

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.

6769  
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 C No. 004E  
API Number: 30-039-22298 OCD Permit Number: \_\_\_\_\_  
U/L or Qtr/Qtr M Section 24 Township 26N Range 05W County: Rio Arriba  
Center of Proposed Design: Latitude 36.467055 Longitude -107.316614 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: 95 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 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 indentify the facility or facilities for the disposal of liquids, drilling fluids and drill cuttings. Use attachment if more than two facilities are required.*

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

Will any of the proposed closed-loop system operations and associated activities occur on or in areas that *will not* be used for future service and operations?  
 Yes (If yes, please provide the information below)  No

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

Soil Backfill and Cover Design Specifications - based upon the appropriate requirements of Subsection H of 19.15.17.13 NMAC  
 Re-vegetation Plan - based upon the appropriate requirements of Subsection I of 19.15.17.13 NMAC  
 Site Reclamation Plan - based upon the appropriate requirements of Subsection G of 19.15.17.13 NMAC

17.  
**Siting Criteria (regarding on-site closure methods only):** 19.15.17.10 NMAC  
*Instructions: Each siting criteria requires a demonstration of compliance in the closure plan. Recommendations of acceptable source material are provided below. Requests regarding changes to certain siting criteria may require administrative approval from the appropriate district office or may be considered an exception which must be submitted to the Santa Fe Environmental Bureau office for consideration of approval. Justifications and/or demonstrations of equivalency are required. Please refer to 19.15.17.10 NMAC for guidance.*

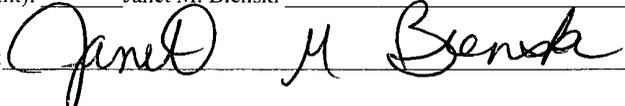
Ground water is less than 50 feet below the bottom of the buried waste. - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> NA
Ground water is between 50 and 100 feet below the bottom of the buried waste - NM Office of the State Engineer - iWATERS database search; USGS; Data obtained from nearby wells	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> 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	<input 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. - Visual inspection (certification) of the proposed site; Aerial photo; Satellite image	<input type="checkbox"/> Yes <input type="checkbox"/> 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	<input type="checkbox"/> Yes <input 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 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 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 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 type="checkbox"/> No
Within a 100-year floodplain. - FEMA map	<input type="checkbox"/> Yes <input type="checkbox"/> 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

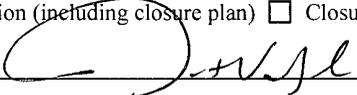
19.  
**Operator Application Certification:**  
 I hereby certify that the information submitted with this application is true, accurate and complete to the best of my knowledge and belief.

Name (Print): Janet M. Bienski Title: Regulatory Assistant

Signature:  Date: 10/13/10

e-mail address: jbienski@enervest.net Telephone: 713-495-1571

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

OCD Representative Signature:  Approval Date: 1/26/11

Title: Compliance Officer 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 application to permit an existing below-grade tank or a new below-grade tank at a recently completed well, all under the authority of 19.15.17 NMAC. The below-grade tank at this location is used to collect produced water from the primary and secondary separators. This tank is not currently permitted; therefore this document serves as supporting documentation referenced in the attached Form C-144.

This application is being submitted for the following well site:

Well Name: JICARILLA C No. 004E  
API No: 30-039-22298  
Location: UL M, Sec 24, 26N, 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 & Site Physical Inspection Sheet  
09 – Karst Map for unstable areas

References

# Section I

Sitting Criteria Compliance Demonstration

**Jicarilla C No. 004E**

**API No. 30-039-22298**

**Sitting Criteria Compliance Demonstration**

<b>Criteria as per 19.15.17.10.(A) (1)</b>	<b>In Compliance</b>	<b>Comments</b>
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	Refer to Observed Setting Requirements completed by field personnel in Appendix 08 Tapicito Creek 300' south - not continuously flowing
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 be constructed to exclude livestock with at least four strands of barbed wire evenly spaced between one foot from the ground and four feet 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

