

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.

4800

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

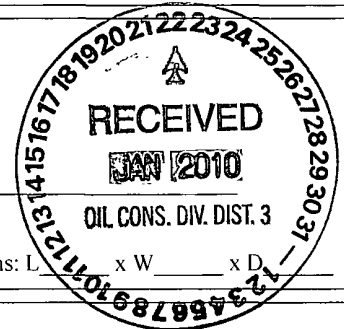
- Type of action: ☒ Permit of a pit, closed-loop system, below-grade tank, or proposed alternative method  
☐ Closure of a pit, closed-loop system, below-grade tank, or proposed alternative method  
☐ Modification to an existing permit  
☐ Closure plan only submitted for an existing permitted or non-permitted 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 Contract 148 #7  
API Number: 30-039-05995 OCD Permit Number: \_\_\_\_\_  
U/L or Qtr/Qtr P Section 15 Township 25N Range 05W County: Rio Arriba  
Center of Proposed Design: Latitude 36.395402 Longitude -107.341616 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: L \_\_\_\_\_ x W \_\_\_\_\_ x D \_\_\_\_\_



3.  
☐ **Closed-loop System:** Subsection H of 19.15.17.11 NMAC  
Type of Operation: ☐ P&A ☐ Drilling a new well ☐ Workover or Drilling (Applies to activities which require prior approval of a permit or notice of intent)  
☐ Drying Pad ☐ Above Ground Steel Tanks ☐ Haul-off Bins ☐ Other \_\_\_\_\_  
☐ 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: 45 bbl Type of fluid: Primarily produced water w/ compressor skid precipitation & incidental lubricating oil  
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 \_\_\_\_\_ electronic monitoring \_\_\_\_\_  
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 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 checked="" type="checkbox"/> Yes <input 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 & 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:  Date: 1-18-10

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:  Approval Date: 5/16/2012

Title: Deputy Oil & Gas Inspector, District #3 OCD Permit Number: \_\_\_\_\_

21.

**Closure Report (required within 60 days of closure completion):** Subsection K of 19.15.17.13 NMAC

**Instructions:** Operators are required to obtain an approved closure plan prior to implementing any closure activities and submitting the closure report. The closure report is required to be submitted to the division within 60 days of the completion of the closure activities. Please do not complete this section of the form until an approved closure plan has been obtained and the closure activities have been completed.

☐ Closure Completion Date: \_\_\_\_\_

22.

**Closure Method:**

☐ Waste Excavation and Removal ☐ On-Site Closure Method ☐ Alternative Closure Method ☐ Waste Removal (Closed-loop systems only)  
☐ If different from approved plan, please explain.

23.

**Closure Report Regarding Waste Removal Closure For Closed-loop Systems That Utilize Above Ground Steel Tanks or Haul-off Bins Only:**

**Instructions:** Please identify the facility or facilities for where the liquids, drilling fluids and drill cuttings were disposed. Use attachment if more than two facilities were utilized.

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

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

Were the closed-loop system operations and associated activities performed on or in areas that *will not* be used for future service and operations?

☐ Yes (If yes, please demonstrate compliance to the items below) ☐ No

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

- ☐ Site Reclamation (Photo Documentation)  
☐ Soil Backfilling and Cover Installation  
☐ Re-vegetation Application Rates and Seeding Technique

24.

**Closure Report Attachment Checklist:** *Instructions: Each of the following items must be attached to the closure report. Please indicate, by a check mark in the box, that the documents are attached.*

- ☐ Proof of Closure Notice (surface owner and division)  
☐ Proof of Deed Notice (required for on-site closure)  
☐ Plot Plan (for on-site closures and temporary pits)  
☐ Confirmation Sampling Analytical Results (if applicable)  
☐ Waste Material Sampling Analytical Results (required for on-site closure)  
☐ Disposal Facility Name and Permit Number  
☐ Soil Backfilling and Cover Installation  
☐ Re-vegetation Application Rates and Seeding Technique  
☐ Site Reclamation (Photo Documentation)

On-site Closure Location: Latitude \_\_\_\_\_ Longitude \_\_\_\_\_ NAD: ☐ 1927 ☐ 1983

25.

**Operator Closure Certification:**

I hereby certify that the information and attachments submitted with this closure report is true, accurate and complete to the best of my knowledge and belief. I also certify that the closure complies with all applicable closure requirements and conditions specified in the approved closure plan.

Name (Print): \_\_\_\_\_ Title: \_\_\_\_\_

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

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

**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 San Juan 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 Contract 148 #7  
API No: 30-039-05995  
Location: UL P, Sec 15, 25N, 05W

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, Facility Inspection Sheet, Below-Grade Tank Diagram  
09 – Karst Map for unstable areas

**References**

# **Section I**

**Sitting Criteria Compliance Demonstration**

## Jicarilla Apache Tribal 148 #7

API No. 30-039-05995

### 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)	No - 100 Ft from Dry Wash	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.

- 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

Most of our below-grade tank systems were installed prior to June 16, 2008 and are 16.5' x 16.5' x 4' square excavated area design. As tanks are retro fitted, this will be changed to one of the above. 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 Appendix 8 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 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.

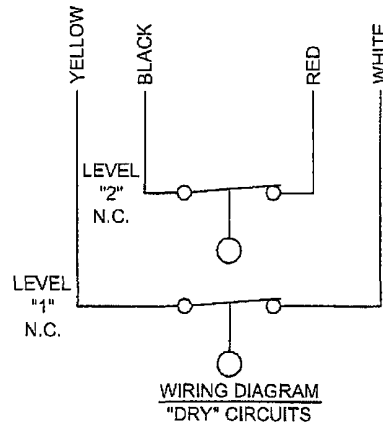
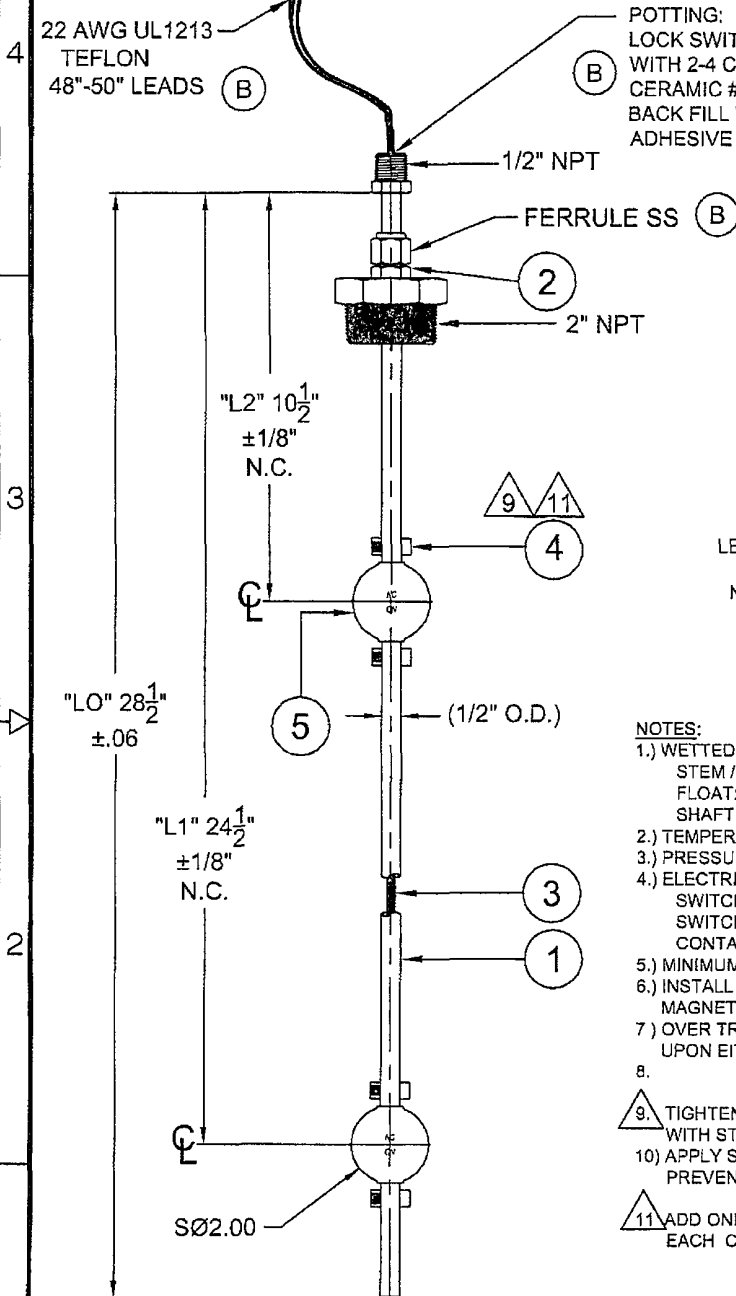
EV tank design will be a single walled tank constructed to ensure that the side walls are open for visual inspection for leaks; the bottom will be elevated six inches above the ground surface and will contain a geomembrane liner, as described above, directly on the ground level of the containment area.

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, retrofitted 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.

PROPRIETARY NOTICE:  
THIS DOCUMENT AND THE DATA  
DISCLOSED HEREIN OR HEREWITH  
IS NOT TO BE REPRODUCED,  
USED, OR DISCLOSED IN WHOLE  
OR IN PART TO ANYONE WITHOUT  
THE PERMISSION OF INNOVATIVE  
SOLUTIONS

REVISION BLOCK				
REV.	E.C.N. NO.	DESCRIPTION	DATE	APPR'D.
00		INITIAL RELEASE	6/27/06	D.T.
A	N1389	ADDED TUBE END SHRINK AND POTTING	7/26/07	MJR
B	N1528	UPDATED LEAD WIRES, POTTING AND FERRULE	7/2/09	R.B.



#### NOTES:

- WETTED MATERIALS:  
STEM / MOUNTING: 316/316L S.S.  
FLOAT: 316L S.S.  
SHAFT COLLAR: 316 S.S.
- TEMPERATURE RANGE: -40°F to +250°F
- PRESSURE RATING: 120 PSIG
- ELECTRICAL SPECIFICATIONS:  
SWITCHING VOLTAGE: 240V AC/DC MAX.  
SWITCHING CURRENT: 0.5 AMP MAX.  
CONTACT RATING: 50VA MAX.
- MINIMUM MEDIA SP. GR.: 0.85 S.G.
- INSTALL FLOAT IN THE N.C. POSITION WITH MAGNET UP AS SHOWN.
- OVER TRAVEL TO BE BETWEEN 1/16\" AND 3/16\" MAX. UPON EITHER SWITCH CLOSURE OR OPENING.
- 
- TIGHTEN SCREW ONLY 1/2 THRU PAST CONTACT WITH STEM.
- APPLY SILICON SEALER AROUND SWITCHES TO PREVENT SHOCK TO SWITCHES
- ADD ONE DROP OF LOCTITE 290 TO THE SET SCREWS OF EACH COLLAR.

5	2	2000-2000-0006	2000-STD FLOAT	316L S.S.
4	4	0610-0500-0008	1/2\" SHAFT COLLAR	316 S.S.
3	1	3000C3890-0001	SWITCH ASSEMBLY	
2	1	0199-0908-0500	ADJUSTABLE MOUNTING	316/316L
1	1	5000C3890-0001	STEM/MTG. SUB-ASSEMBLY	316/316L
ITEM	QTY	PART NUMBER	DESCRIPTION, CATALOG NO. OR FINISHED SIZE	MAT'L
UNLESS OTHERWISE SPECIFIED				
DIMENSIONS ARE IN INCHES, ( ) ARE IN MM (MILLIMETERS)				
TOLERANCES:				
X ± 1 XX ± .01 XXX ± .005				
FRACTIONS ± 1/64, ANGLES ± 30°				
MACHINED SURFACES:  FINISH				
REMOVE ALL BURRS AND SHARP EDGES				
NEXT ASSY.		MATERIAL: AS NOTED		
		DRAWN BY: MJR DATE: 6/26/06		INNOVATIVE SOLUTIONS, LLC
		CHKD. BY: D.T. DATE: 6/27/06		2 LEVEL S.S. / S.S. FLOAT
		APP'D BY: D.T. DATE: 6/27/06		L500 LEVEL SENSOR
		PROJECT NO.:		FSCM NO.:
		BATCH NO.:		L500C3890-0001
		SIZE: B		SHEET 1 OF 1

## **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 at an imminent threat to fresh water, public health, safety of 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. GSE HD Specifications**

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, %			700	700	700	700	700
Elongation at Yield, %			13	13	13	13	13
	G.L. 2.0 in (51 mm)						
	G.L. 1.3 in (33 mm)						
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
<b>TYPICAL ROLL DIMENSIONS</b>							
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 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 Contract 148 #7**

**API 30-039-05995**

The above referenced well is located at UL P, Sec 15, 25N, 05W at an elevation of 6892. Surface casing was set to a depth of 151' or at a depth of 6741'.

According to the Office of State Engineer, the closest water well drilled was RG 70162 about 4 miles SE of our location. Drilled to 150 feet at an elevation of 7030, it shows water encountered at 95 feet or at a depth of 6935 or 194 feet below our location.

In 1985, Amoco Production drilled their Jicarilla Contract 148 #17 (30-039-21999) about 600 feet North of our location. It was at an elevation of 6888 with no indication of water being encountered. Surface casing was set at 324 feet which would be at 6564. This would be 177 feet above our well.

