT
- SURF-UNDERG
- SURFACE
- UNDERGROUND
- UNDERWATER
- UNKNOWN
- WELL

Political Boundaries

- Township Range Section
- State boundary
- Urban Areas (2000 Census)
- Cities
- Interstate
- US Highway
- State Highway
- Local Road

Surface Water

- Stream/River
- Perennial Stream
- Intermittent Stream
- Lake/Pond
- Reservoir
- Playa
- Swamp/Marsh
- Estuary
- Sink/Rise
- Spring/Seep

Statewide Wells

- OSE
- USGS (gwelev/date)
- USGS (DTW/date)
- Oil/Gas (API/Type)

NOTES

API = American Petroleum Institue well number
DTW = depth to water in feet below ground surface
gwelev = ground water elevation in feet relative to mean sea level
OSE = NM Office of the State Engineer
USGS = US Geological Survey

Karst – use for unstable areas

- Fissures and voids present to a depth of 250 ft (75 m) or more in areas of subsidence from piping in thick, unconsolidated material
- Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; In gently dipping to flat-lying beds of carbonate rock
- Fissures, tubes and caves generally less than 1,000 ft (300 m) long; 50 ft (15 m) or less vertical extent; in moderately to steeply dipping beds of carbonate rock
- Fissures, tubes, and caves generally absent; where present in small isolated areas, less than 50 ft (15 m) long; less than 50 ft (15 m) vertical extent; in gently dipping to flat-lying beds of carbonate rock
- Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in gently dipping to flat-lying beds of carbonate rock
- Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in gently dipping to flat-lying beds of gypsum
- Fissures, tubes, and caves over 1,000 ft (300 m) long; 50 ft (15 m) to over 250 ft (75 m) vertical extent; in moderately to steeply dipping beds of carbonate rock
- Fissures, tubes, and tunnels present to a depth of 250 ft (75m) or more in lava
- Fissures, tubes, and tunnels present to a depth of 50 ft. (15 m) in lava
- no karst

NM GEOLOGY

- not specified
- D, Paleozoic-Percha Shale
- J, Jurassic Rocks, undivided
- Je, Jurassic-Entrada Sandstone
- Jm, Jurassic-Morrison Formation
- Jmsu, Jurassic-Morrison Formation and upper San Rafael Group
- Jsr, Jurassic-San Rafael Group
- Jz, Jurassic-Zuni Sandstone
- Jze, Jurassic-Zuni and Entrada Sandstone; undivided
- K, Cretaceous rocks, undivided
- Ka, <Null>
- Kbm, Cretaceous-Mancos Formation and Beartooth Quartzite
- Kc, Cretaceous-Carlile Shale
- Kcc, Cretaceous-Crevasse Canyon Formation; coal-bearing and sandstone units
- Kch, Cretaceous-Cliff House Sandstone
- Kd, Cretaceous-Dakota Sandstone
- Kdg, Cretaceous-Dakota Group
- Kdm, Cretaceous-Intertongued Dakota-Mancos sequence
- Kdr, Cretacous-Dakota Sandstone and Rio Salado Tongue of the Mancos Shale
- Kg, Cretaceous-Gallup Sandstone
- Kgc, Cretaceous-Dakota Sandstone and Rio Salado Tongue of the Mancos Shale; undivided
- Kgg, Cretaceous-Graneros Shale and Greenhorn Formation
- Kgh, Cretaceous-Greenhorn Formation
- Kgr, Cretaceous-Graneros Shale
- Ki, Uppermost Cretaceous intrusive rocks
- Kkf, Cretaceous-Kirtland and Fruitland Formations
- Kl, Lower Cretaceous, undivided
- Kls, Cretaceous-Lewis Shale
- Klv, Cretaceous-La Ventana Tongue of the Cliff House Sandstone
- Km, Cretaceous-Manco Shale
- Kma, Cretaceous-Moreno Hill Formation and Atarque Sandstone
- Kmc, Cretaceous-McRae Formation
- Kmf, Menefee Formation; mudstone, shale, and sandstone
- Kmg, Cretaceous-Gallup Sandstone and underlying D-Cross Tongue of the Mancos Shale
- Kml, Cretaceous-Mancos Shale, Lower Part
- Kmm, Cretaceous-Mulatto Tongue of Mancos Shale
- Kmr, Cretaceous-Rio Salado Tongue of the Mancos Shale
- Kms, Cretaceous-Satan Tongue of Mancos Shale
- Kmu, Cretaceous-Mancos Shale, Upper Part
- Kmv, Cretaceous-Mesaverde Group

continued on next page

NM Geology - continued

Kmv, Cretaceous-Mesaverde Group
Knf, Cretaceous-Fort Hays Limestone Member of Niobrara Formation
Kpc, Cretaceous-Pictured Cliffs Sandstone
Kpg, Cretaceous-Pescao Tongue of the Manco Shale and Gallup Sandstone
Kph, Cretaceous-Hosta Tongue of Point Lookout Sandstone
Kpl, Point Lookout Sandstone
Kpn, Cretaceous-Pierre Shale and Niobrara Formation
Kth, Cretaceous-Tres Hermanos Formation
Ku, Upper Cretaceous; undivided
Kvt, Cretaceous-Vermejo Formation and Trinidad Sandstone
M(c), Mississippian through Cambrian
M, Paleozoic-Mississippian rocks, undivided
MD, Paleozoic-Mississippian and Devonian rocks; undivided
O(c), Ordovician and Cambrian
O(c)p, Ordovivian-Cambrian plutonic rocks
P(p), Permian and Pennsylvanian; undivided
P(p)lc, Permian-Lead Camp Formation
P(p)m, Permian-Maderia Formation
P(p)me, Permian-Maderia Formation; exotic blocks
P(p)ps, Permian-Panther Seep Formation
P(p)s, Permian-Sandia Formation
P(p)sc, Permian-Sangre de Cristo Formation
P, Paleozoic-Permian Rocks, undivided
Pa, Paleozoic-Abo Formation; red beds
Pal, Paleozoic-Lower part of Abo Formation
Pat, Permian-Artesia Group; shelf facies forming south-southeast trending outcrop
Pau, Paleozoic-Upper Part of Abo Formation
Pay, Paleozoic-Abo and Yeso Formations
Pb, Paleozoic-Bursum Formation; shale, arkose, and limestone
Pbc, <Null>
Pc, Paleozoic-Castile Formation; anhydrite sequence
Pcc, Paleozoic-Cherry Canyon Formation; sandstone, limestone, shale
Pco, Paleozoic-Cutoff Shale
Pcp, <Null>
Pct, Paleozoic-Cutler Formation
Pg, Paleozoic-Glorieta Sandstone; high-silica quartz sandstone
Pgq, Paleozoic-Grayburg and Queen Formations; sandstones, gypsum, anhydrite, dolomite, and red mustone
Ph, Paleozoic-Hueco Formation
Playa, Playa Deposits
Pqm, Paleozoic-Quartermaster Formation; red sandstone and siltstone; Upper Permian
Pqr, Paleozoic-Quartermaster and Rustler Formations; Upper Permian