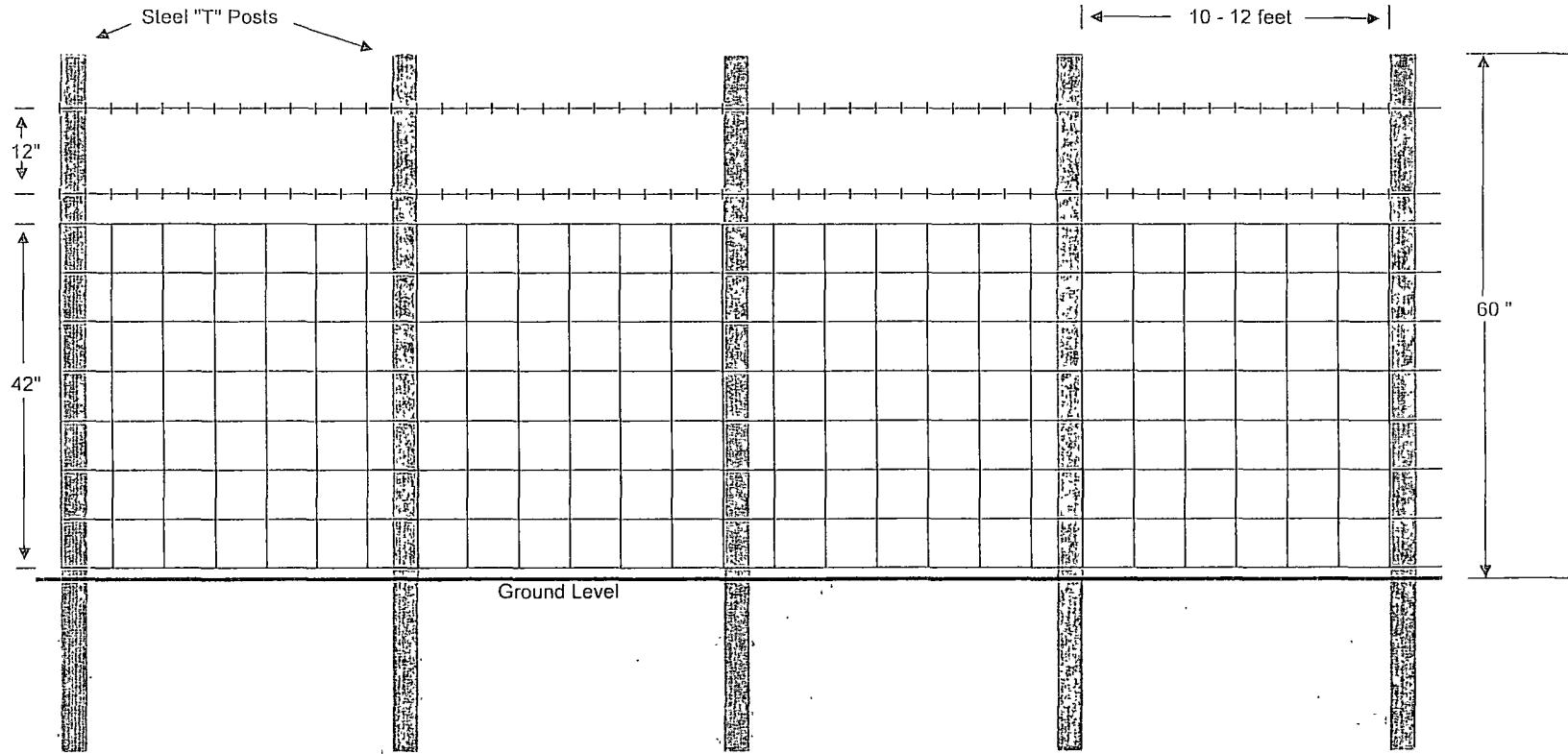
Any single walled below-grade tank installed before June 16, 2008 where any portion of the tank sidewall is below the ground surface and not totally visible shall be closed, retrofited or replaced before June 15, 2013. EV will fully comply with Paragraph 1 thru 4 of Section I of 19.15.17.11 NMAC for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