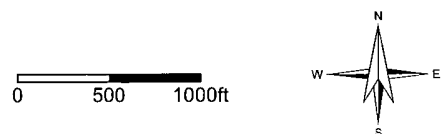
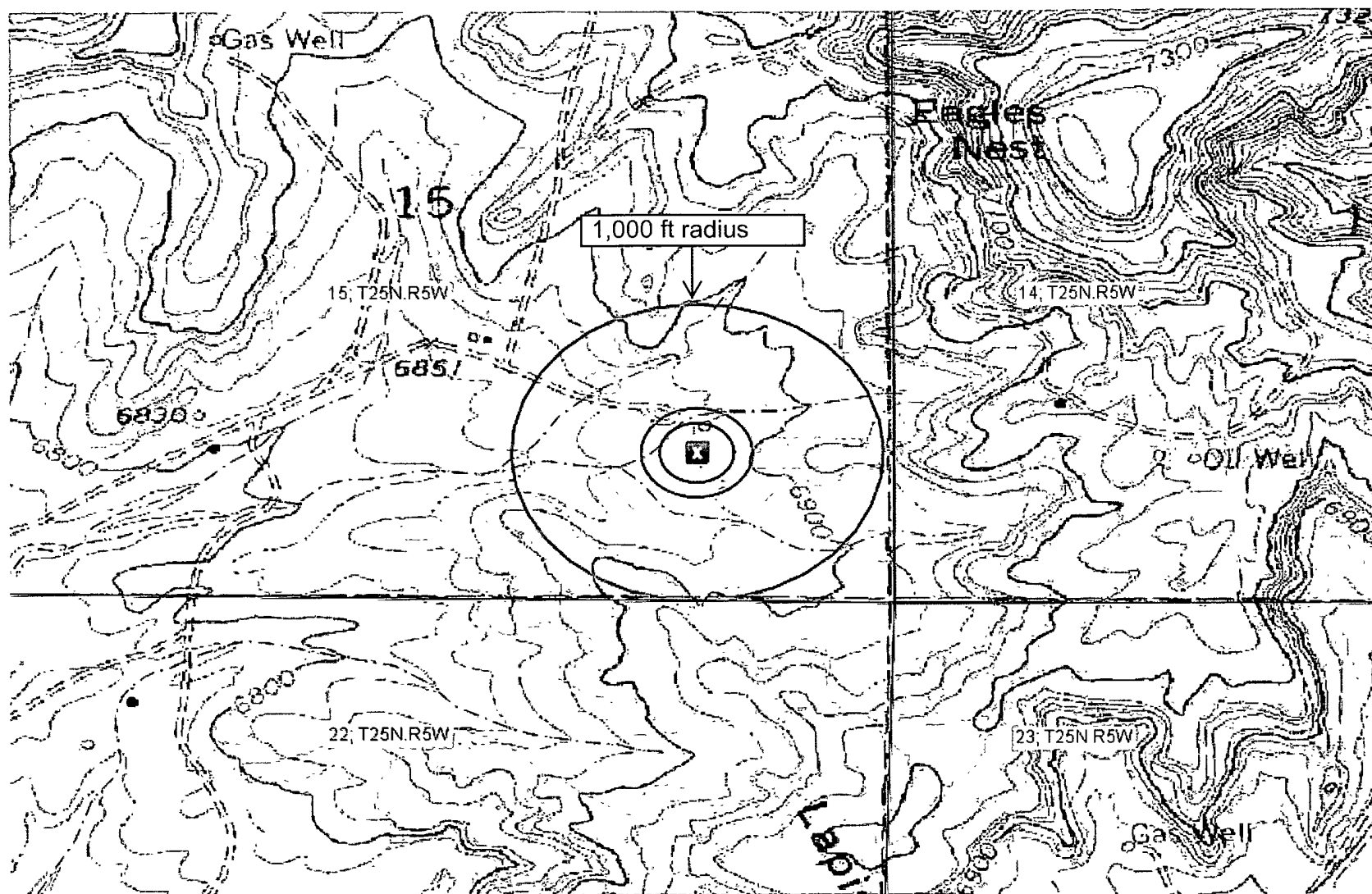
In 1982, Amoco Production drilled their Jicarilla Contract 148 #17Y (30-039-23173) about 200 feet East of our location. It was at an elevation of 6881 with no indication of water being encountered. Surface casing was set at 328 feet which would be at 6553. This would be 188 feet above our well.

The groundwater at our well site would be greater than 150 feet at a minimum. This should allow ample protection for any groundwater in the area.



# **Appendix 01**

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



Petroleum Recovery  
Research Center

TOPO - Jicarilla Contract 148 #7

Figure: 01

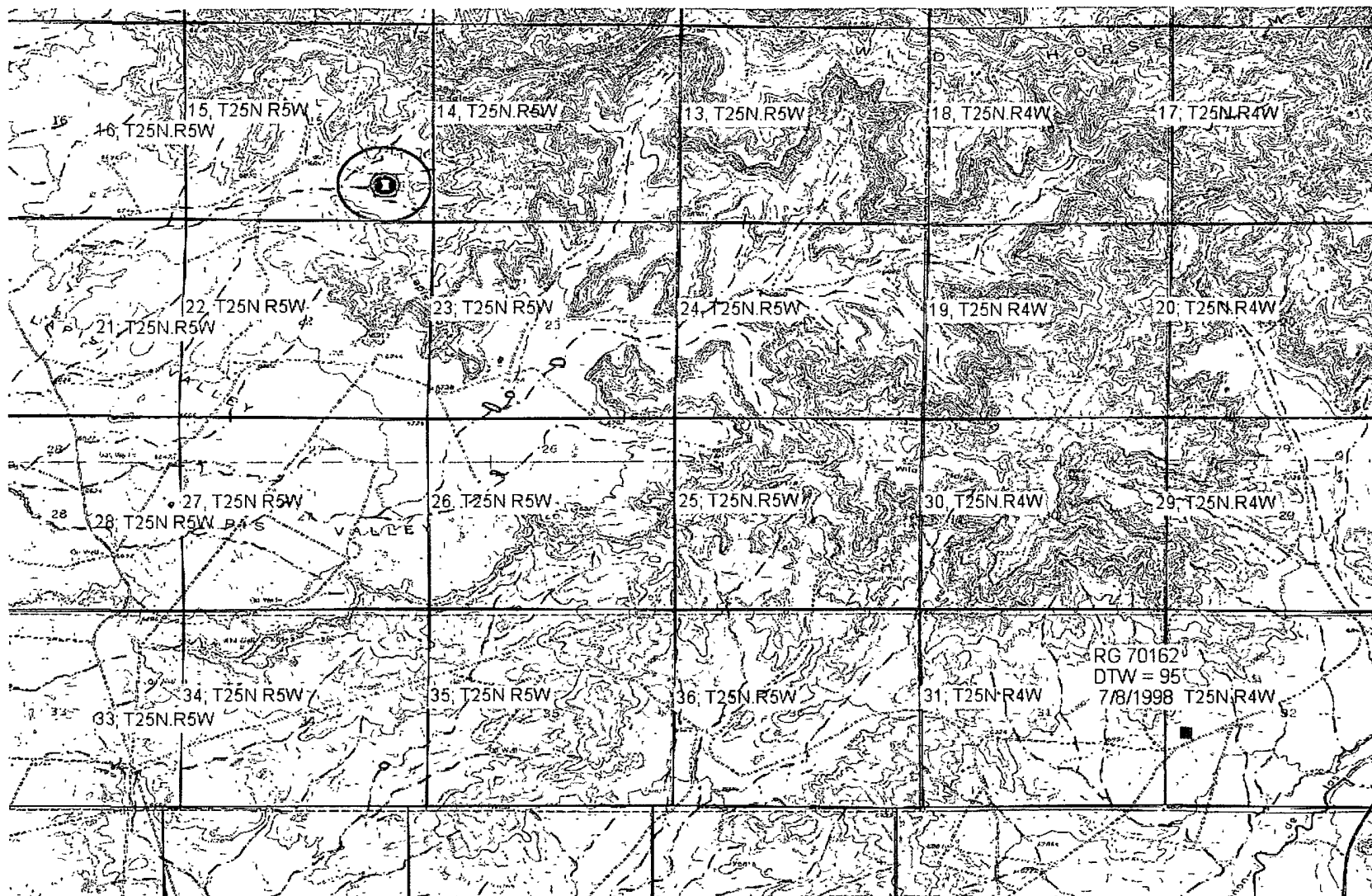
P - Sec 15, 25N, 05W

Jan 06, 2010

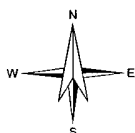
API 30-039-05995

# **Appendix 02**

## **Ground Water Depth**



0 2000 4000ft



Petroleum Recovery  
Research Center

OSE Water Wells - Jicarilla Contract 148 #7

Figure: 02

P - Sec 15, 25N, 05W

Jan 06, 2010

API 30-039-05995



# New Mexico Office of the State Engineer

## Water Right Summary



WR File Number: RG 70162

Primary Purpose: DOM 72-12-1 DOMESTIC ONE HOUSEHOLD

Primary Status: PMT PERMIT

Total Acres:

Total Diversion: 3

Owner: RICHARD AND NAOMI CARDENAS

### Documents on File

Doc	File/Act	Status			Transaction Desc.	From/To	Acres	Diversion	Consumptive
		1	2	3					
72121	1998-07-06	PMT	LOG	PRC	RG 70162	T		3	

### Point of Diversion

(NAD83 UTM in meters)

Pod Number	Source	Q Q Q	64 16 4 Sec Tws Rng	X	Y	Other Location Desc
<u>RG 70162</u>	Shallow			295149	4025729	

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 Richard E. Naomi Candinas Owner's Well No. RG-70162  
Street or Post Office Address P.O. Box 4368 NOCBU  
City and State Taos, NM 87571

Well was drilled under Permit No. HC-17909 and is located in the:

a.  $\frac{1}{4}$   $\frac{1}{4}$   $\frac{1}{4}$   $\frac{1}{4}$  of Section \_\_\_\_\_ Township \_\_\_\_\_ Range \_\_\_\_\_ N.M.P.N.

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

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

d. X = 196000 feet, Y = 1950000 feet, N.M. Coordinate System Central Zone in the Gijosa Grant.

(B) Drilling Contractor Cisneros well Drilling License No. WO-1398

Address P.O. Box 57, Questa, NM 87556

Drilling Began 7/8/98 Completed 7/10/98 Type tools 3 conc bit Size of hole 6 3/4 in.

Elevation of land surface or 7030 at well is \_\_\_\_\_ ft. Total depth of well 150' ft.

Completed well is ☒ shallow ☐ artesian. Depth to water upon completion of well 95' 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			
<u>0-5</u>	<u>5'</u>		<u>Top soil</u>	<u>9 gallons</u>
<u>5'</u>	<u>7'</u>		<u>Clay</u>	
<u>7'</u>	<u>35'</u>		<u>Gravel</u>	
<u>35'</u>	<u>150'</u>		<u>Clay, Gravel, Sand</u>	

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
<u>4 1/2</u>			<u>0'</u>	<u>150'</u>			<u>110'</u>	<u>150'</u>

Section 4. RECORD OF MUDDING AND CEMENTING

Depth in Feet		Hole Diameter	Sacks of Mud	Cubic Feet of Cement	Method of Placement
From	To				
<u>0'</u>	<u>150'</u>	<u>6 3/4</u>	<u>2 sack</u>		<u>By Hand</u>

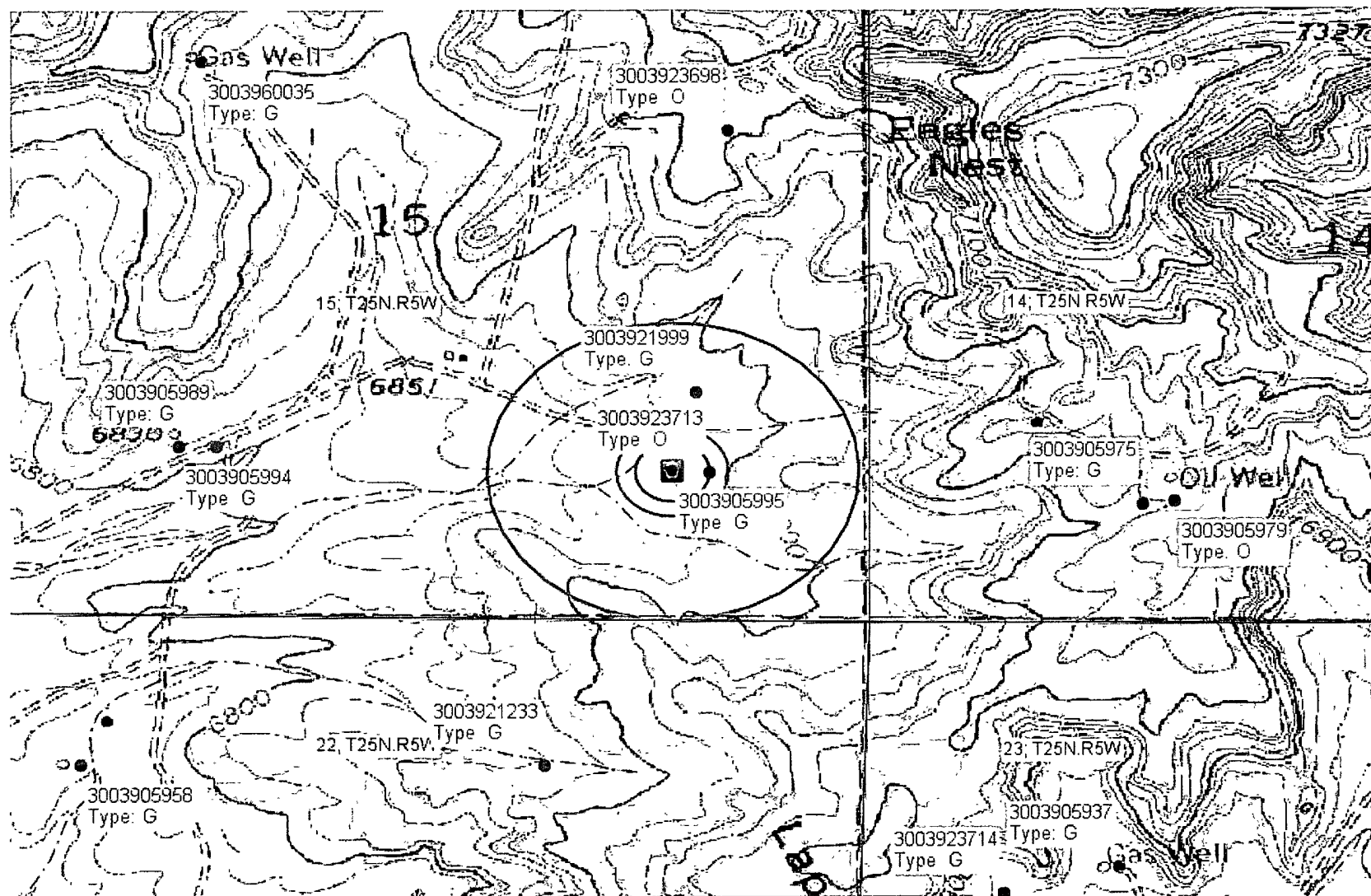
Section 5. PLUGGING RECORD

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			

Date Received 10-5-98 FOR USE OF STATE ENGINEER ONLY X = 196,000  
Y = 1,950,000 Quad Central ✓  
File No. RG-70162 Use Dom Location No. Gijosa



