

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.

60582

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

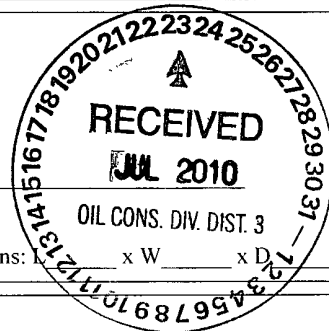
- Type of action: ☒ Permit of a pit, closed-loop system, below-grade tank, or proposed alternative method  
☐ Closure of a pit, closed-loop system, below-grade tank, or proposed alternative method  
☐ Modification to an existing permit  
☐ Closure plan only submitted for an existing permitted or non-permitted 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: EnerVest Operating, LLC OGRID #: 143199  
Address: 1001 Fannin St. Ste 800 Houston, Texas 77002  
Facility or well name: Jicarilla Apache 102 #9M  
API Number: 30-039-29771 OCD Permit Number: \_\_\_\_\_  
U/L or Qtr/Qtr O Section 04 Township 26N Range 04W County: Rio Arriba  
Center of Proposed Design: Latitude 36.51043 Longitude -107.25493 NAD: ☐ 1927 ☒ 1983  
Surface Owner: ☐ Federal ☐ State ☐ Private ☒ Tribal Trust or Indian Allotment

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



3.  
☐ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC  
Type of Operation: ☐ P&A ☐ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent)  
☐ Drying Pad ☐ Above Ground Steel Tanks ☐ Haul-off Bins ☐ Other \_\_\_\_\_  
☐ 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 PROPOSED NEW CONSTRUCTION FOR NEW DRILL  
Volume: 95 bbl Type of fluid: \_\_\_\_\_ Produced Water \_\_\_\_\_  
Tank Construction material: Steel w/ expanded metal cover  
☐ 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 45 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 42" Hog-wire fence with 2 strands barbed-wire on top

7.

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

- ☒ Screen ☐ Netting ☐ Other \_\_\_\_\_
- ☐ Monthly inspections (If netting or screening is not physically feasible)

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

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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark). - Topographic map; Visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application. (Applies to temporary, emergency, or cavitation pits and below-grade tanks) - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 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	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> NA
Within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application. - NM Office of the State Engineer - iWATERS database search; Visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended. - Written confirmation or verification from the municipality; Written approval obtained from the municipality	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within 500 feet of a wetland. - US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within the area overlying a subsurface mine. - Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within an unstable area. - Engineering measures incorporated into the design; NM Bureau of Geology & Mineral Resources; USGS; NM Geological Society; Topographic map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Within a 100-year floodplain. - FEMA map	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

11.

**Temporary Pits, Emergency Pits, and Below-grade Tanks Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☒ Hydrogeologic Report (Below-grade Tanks) - based upon the requirements of Paragraph (4) of Subsection B of 19.15.17.9 NMAC  
☐ Hydrogeologic Data (Temporary and Emergency Pits) - based upon the requirements of Paragraph (2) of Subsection B of 19.15.17.9 NMAC  
☒ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC  
☒ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC  
☒ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC  
☒ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_ or Permit Number: \_\_\_\_\_

12.

**Closed-loop Systems Permit Application Attachment Checklist:** Subsection B of 19.15.17.9 NMAC**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Geologic and Hydrogeologic Data (only for on-site closure) - based upon the requirements of Paragraph (3) of Subsection B of 19.15.17.9  
☐ Siting Criteria Compliance Demonstrations (only for on-site closure) - based upon the appropriate requirements of 19.15.17.10 NMAC  
☐ Design Plan - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC  
☐ Closure Plan (Please complete Boxes 14 through 18, if applicable) - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

☐ Previously Approved Design (attach copy of design) API Number: \_\_\_\_\_

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

13.

**Permanent Pits Permit Application Checklist:** Subsection B of 19.15.17.9 NMAC**Instructions:** Each of the following items must be attached to the application. Please indicate, by a check mark in the box, that the documents are attached.

- ☐ Hydrogeologic Report - based upon the requirements of Paragraph (1) of Subsection B of 19.15.17.9 NMAC  
☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC  
☐ Climatological Factors Assessment  
☐ Certified Engineering Design Plans - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Dike Protection and Structural Integrity Design - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Leak Detection Design - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Liner Specifications and Compatibility Assessment - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Quality Control/Quality Assurance Construction and Installation Plan  
☐ Operating and Maintenance Plan - based upon the appropriate requirements of 19.15.17.12 NMAC  
☐ Freeboard and Overtopping Prevention Plan - based upon the appropriate requirements of 19.15.17.11 NMAC  
☐ Nuisance or Hazardous Odors, including H<sub>2</sub>S, Prevention Plan  
☐ Emergency Response Plan  
☐ Oil Field Waste Stream Characterization  
☐ Monitoring and Inspection Plan  
☐ Erosion Control Plan  
☐ Closure Plan - based upon the appropriate requirements of Subsection C of 19.15.17.9 NMAC and 19.15.17.13 NMAC

14.

**Proposed Closure:** 19.15.17.13 NMAC**Instructions:** Please complete the applicable boxes, Boxes 14 through 18, in regards to the proposed closure plan.

Type: ☐ Drilling ☐ Workover ☐ Emergency ☐ Cavitation ☐ P&A ☐ Permanent Pit ☒ Below-grade Tank ☐ Closed-loop System  
☐ Alternative

Proposed Closure Method: ☒ Waste Excavation and Removal  
☐ Waste Removal (Closed-loop systems only)  
☐ On-site Closure Method (Only for temporary pits and closed-loop systems)  
☐ In-place Burial ☐ On-site Trench Burial  
☐ Alternative Closure Method (Exceptions must be submitted to the Santa Fe Environmental Bureau for consideration)

15.

**Waste Excavation and Removal Closure Plan Checklist:** (19.15.17.13 NMAC) **Instructions:** Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.

- ☒ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC  
☒ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC  
☒ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings)  
☒ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  
☒ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC  
☒ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

16.

**Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:** (19.15.17.13.D NMAC)**Instructions:** Please identify the facility or facilities for the disposal of liquids, drilling fluids and drill cuttings. Use attachment if more than two facilities are required.

Disposal Facility Name: \_\_\_\_\_ Disposal Facility Permit Number: \_\_\_\_\_

Disposal Facility Name: \_\_\_\_\_ Disposal Facility Permit Number: \_\_\_\_\_

Will any of the proposed closed-loop system operations and associated activities occur on or in areas that *will not* be used for future service and operations?☐ Yes (If yes, please provide the information below) ☐ No*Required for impacted areas which will not be used for future service and operations:*☐ Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

17.

**Siting Criteria (regarding on-site closure methods only):** 19.15.17.10 NMAC**Instructions:** Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17.10 NMAC for guidance.

Ground water is less than 50 feet below the bottom of the buried waste.

- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells

☐ Yes ☐ No☐ NA

Ground water is between 50 and 100 feet below the bottom of the buried waste

- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells

☐ Yes ☐ No☐ NA

Ground water is more than 100 feet below the bottom of the buried waste.

- NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells

☐ Yes ☐ No☐ NA

Within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).

- Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within 300 feet from a permanent residence, school, hospital, institution, or church in existence at the time of initial application.

- Visual inspection (certification) of the proposed site; Aerial photo; Satellite image

☐ Yes ☐ No

Within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application.

- NM Office of the State Engineer - iWATERS database; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within incorporated municipal boundaries or within a defined municipal fresh water well field covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.

- Written confirmation or verification from the municipality; Written approval obtained from the municipality

☐ Yes ☐ No

Within 500 feet of a wetland.

- US Fish and Wildlife Wetland Identification map; Topographic map; Visual inspection (certification) of the proposed site

☐ Yes ☐ No

Within the area overlying a subsurface mine.

- Written confirmation or verification or map from the NM EMNRD-Mining and Mineral Division

☐ Yes ☐ No

Within an unstable area.

- Engineering measures incorporated into the design; NM Bureau of Geology &amp; Mineral Resources; USGS; NM Geological Society; Topographic map

☐ Yes ☐ No

Within a 100-year floodplain.

- FEMA map

☐ Yes ☐ No

18.

**On-Site Closure Plan Checklist:** (19.15.17.13 NMAC) **Instructions:** Each of the following items must be attached to the closure plan. Please indicate, by a check mark in the box, that the documents are attached.☐ Siting Criteria Compliance Demonstrations - based upon the appropriate requirements of 19.15.17.10 NMAC☐ Proof of Surface Owner Notice - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC☐ Construction/Design Plan of Burial Trench (if applicable) based upon the appropriate requirements of 19.15.17.11 NMAC☐ Construction/Design Plan of Temporary Pit (for in-place burial of a drying pad) - based upon the appropriate requirements of 19.15.17.11 NMAC☐ Protocols and Procedures - based upon the appropriate requirements of 19.15.17.13 NMAC☐ Confirmation Sampling Plan (if applicable) - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC☐ Waste Material Sampling Plan - based upon the appropriate requirements of Subsection F of 19.15.17.13 NMAC☐ Disposal Facility Name and Permit Number (for liquids, drilling fluids and drill cuttings or in case on-site closure standards cannot be achieved)☐ Soil Cover Design - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC☐ Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC☐ Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

19.

**Operator Application Certification:**

I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Ronnie L. Young Title: Compliance Supervisor

Signature: Ronnie L Young Date: 7.19.10

e-mail address: ryoung@enervest.net Telephone: 713-495-6530

20.

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

OCD Representative Signature: Brandi Bell Approval Date: 7/28/10

Title: Environ spec 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: \_\_\_\_\_

**Attachment to Form C-144**  
**Below-grade Tank Permit Application**

**Introduction:**

EnerVest Operating, LLC (EV) is submitting this permit application to operate an existing below-grade tank under the authority of 19.15.17 NMAC. The tank is not currently permitted; therefore this document serves as supporting documentation referenced in the attached Form C-144. EV operates coal bed methane production sites in Rio Arriba County, New Mexico. The below-grade tank at this location is used to collect precipitation and residual lubrication oil from the engine skid drain system and produced water from the primary and secondary separators. Produced water from the secondary separator may have small quantities of entrained lubricating oil from the compressor cylinder. In general, emulsified lubricating oil makes up a small percentage of the overall contents of the below-grade tank.

This application is being submitted for the following well site:

Well Name: Jicarilla Apache 102 #9M  
API No: 30-039-29771  
Location: UL O, Sec 04, 26N, 04W

The supporting documentation contained in this C-144 attachment is organized as follows:

Section I – Sitting Criteria Compliance Demonstration  
Section II – Design Plan  
Section III – Operating and Maintenance Plan  
Section IV – Closure Plan  
Section V – Hydrogeology Report

**Appendices:**

01 – USGS 7.5 Minute Topo Map  
02 – Groundwater (water well search)  
03 – Aerial Photo  
04 – Municipal Boundary Map  
05 – U.S. Fish & Wildlife Wetland Identification Map  
06 – FEMA 100-year Floodplain map  
07 – Mine Map  
08 – C-102 Location Plat & Site Physical Inspection Sheet  
09 – Karst Map for unstable areas

**References**

# **Section I**

**Sitting Criteria Compliance Demonstration**

## Jicarilla Apache 102 #9M

API No. 30-039-29771

### Sitting Criteria Compliance Demonstration

Criteria as per 19.15.17.10.(A) (1)	In Compliance	Comments
Ground water less than 50' below bottom of tank	Yes	Refer to "Site Hydrology Report" in Section V
Within 300' of continuously flowing watercourse or 200 feet of other significant watercourse, lakebed, sinkhole, or playa lake (measured from ordinary high-water mark)	Yes	Refer to Observed Setting Requirements completed by field personnel in Appendix 08
Within 300 feet of a permanent residence, school, hospital, institution, or church	Yes	Refer to Observed Setting Requirements completed by field personnel in Appendix 08
Within 500 ft of a private, domestic freshwater well or spring or within 1000 ft of freshwater well or spring in existence at time of application	Yes	Refer to Observed Setting Requirements completed by field personnel in Appendix 08
Within incorporated municipal boundary of defined municipal fresh water field	Yes	Refer to Observed Setting Requirements completed by field personnel in Appendix 08
Within 500 feet of a wetland	Yes	Refer to Observed Setting Requirements completed by field personnel in Appendix 08 and USF&W Map in Appendix 5
Within the area overlying a subsurface mine.	Yes	Refer to Observed Setting Requirements completed by field personnel in Appendix 08
Within an unstable area	Yes	Refer to Observed Setting Requirements completed by field personnel in Appendix 08 and Karst Map in Appendix 09
Within a 100-year floodplain	Yes	Refer to Observed Setting Requirements completed by field personnel in Appendix 08 and FEMA Map in Appendix 06



# Section II

Design & Construction Plan

**EnerVest Operating, LLC (EV)**

**BELOW-GRADE TANK  
DESIGN AND CONSTRUCTION SPECIFICATIONS**

**Rule 19.15.17.11**

- C. Enervest Operating is the official operator of record for all wells which have below-grade tanks to be addressed in this specification. All below-grade tanks are located on these leases and will be in full compliance with 19.15.16.8 regarding signage.
- D. EV will ensure a fence shall be constructed and maintained in good repair with gates that are closed and locked when responsible personnel are not on site. EV shall insure that all gates are closed and locked when responsible personnel are not on-site.

If the below-grade tank is located within 1,000 feet of a permanent residence, school, hospital, institution or church, the fence shall be a chain link security fence at least 6 feet in height with at least two strands of barbed wire on top.

If the below-grade tank is not within 1,000 feet of the above mentioned structures, the fence shall constructed to exclude livestock with at least four strands of barbed wire evenly spaced between one foot from the ground and four foot above the ground.

EV is requesting administrative approval to use a 42" Hog wire fence with 2 strands barbed-wire on top in lieu of the required four strand barbed wire fence. This will be supported with iron posting at the corners and 10 – 12 feet apart. EV believes this will offer better protection for wildlife in these tank areas. Please refer to Exhibit 2.1 of this Section.

- E. EV shall ensure an open top tank is screened with expanded 3/16" metal screen or a fully closed top, both of which are welded on the top of the tank. Such screening will be painted to blend with the below-grade tank. EV believes this is sufficient strength to protect migratory birds or other wildlife.
- I. EV will ensure all below-grade tanks will be constructed of 3/16" steel, resistant to the tank's contents and to damage from sunlight. Based on water production and road condition for access during the winter months there are a choice of three different sizes which could be used:

<b>CAPACITY</b>	<b>DIAMETER</b>	<b>HEIGHT</b>
125 bbl	15'	4'
120 bbl	12'	6'
100 bbl	12'	5'

This tank will contain liquids and should prevent contamination of fresh water to protect the public health and environment.

The below-grade system will include a excavated area for the tanks which will be dependent upon the size of the tank used:

- 18' x 18' x 4' High    Square excavated area
- 18' Diameter x 4' High Circular excavated area
- 18' Diameter x 5' High Circular excavated area

The particular area and well conditions will determine which design best for that particular well. EV will ensure that there will be room to walk around the tank inside the containment area which will better enable our field personnel to inspect for damage to liners or incidental leaks. Please refer to tank diagram under Exhibit 2.2 of this section for details.

All excavated areas will be reinforced with metal walls to prevent collapse. There will be sufficient open area on all sides of the tank to witness any incidental release that may occur. Please refer to tank diagram under Appendix 8.

EV will ensure the base of any excavated area containing a below-grade tank will be level and free of rocks, debris, sharp edges or irregularities to prevent punctures, cracks or indentations of the liner or tank bottom.

EV will ensure that any geomembrane liner used shall consist of 30-mil flexible PVC or 60-mil HDPE liner or equivalent liner material. The liner shall be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salt and acidic and alkaline solutions and shall be resistant to ultraviolet light. The liner shall have a hydraulic conductivity no greater than  $1 \times 10^{-9}$  cm/sec. The liner shall be compatible with EPA SW-846 method 9090A. EV will install the liner in such a manner as to divert any possible leak for visual inspection. EV will demonstrate to the OCD that the liner complies with the specifications within Subparagraph (a) of Paragraph (4) of Section I of 19.156.17.11 NMAC and obtain approval from the division prior to the installation of the new design.

EV is requesting administrative approval to use an equivalent liner. The "Dura-Skirm J45 BB" is a 45-mil reinforced liner which we feels offers the same or better protection as the required 60-mil liner as indicated above. Please refer to Exhibit 2.3 of this Section for the specification sheets for this liner.

EV will ensure the fluid levels of tanks will be monitored by automatic high level alarms at 24" from the top and shut-off devise at 10 1/2 inches from the top of the tank. The tanks will be also equipped with a manual shut-off valve in the event it is needed. Please see design specification sheet of this system in this section.

The majority of our below-grade tanks are within the berm around our tank battery and as so are protected from run-on water. Those outside this berm will be protected with an earthen berm which will extend at least 6" above surface ground level to divert run-on around the tank. The side walls of the excavated area will extend at least 6" above the ground level to divert run-on water around the tank. Any possible leak will be diverted, on the liner, in such a way can be visually inspected. Please refer to Exhibit 2.4 of this Section for details of this automatic shut-off system.