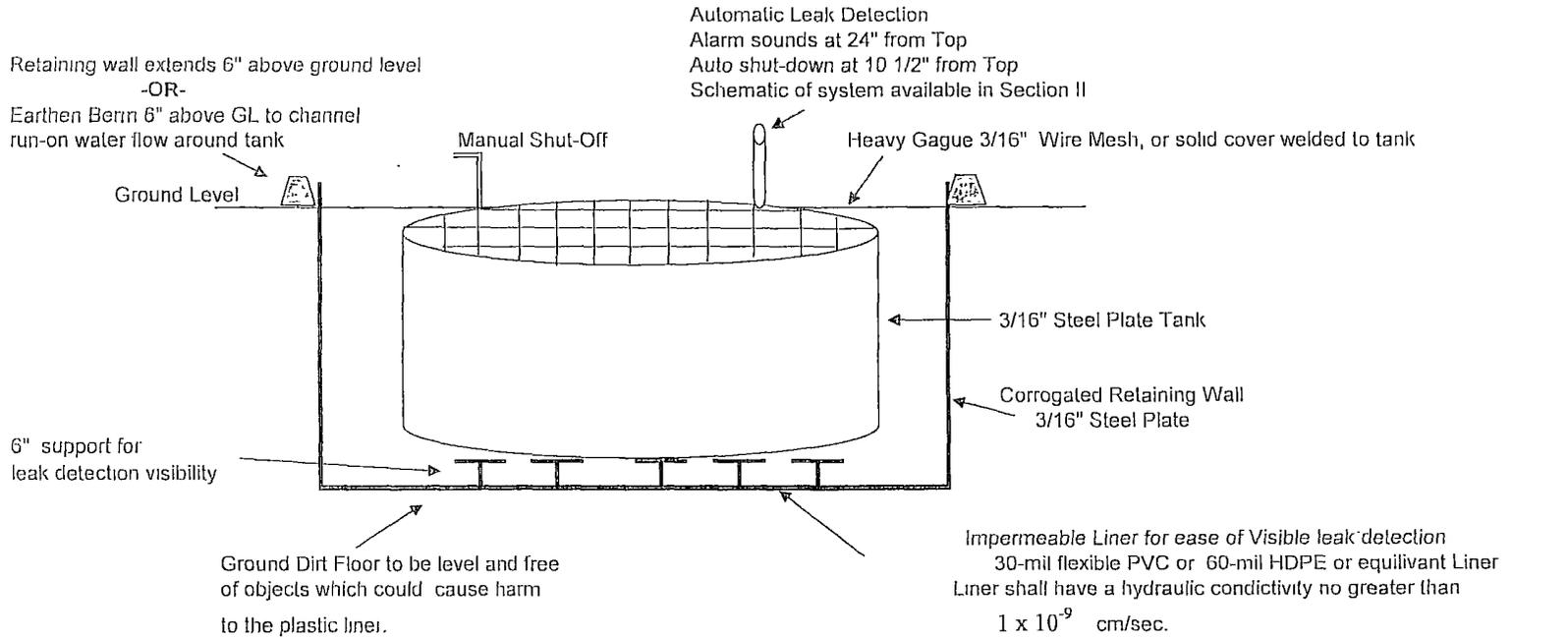




EnerVest Operating, LLC  
Western Division

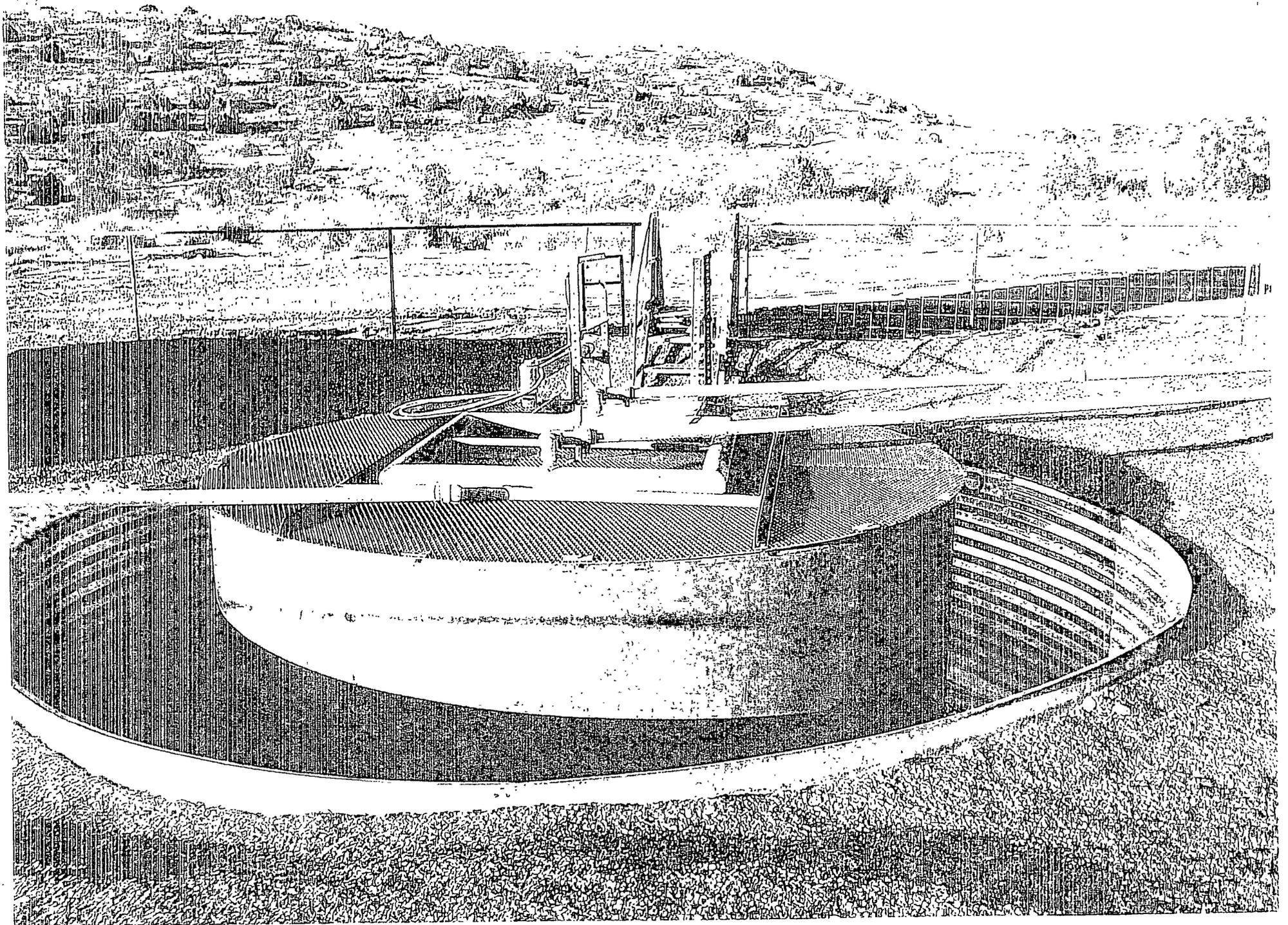
### Below-Grade Tank System

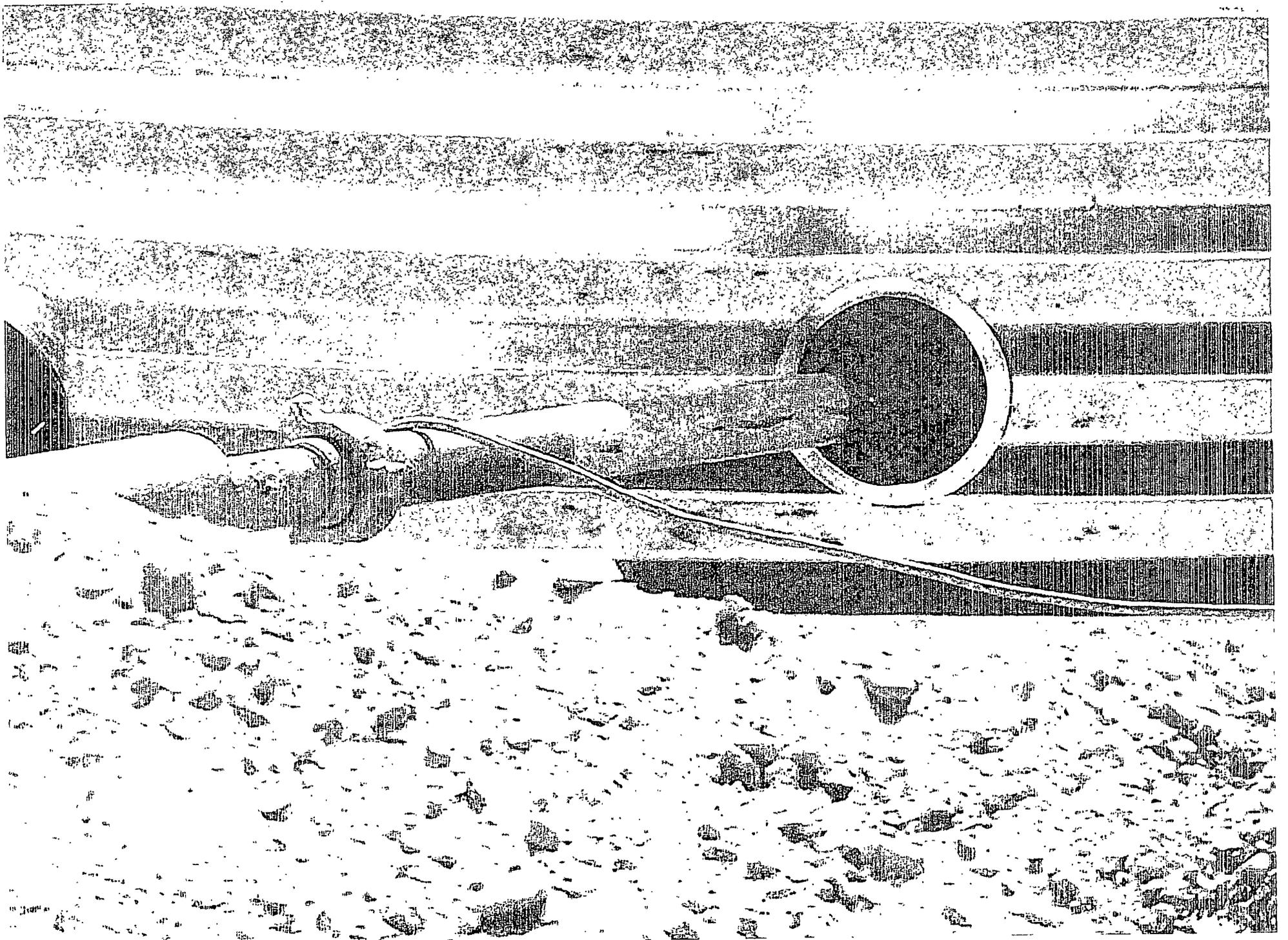