continued on next page

NM Geology - continued

Pqr, Paleozoic-Quartermaster and Rustler Formations; Upper Permian
Pr, Paleozoic-Ruster Formation; siltstone, gypsum, sandstone, and dolomite; Upper Permian
Psa, Paleozoic-San Andres Formation; limestone and dolomite with minor shale
Psg, Paleozoic-San Andres Limestone and Glorieta Sandstone
Psl, Paleozoic-Salado Formation; evaporite sequence; Upper Permian
Psr, Paleozoic-Seven Rivers Formation; gypsum, anhydrite, salt, dolomite, and siltstone
Pty, Paleozoic-Yates and Tansill Formations; sandstones, siltstones, limestone, dolomite, and anhydrite
Pvp, Paleozoic-Victoria Peak Limestone
Py, Paleozoic-Yeso Formation; sandstones, siltstones, anhydrite, gypsum, halite, and dolomite
Pys, Paleozoic-Yeso, Glorieta and San Andres Formations, undivided
Pz, Paleozoic rocks, undivided
QTb, Basaltic and andesitic volcanics interbedded with Pleistocene and Pliocene sedimentary units.
QTg, Gila Group
QTp, Older piedmont alluvial deposits and shallow basin fill
QTs, Upper Santa Fe Group
QTsf, Upper Santa Fe Group, undivided
QTt, Quaternary-Travertine
Qa, Quaternary Alluvium
Qa/QTs,
Qa/QTsf,
Qb, Quaternary-Basalt and andesite flows and local vent deposits
Qbo, Quaternary-Basalt or basaltic andesite; middle and lower Pleistocene
Qbt, Quaternary-Bandalier Tuff; Jemez Mountains area only
Qd, Quaternary-Glacial deposits; till and outwash; upper and middle Pleistocene
Qe, Quaternary-Eolian Deposits
Qe/QTs,
Qe/QTsf,
Qe/Qa, <Null>
Qe/Qp, Quaternary-Eolian Piedmont Deposits
Qe/Qpl,
Qe/Tnb,
Qeg, Quaternary-Gypsiferous eolian deposts
Ql, Quaternary-Landslide deposits and colluvium
Ql/QTs, <Null>
Qoa, Quaternary-Older Alluvial Deposits
Qoa/To, Quaternary-Older Alluvial Deposits/Ogalalla
Qp, Quaternary-Piedmont Alluvial Deposits
Qp/QTs,
Qp/QTsf,
Qp/Tsf,
Qpl, Quaternary-Lacustrine and Playa Deposits

continued on next page

NM Geology - continued

- Qr, Quaternary-Silicic volacanic rocks
- Qv, Quaternary-Basaltic volcanoes; tuff rings, cinders, and proximal lavas
- Qvr, Quaternary-Valles Rhyolite; Jemez Mountains area only
- SO(c), Silurian through Cambrian
- SO, Paleozoic-Silurian and Ordovican rocks, undivided
- T(r), Triassic Rocks, undivided; continental red beds
- T(r)b, Triassic-Bull Canyon
- T(r)c, Triassic-Chinle Group
- T(r)cu, Triassic-Upper Chinle Group
- T(r)g, Triassic-Garita Creek Formation
- T(r)m, Triassic-Moenkopi Formation
- T(r)r, Triassic-Redonda Formation
- T(r)rp, Triassic-Rock Point Formation; Chinle Group
- T(r)s, Triassic-Santa Rosa Formation
- T(r)t, Triassic-Trujillo Formation
- TKa, Animas Formation
- TKav, Andestic Volcanics
- TKi, Paleogene and Upper Cretaceous intrusive rocks
- TKpr, Poison Canyon and Raton Formations; undivided
- TKr, Raton Formation
- Tc, Tertiary-Chuska Sandstone
- Tfl, Tertiary-Fence Lake Formation
- Thb, Hinsdale Basalt
- Ti, Tertiary intrusive rocks; undifferentiated
- Tif, Middle Tertiary felsic shallow-intrusive rocks
- Tla, Lower Tertiary, andesite and basaltic andesite flows, and associated volcanic units
- Tli, Tertiary-intrusive rocks and intermediate to felsic dikes and plugs
- Tlp, Tertiary-Los Pinos Formation of Lower Santa Fe Group
- Tlrf, Tertiary-Lower Oligocene silicic (or felsic) flows, domes, and associated pyroclastic rocks and intrusions
- Tlrp, Tertiary-Lower Oligocene silicic pyroclatic rocks
- Tlv, Tertiary-Lower Oligocene and Eocene volcanic rocks, undifferentiated
- Tmb, Basalt and andesite flows; Miocene
- Tn, Nacimiento Formation
- Tnb, Basalt and andesite flows; Neogene
- Tnr, Tertiary-Silicic to intermediate volcanic rocks
- Tnv, Tertirary-Neogene volcanic rocks
- To, Tertiary-Ogallala Formation
- Toa, Tertiary-Ojo Alamo Formation
- Tos, Tertiary-sedimentary and volcaniclastic rocks
- Tpb, Basalt and andesite flows; Pliocene

continued on next page

NM Geology - continued

- Tpc, Tertiary-Poison Canyon Formation
- Tps, Tertiary-Paleogene sedimentary units
- Tsf, Tertiary-Lower and Middle Santa Fe Group
- Tsj, Tertiary-San Jose Formation
- Tual, Tertiary-Upper Oligocene andesites and basaltic andesites
- Tuau, Tertiary-Lower Miocene and uppermost Oligocene basaltic andesites
- Tui, Tertiary-Miocene to Oligocene silicic to intermediate intrusive rocks; dikes, stocks, plugs, and diatremes
- Tuim, Upper and Middle Tertiary mafic intrusive rocks
- Turf, Tertiary-Upper Oligocene silicic (or felsic) flows and masses and associated pyroclasitc rocks
- Turp, Tertiary-Upper Oligocene rhyolitic pyroclastic rocks
- Tus, Upper Tertiary sedimentary units
- Tuv, Tertiary-Volcanic and some volcaniclastic rocks; undifferentiated
- Tv, Middle Tertiary volcanic rocks; undifferentiated
- Water
- X, Precambrian-Lower Proterozoic rocks; undivided
- Xm, Precambrian-Lower Proterozoic metasedimentary rocks
- Xmo, Precambrian- Lower Proterozoic metamorhic rocks; dominantley mafic
- Xms, Precambrian-Lower Proterozoic metasedimentary rocks
- Xmu, Precambrian-Lower Proterozoic metamorphic rocks, undivided
- Xp, Precambrian-Lower Proterozoic plutonic rocks
- YXp, Precambrian-Middle and Lower Proterozoic plutonic rocks, undivided
- Yp, Precambrian-Middle Proterozoic plutonic rocks
- Ys, Precambrian-Middle Proterozoic sedimentary rocks
- ds, Quaternary-Disturbed Ground

end of geology legend

C-102 Form

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 and Natural Resources Department

OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised October 12, 2005
Submit to Appropriate District Office
State Lease - 4 Copies
Fee Lease - 3 Copies

WELL LOCATION AND ACREAGE DEDICATION PLAT

☐ AMENDED REPORT

API Number	Pool Code	Pool Name

Property Code	Property Name	Well Number
	ROSS DRAW UNIT	31
OGRID No.	Operator Name	Elevation
	J.C. WILLIAMSON	2979'

Surface Location

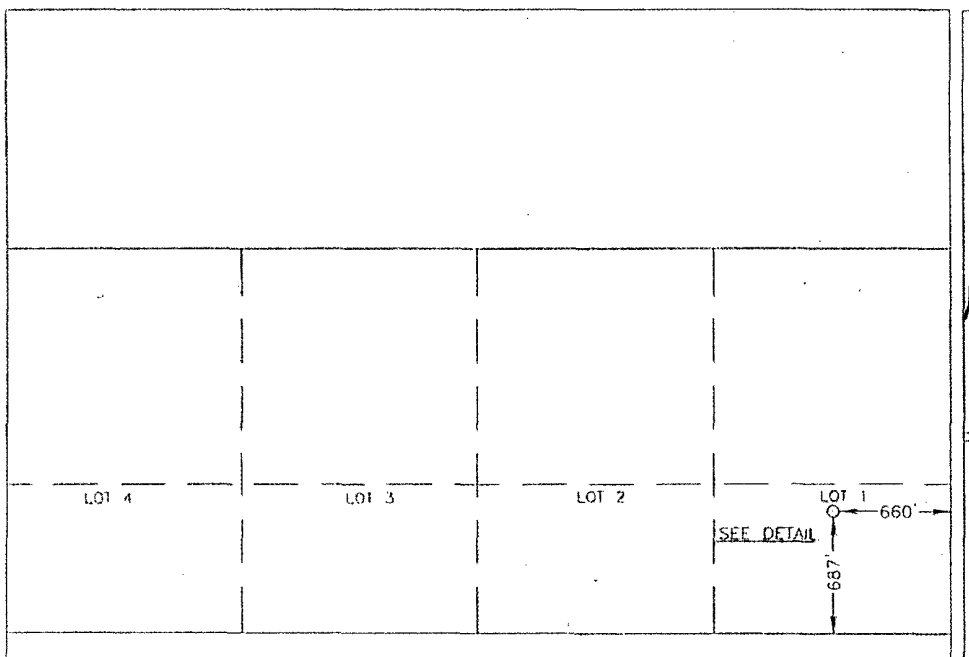
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
1	33	26-S	30-E		687	SOUTH	660	EAST	EDDY

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

Dedicated Acres	Joint or Infill	Consolidation Code	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

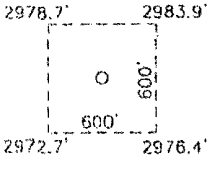


GEODETIC COORDINATES
NAD 27 NME

Y=364713.6 N
X=640747.3 E

LAT.=32.001899° N
LONG.=103.879295° W

DETAIL



OPERATOR CERTIFICATION

I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Signature 10/27/10 Date

DARRELL FOIMAR
Printed Name

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.