EV tank design will be a single walled tank constructed to ensure that the side walls are open for visual inspection for leaks; the bottom will be elevated six inches above the ground surface and will contain a geomembrane liner, as described above, directly on the ground level of the containment area.

Once a below-grade tank which was installed prior to June 16, 2008 does not demonstrate integrity, EV shall promptly repair or remove that below-grade tank and close the tank or install a below-grade tank that is in full compliance with Paragraph 1 thru 4 of Section I of 19.15.17.11 NMAC. EV shall comply with the operational requirements of 19.15.17.12 NMAC. Please refer to tank diagram under Appendix 8 for details

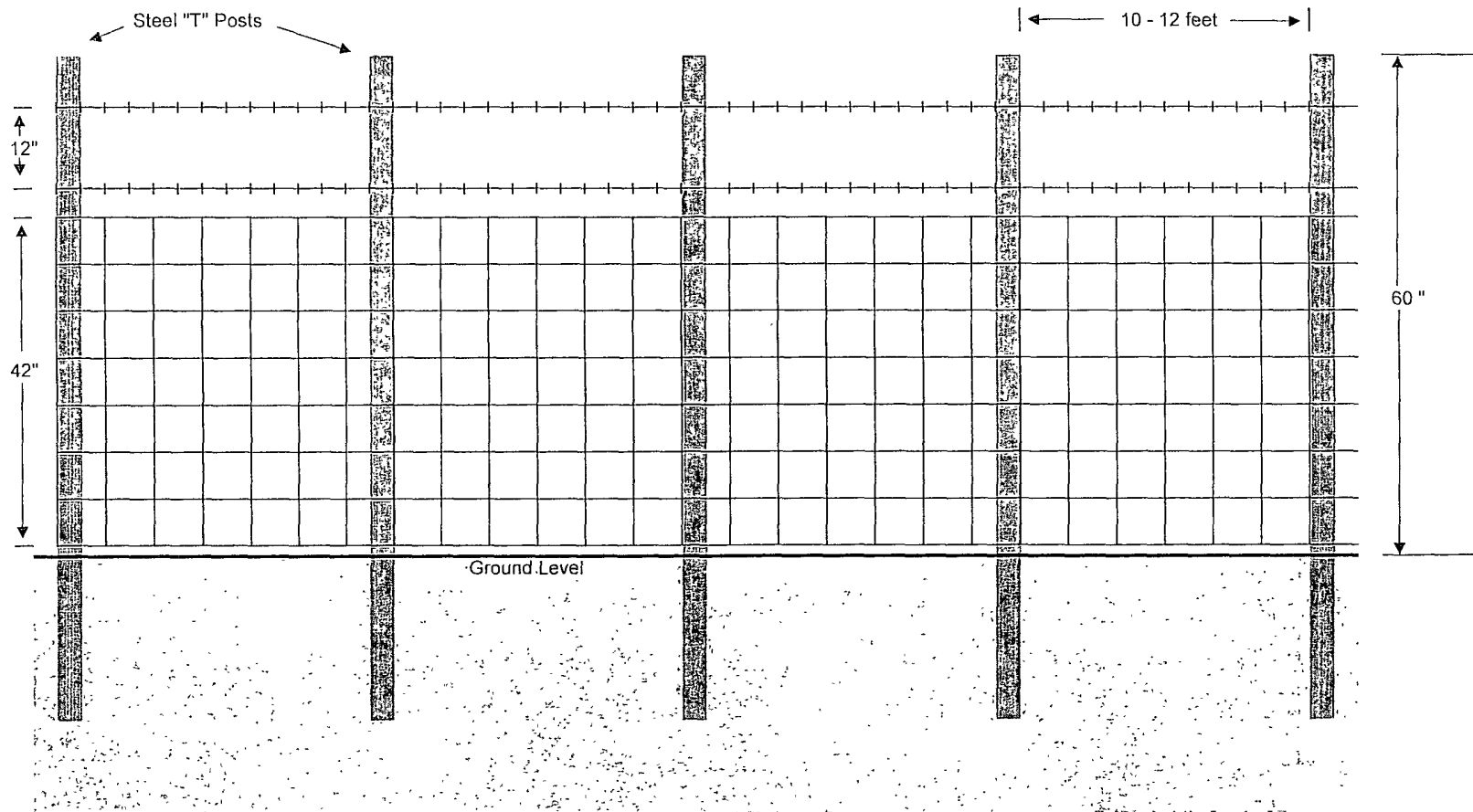
Any single walled below-grade tank installed before June 16, 2008 where any portion of the tank sidewall is below the ground surface and not totally visible shall be closed, retrofited or replaced before June 15, 2013. EV will fully comply with Paragraph 1 thru 4 of Section I of 19.15.17.11 NMAC for all retrofitting or replacement of below-grade tanks.

# ENERVEST OPERATING, LLC

## Proposed Alternative Fencing

### Below-Grade Tank Construction

42" Hogwire Fence with 2 strands barbed-wire on top

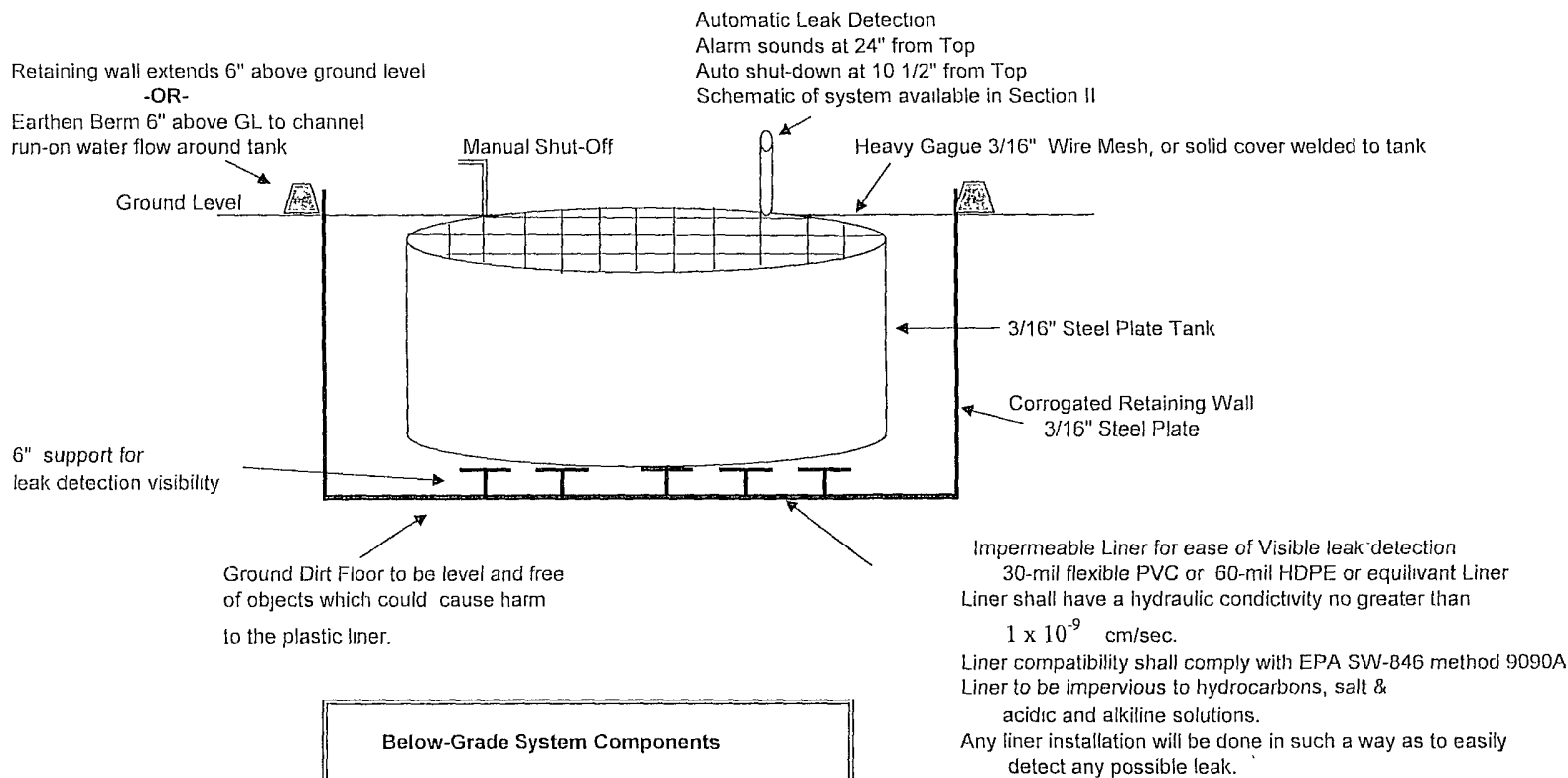




EnerVest Operating, LLC  
Western Division

## Below-Grade Tank System

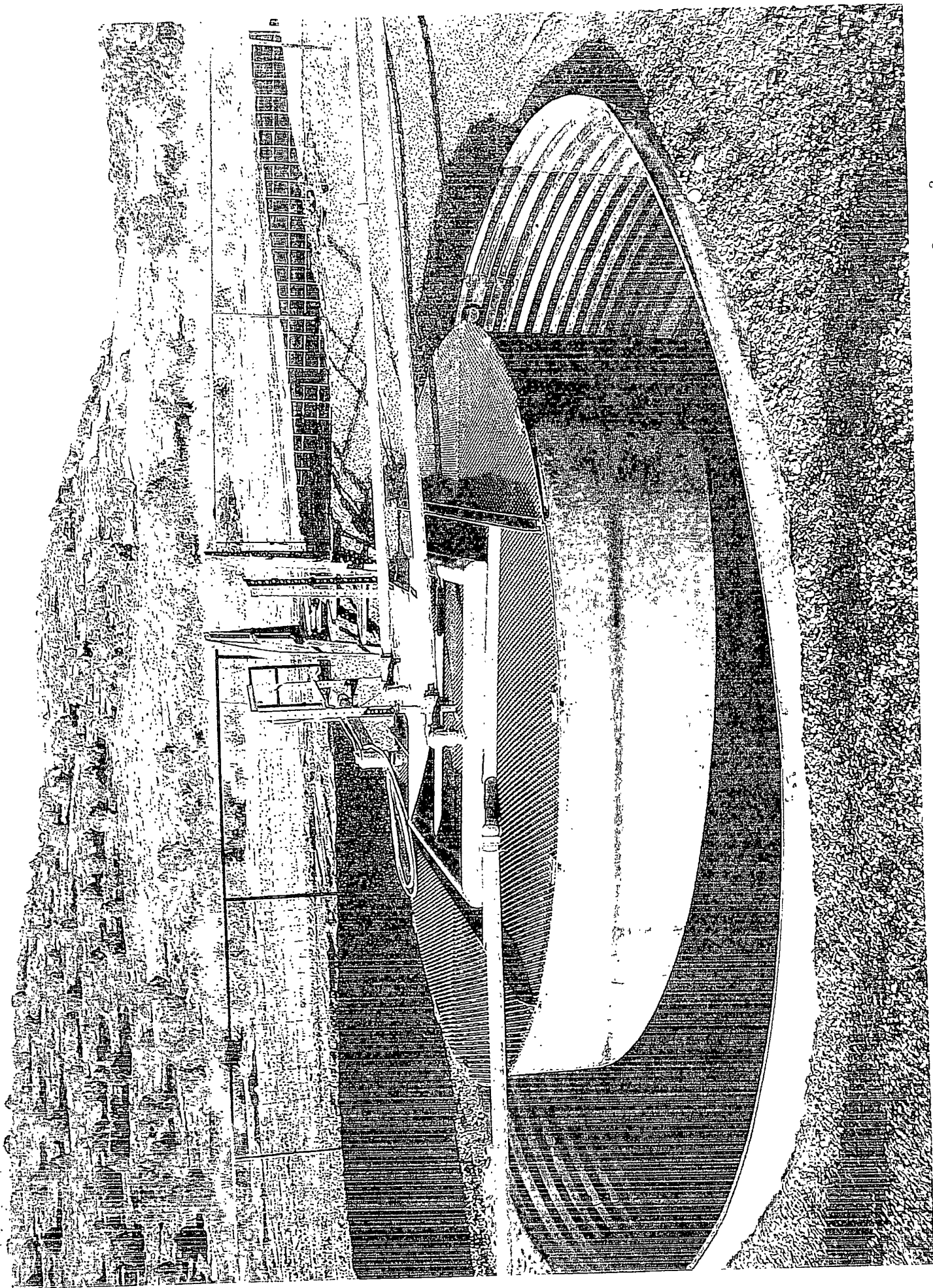
Gravity Fed - Produced Water

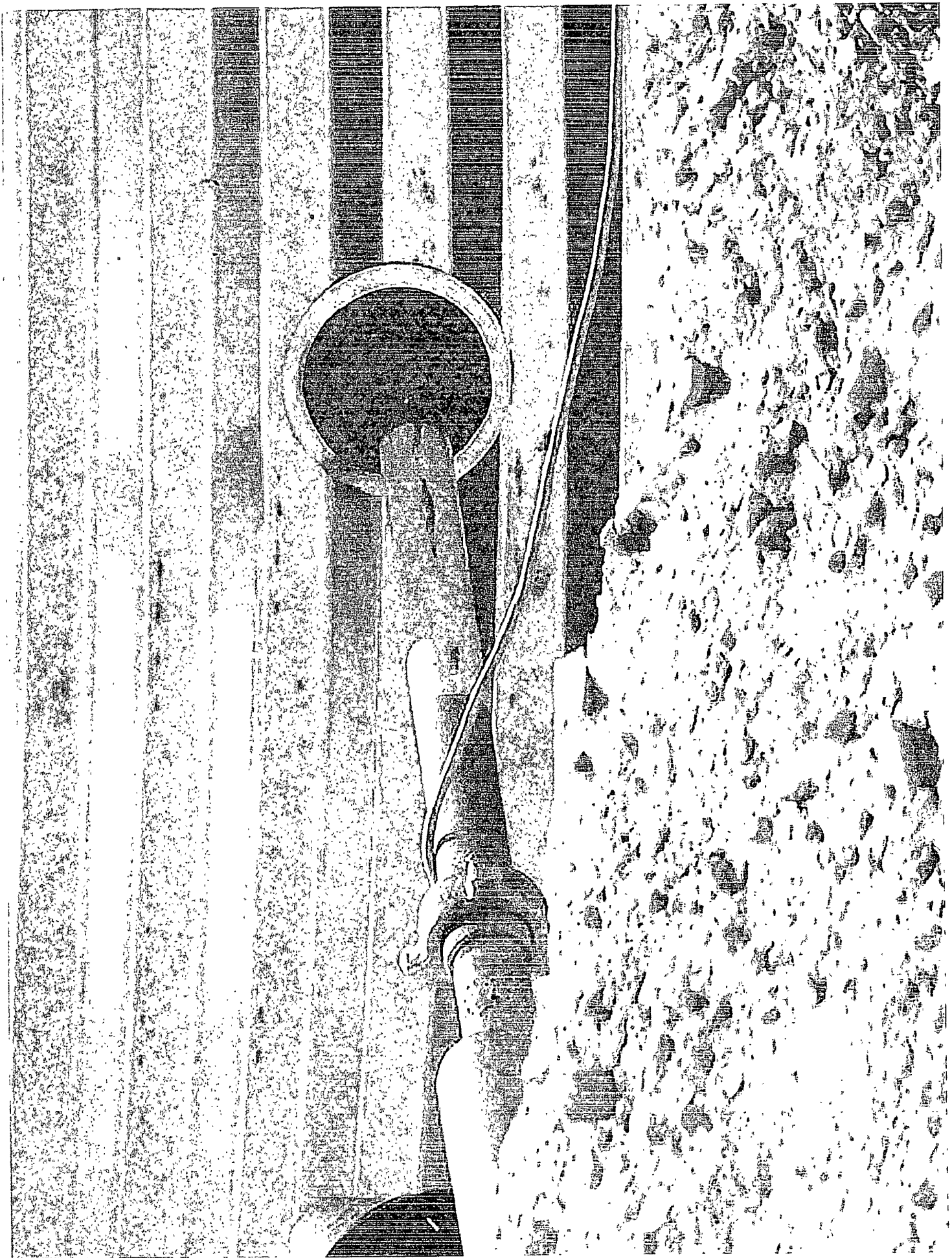


### Below-Grade System Components

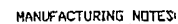
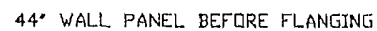
Tank Size		Excavation Areas
Capacity	Dia x Height	
125 Bbl	15' x 4'	18' x 18' x 4' Square
120 Bbl	12' x 6'	18' x 4' Circular
100 Bbl	12' x 5'	18' x 5' Circular

Tank size dependent upon water production & road conditions  
Excavation Area size dependent upon tank size