Petroleum Recovery  
Research Center

Offset Wells - Jicarilla Contract 148 #7

Figure: 2a

P - Sec 15, 25N, 05W

Jan 06, 2010

API 30-039-05995

All distances must be from the outer boundaries of the Section

21999

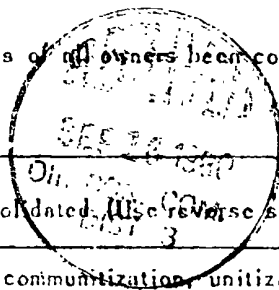
Operator <b>AMOCO PRODUCTION COMPANY</b>			Lease <b>Jicarilla Contract 148</b>		Well No. <b>17</b>
Unit Letter <b>I</b>	Section <b>15</b>	Township <b>25N</b>	Range <b>5W</b>	County <b>Rio Arriba</b>	
Actual Wellbore Location of Well:					
<b>1520</b>	feet from the	<b>South</b>	line and	<b>870</b>	feet from the
<b>6888</b>	Ground Level Elev.	<b>Chacra</b>	Producing Formation	<b>Otero Chacra</b>	Dedicated Acreage
					<b>160 Acres</b>

1. Outline the acreage dedicated to the subject well by colored pencil or hatchure marks on the plat below.
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).
3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling, etc?

☐ Yes ☐ No If answer is "yes," type of consolidation \_\_\_\_\_

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) \_\_\_\_\_

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Division.



ACCEPTED FOR RECORD

SEP 15 1980

FARMINGTON DISTRICT

BY \_\_\_\_\_

Section 15

870'

1520'

#### CERTIFICATION

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

*R. A. Downey*

Name

**R. A. DOWNEY**

Position

**DISTRICT ENGINEER**

Company

**AMOCO PRODUCTION COMPANY**

Date

**SEPTEMBER 9, 1980**

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 knowledge and belief.

Date Surveyed

**November 30, 1978**

Registered Professional Engineer  
and/or Land Surveyor

Original signed by  
**Fred B. Kerr, Jr.**

Certificate No.

**3950**

0 100 200 300 400 500 600 700 800 900 1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000

AMOCO



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE\*

(See other In-  
structions on  
reverse side)Form approved.  
Budget Bureau No. 42-R555.6.

## WELL COMPLETION OR RECOMPLETION REPORT AND LOG\*

1a. TYPE OF WELL:		OIL WELL <input checked="" type="checkbox"/> GAS WELL <input type="checkbox"/> DRY <input type="checkbox"/> Other <input type="checkbox"/>	
b. TYPE OF COMPLETION:		NEW WELL <input checked="" type="checkbox"/> WORK OVER <input type="checkbox"/> DEEP-EN <input type="checkbox"/> PLUG BACK <input type="checkbox"/> DIFF. RESVR. <input type="checkbox"/> Other <input type="checkbox"/>	
2. NAME OF OPERATOR Amoco Production Company			
3. ADDRESS OF OPERATOR 501 Airport Drive Farmington, NM 87401			
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)* At surface 1520' FSL x 870' FEL Section 15, T25N, R5W At top prod. interval reported below Same At total depth Same			
14. PERMIT NO.		DATE ISSUED	
15. DATE SPUNDED 5-1-79		16. DATE T.D. REACHED 5-21-79	
17. DATE COMPL. (Ready to prod.) 1-15-80		18. ELEVATIONS (DF, REB, RT, CR, ETC.)* 6888' GL 6901' KB	
19. ELEV. CASINGHEAD		20. TOTAL DEPTH, MD & TVD 7800'	
21. PLUG, BACK T.D., MD & TVD 7300'		22. IF MULTIPLE COMPL., HOW MANY*	
23. INTERVALS DRILLED BY O-TD		24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)* 6436-6798', Gallup	
25. WAS DIRECTIONAL SURVEY MADE No		26. TYPE ELECTRIC AND OTHER LOGS RUN Radioactivity Gamma Collar Perforation, Linear Neutron Compensated Density, Induction	
27. WAS WELL CORRED No		28. CASING RECORD (Report all strings set in well) Electric	
CASING SIZE		WEIGHT, LB./FT.	
9-5/8"		32.30#	
7"		20#, 23#, 26#	
DEPTH SET (MD)		HOLE SIZE	
324'		12-1/4"	
7800'		8-3/4"	
CEMENTING RECORD		AMOUNT PULLED	
250 SX			
1225 SX			
29. LINER RECORD		30. TUBING RECORD	
SIZE		TOP (MD)	
BOTTOM (MD)		SACKS CEMENT*	
SCREEN (MD)		SIZE	
2-3/8"		DEPTH SET (MD)	
6806'		PACKER SET (MD)	
7300'			
31. PERFORATION RECORD (Interval, size and number) 6436-6450', 6478-6494', 6510-6550', 2 SPF total of 140 holes. 6618-6656', 6500-6710', 6744-6754', 6788-6798', 2 SPF of .38" Dia., total of 116 holes.		32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.	
DEPTH INTERVAL (MD)		AMOUNT AND KIND OF MATERIAL USED	
6436-6550'		250,000# sand, 100,000 gal. frac fluid	
6618-6798'		230,000# sand, 80,000 gal. frac fluid	
33. PRODUCTION		34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.) To be sold	
DATE FIRST PRODUCTION		PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) Pumping	
WELL STATUS (Producing or shut-in) SI		DATE OF TEST 1-15-80	
HOURS TESTED 24		CHOKE SIZE 1.0	
PROD'N. FOR TEST PERIOD 8.5		OIL—BBL. 8.5	
GAS—MCF. 91		WATER—BBL. 0	
OIL GRAVITY-API (CORR.) 36.3		GAS-OIL RATIO 10,706	
FLOW, TUBING PRESS. 40 PSIG		CASING PRESSURE 40 PSIG	
CALCULATED 24-HOUR RATE 8.5		OIL—BBL. 8.5	
GAS—MCF. 91		WATER—BBL. 0	
OIL GRAVITY-API (CORR.) 36.3		GAS-OIL RATIO 10,706	
35. LIST OF ATTACHMENTS		36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records.	
SIGNED E. E. SVOBODA		TITLE Dist. Adm. Supvr.	
DATE 1-22-80		DATE 1-22-80	

JAN 28 '80

\*(See Instructions and Spaces for Additional Data on Reverse Side)

District

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE\*

Form approved.  
Budget Bureau No. 1004-0137  
Expires August 31, 1985

WELL COMPLETION OR RECOMPLETION REPORT AND LOG\*

RECEIVED

1a TYPE OF WELL: ☒ OIL WELL ☐ GAS WELL ☐ DRY ☐ OTHER  
b TYPE OF COMPLETION: ☒ NEW WELL ☐ WORK OVER ☐ DEEP EN ☐ PLUG BACK ☐ DIFF. REPAIR ☐ OTHER  
2 NAME OF OPERATOR: Amoco Production Co.  
3 ADDRESS OF OPERATOR: 501 Airport Drive, Farmington, N M 87401  
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\*  
At surface 990' FSL X 790' FEL  
At top prod. interval reported below same  
At total depth Same

BUREAU OF LAND MANAGEMENT  
FARMINGTON RESOURCE AREA

LEASE DESIGNATION AND SERIAL NO.  
09000148  
6 IF INDIAN ALLOTTEE OR TRIBE NAME  
Jicarilla Apache  
7 UNIT AGREEMENT NAME  
8 LEASE OR LEASE NAME  
Jicarilla Contract 148  
9 WELL NO.  
17 Y  
10 FIELD AND POOL, OR WILDCAT  
W. Lindrith Gallup-Dakota  
11 SEC., T., R., M., OR BLOCK AND SURVEY OR AREA  
SE/SE Sec 15, T25N, R5W

12 COUNTY OR PARISH  
Rio Arriba  
13. STATE  
New Mexico

15. DATE SPUDDED 6-16-85  
16. DATE T.D. REACHED 7-2-85  
17. DATE COMPL. (Ready to prod.) 7-24-85  
18 ELEVATIONS (OF, RNB, RT, GR, ETC.)\* 6894' GR  
19 ELEV. CASINGHEAD 6881' GR

20. TOTAL DEPTH, MD & TVD 7660'  
21. PLUG, BACK T.D., MD & TVD 7629'  
22. IF MULTIPLE COMPL., HOW MANY? Single  
23 INTERVALS DRILLED BY 10-TD

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)\*  
7338'-7526' Gallup Dakota  
25. WAS DIRECTIONAL SURVEY MADE  
Yes

26. TYPE ELECTRIC AND OTHER LOGS RUN  
DIL-GR-SP; LDT-CNL-GR-CAL  
27. WAS WELL CORED  
No

28 CASING RECORD (Report all strings set in well)

CASINO SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT FULLED
8 5/8"	24#, K55	328'	12 1/4"	354 c.f.class B portland	
4 1/2"	11.6#, J55	7659'	7 7/8"	900 c.f. class B Portland, 118 c.f. class B Portland, 620 c.f. class B Portland	

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30 TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 3/8"	7540'	

31. PERFORATION RECORD (Interval, size and number)

7338'-7364', 7454'-7474',  
7498'-7526', 4 jspf, .49",  
296 holes.

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
7338'-7526'	116,000 gal 30# gel led water and 174,000# 20-40 sand

33\* PRODUCTION

DATE FIRST PRODUCTION		PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)				WELL STATUS (Producing or shut-in)	
7/24/84		Pumping				Shut-in	
DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N FOR TEST PERIOD	OIL—BBL	GAS—MCF	WATER—BBL	GAS-OIL RATIO
8/24/84	24 hours	20/64	→	30	370	30	12333
FLOW, TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL—BBL	GAS—MCF	WATER—BBL	OIL GRAVITY-API (CORR.)	
230 PSIG	940 PSIG	→	30	370	30	42°	

34 DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)

To Be Sold

35 LIST OF ATTACHMENTS

None

36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records

SIGNED *[Signature]*

TITLE Adm. Supervisor

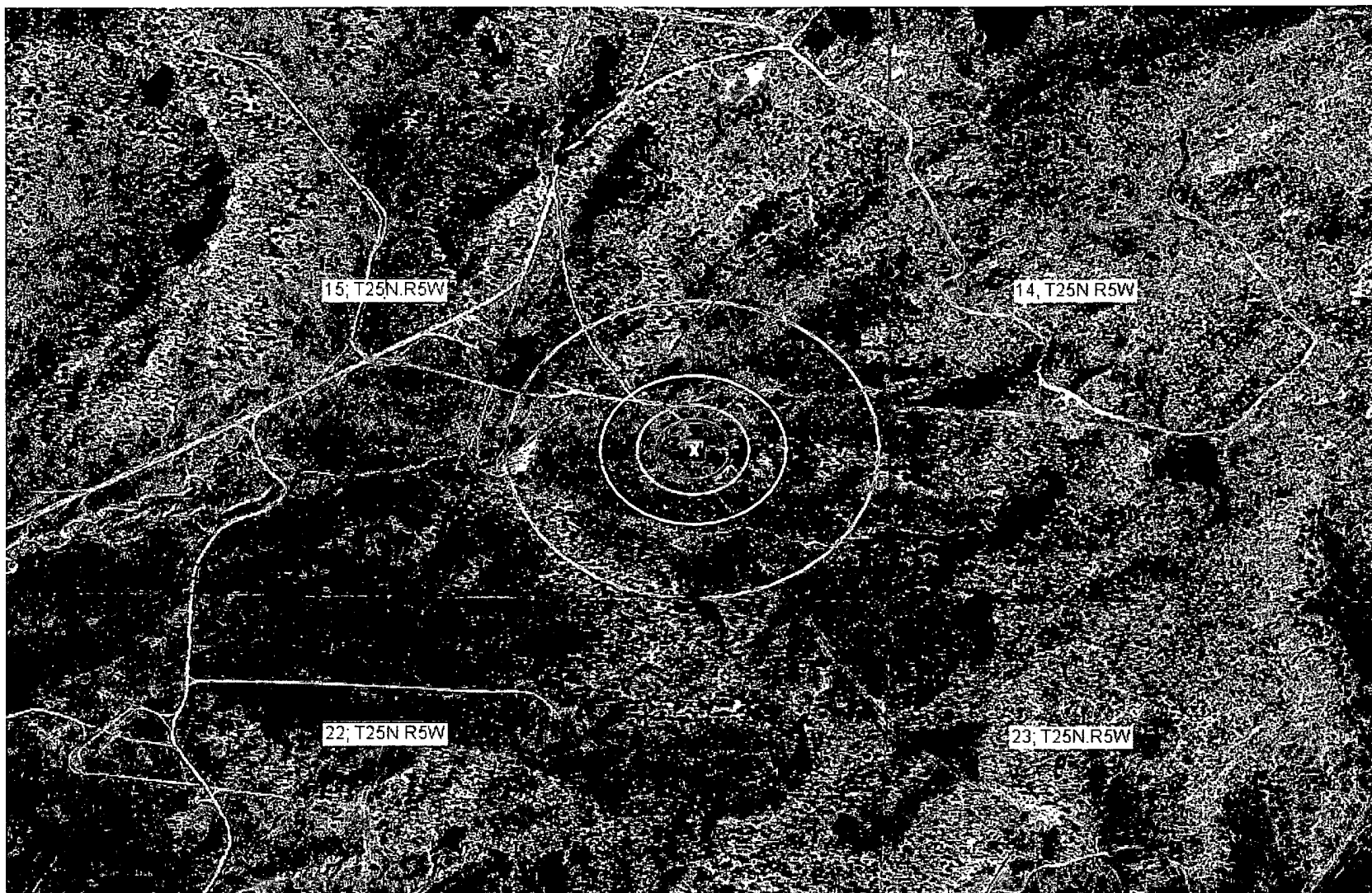
DATE 10/7/85

\*(See Instructions and Spaces for Additional Data on Reverse Side)