JANUARY 5, 2010

Date Surveyed LA

Signature & Seal of Professional Surveyor

NEW MEXICO 3239 REGISTERED PROFESSIONAL SURVEYOR

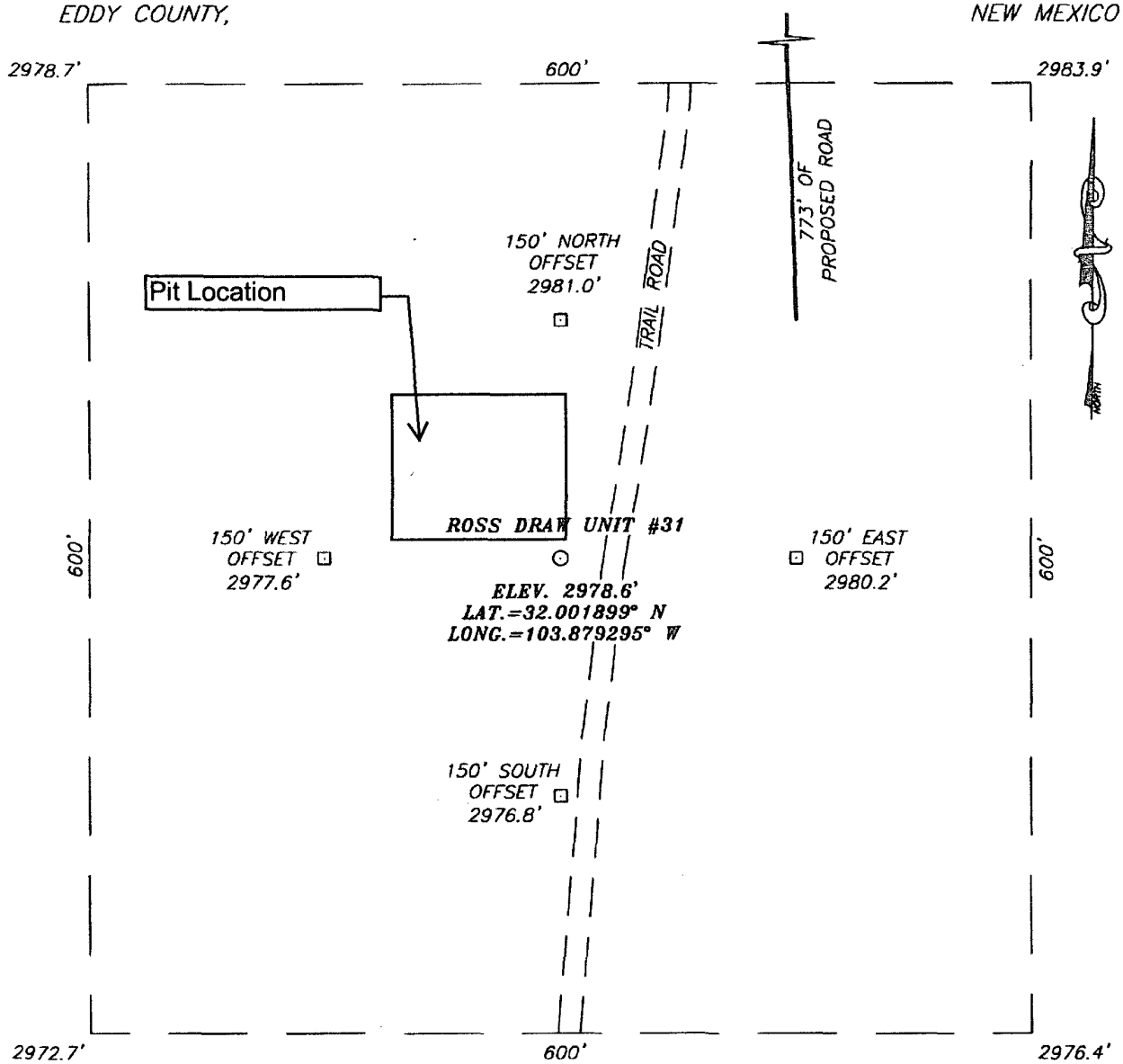
Ronald J. Eidson 01/27/2010

10-1-1-0725

Certificate No. RONALD EIDSON 3239

SECTION 33, TOWNSHIP 26 SOUTH, RANGE 30 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO



DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF CO. RD. #786 (BUCK JACKSON) AND STATE LINE ROAD, GO WEST ON BATTLE AXE FOR APRPOX. 6.6 MILES. TURN LEFT AND GO SOUTH APPROX. 500 FEET TO THE ROSS DRAW UNIT #12 WELL PAD AND A PROPOSED ROAD SURVEY. FOLLOW ROAD SURVEY 773 FEET SOUTH TO THIS LOCATION.

100 0 100 200 Feet

Scale:1"=100'

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO
HOBBS, N.M. 88240
(575) 393-3117

J.C. WILLIAMSON

ROSS DRAW UNIT #31 WELL
LOCATED 687 FEET FROM THE SOUTH LINE
AND 660 FEET FROM THE EAST LINE OF SECTION 33,
TOWNSHIP 26 SOUTH, RANGE 30 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

Survey Date: 1/22/10	Sheet 1 of 1 Sheets		
W.O. Number: 10.11.0125	Dr By: LA	Rev 1:N/A	
Date: 1/27/10		10110125	Scale:1"=100'