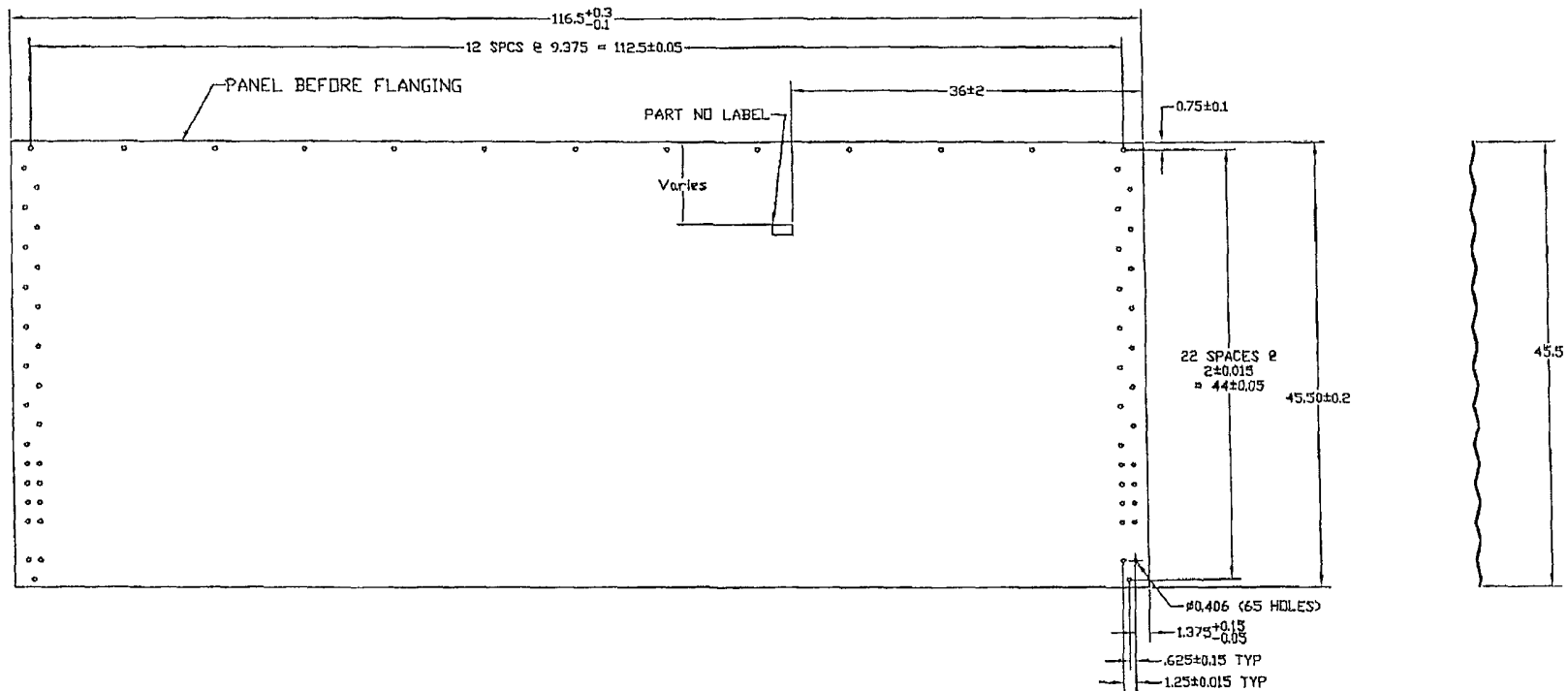


- MANUFACTURING NOTES:
- |                                   |            |
|-----------------------------------|------------|
| 1. CORRUGATION.....               | SEE DETAIL |
| 2. HOLE OFF CENTER OF CORR.....   | ± .05      |
| 3. HOLE BURR MAX.....             | .01        |
| 4. CUT OFF BURR MAX.....          | .01        |
| 5. CORNER HOLE TO HOLE DIAGONAL ± | .15        |

MATERIAL SPECIFICATIONS				
THICKNESS		BLANK WIDTH	WALL SHEET PART NO	WEIGHT (Lb)
NOMINAL	MINIMUM			
0.066	0.061	46.3	CW4415F	98.3
0.096	0.088	46.3	CW4413F	143.4

Exhibit 2.2 pg 4





- MANUFACTURING NOTES:
1. CORRUGATION... SEE DETAIL
  2. HOLE OFF CENTER OF CORR... ± .05
  3. HOLE BURR MAX... .01
  4. CUT OFF BURR MAX... .01
  5. CORNER HOLE TO HOLE DIAGONAL ± .15

NO	DATE	REVISION	E.C.R.	BY	CH.

DIMENSIONS SHOWN ARE IMPERIAL  
UNITS SHOWN IN BRACKETS

TOLERANCES  
(UNLESS OTHERWISE NOTED)

DIMENSIONS:

IMPERIAL (in.) METRIC (mm)

XX ± .1 X ± .2

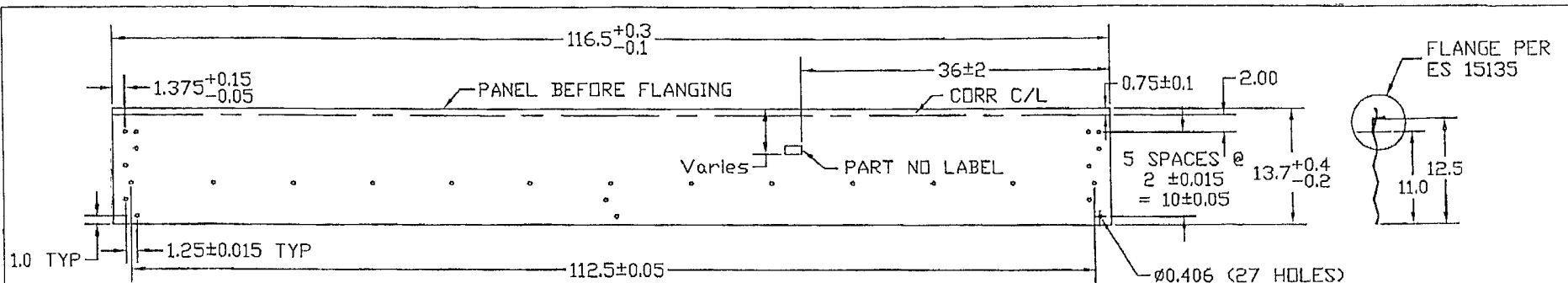
XXX ± .03 XX ± 1.0

XXXX ± .010 XXX ± .50

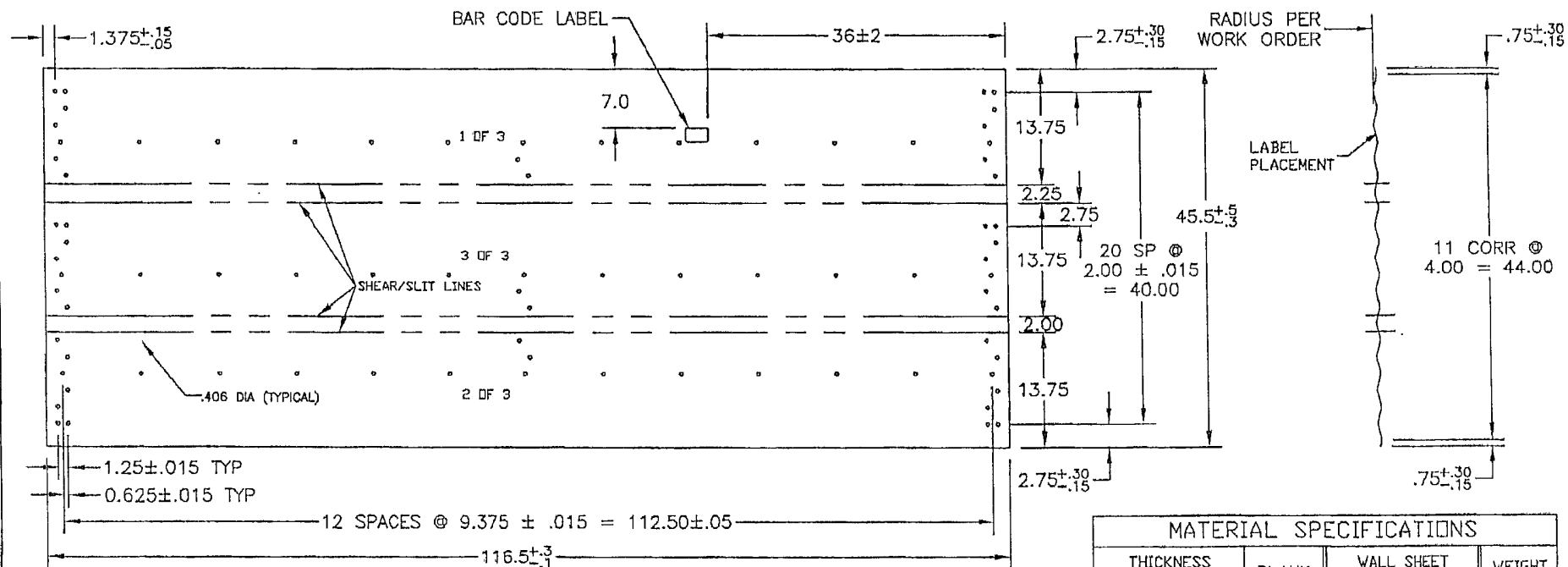
ANGULAR: ± 1°

MATERIAL SEE CHART - ASTM A653 SS GR 50 G115 D1L	BLANK SIZE 46.5 x 116.5	SURFACE AREA see chart	WEIGHT (LBS.) see chart
DESIGN BA	THIS DRAWING IS THE EXCLUSIVE PROPERTY OF WESTEEL AND ALL RIGHTS ARE RESERVED	SCALE n ts	DWN. (Y.M.D.) 04.12.01
DRAWN RF	NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM WESTEEL, a Division of JENISYS ENGINEERED PRODUCTS	E.C.R. A6834	LOCATION WINNIPEG
CHECKED BA	DRAWING TITLE 44' FULL PANEL - 57' ONLY CONTAINMENT RING	E.P. NO.	TYPE A-2000
APPROVED BA	CUSTOMER	SIZE B	REV. NO. 0
PRINTING DATE	DRAWING NO. ES 15518		



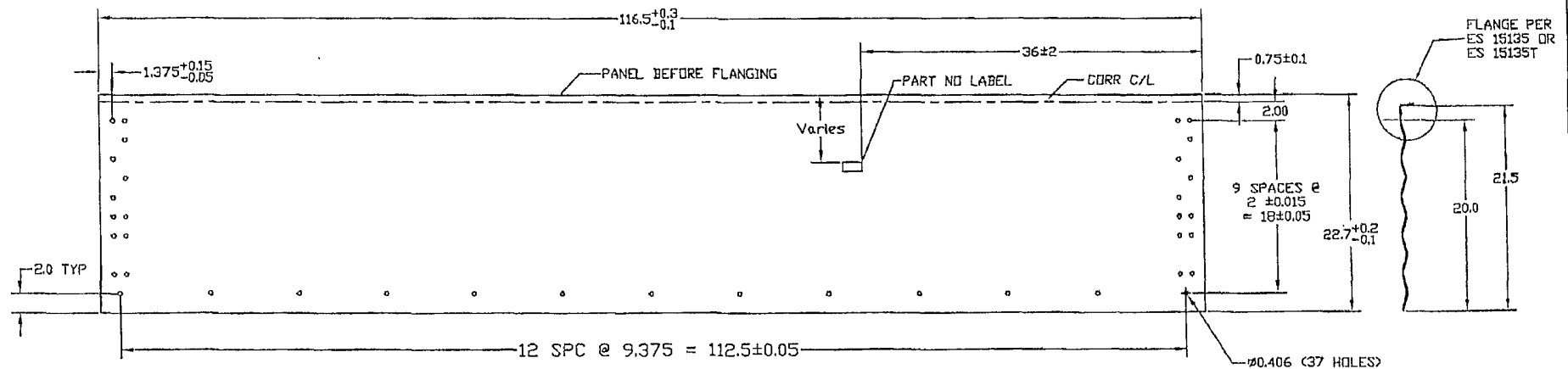


13 1/2" WALL PANEL LAYOUT BEFORE FLANGING

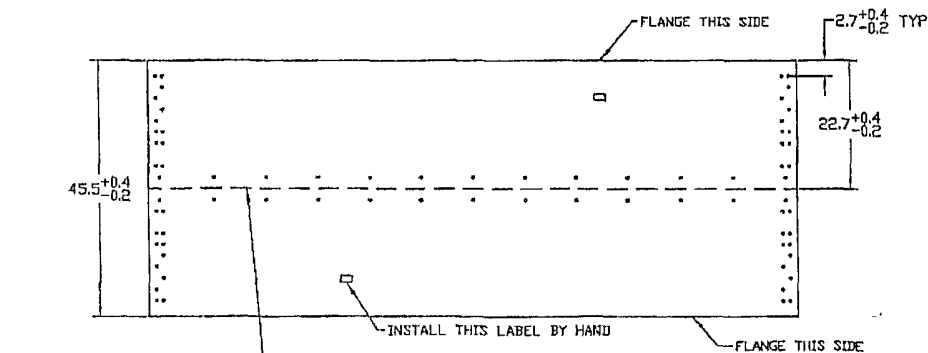


MATERIAL SPECIFICATIONS				
THICKNESS		BLANK WIDTH	WALL SHEET PART NO	WEIGHT (lb)
NOMINAL	MINIMUM			
0.066	0.061	14.75	019419	31.5

										MATERIAL		BLANK SIZE		WEIGHT (LBS.)			
										SEE CHART - ASTM A653 SS GR50 G115 OIL		46.5x116.5 (3 pcs)		31.5			
										DESND.	THIS DRAWING IS THE EXCLUSIVE PROPERTY OF WESTEEL. AND ALL RIGHTS ARE RESERVED.		SCALE	DWN. (Y.M.D.)	LOCATION		
										BA	NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM Westeel Limited		N.T.S.	2006.08.08	WPG		
										DWN.			E.C.R.	E.P. NO.	DWG TYPE		
										RF			A6834	02-255	A-2000		
										CHKD.	DRAWING TITLE		SIZE	DRAWING NO.	REV. NO.		
										BA	9.5" FULL PANEL - 52.5" ONLY CONTAINMENT RING		A	019419	O		
										APPD.	CUSTOMER	PRINTING DATE (Y.M.D.)					
										BA	-	-					
NO	DATE	REVISION			E.C.R.	BY	CH.										
										DIMENSIONS SHOWN ARE IMP. MM. UNITS SHOWN IN BRACKETS							
										TOLERANCES (UNLESS OTHERWISE NOTED)							
										DIMENSIONS:							
										IMPERIAL (in) METRIC (mm)							
										.XX ? .1 X ? 2							
										.XX ? .03 X ? 1.0							
										.XXX ? .010 .XX ? .50							
										ANGULAR: ± 1°							

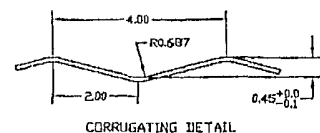


21 1/2' WALL PANEL LAYOUT BEFORE FLANGING



SLIT ON CENTER OF CORR AFTER CORR/PUNCHING

MANUFACTURING VIEW ONLY - DOUBLE PANEL AFTER CORR & PUNCH, BEFORE SLITTING & FLANGING



#### MANUFACTURING NOTES:

1. CORRUGATION..... SEE DETAIL
2. HOLE OFF CENTER OF CORR..... ± .05
3. HOLE BURR MAX..... .01
4. CUT OFF BURR MAX..... .01
5. CORNER HOLE TO HOLE DIAGONAL..... ± .15