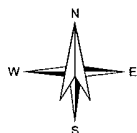
Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States a false statement or representation as to any matter within its jurisdiction.

## **Appendix 03**

**Aerial Photo**



0 500 1000ft



Petroleum Recovery  
Research Center

Aerial - Jicarilla Contract 148 #7

Figure: 03

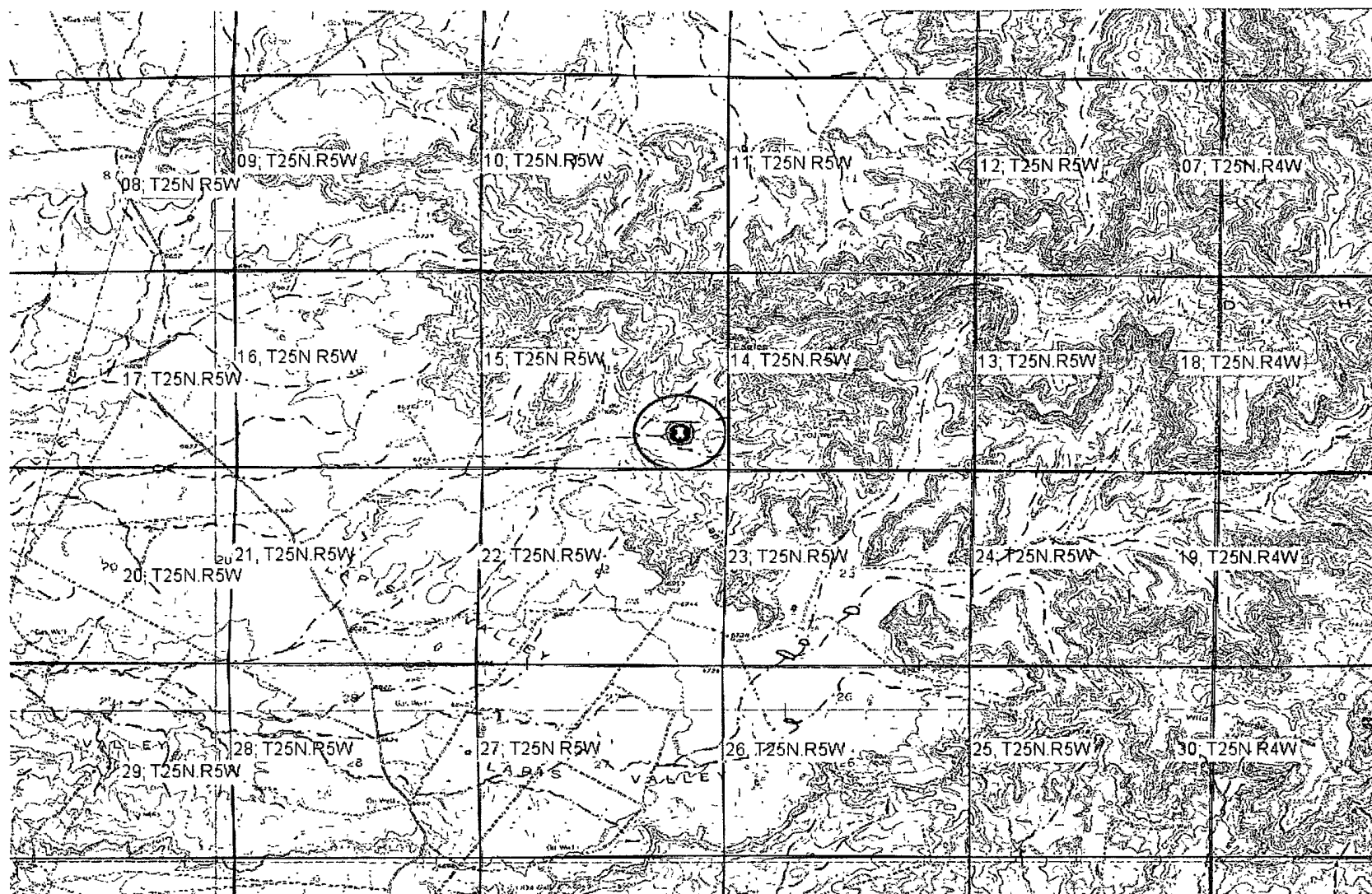
P - Sec 15, 25N, 05W

Jan 06, 2010

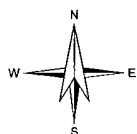
API 30-039-05995

# **Appendix 04**

## **Municipality Boundary Map**



0 2000 4000ft



Petroleum Recovery  
Research Center

Municipalities - Jicarilla Contract 148 #7

Figure: 04

P - Sec 15, 25N, 05W

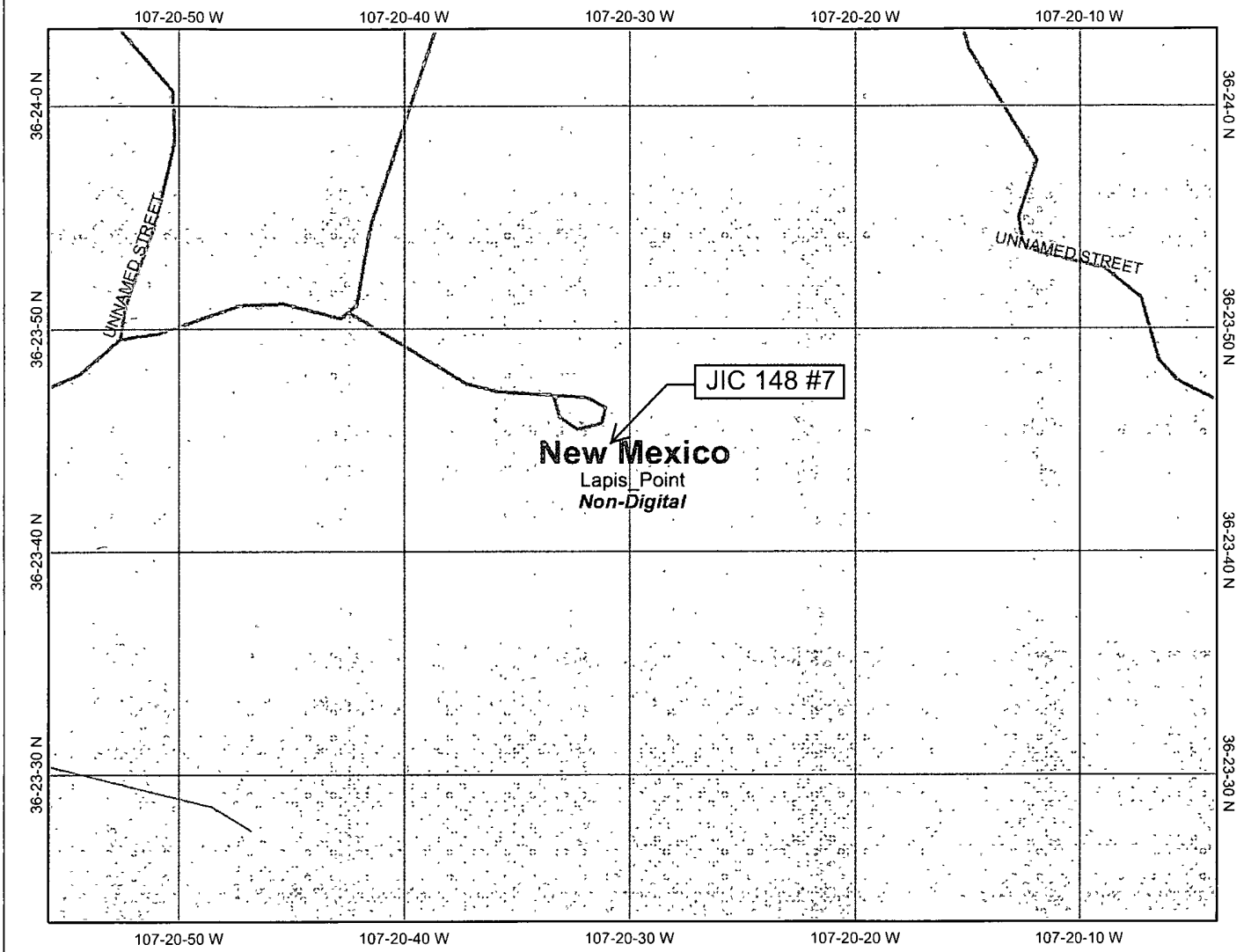
Jan 06, 2010

API 30-039-05995

## **Appendix 05**

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

# Internet Mapping Framework



## Legend

- Ohio\_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: 1:8,659

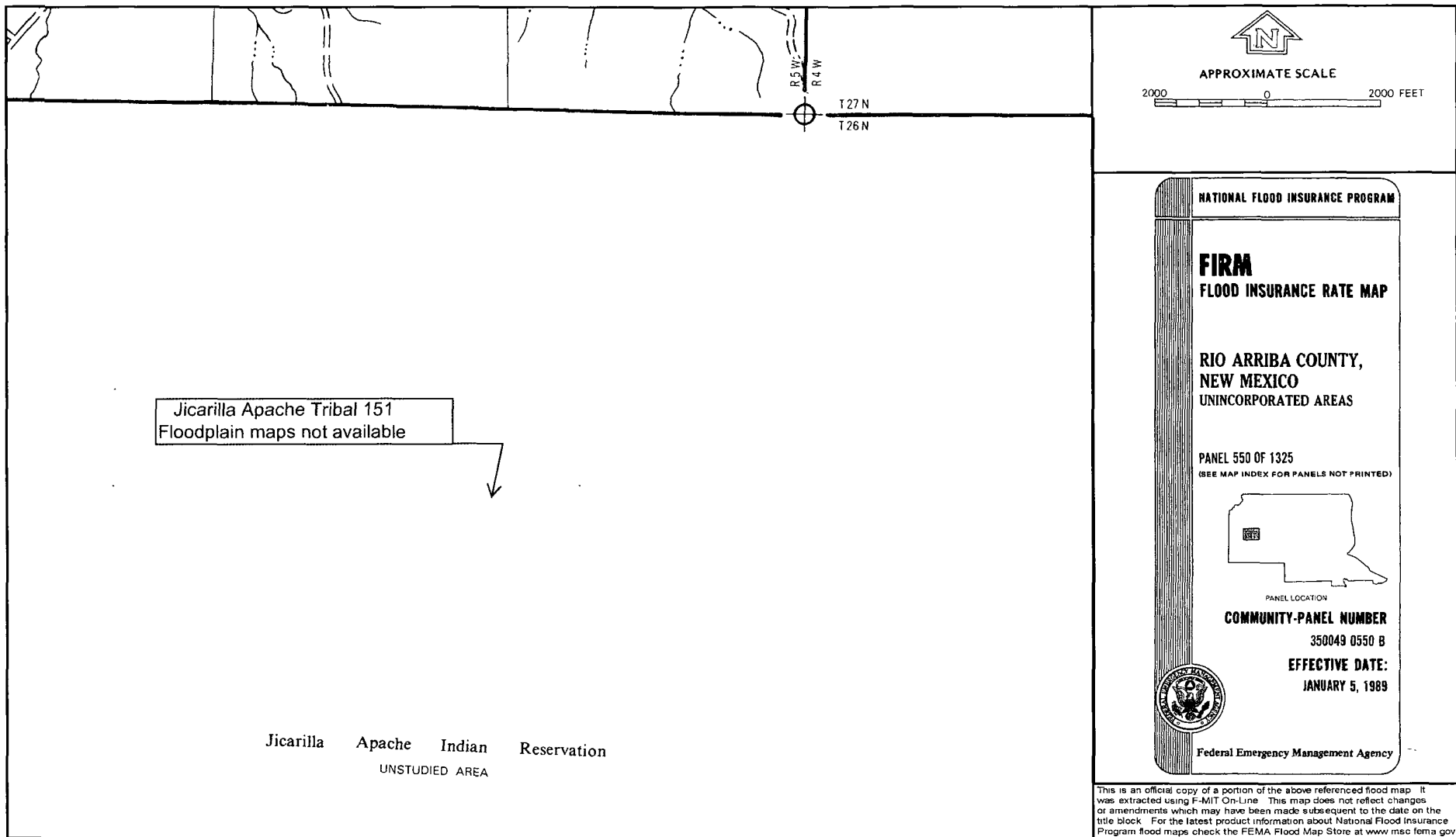
This map is a user generated static output from an Internet mapping site and is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. THIS MAP IS NOT TO BE USED FOR NAVIGATION