Gravity Fed - Produced Water

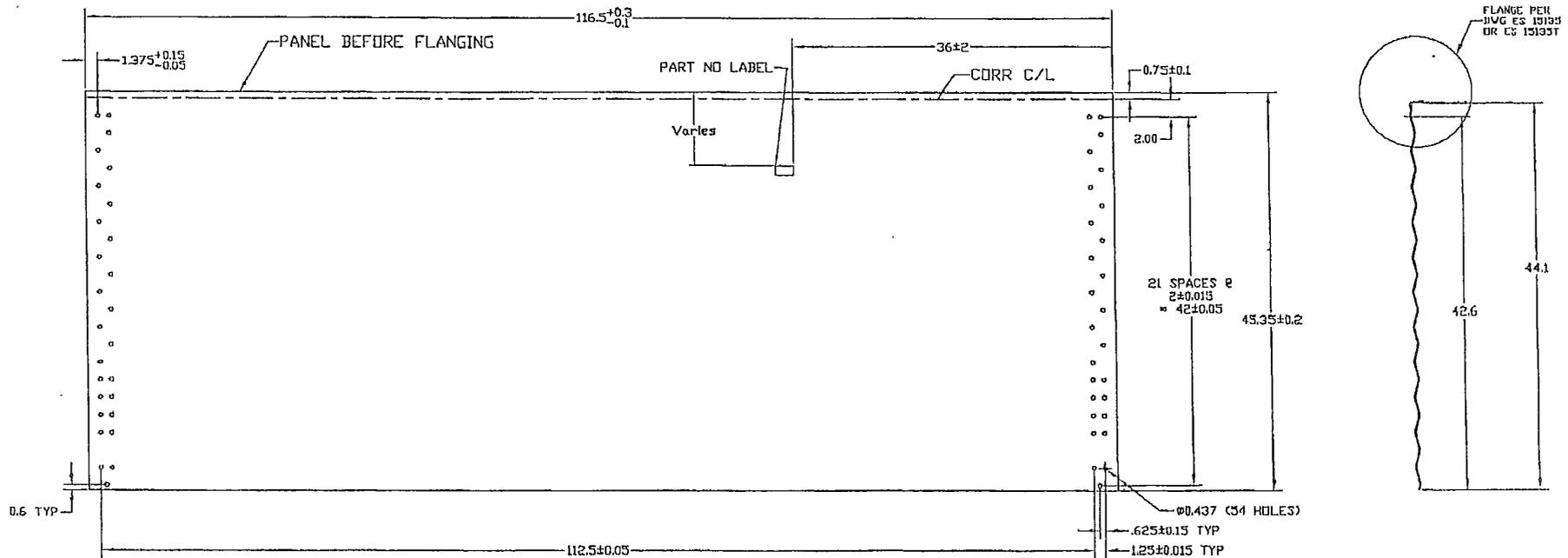


Below-Grade System Components		
Capacity	Tank Size Dia x Height	Excavation Areas
125 Bbl	15' x 4'	18' x 18' x 4' Square
120 Bbl	12' x 6'	18' x 4' Circular
100 Bbl	12' x 5'	18' x 5' Circular

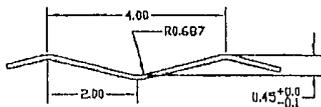
Tank size dependent upon water production & road conditions  
Excavation Area size dependent upon tank size