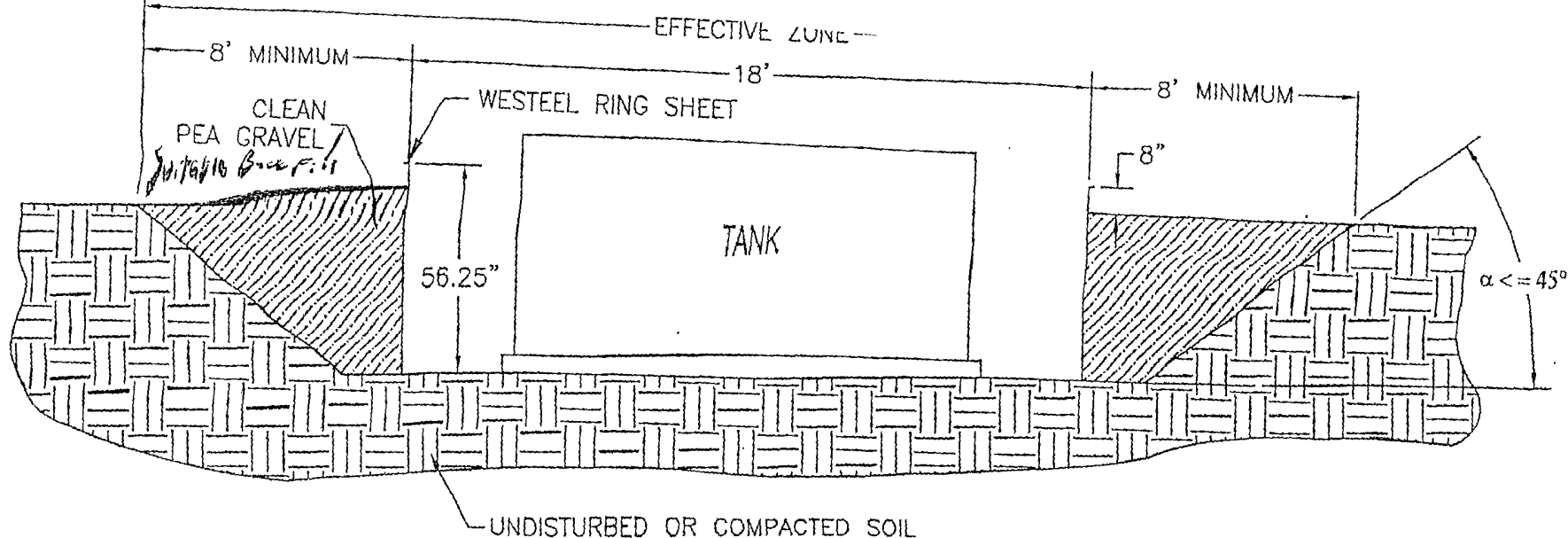
#### MATERIAL SPECIFICATIONS

THICKNESS	BLANK WIDTH	WALL SHEET	WEIGHT
NOMINAL	MINIMUM	PART NO	(lb)
0.066	0.061	23.3	C10514
			49.4

NO	DATE	REVISION	E.C.R.	BY	CH
1	06/12/06	CORRECTED HOLE PATTERN ON BOTTOM BLANK	AG898	RF	RF

DIMENSIONS SHOWN ARE IMPERIAL UNITS SHOWN IN BRACKETS	
TOLERANCES UNLESS OTHERWISE NOTED	
IMPERIAL (in)	METRIC (mm)
± .3	± 2
± .03	± 1.0
± .010	± .25
ANGULAR ± 1°	

MATERIAL	BLANK SIZE	SURFACE AREA	WEIGHT (LBS)
SEE CHART - ASTM A653 SQ GR50 G115 OIL	46.6x116.5 (2 pcs)		49.4
DESIGN RM	THIS DRAWING IS THE EXCLUSIVE PROPERTY OF VESTEEL AND ALL RIGHTS ARE RESERVED	SCALE	OWN. CYHJJD
DRAWN RM	NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM VESTEEL, a division of JENISYS ENGINEERED PRODUCTS	E.C.R.	98.08.13
CHKD. YS	DRAWING TITLE	A 6428	E.P. NO.
APPR. RM	CUSTOMER	B	98-197
	PRINTING DATE		TYPE
			ACAD14
			REV. NO.
			1



#### INSTALLATION INSTRUCTIONS & SITE REQUIREMENTS

1. EXCAVATE AS PER ABOVE
2. FOR BEST RESULTS, BACKFILL WITH CLEAN PEA GRAVEL (~~OR EQUIVALENT FREE FLOWING MATERIAL~~) EVENLY AROUND THE STRUCTURE, TAKING CARE NOT TO FILL IN ANY ONE AREA VERY HIGH RELATIVE TO OTHER AREAS, SO AS TO MAINTAIN THE STRUCTURE AS ROUND. WORKING AROUND THE STRUCTURE IN APPROXIMATELY 6" LIFTS IS RECOMMENDED. (NOTE: ALTERNATIVE MATERIALS CAN BE USED BUT CARE MUST BE TAKEN TO INSURE THAT THE EXTERNAL PRESSURES ACTING ON THE STRUCTURE REMAIN UNIFORM. IF NATIVE SOIL IS USED AS A BACKFILL MATERIAL, IT SHOULD BE UNIFORM IN CONSISTENCY, AND BE FREE OF LARGE ROCKS OR UNBROKEN CLUMPS, WHICH COULD RESULT IN UNEVEN LOADING).
3. THE COMPLETED STRUCTURE SHOULD EXTEND APPROXIMATELY 8" ABOVE GRADE
4. TO INSURE STRUCTURAL INTEGRITY, UNEVEN EXTERNAL WALL PRESSURE IS TO BE AVOIDED. NO VEHICLES OR OTHER SOURCES OF POINT LOADING SHOULD BE PERMITTED WITHIN THE EFFECTIVE ZONE (AS ILLUSTRATED).
5. WESTEEL IS NOT LIABLE FOR ANY DAMAGES OR INJURIES RESULTING FROM ANY FAILURE DUE TO IMPROPER INSTALLATION, IMPROPER SITE CONDITIONS, OR INADEQUATE MAINTENANCE OF THE SITE.

NOTE: THIS SYSTEM IS NOT DESIGNED FOR THE SECONDARY CONTAINMENT OF LIQUIDS, RATHER, TO ALLOW FOR INSPECTION OF THE TANK.

# DURA-SKRIM®

# J30, J36 & J45 BB

## PRODUCT DESCRIPTION

**DURA-SKRIM J30, J36 and J45** are Linear Low Density Polyethylene geomembranes reinforced with a heavy encapsulated 1300 Denier polyester reinforcement. In addition to excellent dimensional stability the tri-directional reinforcement provides exceptional tear and tensile strength.

**DURA-SKRIM J-Series** membranes are formulated with thermal and UV stabilizers to assure a long service life. Custom colors are available based on minimum volume requirements.

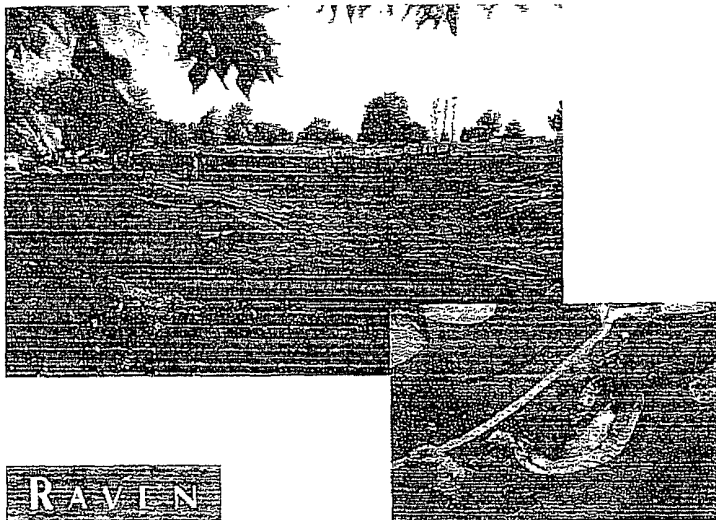
## PRODUCT USE

**DURA-SKRIM J30, J36 and J45** are used in applications that require exceptional outdoor life and demand high tear strength and resistance to thermal expansion.

**DURA-SKRIM J30, J36 and J45** are manufactured from a very chemical-resistant, Linear Low Density Polyethylene with excellent cold crack performance.

## SIZE & PACKAGING

**DURA-SKRIM J30, J36 and J45** are available in a variety of widths and lengths to meet the project requirements. Large diameter mill rolls are available to assure an efficient seaming process. Factory welded panels are accordion folded and tightly rolled on a heavy-duty core for ease of handling and time saving installation.



**RAVEN**  
INDUSTRIES  
Engineered Films Division

PRODUCT	PART NUMBER
DURA-SKRIM J30	J30BB
DURA-SKRIM J36	J36BB
DURA-SKRIM J45	J45BB

## COMMON APPLICATIONS

- Waste Lagoon Liners
- Floating Covers
- Daily Landfill Covers
- Modular Tank Liners
- Tunnel Liners
- Remediation Liners
- Earthen Liners
- Interim Landfill Covers
- Remediation Covers
- Landfill Caps
- Erosion Control Covers
- Radon Retarder
- Canal Liners
- Disposal Pit Liner
- Water Containment Ponds
- Heap Leach Liner





# DURA-SKRIM®

# J30, J36 & J45 BB



PROPERTIES	TEST METHOD	DURA-SKRIM J30BB		DURA-SKRIM J36BB		DURA-SKRIM J45BB	
		Min. Roll Averages	Typical Roll Averages	Min. Roll Averages	Typical Roll Averages	Min. Roll Averages	Typical Roll Averages
APPEARANCE		Black/Black		Black/Black		Black/Black	
THICKNESS, NOMINAL	ASTM D5199	27 mil	30 mil	32 mil	36 mil	40 mil	45 mil
WEIGHT <small>lbs/MSF (oz/yd<sup>2</sup>)</small>	ASTM D5261	126 lbs (18.14)	140 lbs (20.16)	151 lbs (21.74)	168 lbs (24.18)	189 lbs (27.21)	210 lbs (30.24)
CONSTRUCTION		**Extrusion laminated with encapsulated tri-directional scrim reinforcement					
PLY ADHESION	ASTM D413	16 lbs	20 lbs	19 lbs	27 lbs	25 lbs	33 lbs
1" TENSILE STRENGTH	ASTM D7003	88 lbf MD 63 lbf DD	110 lbf MD 79 lbf DD	90 lbf MD 70 lbf DD	113 lbf MD 87 lbf DD	110 lbf MD 84 lbf DD	138 lbf MD 105 lbf DD
1" TENSILE ELONGATION @ BREAK % (FILM BREAK)	ASTM D7003	550 MD 550 DD	750 MD 750 DD	550 MD 550 DD	750 MD 750 DD	550 MD 550 DD	750 MD 750 DD
1" TENSILE ELONGATION @ PEAK % (SCRIM BREAK)	ASTM D7003	20 MD 20 DD	33 MD 33 DD	20 MD 20 DD	30 MD 31 DD	20 MD 20 DD	36 MD 36 DD
TONGUE TEAR STRENGTH	ASTM D5884	75 lbf MD 75 lbf DD	97 lbf MD 90 lbf DD	75 lbf MD 75 lbf DD	114 lbf MD 107 lbf DD	100 lbf MD 100 lbf DD	125 lbf MD 127 lbf DD
GRAB TENSILE	ASTM D7004	180 lbf MD 180 lbf DD	218 lbf MD 210 lbf DD	180 lbf MD 180 lbf DD	295 lbf MD 294 lbf DD	220 lbf MD 220 lbf DD	341 lbf MD 337 lbf DD
TRAPEZOID TEAR	ASTM D4533	120 lbf MD 120 lbf DD	146 lbf MD 141 lbf DD	130 lbf MD 130 lbf DD	189 lbf MD 172 lbf DD	160 lbf MD 160 lbf DD	193 lbf MD 191 lbf DD
*DIMENSIONAL STABILITY	ASTM D1204	<1	<0.5	<1	<0.5	<1	<0.5
PUNCTURE RESISTANCE	ASTM D4833	50 lbf	64 lbf	65 lbf	83 lbf	80 lbf	99 lbf
MAXIMUM USE TEMPERATURE		180°F	180°F	180°F	180°F	180°F	180°F
MINIMUM USE TEMPERATURE		-70°F	-70°F	-70°F	-70°F	-70°F	-70°F

MD = Machine Direction  
DD = Diagonal Directions



Note: Minimum Roll Averages are set to take into account product variability in addition to testing variability between laboratories.

\*Dimensional Stability Maximum Value

\*\*DURA-SKRIM J30BB, J36BB and J45BB are a four layer reinforced laminate. The outer layers consist of a high strength polyethylene film manufactured using virgin grade resins and stabilizers for UV resistance in exposed applications.

DURA-SKRIM J30BB, J36BB and J45BB are reinforced with a 1300 denier tri-directional scrim reinforcement.

Note: To the best of our knowledge, unless otherwise stated, these are typical property values and are intended as guides only, not as specification limits. NO WARRANTIES ARE MADE AS TO THE FITNESS FOR A SPECIFIC USE OR MERCHANTABILITY OF PRODUCTS REFERRED TO, no guarantee of satisfactory results from reliance upon contained information or recommendations and disclaims all liability for resulting loss or damage.



RAVEN INDUSTRIES, INC. / Engineered Films Division  
P.O. Box 5107 • Sioux Falls, SD 57117-5107  
Ph: (605) 335-0174 • Fx: (605) 331-0333  
Toll Free: 800-635-3456



ISO 9001:2000  
CERTIFIED MANAGEMENT SYSTEM

[www.ravengco.com](http://www.ravengco.com)

6/09 EFD 1125

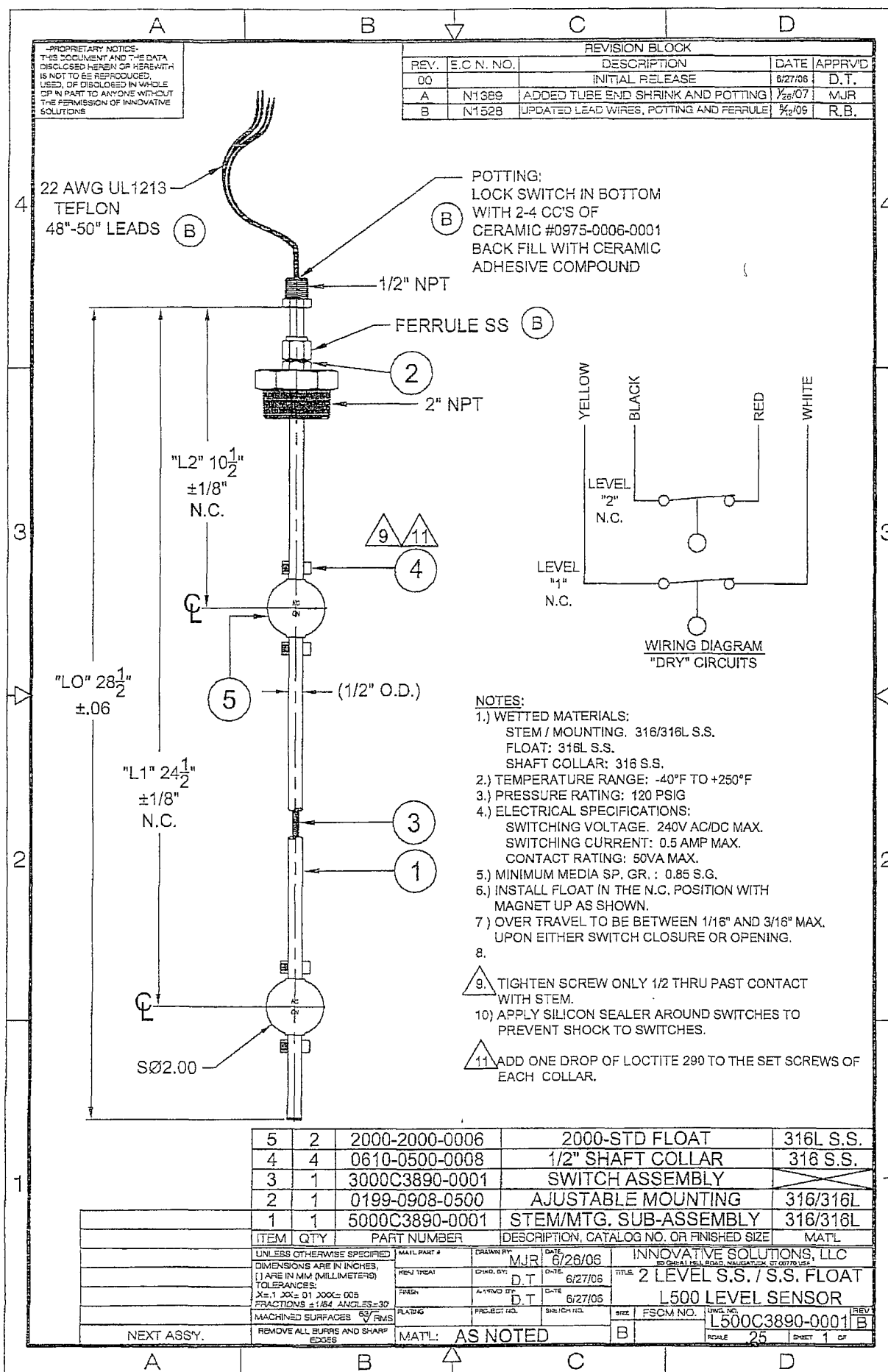


Exhibit 2.4

## **Section III**

### **Operation & Maintenance Plan**

**EnerVest Operating, LLC (EV)**

**BELOW-GRADE TANK  
OPERATIONAL REQUIREMENTS**

**Rule 19.15.17.12**

- A. EV will operate and maintain Below-Grade Tanks to insure the integrity of the below-grade tank, liner, liner system or berms to prevent contamination of fresh water and protect public health and the environment.

EV will not discharge or store any hazardous waste material of any kind in any Below-Grade Tank.

Any penetration of the below-grade below the liquid's surface that may occur, EV shall remove all liquid above the damage or leak line within 48 hours of the discovery. EV shall notify the appropriate district office within 48 hours of the discovery and repair the damage or replace the liner or below-grade tank.

EV will insure the metal retaining walls of the below-grade system around each tank will extend at least 6" above ground level or be equipped with a 6" earthen berm in an effort to divert run-on water around the below-grade system.

- D. EV will insure that a below-grade tank constructed and installed prior to June 16, 2008 that does not meet the requirements of 19.15.17.11 NMAC and does not demonstrate integrity or that the below-grade tank develops any conditions as identified in 19.15.17.12 NMAC shall close the existing below-grade tank pursuant to the closure requirements of 19.15.17.13 NMAC and install a below-grade tank that is in full compliance with our approved design. Please see below-grade system diagram in Appendix 8 for details.