Appendix A

Photodocumentation of site

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

Appendix A – Documentation of Site Visit

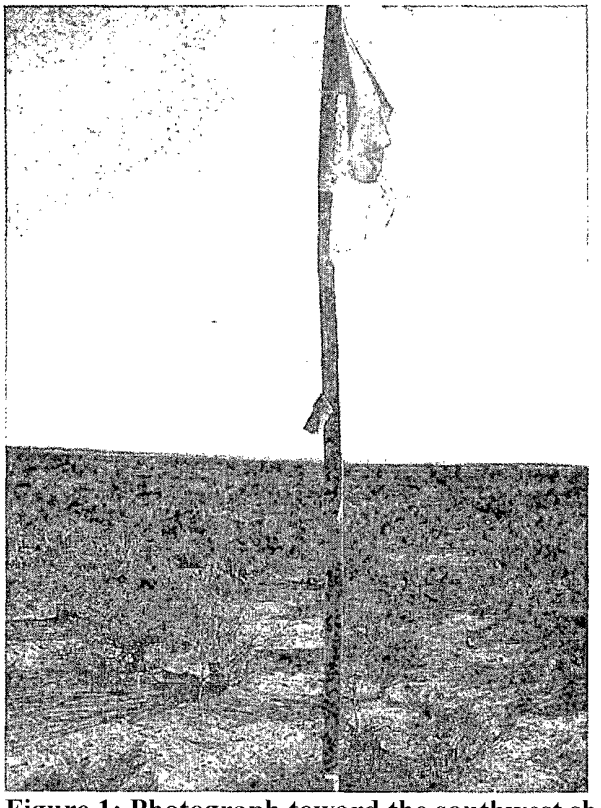


Figure 1: Photograph toward the southwest showing location flag

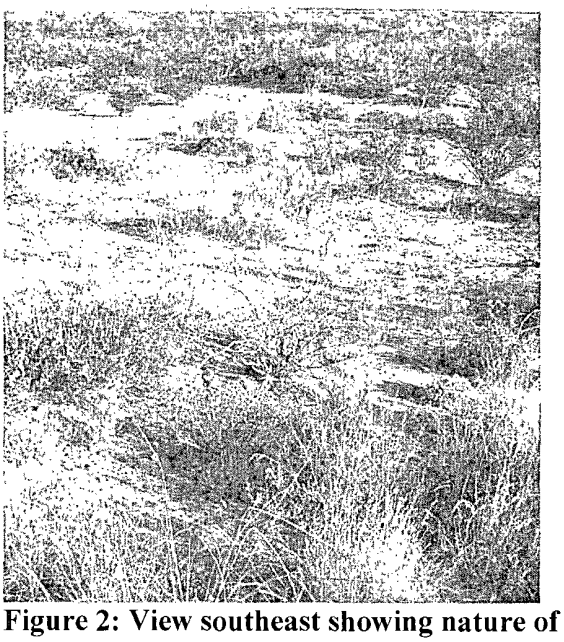


Figure 2: View southeast showing nature of vegetation and land use

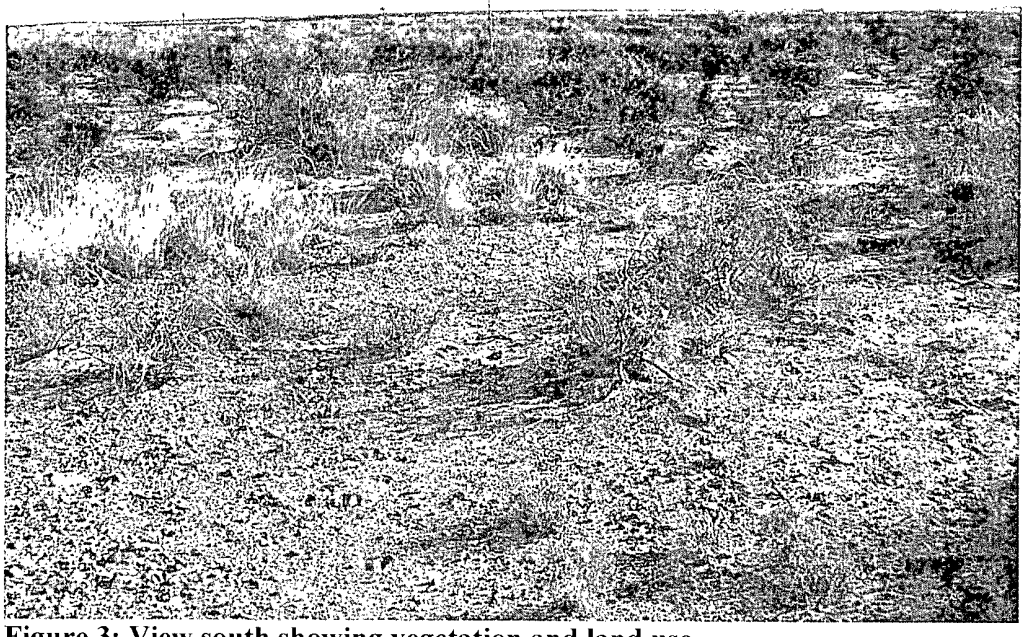


Figure 3: View south showing vegetation and land use

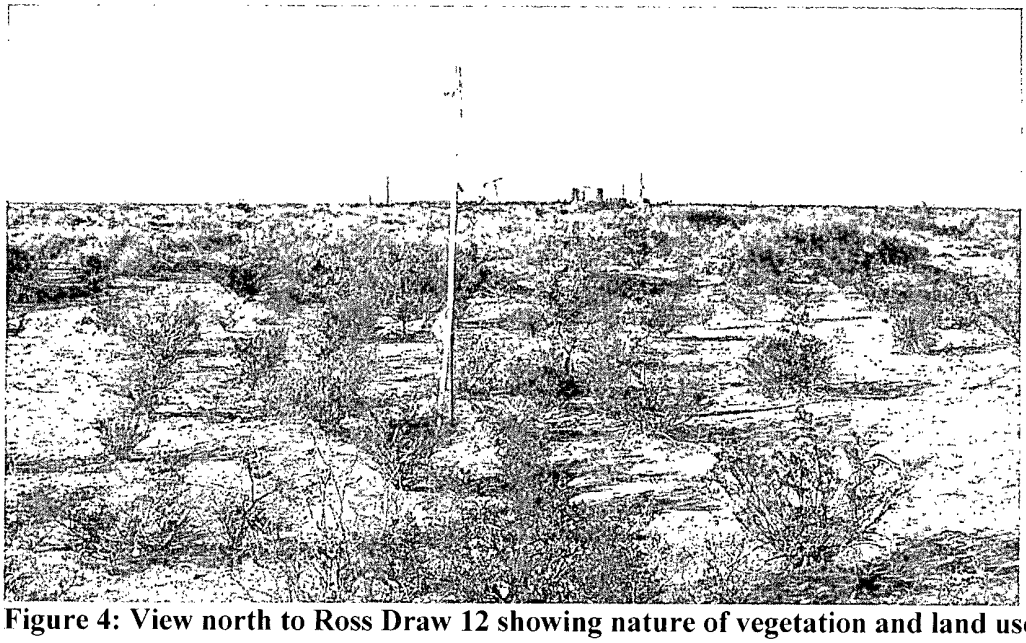


Figure 4: View north to Ross Draw 12 showing nature of vegetation and land use.

Appendix B

Under Drain System

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

Appendix B: Pit Drainage System

Above the primary pit liner the operator or a qualified liner installation contractor will install the pit drainage system as described below. Data on material for drainage system follows the installation description.

1. Place two (2) AwkaDrain 6-inch Strips (or equivalent such as SiteDrain Strip 9406T) 8-12 feet apart above the primary liner of the bottom of the pit. The distance between the drainage strips will be defined by the width of the overlying geotextile material described below.
2. Carefully place 1-3 inches of sand/gravel or other permeable material (e.g. straw, geonet or SiteDrain Sheet) between the drainage strips. The contractor shall place geotextile material on the primary liner if placement of the selected permeable material could compromise the integrity of the primary liner.
3. The drainage strips and permeable material create a drainage mat that is 8-12 feet wide and as long as practical based upon the geometry of the pit bottom. Place a length of drainage strip at each end of the drainage mat.
4. Place geotextile over the drainage strips and permeable material that form the drainage mat.
5. Place sandbags over the drainage mat to secure this material on the pit floor.
6. Create additional drainage mats as described above until about 40% of pit floor is covered by mats.
7. Create two separate drainage systems by connecting half of the mats together with additional lengths of drainage strips and/or with flexible conduit as described in the manufacture's specifications.
8. One drainage mat system connects to an 8-inch PVC riser via flexible conduit secured to a tee and reducer at the base of the riser as shown in the attached drawing. The connections between the riser and the drainage mat system should follow the manufacturer's specifications and standard industry practice.
9. The second drainage mat system connects to two 8-inch PVC risers using the same method described above. One riser is adjacent to the riser for the first system and the second riser is located on the far side of the drilling pit.
10. The three PVC risers and end-tees are placed in two small depressions in the base of the pit. The bottom of each depression is 2-feet lower than the base of the main pit. The geometry of the depression allows for a 2H:1V slope on the pit bottom – resulting in a depression that is about 8-feet in diameter.

The operator will place one pump in one of the riser system riser pipes to remove fluid from the pit after drilling ceases. If possible, a second pump will be installed in a second riser. The third riser will be used for measurement of fluid levels in the pit during drainage and for a back-up pumping system in the event that the primary pumping risers are damaged.

AKWADRAIN™ soil strip drain

PRODUCT DESCRIPTION

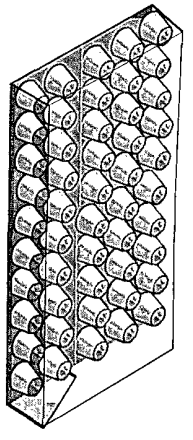
AKWADRAIN soil strip drain is a two-part prefabricated soil strip drain consisting of a formed polystyrene core covered on all sides with a non-woven, needle-punched polypropylene filter fabric. The fabric allows water to pass into the drain core while restricting the movement of soil particles which might clog the core. The core allows the water to flow to designated drainage exits.