44' WALL PANEL BEFORE FLANGING

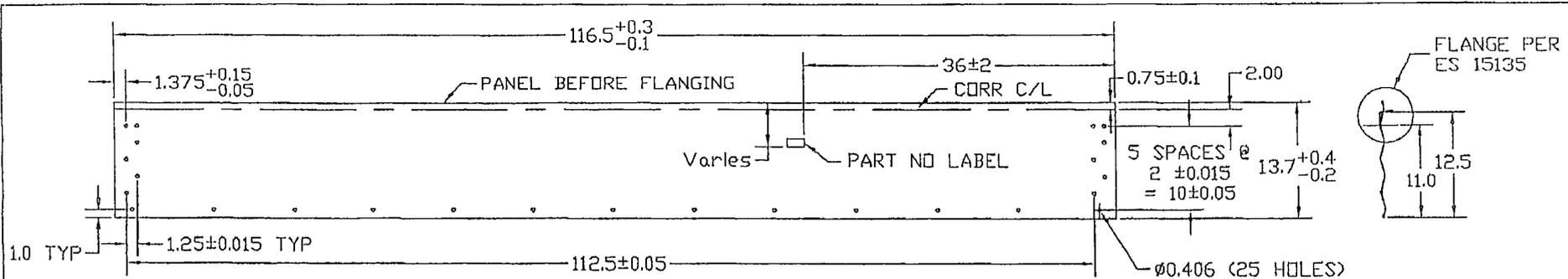


CORRUGATING DETAIL

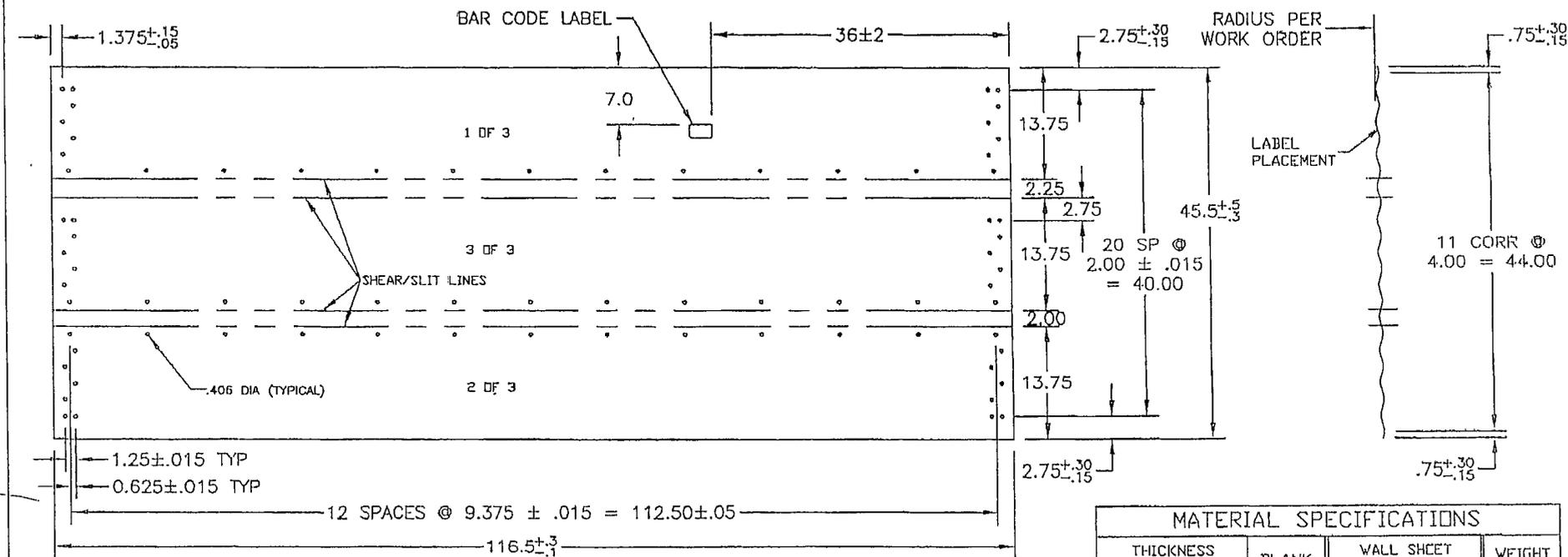
- MANUFACTURING NOTES:  
 1. CORRUGATION \_\_\_\_\_ SEE DETAIL  
 2. HOLE OFF CENTER OF CORR. \_\_\_\_\_ ± .05  
 3. HOLE BURR MAX. \_\_\_\_\_ .01  
 4. CUT OFF BURR MAX. \_\_\_\_\_ .01  
 5. CORNER HOLE TO HOLE DIAGONAL ± .13

MATERIAL SPECIFICATIONS				
THICKNESS		BLANK WIDTH	WALL SHEET PART NO	WEIGHT (lb)
NOMINAL	MINIMUM			
0.066	0.061	46.3	CW4413F	98.5
0.096	0.088	46.3	CW4413F	143.4

DIMENSIONS SHOWN ARE IMPERIAL UNITS SHOWN IN BRACKETS				DESIGN: RM		MATERIAL: SEE CHART - ASTM A653 SS GR 30 G115 OIL		BLANK SIZE: 46.5 x 116.5		SURFACE AREA		WEIGHT (LBS) see chart	
TOLERANCES (UNLESS OTHERWISE NOTED)				DWN. RF		WESTEEL		SCALE: nts		DWN. (Y.M.D.): 02.02.19		LOCATION: WINNIPEG	
DIMENSIONS: IMPERIAL (in) METRIC (mm)				CHKD. BA		DRAWING TITLE: CONTAINMENT RING 44' WALL PANEL		E.C.R. A6647		E.P. NO. 02-255		TYPE: ACAD14	
1 01.28.04 LOWERED CLAMP LOCATION 4'				A6786 RF BA		APPD. CUSTOMER		SIZE: B		DRAWING NO. ES 15510		REV. NO. 1	
NO	DATE	REVISION	E.C.R.	BY	CH.	PRINTING DATE							
						DRAWING TITLE		SIZE		DRAWING NO.		REV. NO.	
						DRAWING TITLE		SIZE		DRAWING NO.		REV. NO.	
						DRAWING TITLE		SIZE		DRAWING NO.		REV. NO.	
						DRAWING TITLE		SIZE		DRAWING NO.		REV. NO.	
						DRAWING TITLE		SIZE		DRAWING NO.		REV. NO.	