EV will insure all Below-grade tanks will be equipped with automatic high-level alarm which sounds at 24" and than shut off devise to insure that flow will shut off at the freeboard height of 10 1/2 inches.

The majority of our below-grade tanks are within the berm around our tank battery and as so are protected from run-on water. Those outside this berm will be protected with an earthen berm which will extend at least 6" above surface ground level to divert run-on around the tank.

EV will remove any visible or measurable layer of oil from the fluid surface of a below-grade tank.

With any below-grade tank, installed before June 16, 2008, that is retrofitted or replaced with another tank, EV will insure that the soil beneath the removed soil is inspected for wet, discolored, or any other evidence of release, with photographic evidence. EV will report the results of all testing to the division on form C-141 and demonstrate to the division whether the evidence of contamination indicates an imminent threat to fresh water, public health, safety or the environment exists. If the division determines that the contamination does not pose an imminent threat to fresh water, public health, safety or the environment, EV shall complete the retrofit or the replacement of the below-grade tank as per our approved design program as indicated in Appendix 8. If EV or the division determines that the contamination poses an imminent threat to fresh water, public health, safety or the environment, then EV shall close the existing below-grade tank pursuant to the closure requirements of 19.17.15.13 NMAC prior to initiating the retrofit or replacement.

Table 1.1 GSE HD Smooth Geomembrane

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE VALUE				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, (minimum average) mil (mm)	ASTM D 5199	every roll	30 (0.75)	40 (1.00)	60 (1.50)	80 (2.00)	100 (2.50)
Lowest individual reading (-10%)			27 (0.69)	36 (0.91)	54 (1.40)	72 (1.80)	90 (2.30)
Density, g/cm <sup>3</sup>	ASTM D 1505	200,000 lb	0.94	0.94	0.94	0.94	0.94
Tensile Properties (each direction)	ASTM D 6693, Type IV Dumbell, 2 ipm	20,000 lb					
Strength at Break, lb/in-width (N/mm)			120 (21)	152 (26)	243 (42)	327 (57)	410 (71)
Strength at Yield, lb/in-width (N/mm)			66 (11)	84 (14)	132 (23)	177 (30)	212 (37)
Elongation at Break, %	G.L. 2.0 in (51 mm) G.L. 1.3 in (33 mm)		700	700	700	700	700
Elongation at Yield, %			13	13	13	13	13
Tear Resistance, lb (N)	ASTM D 1004	45,000 lb	21 (93)	28 (124)	42 (186)	58 (257)	73 (324)
Puncture Resistance, lb (N)	ASTM D 4833	45,000 lb	65 (289)	85 (378)	125 (556)	160 (711)	195 (867)
Carbon Black Content, % (Range)	ASTM D 1 603*/421 8	20,000 lb	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0	2.0 - 3.0
Carbon Black Dispersion	ASTM D 5596	45,000 lb	Note <sup>(1)</sup>	Note <sup>(1)</sup>	Note <sup>(1)</sup>	Note <sup>(1)</sup>	Note <sup>(1)</sup>
Notched Constant Tensile Load, hr	ASTM D 5397, Appendix	200,000 lb	1000	1000	1000	1000	1000
Oxidative Induction Time, min	ASTM D 3895, 200°C; O <sub>2</sub> , 1 atm	200,000 lb	>140	>140	>140	>140	>140
TYPICAL ROLL DIMENSIONS							
Roll Length <sup>(2)</sup> , ft (m)			1,120 (341)	870 (265)	560 (171)	430 (131)	340 (104)
Roll Width <sup>(2)</sup> , ft (m)			22.5 (6.9)	22.5 (6.9)	22.5 (6.9)	22.5 (6.9)	22.5 (6.9)
Roll Area, ft <sup>2</sup> (m <sup>2</sup> )			25,200 (2,341)	19,575 (1,819)	12,600 (1,171)	9,675 (899)	7,650 (711)

NOTES:

- \* <sup>(1)</sup>Dispersion only applies to near spherical agglomerates. 9 of 10 views shall be Category 1 or 2. No more than 1 view from Category 3.
- \* <sup>(2)</sup>Roll lengths and widths have a tolerance of ± 1%.
- GSE HD is available in rolls weighing approximately 3,900 lb (1,769 kg).
- All GSE geomembranes have dimensional stability of ±2% when tested according to ASTM D 1204 and LTB of <-77° C when tested according to ASTM D 746.
- \*Modified.

**O.R.E. SYSTEMS**  
P.O. Box 3677  
Farmington, NM 87499  
(505) 327-2161

## **Section IV**

**Closure Plan**

**EnerVest Operating, LLC (EV)**

**BELOW-GRADE TANK  
CLOSURE REQUIREMENTS**

**Rule 19.15.17.13**

Before June 15, 2013, EV shall close, retrofit, or replace an existing below-grade tank that has not demonstrated integrity.

EV shall close a below-grade tank within the time periods provided in 19.15.17.13 NMAC, or by an earlier date that the division requires because of imminent danger to fresh water, public health or the environment.

- A. EV shall close an existing below-grade tank that does not meet the requirements of Subsection I, paragraphs (1) through (4), of 19.15.17.11 NMAC if not retrofitted to comply with said requirements prior to any sale or change of operator to 19.15.9.9 NMAC.

Any below-grade tank installed prior to June 16, 2008 that is single walled and where any portion of the tank sidewall is below the ground surface and not visible shall equip or retrofit the below-grade tank to comply with paragraphs (1) through (4) of Subsection I of 19.15.17.11 NMAC, or close it, within 5 years after June 16, 2008.

Within 60 days of cessation of the permitted below-grade tanks operation or as required by Subsection B of 19.15.17.17 NMAC, EV shall close the below-grade tank in accordance with a closure plan that the appropriate division district office approves.

- J. Prior to implementing any closure operations EV shall research county tax records to determine the name and address of the surface owner of the properties involved. EV shall notify this surface owner via Certified U.S. Mail, return receipt requested, of their intent to close said below-grade tank.

Upon determination, EV will notify the appropriate district office prior to any closure operations beginning. Such notification shall be at least 72 hours, via U.S. Mail, prior to beginning work but not more than one week prior to beginning work. Such notice shall contain at a minimum the following:

Operators Name  
Unit letter, Section, Township, & Range of well  
Well name and well number  
API Number of well



- E. .All free standing liquids and sludge will be removed at the start of the below-grade tank closure process from the below-grade tank and disposed of in one of the below division-approved facility as indicated below:

TNT Land Farm	Permit # NM-01-0008	Liquids & Sludge
Environtech Land Farm	Permit # NM-01-0011	Solids
AguaMoss	Permit # 247130	Liquids

EV will obtain prior approval from the division to dispose, recycle, reuse, or reclaim the below-grade tanks and provide documentation of the final disposition of the below-grade tank in the closure report.

Existing liners that are removed as a result of closure will be wiped cleaned and disposed of at a solid waste facility listed below in compliance with Subparagraph (M) of Paragraph (I) of Subsection C 19.15.35.8 NMAC..

San Juan Regional Landfill	Permit # SWM 052426 or
“	Special Waster Permit # SWM052433 “sp”

If there is any on-site equipment associated with a below0grade tank, EV shall remove the equipment, unless the equipment is required for some other purpose .

Upon removal of the below-grade tank, EV will take, at a minimum, a five point composite sample from where the tank was sitting. EV shall collect individual grab samples will be taken from any area that is wet, discolored or showing other evidence of a release. All samples will be analyzed for the following:

Components	Test Method	Limits (mg/Kg)
Benzene	EPA SW-846 8021B or 8260B	0.2
BTEX	EPA SW-846 8021B or 8260B	50
TPH	EPA SW-846 418.1	100
Chlorides	EPA 300.1	250 or background, whichever is greater

EV will insure that the results of all sampling shall be reported to the division on approved form C-141. EV understands that the division may require additional delineation upon review of the results.

If sampling demonstrates that concentrations specified above have NOT been exceeded, or that a release has NOT occurred, EV will backfill the excavation with compacted, non-waste containing, earthen material, construct a division prescribed soil cover, and recontour and re-vegetate the site. The division prescribed soil cover, recontouring, and re-vegetation shall comply with 19.15.17.13.

If EV or the division determines that a release has occurred, EV shall fully comply with 19.15.29 NMAC and 19.15.30 NMAC as appropriate.

- G. Once EV has closed a below-grade tank, we shall reclaim the site to a safe and stable condition that blends with the surrounding undisturbed area. When possible, EV will restore the impacted surface area to the condition that existed prior to oil and gas operations by the placement of soil cover.

If the closed area is within the confines of the pad location EV will blend the site to match the pad location as much as possible. Such activities shall prevent erosion, protect fresh water, human health and the environment. EV will obtain written agreement from the surface owner for any alternate re-vegetation proposals and submit to the division for final approval.

- H. The soil cover design will be consistent with the requirements of 19.15.17.13(H)(1) and (3). 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 will be constructed to the site's existing grade and prevent ponding of water and erosion of the cover material.

- I. EV will seed the disturbed areas the first growing season after closing the below grade tank. Seeding will be accomplished via drilling on the contour whenever practical or by other division-approved methods. BLM or Forest Service stipulated seed mixes will be used on federal lands. Vegetative cover will equal 70% of the native perennial vegetative cover (un-impacted) consisting of at least three native plant species, including at least one grass, but not including noxious weeds, and maintain that cover through two successive growing seasons. Repeat seeding or planting will be continued until successful vegetative growth occurs. During the two growing seasons that prove viability, there shall be no artificial irrigation of the vegetation.

EV shall notify the division when it has seeded or planted and when it successfully achieves re-vegetation by U.S. Mail.

- K. Within 60 days of completion of closure operations, EV will file Form C-144, with attachments, outlining the detailed operations of the closing operations. Such attachments shall include, but not be limited to, proof of surface owner and division notifications, confirmation of sampling analysis, disposal facility names and permit numbers, soil backfilling and cover installation, re-vegetation application rates and seeding techniques, and photo documentations.

# **Section V**

**Hydrogeology Report**

## **Regional Hydrogeology Report**

The San Jose Formation of Eocene age occurs in New Mexico and Colorado, and its outcrop forms the land surface over much of the eastern half of the central San Juan Basin. It overlies the Nacimiento Formation in the area generally south of the Colorado-New Mexico state line and overlies the Animas Formation in the area generally north of the State line.

The San Jose Formation was deposited in various fluvial-type environments. In general, the unit consists of an interbedded sequence of sandstone, siltstone, and variegated shale. Thickness of the San Jose Formation generally increases from west to east, ranging from 200 feet in the west and south to almost 2,700 feet in the center of the structural basin.

Ground water is associated with alluvial and fluvial sandstone aquifers. Therefore the occurrence of ground water is mainly controlled by the distribution of sandstone in the formation. The distribution of such sandstone is the results of original depositional extent plus any post-depositional modifications, namely erosion and structural deformation.

Transmissivity data for the San Jose Formation are minimal. Values of 40 and 120 feet squared per day were determined from two aquifer tests (Stone et al, 1983. table 5). The reported or measured discharge from 46 water wells completed in San Jose Formation ranges from 0.15 to 61 gallons per minute and the median is 5 gallons per minute. Most of the wells provide water for livestock and domestic use.

The San Jose Formation is a very suitable unit for recharge from precipitation because soils that form on the unit are sandy and highly permeable and therefore readily absorb precipitation. However, low annual precipitation, relatively high transpiration and evaporation rates, and deep dissection of the San Jose Formation by the San Juan River and its tributaries all tend to reduce the effective recharge to the unit.

Stone et al., 1983, Hydrogeology and Water Resources of the San Juan Basin, New Mexico; Socorro, New Mexico Bureau of Mines and Mineral Resources Hydrologic Report 6, 70 p.

## **Site Specific Hydro Geologic Analysis**

### **Jicarilla Apache 102 #09M API 30-039-29771**

The above referenced well is proposed to be drilled at UL O, Sec 04, 26N, 04W at an elevation of 7,136. Surface casing is proposed to be set at 250' or at a depth of 6,886..

According to the Office of State Engineer, the closest water well drilled was SJ 01205 about 2 miles NE of our location. Drilled to 3054 feet at an elevation of 6,848, it shows water encountered at 750 feet or at a depth of 6,098 feet. This would be 788 feet shallower than the surface casing depth of our well.

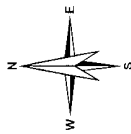
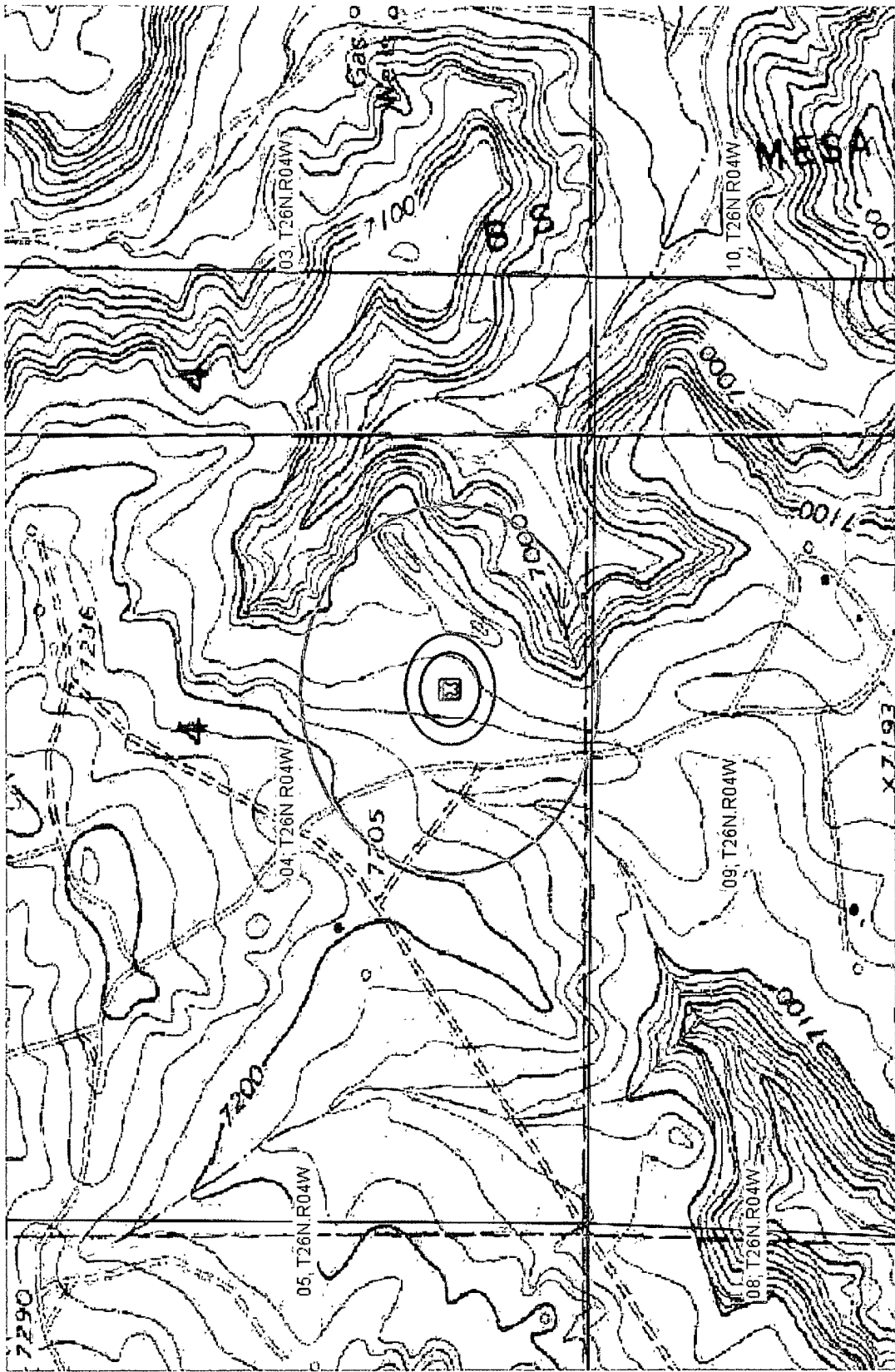
In 1983, Amoco Production drilled their Jicarilla Apache 102 #05A (30-039-23197) about 1200 feet East of our location. It was at an elevation of 6,963 with no indication of water being encountered. Surface casing was set at 350 feet which would be at 6,613. This would be 273 feet above than our well.

There are two other wells drilled within 200' of the above Amoco well. All wells have similar ground elevation and surface casing depth. These wells also have surface casing depths in excess of 250 feet above the surface casing of our proposed well.

The groundwater at our well site would be greater than 200 feet at a minimum. This should allow ample protection for any groundwater in the area.