Map center: 36° 23' 43" N, 107° 20' 30" W



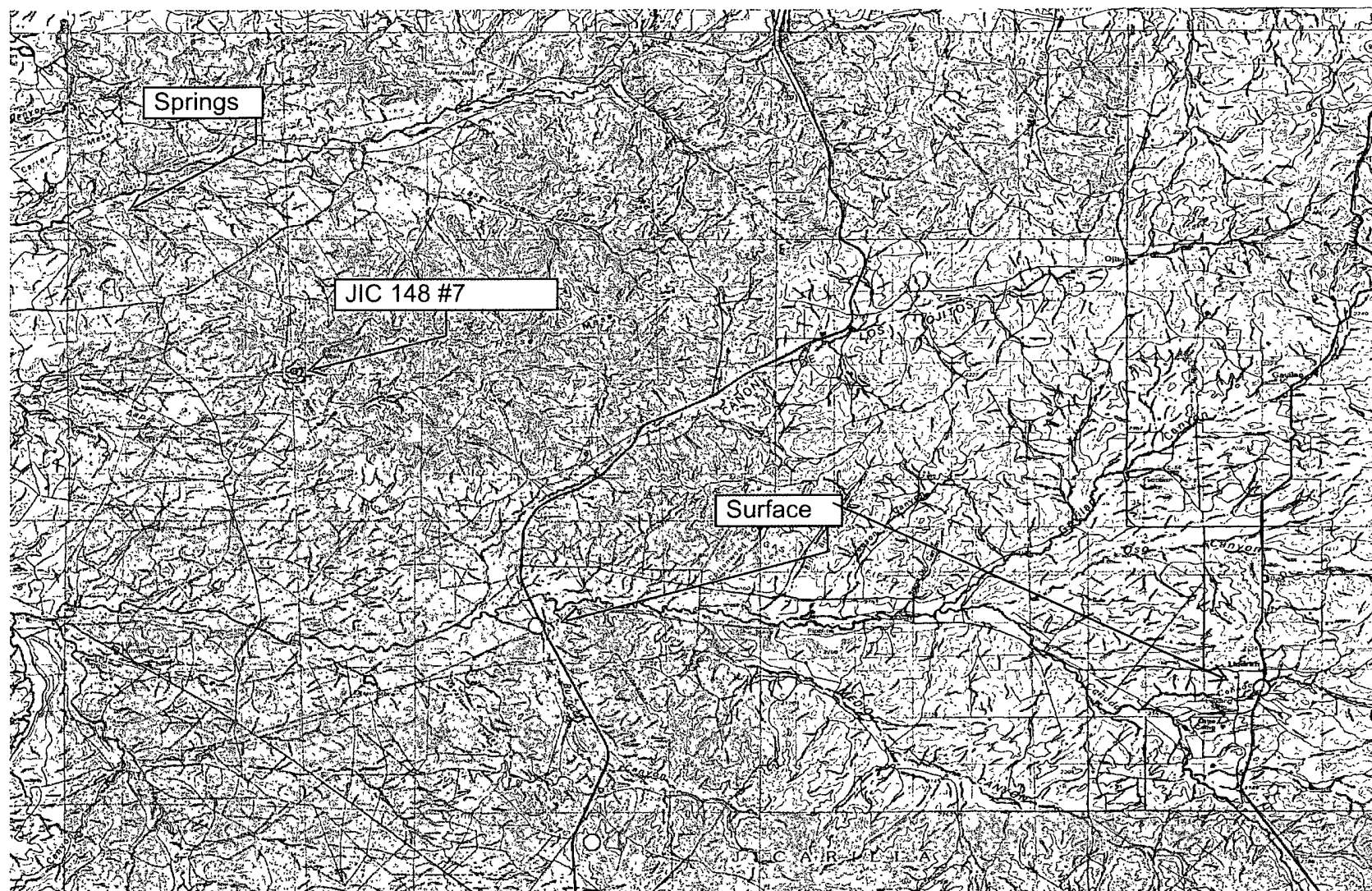
# **Appendix 06**

**FEMA 100-year Floodplain Map**

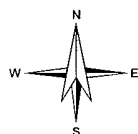


# **Appendix 07**

**Mines, Mills, & Quarries Map**



0 2 4mi



Petroleum Recovery  
Research Center

Mines, Mills, Quarries - Jicarilla Contract 148 #7

Figure: 07

P - Sec 15, 25N, 05W

Jan 06, 2010

API 30-039-05995

## **Appendix 08**

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

NEW MEXICO

Gas Well Plot

OIL CONSERVATION COMMISSION

Jicarilla Contract 148 #7

30-039-05995

Date 1-18-1953

Stanford Oil Co.

Operator

Lease

Lease

Well No.

Name of Producing Formation San Juan Pool San Juan

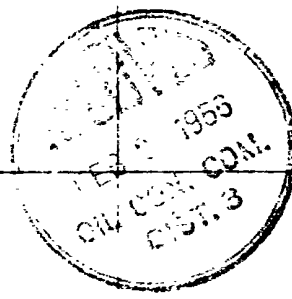
No. Acres Dedicated to the Well 160 ✓

Indicate land status and show ownership.

SECTION 1

TOWNSHIP 5 N

RANGE 3 W

<p>ELEVATION 6892</p>	<p>85/2 @ 151</p>		
			<p>Indian Land 160 acres</p>
			<p>•</p>

I hereby certify that the information given above is true and complete to the best of my knowledge

Signature [Signature]

Position [Signature]

Representing [Signature]

Address [Signature]

# ENERVEST OPERATING LLC

## Below Grade Tank Observed Sitting Requirements

Lease Name & Well Number J. Carillon Contract 148-7PC  
API No. 3003905995  
Observed by Robert Carillon  
Date Observed 9-14-09

MEASURED FROM THE BELOW-GRADE TANK: Yes No If not within limits, explain:

Continuously flowing water course > 300 ft.

☐ ☒

135' South of Dry wash  
100' North of Dry wash

Significant Watercourse, lakebed, sinkhole or  
playa lake > 200 feet

☒ ☐

Permanent Residence > 200 feet

☒ ☐

School > 200 feet

☒ ☐

Hospital > 200'

☒ ☐

Institution or Church > 200'

☒ ☐

Private, domestic fresh water well or  
spring > 500 feet

☒ ☐

Any other fresh water well or spring > 1000 feet

☒ ☐

Within Incorporated municipal boundary of  
defined municipal fresh water field

☐ ☒

Wetland area > 500 feet

☒ ☐

Overlying a subsurface mine

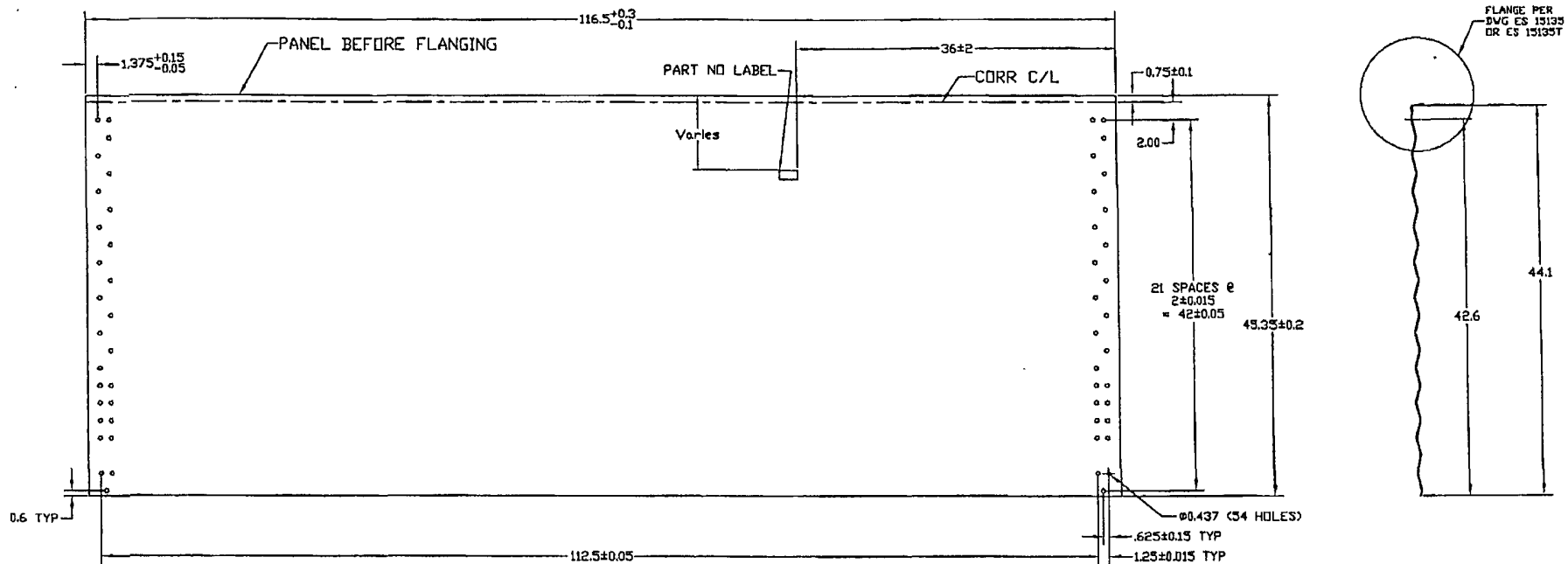
☒ ☒

THERE IS NO SUBSURFACE MINE!  
36° 23.76N 107° 20.49W

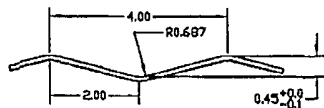
Distance to watercourse or dry wash should be to nearest edge

Please include distance & direction to all waterwells and/or wetland areas

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



44' WALL PANEL BEFORE FLANGING



CORRUGATING DETAIL

MANUFACTURING NOTES:

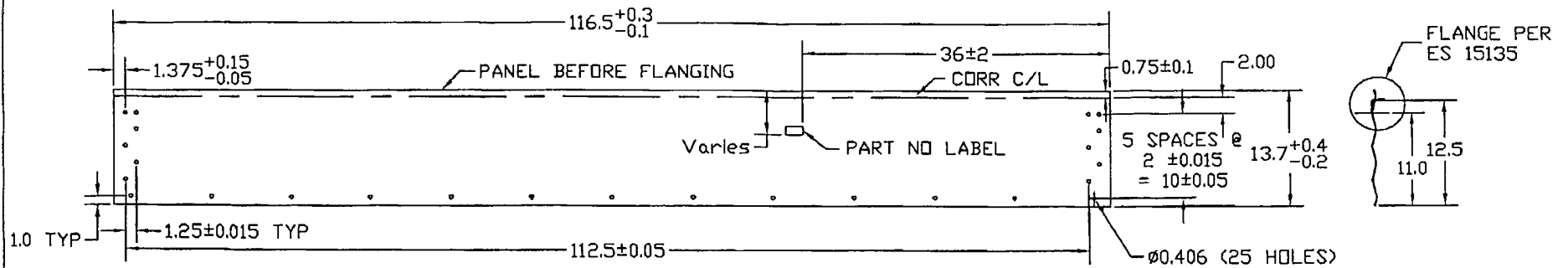
1. CORRUGATION..... SEE DETAIL
2. HOLE OFF CENTER OF CORR..... ± .05
3. HOLE BURR MAX..... .01
4. CUT OFF BURR MAX..... .01
5. CORNER HOLE TO HOLE DIAGONAL ± .15