BASIC USES

AKWADRAIN soil strip drain is designed to replace perforated pipe and stone drainage systems in various applications. It provides a significantly higher flow rate as well as increased ease of handling and installation. The product can be used alone or with other American Wick Drain products, depending on the application.

PACKAGING

- 6" x 150' Rolls
- 12" x 150' or 500' Rolls
- 18" x 150' or 500' Rolls
- 24" x 150' or 500' Rolls
- 36" x 100' Rolls



INSTALLATION INSTRUCTIONS

DRAIN ATTACHMENT METHODS:

When attachment to waterproofing material, concrete or wood is necessary, several methods may be used including metal stick pins, nails driven through washers or wood lathing, construction adhesives or double sided tape. Discuss materials compatibility with waterproofing supplier before using adhesives. Typically any method used for attaching waterproofing protection board will work with drain.

OUTLETS:

Fittings are available to connect AKWADRAIN to 4" pipe. These are available in several configurations, depending on drain width and pipe location. Details are available upon request.

SPLICES:

Splices are available for 6" AKWADRAIN. Other widths are spliced by peeling back the fabric and interlocking the dimpled core. Afterwards, replace the fabric and secure with tape.

CORNERS:

Fittings are available for bending drain around corners. Detailed instructions for installation of fittings available upon request.

BACKFILLING:

Soil should be placed and compacted directly against the drain. Direct compactor exhaust away from drain to prevent damage. Backfill to a minimum 3" above drain to allow for coverage after settlement.

DETAILED INSTRUCTIONS FOR INSTALLATION AND TERMINATION ARE AVAILABLE UPON REQUEST.

AMERICAN WICK DRAIN CORPORATION
1209 Airport Road • Monroe, NC • 28110, USA
800 242-WICK • 704 238-9200 • Fax 704 296-0690
www.americanwick.com • info@americanwick.com

AKWADRAIN™ soil strip drain

Technical Data

PHYSICAL PROPERTIES	TYPICAL US VALUE	TYPICAL SI VALUE	TEST METHOD
FABRIC PROPERTIES			
Material	Polypropylene	Polypropylene	
Grab Tensile Strength	115 lbs	512 N	ASTM D-4632
Puncture Strength	70 lbs	311 N	ASTM D-4833
Trapezoidal Tear	50 lbs	222N	ASTM D-4533
Mullen Burst Strength	235 psi	1620 kPa	ASTM D-3786
Elongation	60%	60%	ASTM D-4632
EOS (AOS)	70 sieve	210 micron	ASTM D-4751
Permittivity	2.2 sec^{-1}	2.2 sec^{-1}	ASTM D-4491
Flow Rate	150 $g/min/ft^2$	6111 $L/min/m^2$	ASTM D-4491
UV Resistance (After 500 hrs.)	70%	70%	ASTM D-4355
DRAIN PROPERTIES			
Peel Strength	38 lbs/ft^2	1.8 k N/m^2	ASTM D-1876
Compressive Strength	6,000-9000 lbs/ft^2	287-455 kN/m^2	ASTM D-1621 (Mod.)
Shear Strength	6,000-9000lbs/ft^2	287-455 kN/m^2	ASTM D-1621 (Mod.)
Fungus Resistance (Core)	No Growth	No Growth	ASTM G-21
Unobstructed Inflow Area (Primary Side)	85%	85%	
In-Plane Flow (Hydraulic gradient=0.1, Loading=10 psi)	21 gpm/ft width	261Lpm/m width	ASTM D-4716

DIMENSIONAL PROPERTIES

	6"x150'	*12"x150'*	*12"x500'*	*18"x150'*	*18"x500'*	*24"x150'*	*24"x500'*	*36"x100'*
Thickness (in)	1	1	1	1	1	1	1	1
Widths (in)	6	12	12	18	18	24	24	36
Roll Length (ft)	150	150	500	150	500	100	500	100
Roll Diameter (ft)	5	5	7	5	7	5	7	3.5
Roll Weight (lbs)	24	48	160	72	240	64	320	96

All information, drawings and specifications are based on the latest product information available at the time of printing. Constant improvement and engineering progress make it necessary that we reserve the right to make changes without notice. All physical properties are typical values. Standard variations in mechanical properties of 10% and in hydraulic properties of 20% are normal.

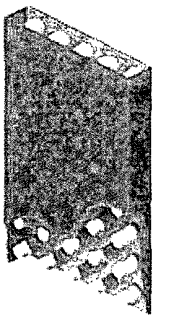
AMERICAN WICK DRAIN CORPORATION
1209 Airport Road • Monroe, NC • 28110, USA
800 242-WICK • 704 238-9200 • Fax 704 296-0690
www.americanwick.com • info@americanwick.com

SITEDRAIN™ STRIP 9400-T

americanwick.com

PREFABRICATED STRIP DRAINS

PRODUCT OVERVIEW



SITEDRAIN Strip 9400-T Series prefabricated soil drains are constructed by fully wrapping a perforated, high strength, high flow capacity polystyrene core with a spunbonded nonwoven filter fabric. The filter fabric is bonded to the core and prevents soil intrusion into the flow channels while allowing water to freely enter the drain core from all sides.

SITEDRAIN Strip 9400-T is designed as a sustainable, performance driven alternative to perforated pipe & stone systems. The spunbonded filter fabric provides superior filtration and strength characteristics for specialty construction applications. SITEDRAIN Strip 9400-T is constructed with a AASHTO M 288-06 Class 3 filter fabric.

TECHNICAL DATA

FABRIC	ASTM TEST METHOD	UNIT OF MEASURE	TYPICAL VALUES
Material [1]			PP
Water Flow Rate	D-4491	gpm/ft²	80
		Lpm/m²	3,260
Grab Tensile Strength	D-4632	lbs	145
		N	645
Puncture Resistance	D-4833	lbs	50
		N	222
Apparent Opening Size	D-4751	sieve	80
		mm	0.177
Permittivity	D-4491	sec^{-1}	1.0
Grab Elongation	D-4632	%	60
UV Resistance	D-4355	% / 500 Hrs	70
AASHTO M 288-06 [2]	Survivability	-	Class 3
CORE			
Material [1]			HIPS
Thickness	D-1777	in	1.0
		mm	25.4
Compressive Strength	D-1621	psf	9,000
		kPA	431
Flow Rate [3]	D-4716	gpm/ft	21
		Lpm/m	261

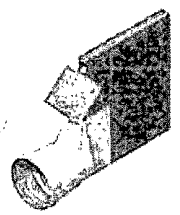
1 - PP = Polypropylene; HIPS = High Impact Polystyrene

2 - AASHTO Designation: M 288-06 Standard Specification for Highway Applications; American Association of State Highway and Transportation Officials, 2006. Geotextile survivability classification from installation stresses in subsurface drainage applications.