# **Appendix 01**

**U.S. 7.5 Minute TOPO Map**



0 500 1000ft

Petroleum Recovery  
Research Center

TOPO - Jicarilla Apache 102 #9M

Figure: 01

O - Sec 04, 26N, 04W

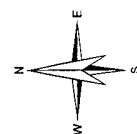
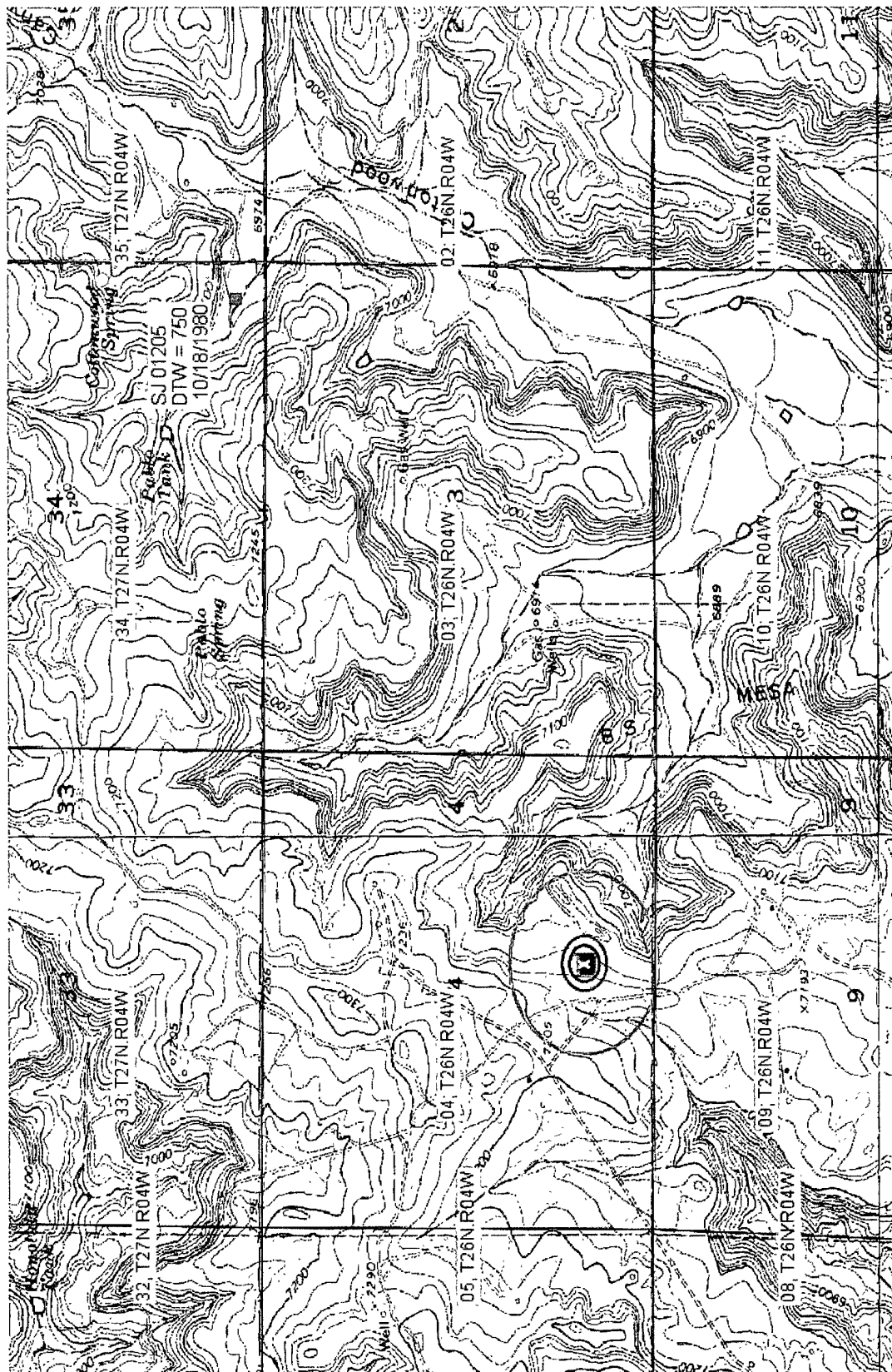
May 11, 2010

API 30-039-29771

# Appendix 02

## Ground Water Depth





0 1000 2000ft

Petroleum Recovery  
Research Center

OSE Surface Water - Jicarilla Apache 102 #9M

Figure: 02

O - Sec 04, 26N, 04W

May 11, 2010

API 30-039-29771



# New Mexico Office of the State Engineer

## Point of Diversion Summary

(quarters are 1=NW 2=NE 3=SW 4=SE)

(quarters are smallest to largest)

(NAD83 UTM in meters)

POD Number

Q64 Q16 Q4 Sec Tws Rng

X

Y

SJ 01205

4 4 4 34 27N 04W

300255 4044335\*

Driller License: AZTEC WELL SERVICING CO. INC.

Driller Name: SANDEL, JERRY

Drill Start Date: 10/18/1980

Drill Finish Date: 10/25/1980

Plug Date:

Log File Date: 11/20/1980

PCW Rcv Date: 12/22/1980

Source: Artesian

Pump Type: SUBMER

Pipe Discharge Size: 2

Estimated Yield:

Casing Size: 7.63

Depth Well: 3054 feet

Depth Water: 750 feet

Water Bearing Stratifications: Top Bottom Description

892 3004 Sandstone/Gravel/Conglomerate

Casing Perforations: Top Bottom

792 3004

\*UTM location was derived from PLSS - see Help

The data is furnished by the NMOSE/ISC and is accepted by the recipient with the expressed understanding that the OSE/ISC make no warranties, expressed or implied, concerning the accuracy, completeness, reliability, usability, or suitability for any particular purpose of the data

## STATE ENGINEER OFFICE

## WELL RECORD

## Section 1. GENERAL INFORMATION

(A) Owner of well El Paso Natural Gas Company Owner's Well No. 1  
 Street or Post Office Address P. O. Box 1492  
 City and State El Paso, Texas 79978

Well was drilled under Permit No. SJ 1205 and is located in the:

a. 1/4 SE 1/4 SW 1/4 SE 1/4 of Section 14 Township 32N Range 7W N.M.P.M.

b. Tract No. \_\_\_\_\_ of Map No. \_\_\_\_\_ of the \_\_\_\_\_

c. Lot No. \_\_\_\_\_ of Block No. \_\_\_\_\_ of the \_\_\_\_\_  
 Subdivision, recorded in Rio Arriba County.

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

(B) Drilling Contractor Aztec Well Service License No. WD 727

Address P. O. Box "B", Aztec, New Mexico 87410

Drilling Began 10/18/80 Completed 10/25/80 Type tools Rotary Size of hole 9 7/8 in.

Elevation of land surface or \_\_\_\_\_ at well is 6848 ft. Total depth of well 3054 ft.

Completed well is ☐ shallow ☒ artesian. Depth to water upon completion of well 792 ft.

## Section 2. PRINCIPAL WATER-BEARING STRATA

Depth in Feet		Thickness in Feet	Description of Water-Bearing Formation	Estimated Yield (gallons per minute)
From	To			
892	3004	599' net	sandstone with layers of shale and coal	4

## Section 3. RECORD OF CASING

Diameter (inches)	Pounds per foot	Threads per in.	Depth in Feet		Length (feet)	Type of Shoe	Perforations	
			Top	Bottom			From	To
7 5/8	26.4# & 39.0#	8rd	surface	3054	3054	B&W	792	3004

## Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				
Surface	3054	9 7/8	clear water	1310	Pumped cement down casing and back up annulus. Displaced cement with a rubber plug to an insert float valve at 3031.

## Section 5. PLUGGING RECORD

Plugging Contractor \_\_\_\_\_  
 Address \_\_\_\_\_  
 Plugging Method \_\_\_\_\_  
 Date Well Plugged \_\_\_\_\_  
 Plugging approved by: \_\_\_\_\_

State Engineer Representative

No.	Depth in Feet		Cubic Feet of Cement
	Top	Bottom	
1			
2			
3			
4			

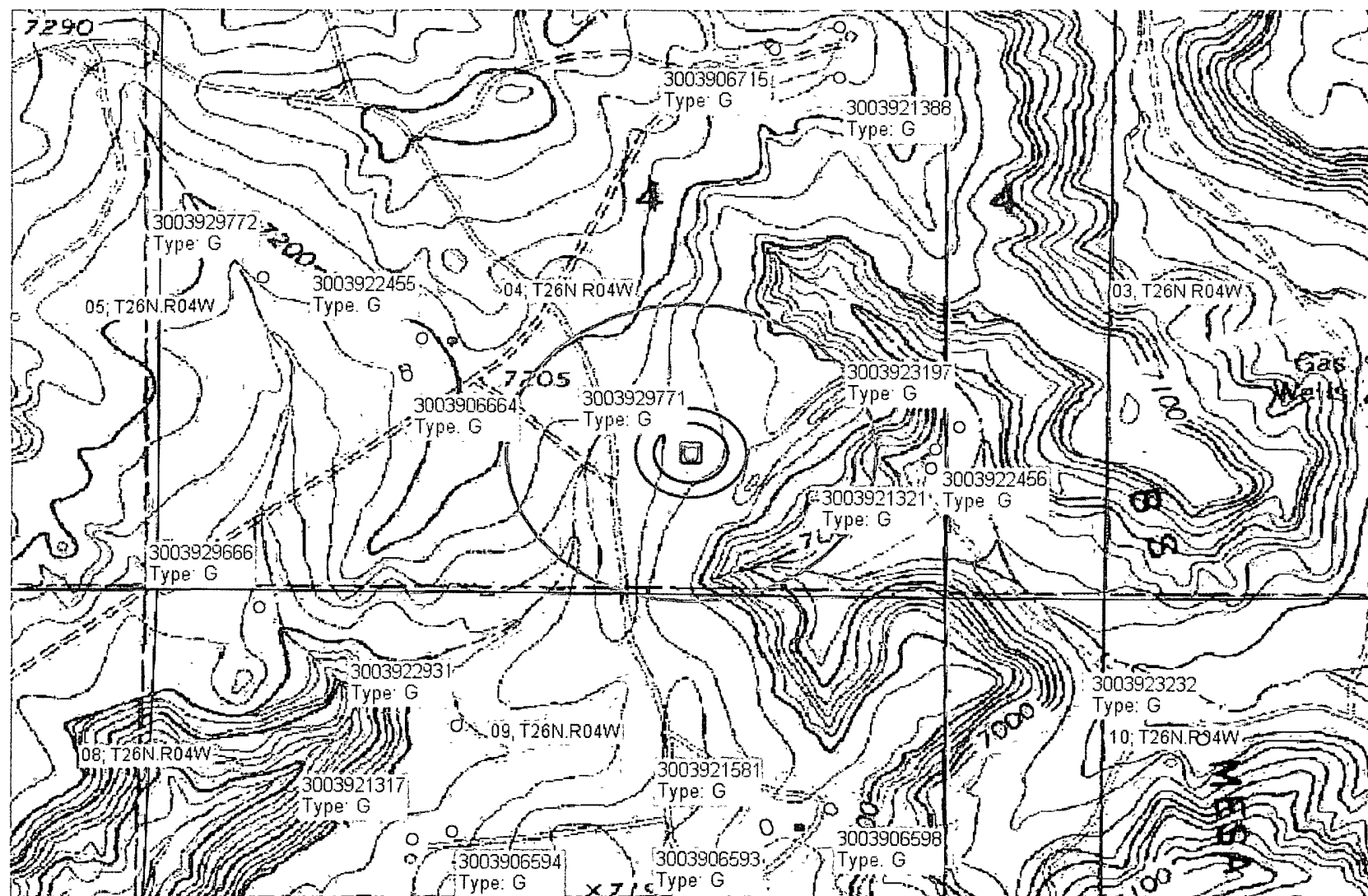
## FOR USE OF STATE ENGINEER ONLY

Date Received 11/20/80

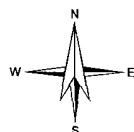
Quad \_\_\_\_\_ FWL \_\_\_\_\_ FSL \_\_\_\_\_

File No. SJ-1205  
 JTS

Use Workover Location No. 32N.7W.14 434  
San Juan County



0 500 1000ft



Petroleum Recovery  
Research Center

Offset Wells - Jicarilla Apache 102 #9M

Figure: 2a

O - Sec 04, 26N, 04W

May 11, 2010

API 30-039-29771

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. Oil well ☐ gas well ☒ other ☐
2. NAME OF OPERATOR  
Amoco Production Company
3. ADDRESS OF OPERATOR  
501 Airport Drive, Farmington, NM 87401
4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)  
AT SURFACE: 1120' FSL x 790' FEL  
AT TOP PROD. INTERVAL: Same  
AT TOTAL DEPTH: Same
16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:

TEST WATER SHUT-OFF ☐  
FRACTURE TREAT ☐  
SHOOT OR ACIDIZE ☐  
REPAIR WELL ☐  
PULL OR ALTER CASING ☐  
MULTIPLE COMPLETE ☐  
CHANGE ZONES ☐  
ABANDON\* ☐

SUBSEQUENT REPORT OF:

(other) spud and set casing

RECEIVED  
SEP 19 1983

(NOTE: Report results of multiple completion or zone change on Form 9-330.)  
BUREAU OF LAND MANAGEMENT  
FARMINGTON RESOURCE AREA

OIL COR. DIV.  
DIST. 3

5. LEASE  
Jicarilla Apache 102
6. IF INDIAN, ALLOTTEE OR TRIBE NAME  
Jicarilla Apache Tribe
7. UNIT AGREEMENT NAME
8. FARM OR LEASE NAME  
Jicarilla Apache 102
9. WELL NO.  
5A
10. FIELD OR WILDCAT NAME  
Blanco Mesaverde
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
SE/SE, Section 4, T26N, R4W
12. COUNTY OR PARISH  
Rio Arriba
13. STATE  
New Mexico
14. API NO.  
30-089-23197
15. ELEVATIONS (SHOW OF, KDB, AND WD)  
6963' GL

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

Moved rotary rig in and spudded a 12-1/4" hole on 7-31-83. Drilled to 351' and landed 8-5/8", 24#, K-55 casing at 350'. Cemented with 420 cu.ft. Class "B" cement containing 2% CaCl<sub>2</sub>. Circulated 36 cu.ft. to surface. Pressure tested surface casing to 600 PSI. Drilled a 7-7/8" hole and reached a TD of 6088' on 8-15-83. Landed 4-1/2", 10.5#, K-55 casing at 6087'. Cemented first stage with 236 cu.ft. Class "B" neat. Cemented second stage with 231 cu.ft. Class "B" 50:50 POZ cement and tailed in with 118 cu.ft. Class "B" neat. Cemented third stage with 1576 cu.ft. Class "B" 65:35 POZ cement and tailed in with 148 cu.ft. Class "B" neat. Cement top was located at 500' by means of a temperaturesurvey. DV tools were set at 4389' and 5341'. Released rig 8-16-83.

Subsurface Safety Valve: Manu. and Type

Set @

F:

18. I hereby certify that the foregoing is true and correct

SIGNED

D.D. Lawson

TITLE Dist. Adm. Supvr. DATE

9/15/83

(This space for Federal or State office use)

APPROVED BY  
CONDITIONS OF APPROVAL, IF ANY

TITLE

DATE

ACCEPTED FOR RECORD

SEP 22 1983

\*See Instructions on Reverse Side

NMOCC

FARMINGTON RESOURCE AREA

BY [Signature]

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE\*  
(Other instructions on re-  
verse side)

Form approved.  
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.  
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input type="checkbox"/> GAS WELL <input checked="" type="checkbox"/> OTHER <input type="checkbox"/>		5. LEASE DESIGNATION AND SERIAL NO. <b>Jicarilla Apache 102</b>
2. NAME OF OPERATOR <b>AMOCO PRODUCTION COMPANY</b>		6. IF INDIAN, ALLOTTEE OR TRIBE NAME <b>Jicarilla Apache Tribe</b>
3. ADDRESS OF OPERATOR <b>501 AIRPORT DRIVE, FARMINGTON, NEW MEXICO 87401</b>		7. UNIT AGREEMENT NAME
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below) At surface <b>840' FSL x 940' FEL, Section 4, T-26-N, R-4-W 21321</b>		8. FARM OR LEASE NAME <b>Jicarilla Apache 102</b>
14. PERMIT NO.		9. WELL NO. <b>22</b>
15. ELEVATIONS (Show whether DF, RT, GR, etc.) <b>5964' GL est.</b>		10. FIELD AND POOL, OR WILDCAT <b>Tapacito Pictured Cliffs</b>
		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA <b>SE/4 SE/4 Section 4 T-26-N, R-4-W</b>
		12. COUNTY OR PARISH <b>Rio Arriba</b>
		13. STATE <b>NM</b>

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <b>Spud and Set Casing</b>	
(Other) <input type="checkbox"/>		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

Spudded 12-1/4" hole at 1:45 P.M. on 9/12/77. Set 6-5/8" K-55 casing at 276' with 200 sx Class "B" Neat, 27 CaCl<sub>2</sub>. Circulated good cement. Reduced to 7-7/8" hole and continued drilling.