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

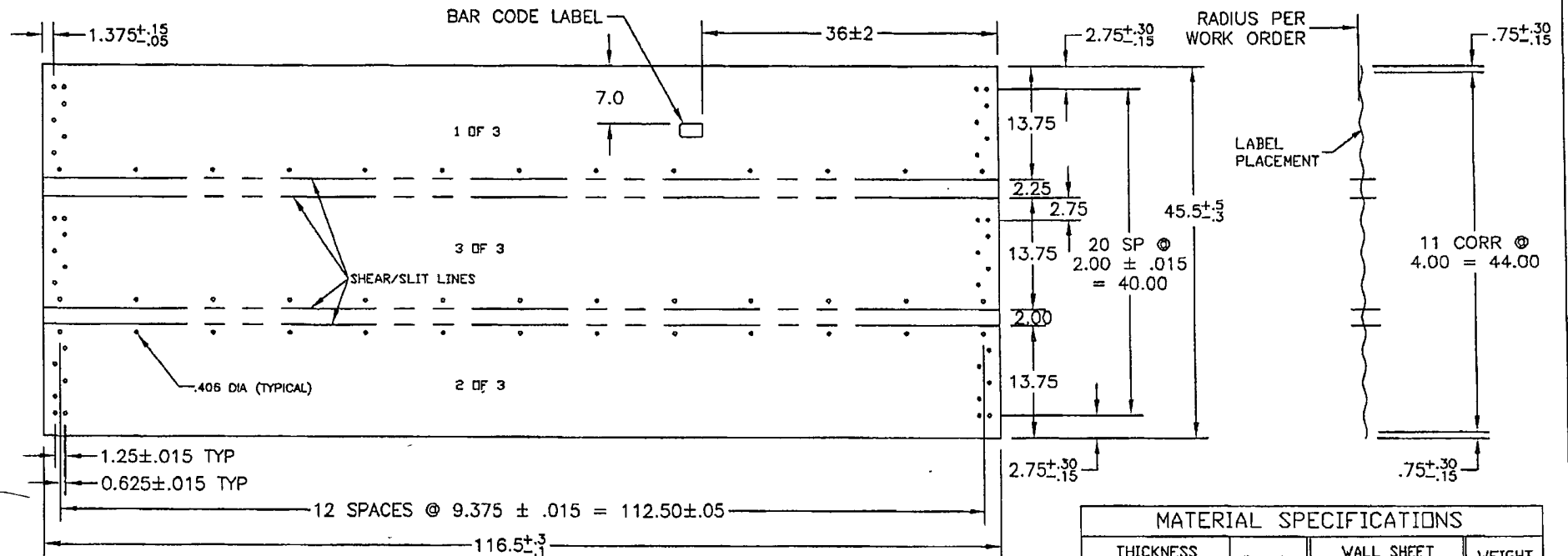
CORRUGATING DETAIL										MATERIAL		BLANK SIZE		SURFACE AREA		WEIGHT (LBS)			
										SEE CHART - ASTM A653 SS GR 50 G115 OIL		46.5 x 116.5				see chart			
										DESND. RM		THIS DRAWING IS THE EXCLUSIVE PROPERTY OF WESTEEL AND ALL RIGHTS ARE RESERVED		SCALE		DWN. (Y.M.D.)		LOCATION	
										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		nts		02.02.19		WINNIPEG	
										DWN. RF				E.C.R. A6647		E.P. NO. 02-255		TYPE ACAD14	
										CHKD. BA		DRAWING TITLE		SIZE		DRAWING NO.		REV. NO.	
										APPD. BA		CONTAINMENT RING 44' WALL PANEL		B		ES 15510		1	
										CUSTOMER		PRINTING DATE							

DIMENSIONS SHOWN ARE IMPERIAL UNITS SHOWN IN BRACKETS				
TOLERANCES (UNLESS OTHERWISE NOTED)				
DIMENSIONS:				
IMPERIAL (in.) METRIC (mm)				
.XX ± .03 .XX ± .10 .XXX ± .010 .XXX ± .10				
ANGULAR ± 1°				
NO	DATE	REVISION	E.C.R.	BY CH.
1	01.28.04	LOWERED CLAMP LOCATION 4"	A6786	RF BA





13 1/2' WALL PANEL LAYOUT BEFORE FLANGING



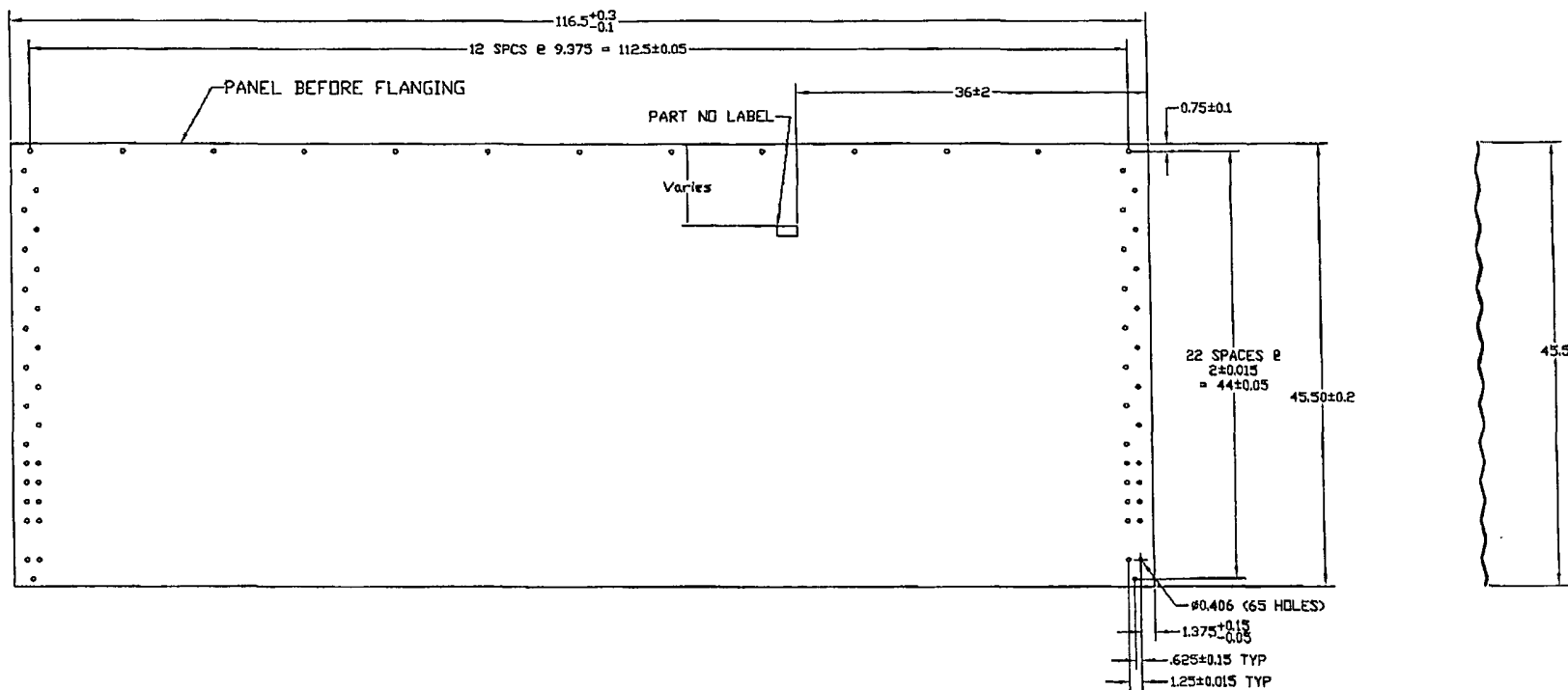
MANUFACTURING VIEW ONLY - TRIPLE PANEL  
CORR & PUNCH, BEFORE SLITTING & FLANGING

MATERIAL SPECIFICATIONS				
THICKNESS		BLANK WIDTH	WALL SHEET PART NO	WEIGHT (LBS)
NOMINAL	MINIMUM			
0.066	0.061	14.75	CW1357F	31.5

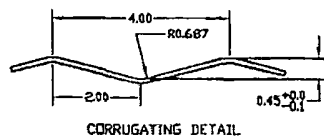
				MATERIAL		BLANK SIZE		WEIGHT (LBS)	
				SEE CHART - ASTM A653 SS GR50 G115 OIL		46.5x116.5 (3 pcs)		31.5	
				DESND. BA		THIS DRAWING IS THE EXCLUSIVE PROPERTY OF VESTEEL AND ALL RIGHTS ARE RESERVED		SCALE N.T.S.	
				DWN. RF		NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM Vesteel Limited		DWN. (Y.M.D.) 2004.11.30	
				CHKD. BA		DRAWING TITLE 13.5' FULL PANEL - 57' ONLY CONTAINMENT RING		E.C.R. A6834	
				APPD. BA		CUSTOMER -		E.P. NO. 02-255	
						PRINTING DATE (Y.M.D.) -		DVG TYPE A-2000	
								SIZE A	
								DRAWING NO. ES 15516	
								REV. NO. O	

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)
.x ? .1	x ? 2
.xx ? .03	.x ? 1.0
.xxx ? .010	.xx ? .50
ANGULAR: ± 1°	




44' WALL PANEL AFTER CORRUGATING AND PUNCHING



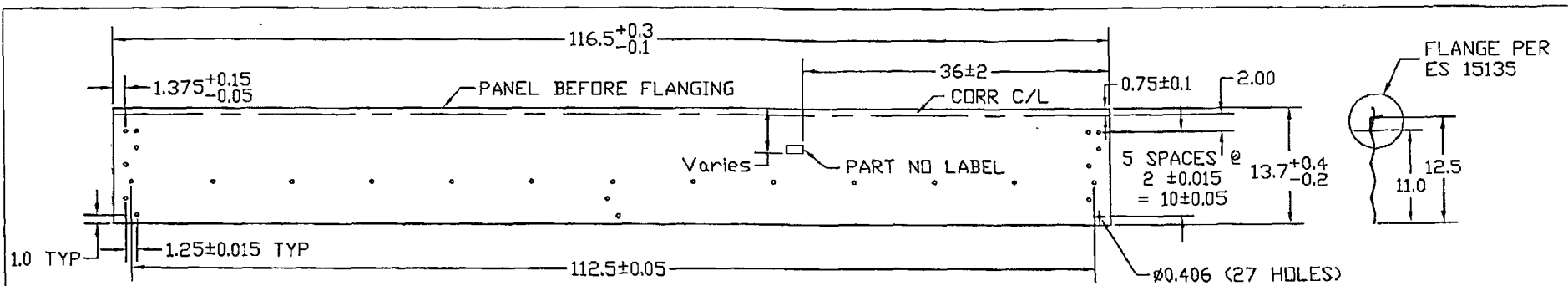
CORRUGATING DETAIL

- 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

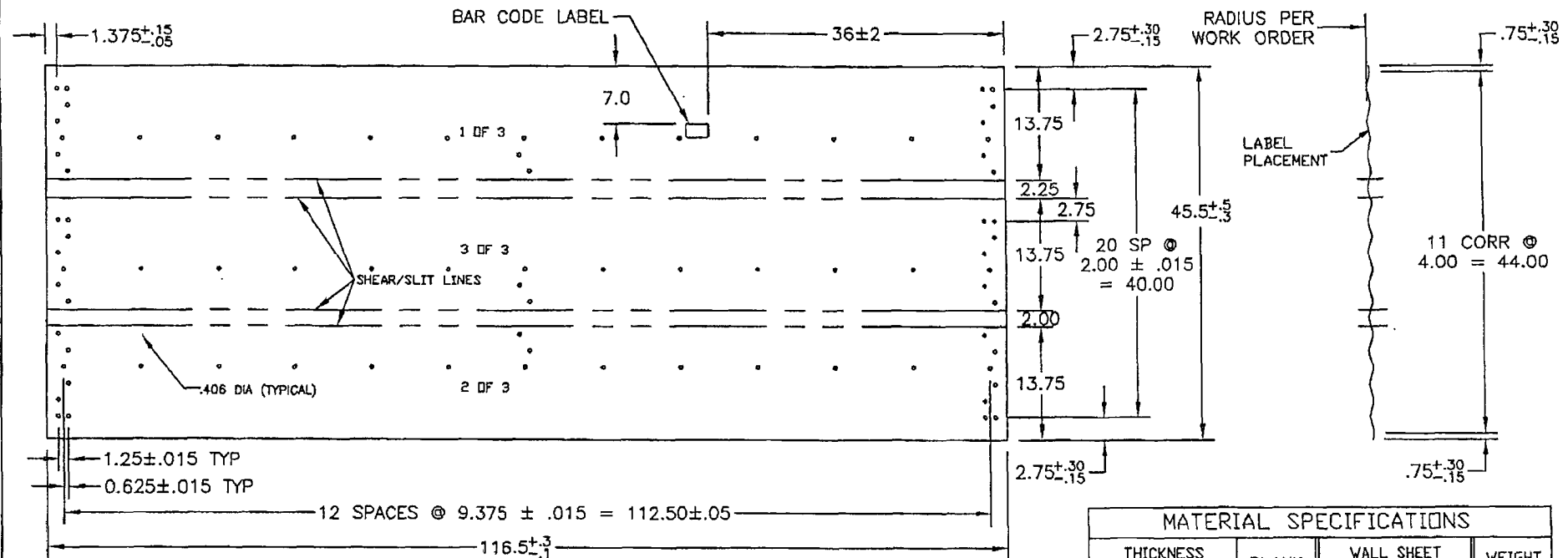
MATERIAL SPECIFICATIONS				
THICKNESS		BLANK WIDTH	WALL SHEET PART NO	WEIGHT (lb)
NOMINAL	MINIMUM			
0.066	0.061	46.5	CW445715F	97.7
0.139	0.130	46.2	CW445710F	208.5

				DIMENSIONS SHOWN ARE IMPERIAL UNITS SHOWN IN BRACKETS		DESIGN BA		THIS DRAWING IS THE EXCLUSIVE PROPERTY OF WESTEEL AND ALL RIGHTS ARE RESERVED NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM WESTEEL, a Division of JENIST'S ENGINEERED PRODUCTS	SCALE nts	DWN. CYM.DJ 04.12.01	LOCATION WINNIPEG			
				TOLERANCES (UNLESS OTHERWISE NOTED)		DWN. RF			E.C.R. A6834	E.P. NO.	TYPE A-2000			
				DIMENSIONS:		CHKD. BA	DRAWING TITLE 44' FULL PANEL - 57' ONLY CONTAINMENT RING	SIZE B	DRAWING NO. ES 15518	REV. NO. 0				
				IMPERIAL (in.) METRIC (mm)		APPR. BA								
				.X ± .1 X ± 2										
				.XX ± .03 X ± 1.0										
				.XXX ± .010 .XX ± .50										
				ANGULAR: ± 1°										
NO	DATE	REVISION	E.C.R. BY	CH.										