3 - In-plane flow rate measured at 3,600 psf (172 kPa) compressive load and a hydraulic gradient of 1.0.

MODEL	WIDTH	ROLL LENGTH
9406-T	6"	150'
9412-T	12"	150' or 500'
9418-T	18"	150' or 500'
9424-T	24"	150' or 500'
9436-T	36"	100'

FITTINGS:
AWD has a full line of fittings that transition collected water from strip drains to standard 4" pipe.



AWD
AMERICAN WICK DRAIN

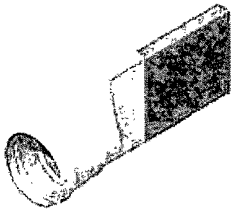
1209 Airport Road, Monroe, NC 28110
TF 800.242.WICK • PH 704.238.9200
FX 704.238.0220 • info@americanwick.com

RECYCLED CONTENT

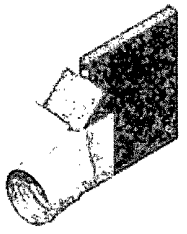
FITTINGS AND ACCESSORIES

ALL FITTINGS ARE MADE FROM HDPE WITH A STANDARD FINISH

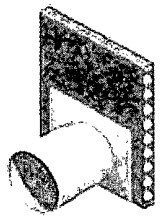
Pipe Outlets (for connecting 4" smooth or corrugated pipe):



6" End Outlet
Product No. FO.06



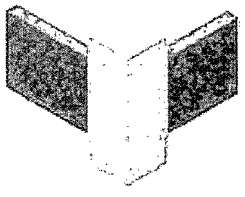
Universal End Outlet*
Product No. FO.U.12-18
Product No. FO.U.24-36



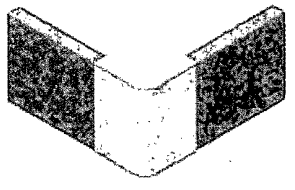
Universal Tee Outlet*
Product No. FT.U.12-18
Product No. FT.U.24-36

*For no fabric use either FO.U or FT.U

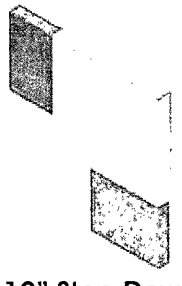
Connectors:



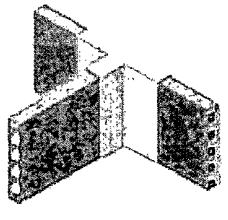
6" or 12" Corner Guard
Product No. Guard.06
Product No. Guard.12



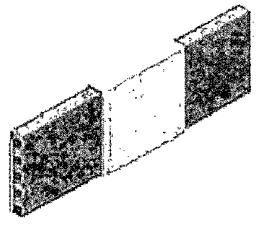
6" Corner
Product No. FC.06



6" or 12" Step Down
Product No. FSD.06
Product No. FSD.12



6" Tee
Product No. FT.06



6" Splice
Product No. FS.06

Accessories:

Underground Tape
3" x 100' Roll
Product No. TAPE

Drainage Grates 3"/4"
Product No. A400F for 3" Pipe
Product No. A500F for 4" Pipe

AWD
AMERICAN WICK DRAIN

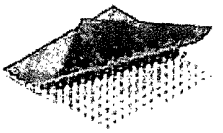
1209 Airport Rd, Monroe, NC 28110
TF: 800.242.9425 PH: 704.238.9200
FX: 704.238.9200 info@americanwick.com

americanwick.com

SITEDRAIN SHEET 184-T

PREFABRICATED SHEET DRAINS

americanwick.com



PRODUCT OVERVIEW

SITEDRAIN Sheet 184-T prefabricated drains are constructed using a formed polystyrene core with a nonwoven filter fabric bonded to one side. The filter fabric is bonded to each dimple to prevent soil intrusion into the core flow channels while allowing water to freely enter the drain core. The core provides an uninterrupted path for water to flow to designated drainage exits.

SITEDRAIN Sheet 184-T products are designed for subsurface, single-sided drainage applications requiring a high compressive strength and flow capacity. SITEDRAIN Sheet 184-T is constructed using an AASHTO M 288-06 Class 3 filter fabric.

TECHNICAL DATA

FABRIC	ASTM TEST METHOD	UNIT OF MEASURE	TYPICAL VALUES
Material [1]			PP
Water Flow Rate	D-4491	gpm/ft^2	80
		Lpm/m^2	3,260
Grab Tensile Strength	D-4632	lbs	145
		N	645
Puncture Resistance	D-4833	lbs	50
		N	222
Apparent Opening Size	D-4751	sieve	80
		mm	0.177
Permittivity	D-4491	sec^{-1}	1.0
Grab Elongation	D-4632	%	60
UV Resistance	D-4355	% / 500 Hrs	70
AASHTO M 288-06 [2]	Survivability	-	Class 3
CORE			
Material [1]			HIPS
Thickness	D-1777	in	.44
		mm	11
Compressive Strength	D-1621	psf	18,000
		kPA	862
Flow Rate [3]	D-4716	gpm/ft	21
		Lpm/m	261

1 - PP = Polypropylene; HIPS = High Impact Polystyrene

2 - AASHTO Designation: M 288-06 Standard Specification for Highway Applications; American Association of State Highway and Transportation Officials, 2006. Geotextile survivability classification from installation stresses in subsurface drainage applications.

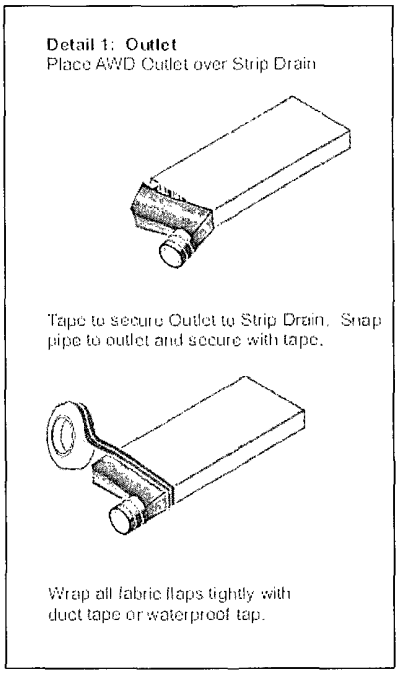
3 - In-plane flow rate measured at 3,600 psf (172 kPa) compressive load and a hydraulic gradient of 1.0.