18. I hereby certify that the foregoing is true and correct

SIGNED *E. S. ...* TITLE Area Adm. Supvr. DATE 9/14/77

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE \_\_\_\_\_

CONDITIONS OF APPROVAL, IF ANY:

\*See Instructions on Reverse Side

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use Form 9-331-C for such proposals.)

1. oil ☐ gas ☒ other ☐  
well well

2. NAME OF OPERATOR

Amoco Production Company

3. ADDRESS OF OPERATOR

501 Airport Drive, Farmington, NM 87401

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)

AT SURFACE: 970' FSL x 920' FEL

AT TOP PROD. INTERVAL: Same

AT TOTAL DEPTH: Same

16. CHECK APPROPRIATE BOX TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

REQUEST FOR APPROVAL TO:

SUBSEQUENT REPORT OF:

TEST WATER SHUT-OFF ☐

FRACTURE TREAT ☐

SHOOT OR ACIDIZE ☐

REPAIR WELL ☐

PULL OR ALTER CASING ☐

MULTIPLE COMPLETE ☐

CHANGE ZONES ☐

ABANDON\* ☐

(other) Spud & Set Casing

5. LEASE

Jicarilla Apache 102

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

Jicarilla Apache

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME

Jicarilla Apache 102

9. WELL NO.

9E

10. FIELD OR WILDCAT NAME

BS Mesa Gallup/Dakota

11. SEC., T., R., M. OR BLK. AND SURVEY OR AREA

SE/4, SE/4, Section 4, T26N, R4W

12. COUNTY OR PARISH 13. STATE

Rio Arriba NM

14. API NO.

30-039-22456

15. ELEVATIONS: (SHOW OF, KDB, AND WD)

6967' GL

(NOTE: Report results of multiple completion or zone change on Form 9-330.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)\*

Spudded a 12-1/4" hole on 9-3-80 and drilled to 340'. Set 9-5/8", 32.3# surface casing at 326' on 9-3-80 and cemented with 315 sx of class "B" Neat cement containing 2% CaCl<sub>2</sub>. Good cement was circulated to the surface. Drilled a 8-3/4" hole to a depth of 4006'. Set 7", 23.0# intermediate casing on 9-10-80 at 4006' and cemented with 660 sx of class "B" Neat cement containing 50:50 Poz, 6% gel, 2# Medium tuf plug per sx, and .8% fluid loss additive. This was tailed in with 100 sx of class "B" Neat cement. No cement was circulated to the surface. Drilled a 6-1/4" hole to a TD of 8150'. Set a 4-1/2" production casing at 8150' on 9-18-80 and cemented with 430 sx of class "B" Neat cement containing 50:50 Poz, 6% gel, 2# Medium tuf plug per sx, and .8% fluid loss additive. This was tailed in with 210 sx of class "B" Neat cement. No cement was circulated to the surface. The rig was released on 9-18-80.

Subsurface Safety Valve: Manu. and Type

Set @

OCT 2 1980

18. I hereby certify that the foregoing is true and correct

SIGNED Original Signed By  
E. S. SVOBODA

TITLE Dist. Adm. Supvr. DATE 10-1-80

(This space for Federal or State office use)

APPROVED **ACCEPTED FOR RECORD**  
CONDITIONS OF APPROVAL, IF ANY:

OCT 08 1980

BY FARMINGTON DISTRICT  
SW

\*See Instructions on Reverse Side

NMOCC

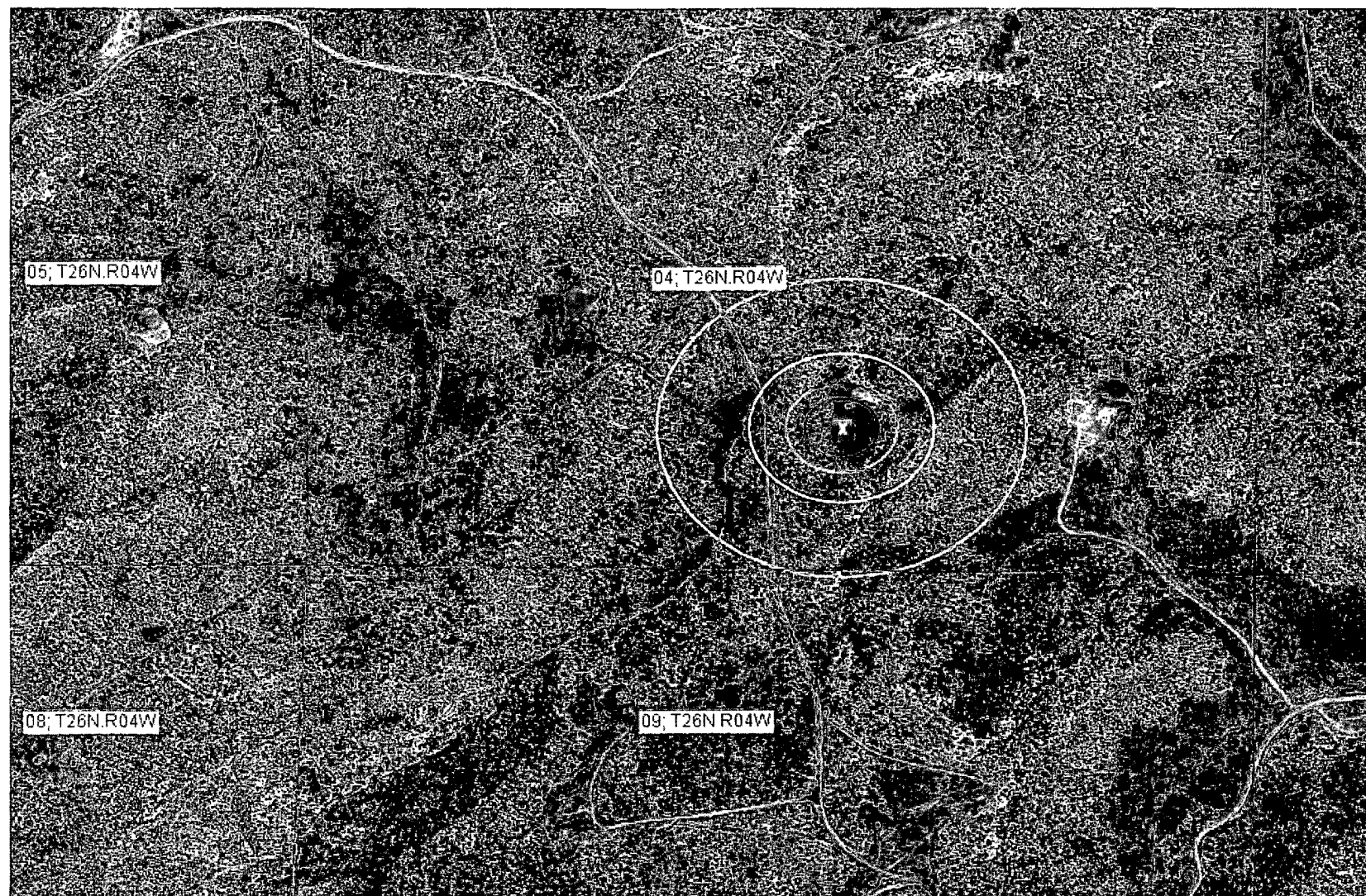
RECEIVED

U. S. GEOLOGICAL SURVEY  
FARMINGTON, N. M.

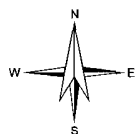
## ***Appendix 03***

***Aerial Photo***





0 500 1000ft



Petroleum Recovery  
Research Center

Aerial View - Jicarilla Apache 102 #9M

Figure: 03

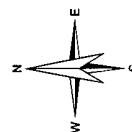
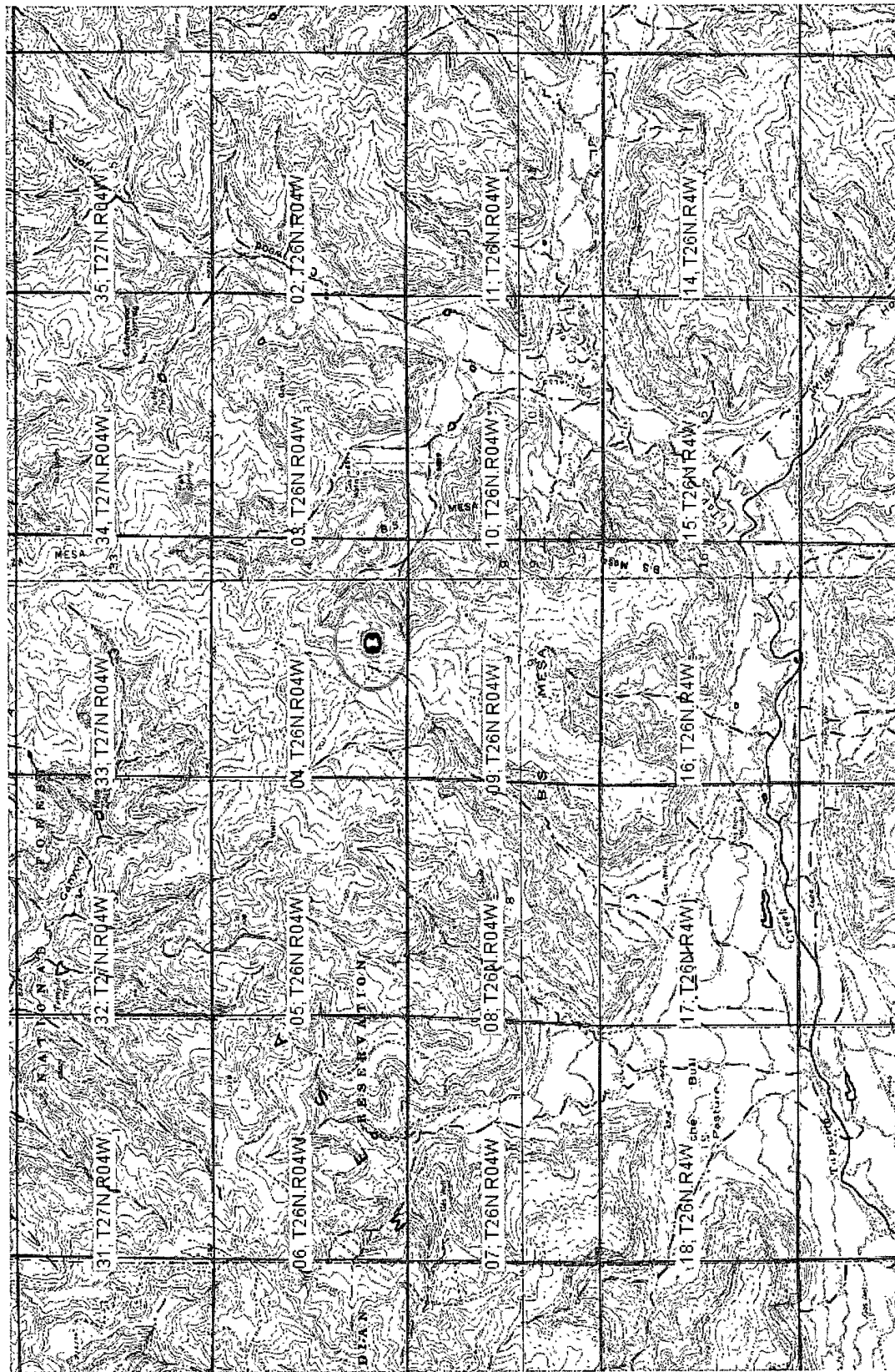
O - Sec 04, 26N, 04W

May 11, 2010

API 30-039-29771

# **Appendix 04**

## **Municipality Boundary Map**



0 2000 4000ft

Petroleum Recovery  
Research Center

Municipalities - Jicarilla Apache 102 #9M

Figure: 04

O - Sec 04, 26N, 04W

May 11, 2010

API 30-039-29771

# **Appendix 05**

**U.S. Fish & Wildlife Wetland Identification Map**

# U. S. Fish & Wildlife Wetlands Map



## Legend

Ohlo\_wet\_scan

- 0
- 1
- Out of range

Interstate  
Major Roads

Other Road  
Interstate  
State highway  
US highway

Roads

Cities

USGS Quad Index 24K

Lower 48 Wetland Polygons

Estuarine and Marine Deepwater  
Estuarine and Marine Wetland  
Freshwater Emergent Wetland  
Freshwater Forested/Shrub Wetland  
Freshwater Pond