13 1/2' WALL PANEL LAYOUT BEFORE FLANGING

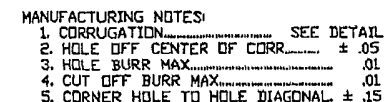


MANUFACTURING VIEW ONLY - TRIPLE PANEL AFTER  
CORR & PUNCH, BEFORE SLITTING & FLANGING

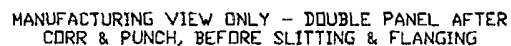
MATERIAL SPECIFICATIONS				
THICKNESS		BLANK WIDTH	WALL SHEET PART NO	WEIGHT (lb)
NOMINAL	MINIMUM			
0.066	0.061	14.75	019419	31.5

MATERIAL					BLANK SIZE		WEIGHT (LBS.)	
SEE CHART - ASTM A653 SS GR50 G115 OIL					46.5x116.5 (3 pcs)		31.5	
THIS DRAWING IS THE EXCLUSIVE PROPERTY OF WESTEEL AND ALL RIGHTS ARE RESERVED. NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM Westeel Limited					SCALE	DWN. (Y.M.D.)	LOCATION	
WESTEEL					N.T.S.	2006.08.08	WPG	
DRAWING TITLE: 9.5" FULL PANEL - 52.5" ONLY CONTAINMENT RING					E.C.R.	E.P. NO.	DVG TYPE	
A6834					02-255	A-2000		
SIZE					DRAWING NO.		REV. NO.	
A					019419		O	
CUSTOMER					PRINTING DATE (Y.M.D.)			
BA					-			

DIMENSIONS SHOWN ARE IMP				
MM UNITS SHOWN IN BRACKETS				
TOLERANCES (UNLESS OTHERWISE NOTED)				
DIMENSIONS:				
IMPERIAL (in)		METRIC (mm)		
x ? .1		x ? 2		
xxx ? .03		xx ? 1.0		
xxx ? .010		xx ? .50		
ANGULAR ± 1°				
NO	DATE	REVISION	E.C.R.	BY CH.

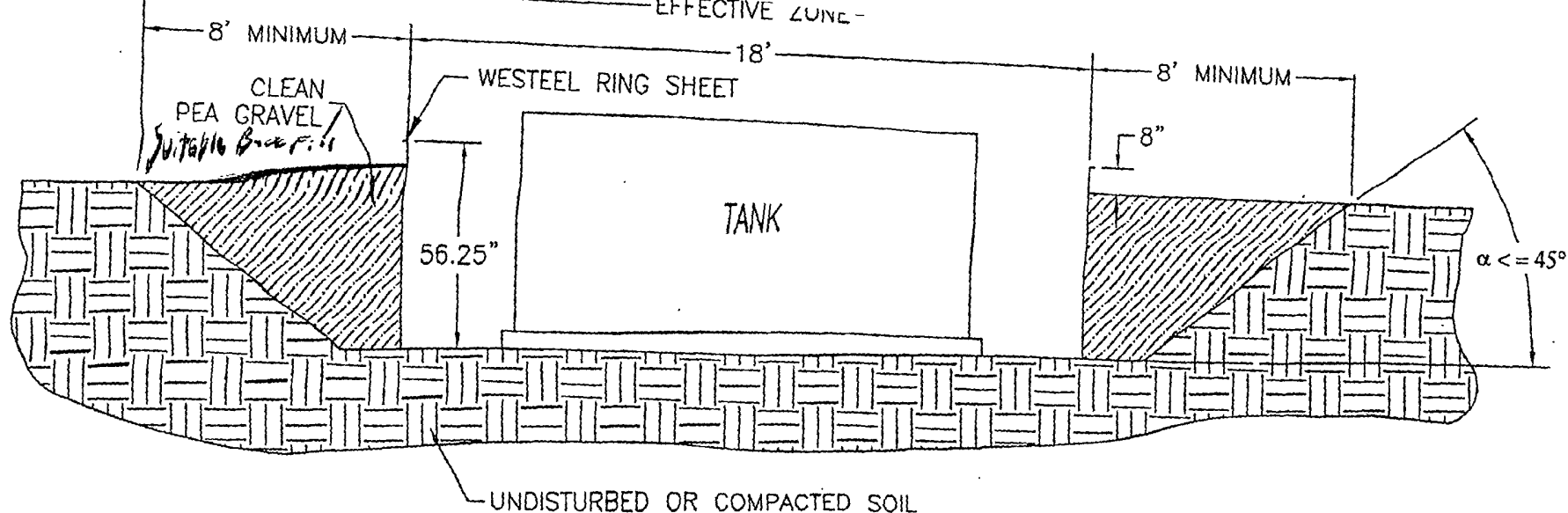


MATERIAL SPECIFICATIONS				
THICKNESS		BLANK WIDTH	WALL SHEET PART NO	WEIGHT (lb)
NOMINAL	MINIMUM			
0.066	0.061	23.3	C10514	49.4



1	06/12/06	CORRECTED HOLE PATTERN ON BOTTOM PLANK	A689B	RF	RF
NO	DATE	REVISION	E.C.R.	BY	CH

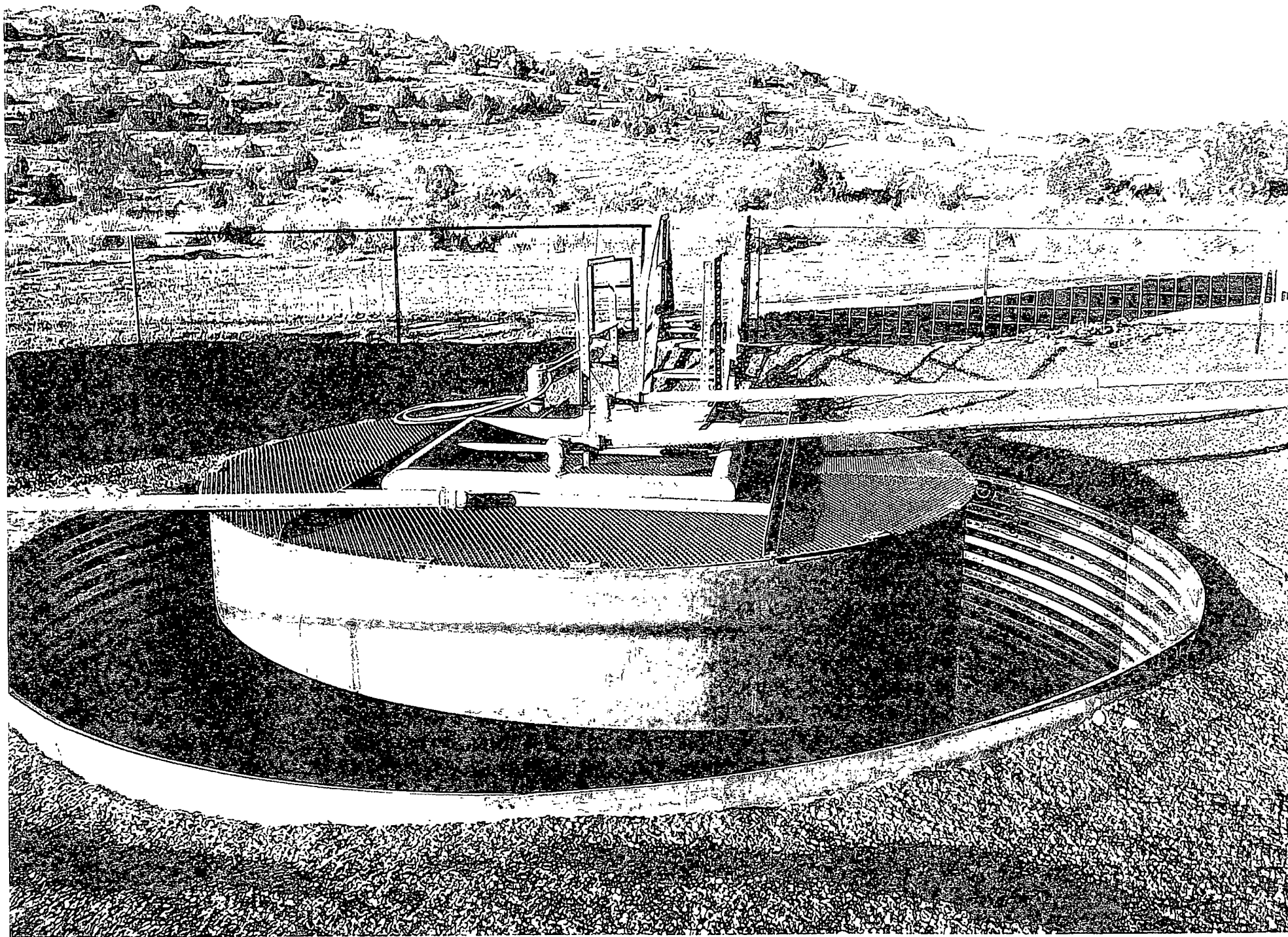
MATERIAL SEE CHART - ASTM A653 SQ GR50 G115 OIL		BLANK SIZE 46.6x116.5 (2 pcs)		SURFACE AREA		WEIGHT (LBS.) 49.4	
DESIGN RM	THIS DRAWING IS THE EXCLUSIVE PROPERTY OF WESTEEL AND ALL RIGHTS ARE RESERVED NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM WESTEEL, a Division of JENSTYS ENGINEERED PRODUCTS			SCALE n ts	DWN (Y/M/D) 98.08.13	LOCATION WINNIPEG	
DWN RM				E.C.R. A 6428	E.P. NO 98-197	TYPE ACAD14	
CHUCK YS	DRAWING TITLE CONTAINMENT RING 22" WALL PANEL			SIZE	DRAWING NO.		REV. NO.
APPRO RM	CUSTOMER		PRINTING DATE		B C10514		1

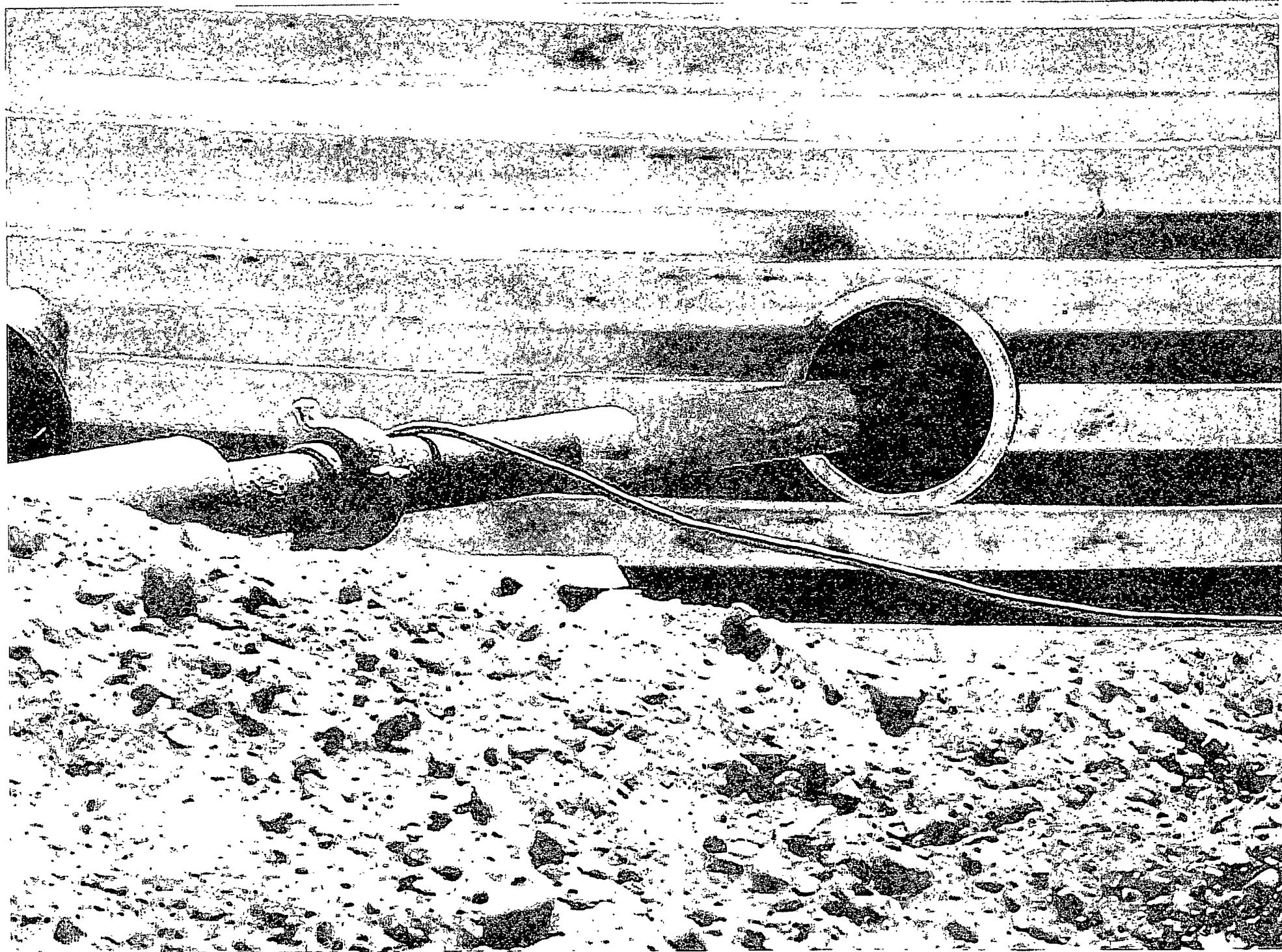


#### INSTALLATION INSTRUCTIONS & SITE REQUIREMENTS

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.