AWD
AMERICAN WICK DRAIN

1209 Airport Road, Monroe, NC 28110
TF 800.242.WICK • PH 704.238.9200
FX 704.238.0220 • info@americanwick.com

RECYCLED CONTENT

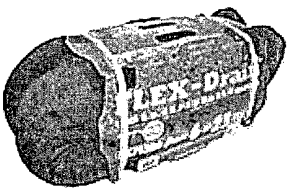
Details for connection of drainage mats from American Wick Drain



Detail 1: Use outlet (product FO.06) as shown to connect strip drain to Perforated FlexDrain with Sock. Use FlexDrain to connect drainage mats together or to connect to riser pipes.

Detail 2: Create rectangular drainage mats by connecting using Strip Drains as shown below.

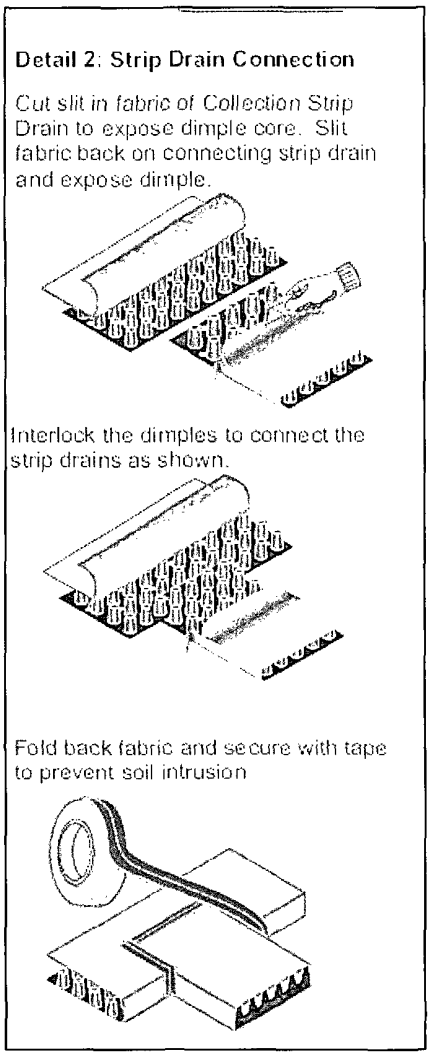
This method or connection with Flex Drain may be used to connect drainage mats in series



Perforated FLEX-Drain® with Sock
Available in 25' lengths

A pipe with spaced slits, covered with removable polyester sock. Appropriate for ground water drainage (French drains, dispersing water from flower beds) in applications where surrounding soil or sand is fine enough to require filtration and/or surrounding debris is considerable.

See http://www.flex-drain.com/pdf/product_testing.pdf for Flex Drain product evaluation



Appendix C

BLM Approved Seed Mixture

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

For Sandy Sites (Seed Mixture #2)

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law (s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

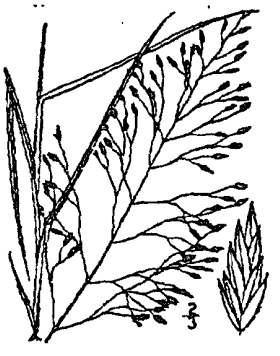
Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The see mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

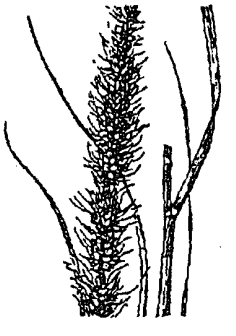
Species	lb/acre
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:
Pounds of seed x percent purity x percent germination = pounds pure live seed

Sand dropseed



Sand lovegrass



Plains bristlegrass

BLM SEEDING REQUIREMENTS IN THE ROSWELL DISTRICT

Seed Mixture 3 (Shallow Sites)

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)/acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed shall be tested and the viability testing of seed shall be done in accordance with State law(s) and within nine months prior to purchase. Commercial seed shall be either certified or registered seed. The seed mixture container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed shall be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture shall be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop to the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed shall be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre noted below are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth will not be made before completion of the first growing season after seeding.

Species to be planted in pounds of pure live seed per acre:

Sideoats grama (Bouteloua curtipendula)	7.0
Lehmann's lovegrass (Eragrostis lehmanniana) or Boer lovegrass (E. chloromelas)	1.0

Pounds of pure live seed: Pounds of seed X percent purity X percent germination = pounds pure live seed

Seed Mixture 4
For Gypsum Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Alkali Sacaton (Sporobolus airoides)	1.0
DWS□ Four-wing saltbush (Atriplex canescens)	5.0

□DWS: DeWinged Seed

*Pounds of pure live seed:
Pounds of seed x percent purity x percent germination = pounds pure live seed

Appendix D

Notice to Landowner

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 ▲ 505.266.5004 ▲ Fax: 505.266-0745

October 25, 2010

Carlsbad Field Office
Bureau of Land Management
620 E. Greene St.
Carlsbad, NM 88220

RE: JC Williamson Ross Draw Unit 31 NMOCD Form C-144

To Whom It May Concern:

This letter is to inform you of JC Williamson's proposal of an on-site closure method for drilling waste at the above referenced site. Attached is the C-144 and supplemental documentation that describes the proposed closure method in full. The proposed method is based upon the appropriate requirements of 19.15.17.13 NMAC, and will be in-place closure unless standards can not be met. If the operator proceeds with in-place closure, the operator will use the following procedures and protocols to implement the closure:

1. Standing water will be removed from the pit in accordance with NMOCD Rules.
2. Fluids on and entrained in the drilling waste will be removed from the pit for re-use or disposal.
3. Precipitation and/or the addition of fresh water to the pit will cause rinsing of waste and removal of constituents of concern via a pit drainage system.
4. The drilling waste will be stabilized in the pit by adding no more than 3 parts clean fill derived from the excavation of the pit to 1 part drilling waste.
5. After stabilization, the mixture will be sampled pursuant to NMOCD Rules.
6. A 4-foot thick soil cover consistent with NMOCD Rules will be placed over the stabilized waste.

If the standards for in-place closure are not met, the operator may elect to implement on-site trench burial for the closure of the temporary pit or excavation and removal, adhering to all applicable NMOCD mandates in any case. About one week prior to on-site closure, you will receive a second notice by certified letter (return receipt request).

If you have questions concerning the attached information, you may contact me at the above address and phone number or via email at r@rthicksconsult.com.

Sincerely,
R.T. Hicks Consultants

Principal

Copy: Darell Folmer, JC Williamson
Mike Bratcher, NMOCD Artesia District Office
Via E-mail, Jim Amos, BLM Carlsbad District