Lake  
Other  
Riverine

Lower 48 Available Wetland Data

Non-Digital

Digital

No Data

Scan

NHD Streams

Counties 100K

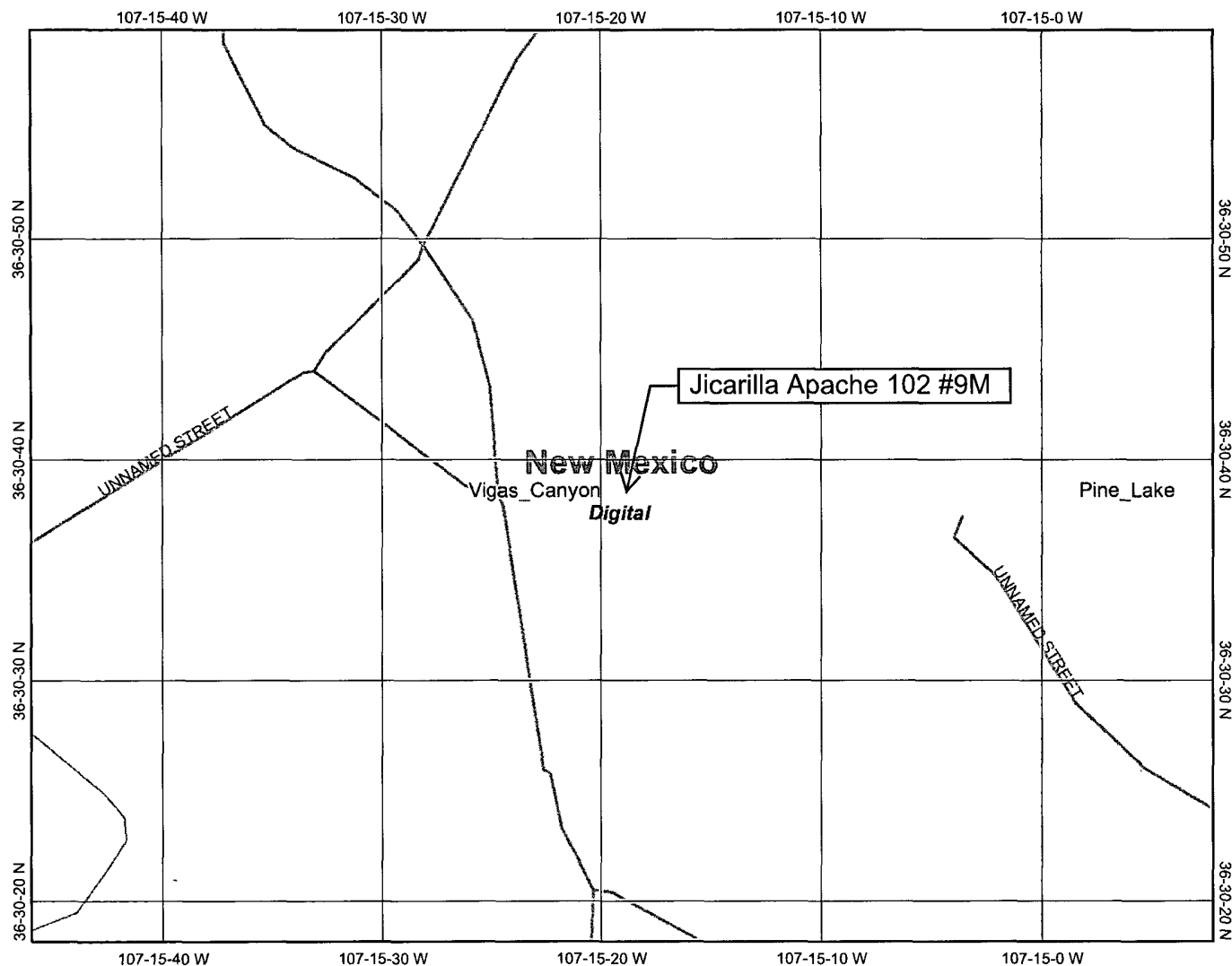
States 100K

South America

North America



Scale: 1:8,925

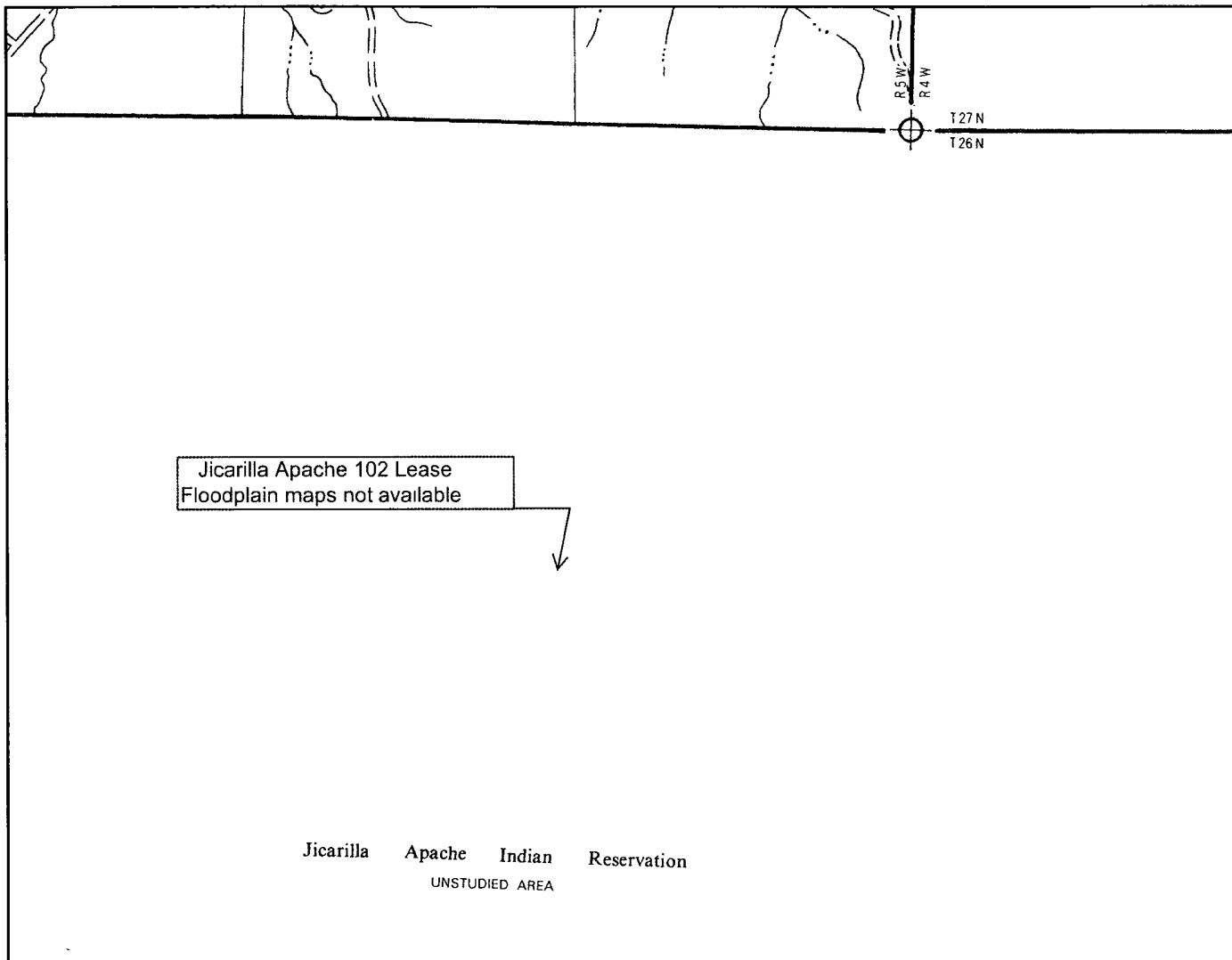


Map center: 36° 30' 39" N, 107° 15' 19" W

This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION.

# Appendix 06

FEMA 100-year Floodplain Map



APPROXIMATE SCALE

2000 0 2000 FEET

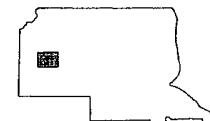
NATIONAL FLOOD INSURANCE PROGRAM

**FIRM**  
FLOOD INSURANCE RATE MAP

RIO ARriba COUNTY,  
NEW MEXICO  
UNINCORPORATED AREAS

PANEL 550 OF 1325

(SEE MAP INDEX FOR PANELS NOT PRINTED)



PANEL LOCATION

COMMUNITY-PANEL NUMBER

350049 0550 B

EFFECTIVE DATE:

JANUARY 5, 1989



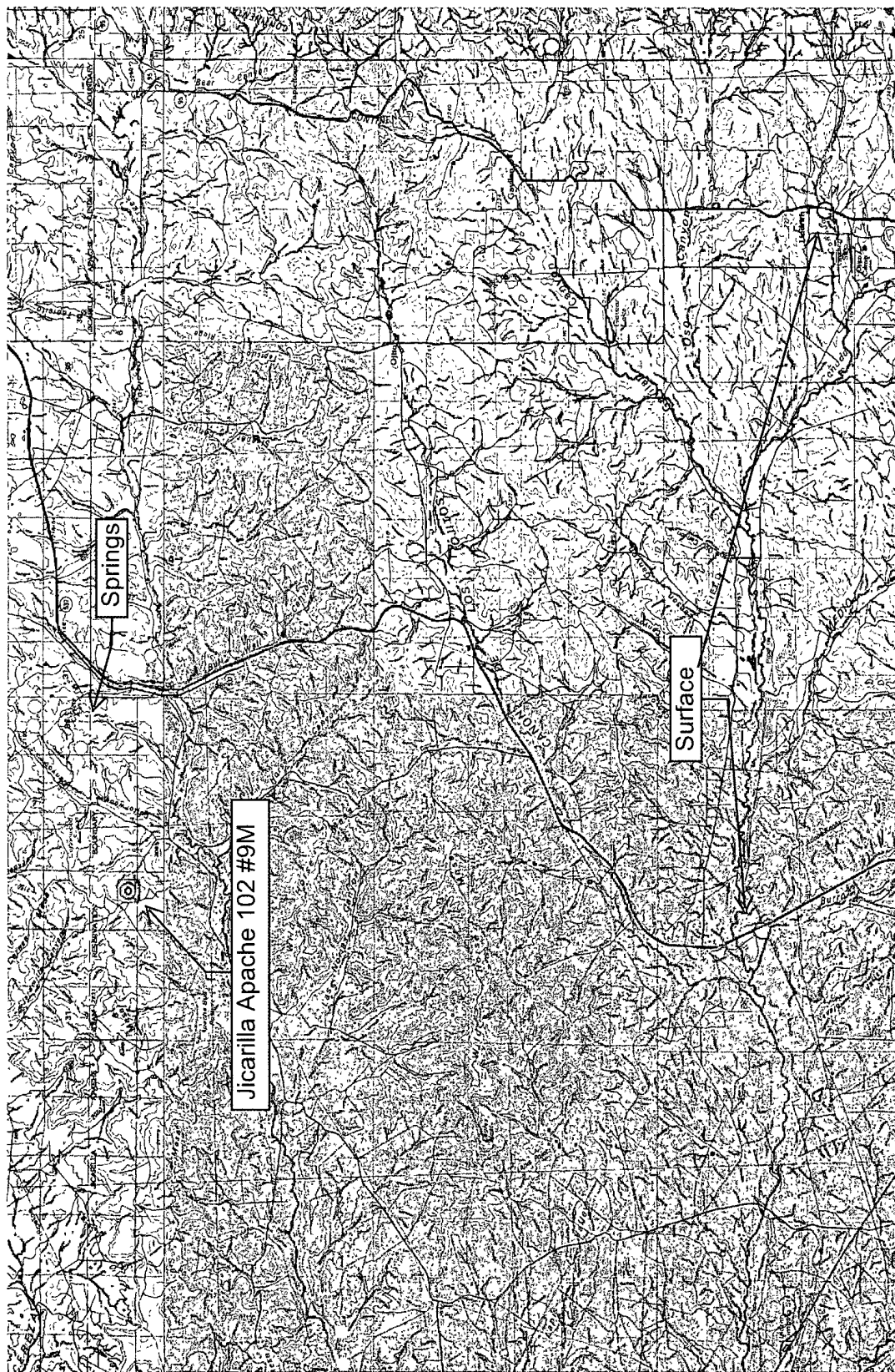
Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at [www.msc.fema.gov](http://www.msc.fema.gov)

## **Appendix 07**

**Mines, Mills, & Quarries Map**



Petroleum Recovery  
Research Center

Mines, Mills, Quarries - Jicarilla Apache 102 #9M

Figure: 07

O - Sec 04, 26N, 04W

May 11, 2010

API 30-039-29771

## **Appendix 08**

**C-102 Location Plat  
Facility Inspection Sheet  
Below-Grade Tank Diagram**

# ENERVEST OPERATING LLC

## Below Grade Tank Observed Sitting Requirements

Lease Name & Well Number 102 FK

Observed by LEE GARNER

Date Observed 5-5-10

### MEASURED FROM THE BELOW-GRADE TANK:

	Yes	No	If no, explain:
Continuously flowing water course > 300 ft.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Significant Watercourse, lakebed, sinkhole or playa lake > 200 feet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Permanent Residence > 200 feet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
School > 200 feet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Hospital > 200'	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Institution or Church > 200'	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Private, domestic fresh water well or spring > 500 feet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Any other fresh water well or spring > 1000 feet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Within incorporated municipal boundary of defined municipal fresh water field	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Wetland area > 500 feet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Overlying a subsurface mine	<input type="checkbox"/>	<input checked="" type="checkbox"/>	

Distance to watercourse or dry wash should be to nearest edge

Please include distance & direction to all waterwells

**Each Below-Grade Tank needing to be permitted, needs a visual inspection  
of the above Criteria as per Rule 19.15.17.10**

DISTRICT I  
1625 N. French Dr., Hobbs, N.M. 88240

DISTRICT II  
1301 W. Grand Ave., Artesia, N.M. 88210

DISTRICT III  
1000 Rio Brazos Rd., Aztec, N.M. 87410

DISTRICT IV  
1220 South St. Francis Dr., Santa Fe, NM 87505

State of New Mexico  
Energy, Minerals & Natural Resources Department

OIL CONSERVATION DIVISION

1220 South St. Francis Dr.  
Santa Fe, NM 87505

Form C-102

Revised June 10, 2003

Submit to Appropriate District Office

State Lease - 4 Copies

Fee Lease - 3 Copies

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

<sup>1</sup> API Number 30-039-29771	<sup>2</sup> Pool Code 72319/71599	<sup>3</sup> Pool Name Blanco Mesoverde/Basin Dakota
<sup>4</sup> Property Code 33455	<sup>5</sup> Property Name JICARILLA 102	<sup>6</sup> Well Number 9M
<sup>7</sup> GRID No. 222374	<sup>8</sup> Operator Name CDX RIO, LLC.	<sup>9</sup> Elevation 7136'

<sup>10</sup> Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
0	4	26-N	4-W		935	SOUTH	2225	EAST	RIO ARRIBA

<sup>11</sup> 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
<sup>12</sup> Dedicated Acres MV - E/322.24 DK - E/322.24					<sup>13</sup> Joint or Infill Y		<sup>14</sup> Consolidation Code		<sup>15</sup> Order No. NSL-5293-A

NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED  
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

16

LOT 4	LOT 3	LOT 2	LOT 1
FD 3 1/4" BC 1972 BLM			
N 00-31-35 W 5296.0' (C)			
LAT: 36°30'38.5" N. (NAD 83) LONG: 107°15'17.8" W. (NAD 83)			
2225'			
935'			
N 89-31-09 W 5204.29' (C)			
CALC'D COR. BY DBL. PORP.			
CALC'D COR. BY DBL. PORP.			

17 OPERATOR CERTIFICATION  
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief

*Richard Corcoran*  
Signature  
Richard Corcoran  
Printed Name  
Land Manager rich.corcoran@cdxgas.com  
Title and E-mail Address  
1-20-06  
Date

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

SEPTEMBER 12, 2005  
Date of Survey  
Signature and Seal of Registered Surveyor  
JOHN A. VORONOV  
NEW MEXICO  
14831  
REGISTERED PROFESSIONAL SURVEYOR  
10-12-05  
Certificate Number

#### 4. CASING AND CEMENTING DESIGN:

##### Casing Program:

<u>Hole Size</u>	<u>Depth</u>	<u>Casing Size</u>
12 1/4"	250'	9 5/8"
8 3/4"	4277' +/- Lewis seat	7"
6 1/4"	8297'	4 1/2"

Csg Size	Casing Type	Top (MD)	Bottom (MD)	Wt. (lb./ft)	Grade	Thread	Condition
9-5/8"	Surface	0'	250'	36.0	J55	STC	New
7"	Intermediate	0'	4277' +/-	23.0	N80	LTC	New
4 1/2"	Prod Liner	4157'	8297'	11.6	N80	LTC	New

Casing Data				Collapse (psi)	Burst (psi)	Min. Tensile (Lbs.)
OD	Wt/Ft	Grade	Thread			
9-5/8"	36.0 lbs.	J55	STC	2,020	3,520	394,000
7"	23.0 lbs.	N80	LTC	3,830	6,340	442,000
4 1/2"	11.6 lbs.	N80	LTC	6,350	7,780	223,000

##### MINIMUM CASING DESIGN FACTORS:

COLLAPSE: 1.125

BURST: 1.00

TENSION: 1.80

Area Fracture Gradient Range: 0.7 – 0.8 psi/foot

Maximum anticipated reservoir pressure: 2,500 psi

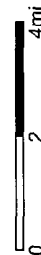
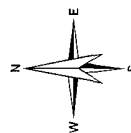
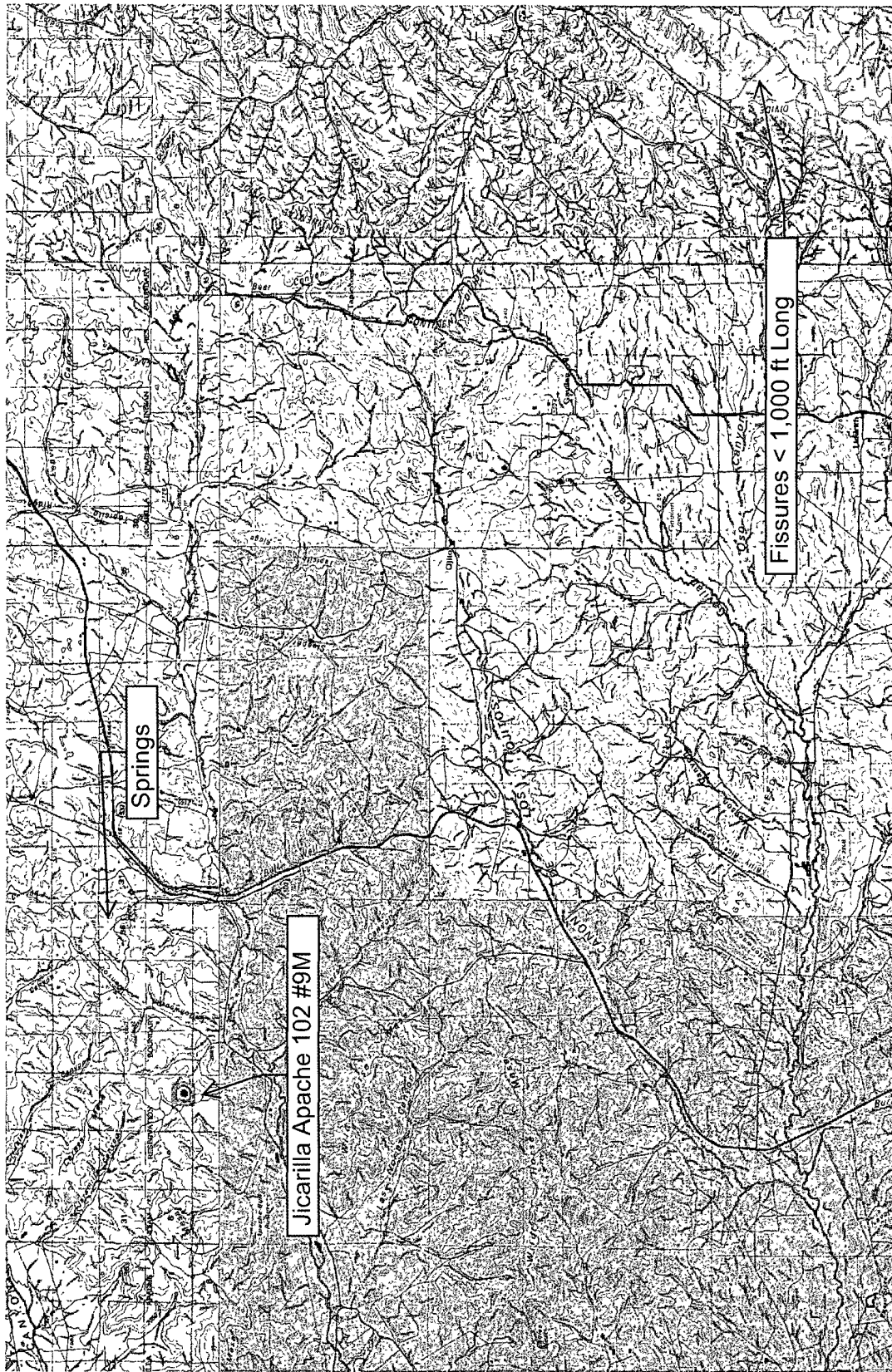
Maximum anticipated mud weight: 9.0 ppg

Maximum surface treating pressure: 3,500 - 3,750 psi

3 

# **Appendix 09**

## **Karst Map**



Petroleum Recovery  
Research Center

Karst Map - Jicarilla Apache 102 #9M

Figure: 09

O - Sec 04, 26N, 04W

May 11, 2010

API 30-039-29771