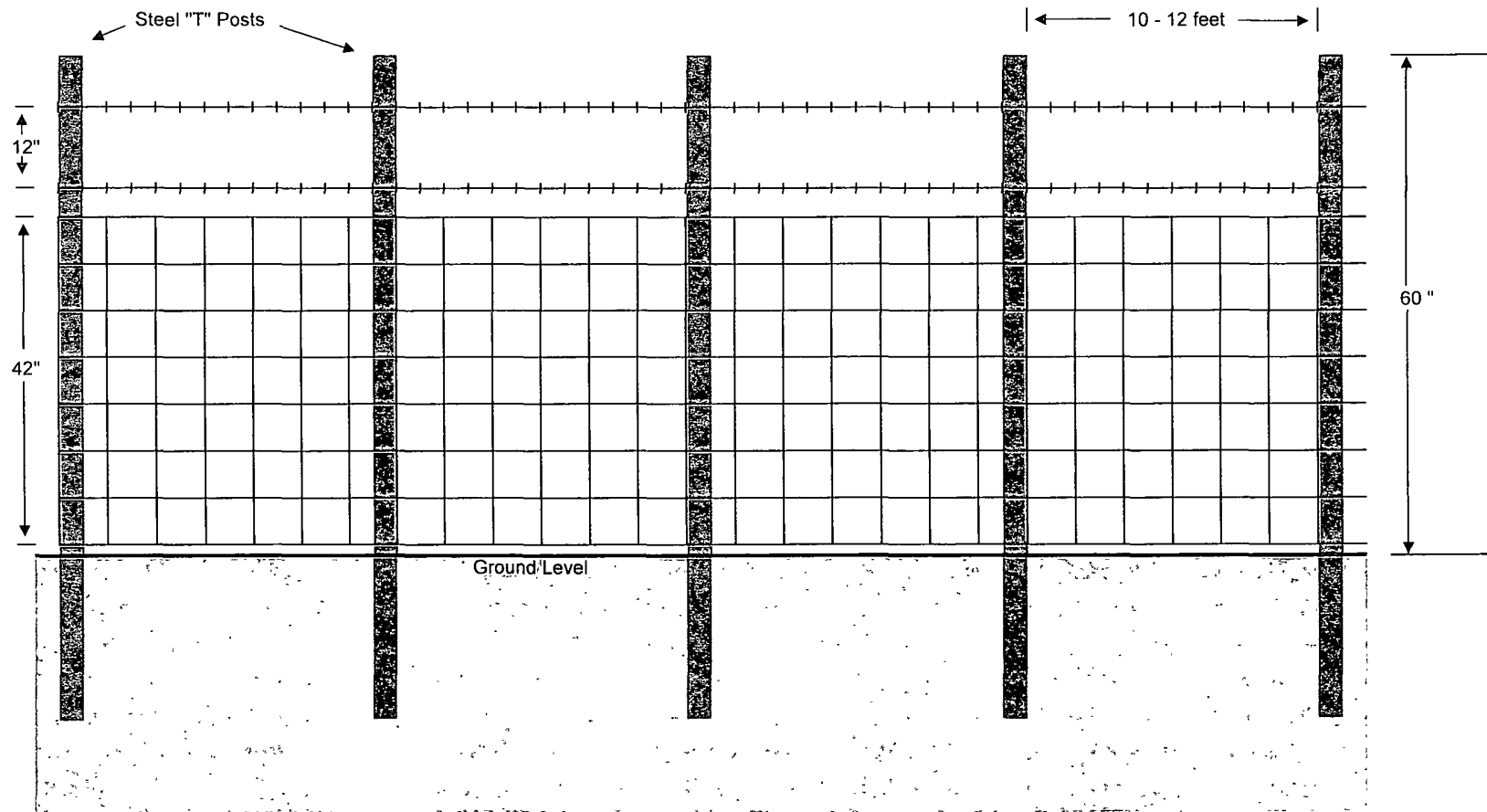


ENERVEST OPERATING, LLC

Proposed Alternative Fencing

Below-Grade Tank Construction

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

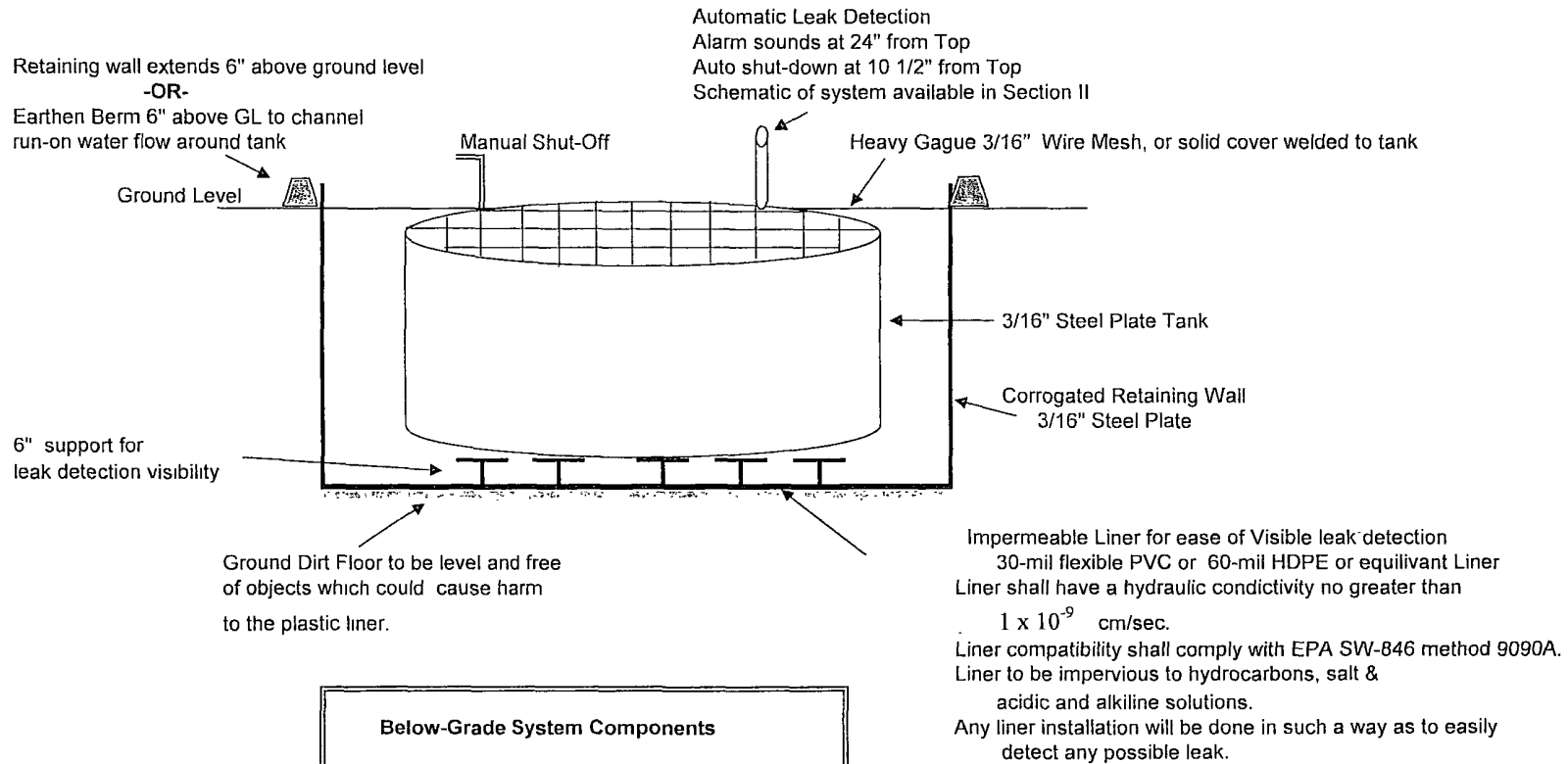




EnerVest Operating, LLC  
Western Division

## Below-Grade Tank System

Gravity Fed - Produced Water



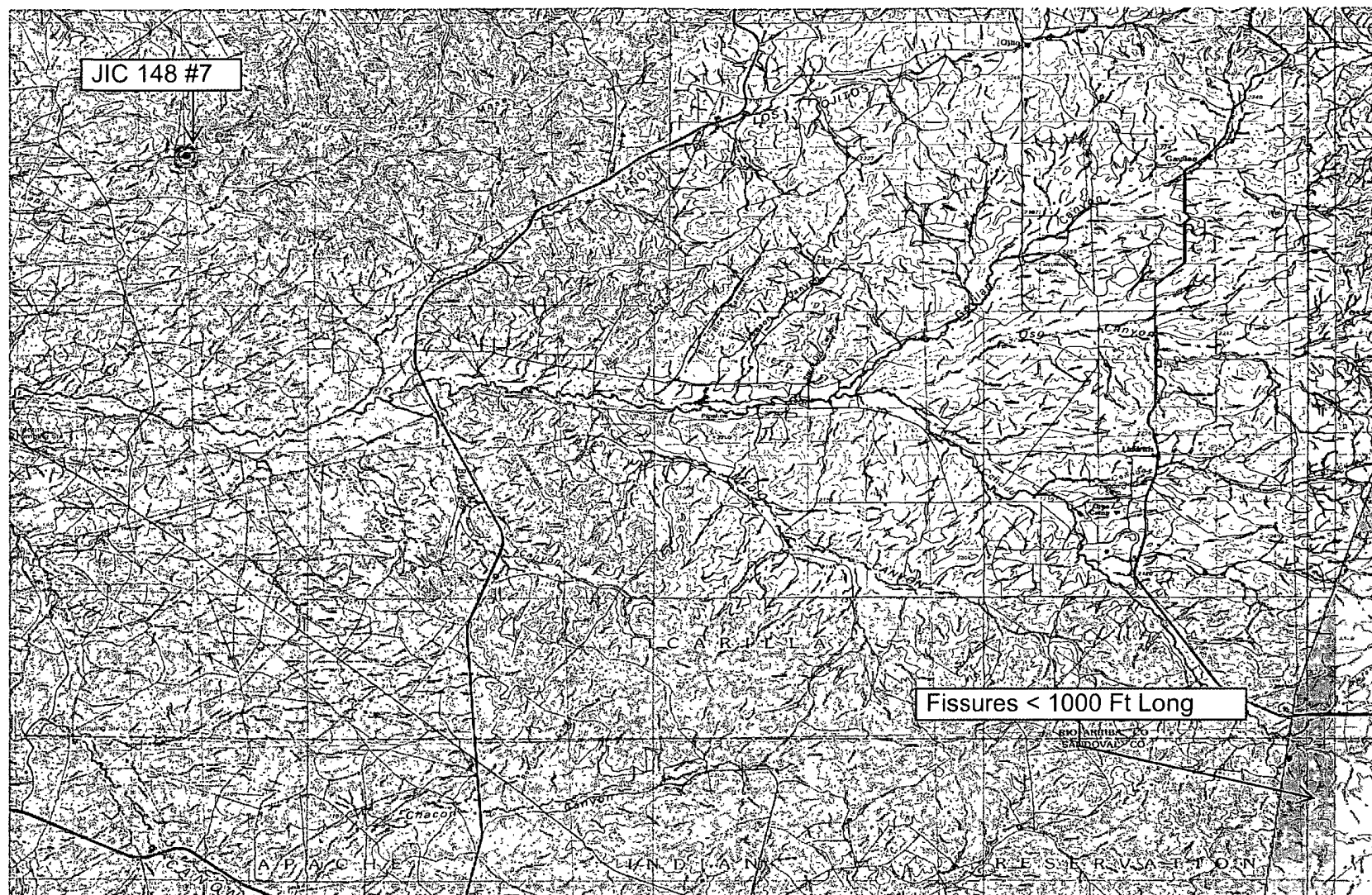
### Below-Grade System Components

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

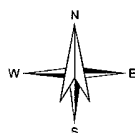
Tank size dependent upon water production & road conditions  
Excavation Area size dependent upon tank size

# Appendix 09

## Karst Map



0 2 4mi



Petroleum Recovery  
Research Center

Karst - Jicarilla Contract 148 #7

Figure: 09

P - Sec 15, 25N, 05W

Jan 06, 2010

API 30-039-05995

## REFERENCES

### **Wetland Map:**

U. S. Fish and Wildlife Service  
National Wetlands Inventory  
Wetlands Mapper  
[www.fws.gov/wetlands/data/mapper](http://www.fws.gov/wetlands/data/mapper)

### **Floodplains map:**

Federal Emergency Management Agency  
National Flood Insurance Program  
FIRM (Flood Insurance Rate Map)  
Map Service Center  
<http://msc.fema.gov/webapp/wcs/stores/servlet/FemaWelcomeView?storeId=10001&catalogId=10001&langId=-1>

### **Depth to Ground Water: Individual water well documentation.**

State of New Mexico  
Office of the State Engineer  
New Mexico Water Rights Reporting System  
[http://www.ose.state.nm.us/waters\\_db\\_index.html](http://www.ose.state.nm.us/waters_db_index.html)

### **Subsurface Mines:**

EMNRD  
Mining & Minerals Division  
Mines, Mills & Quarries Commodity Group  
<http://www.emnrd.state.nm.us/MMD/index.htm>

### **Regional Hydrogeology:**

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.

### **Base Maps:**

Petroleum Recovery Research Center  
PRRC PitRule Web Mapping Portal  
USGS Topo  
TerraServer – US  
[www.pitrule.source3.com](http://www.pitrule.source3.com)