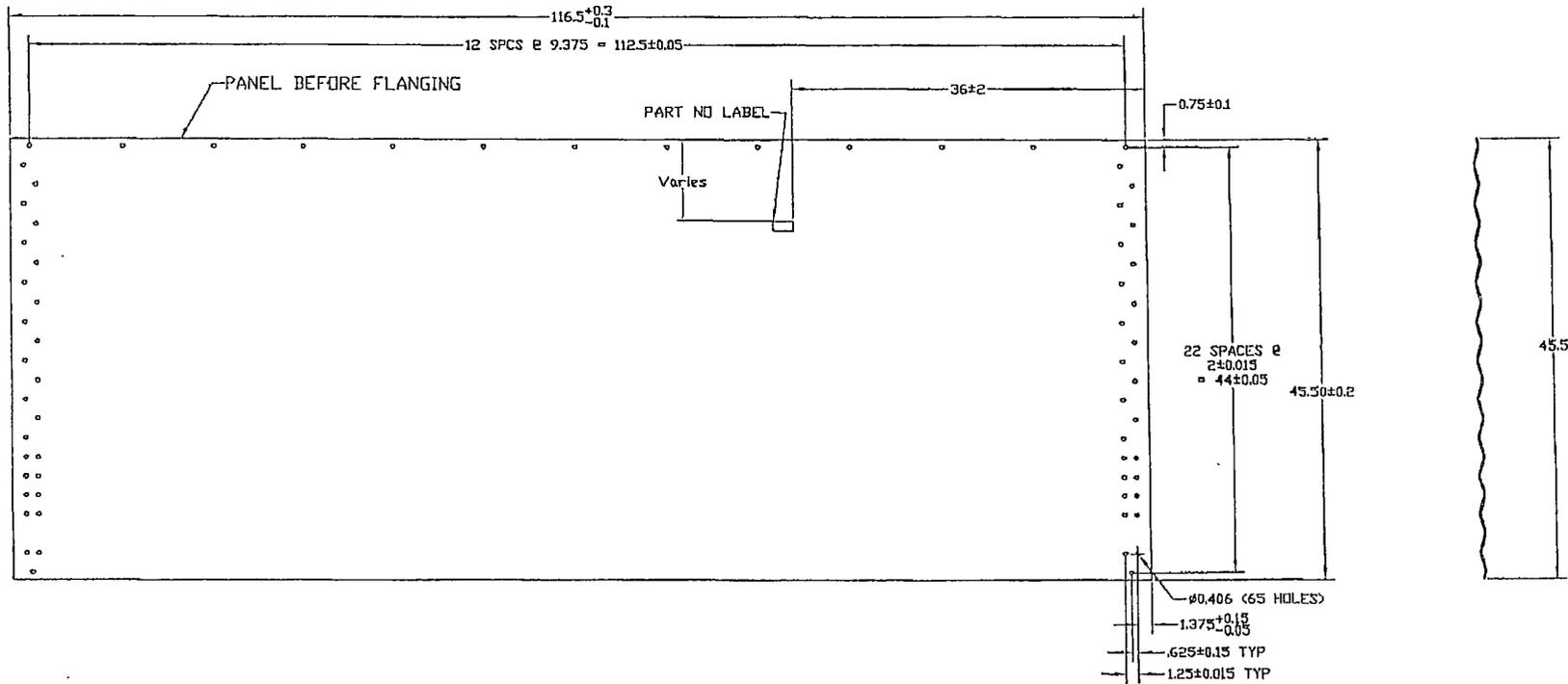
13 1/2' WALL PANEL LAYOUT BEFORE FLANGING



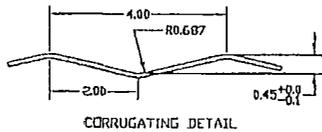
MANUFACTURING VIEW ONLY - TRIPLE PANEL AFTER CORR & PUNCH, BEFORE SLITTING & FLANGING

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

MATERIAL				BLANK SIZE			WEIGHT (LBS.)		
SEE CHART - ASTM A653 SS GR50 G115 OIL				46.5x116.5 (3 pcs)			31.5		
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°				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 N.T.S.	DWN. (Y.M.D.) 2004.11.30	LOCATION WPG
DRAWING TITLE: 13.5' FULL PANEL - 57' ONLY CONTAINMENT RING				SIZE: A		DRAWING NO. ES 15516		REV. NO. O	
NO.	DATE	REVISION	E.C.R.	BY	CH.	CUSTOMER	PRINTING DATE (Y.M.D.)		



44' WALL PANEL AFTER CORRUGATING AND PUNCHING

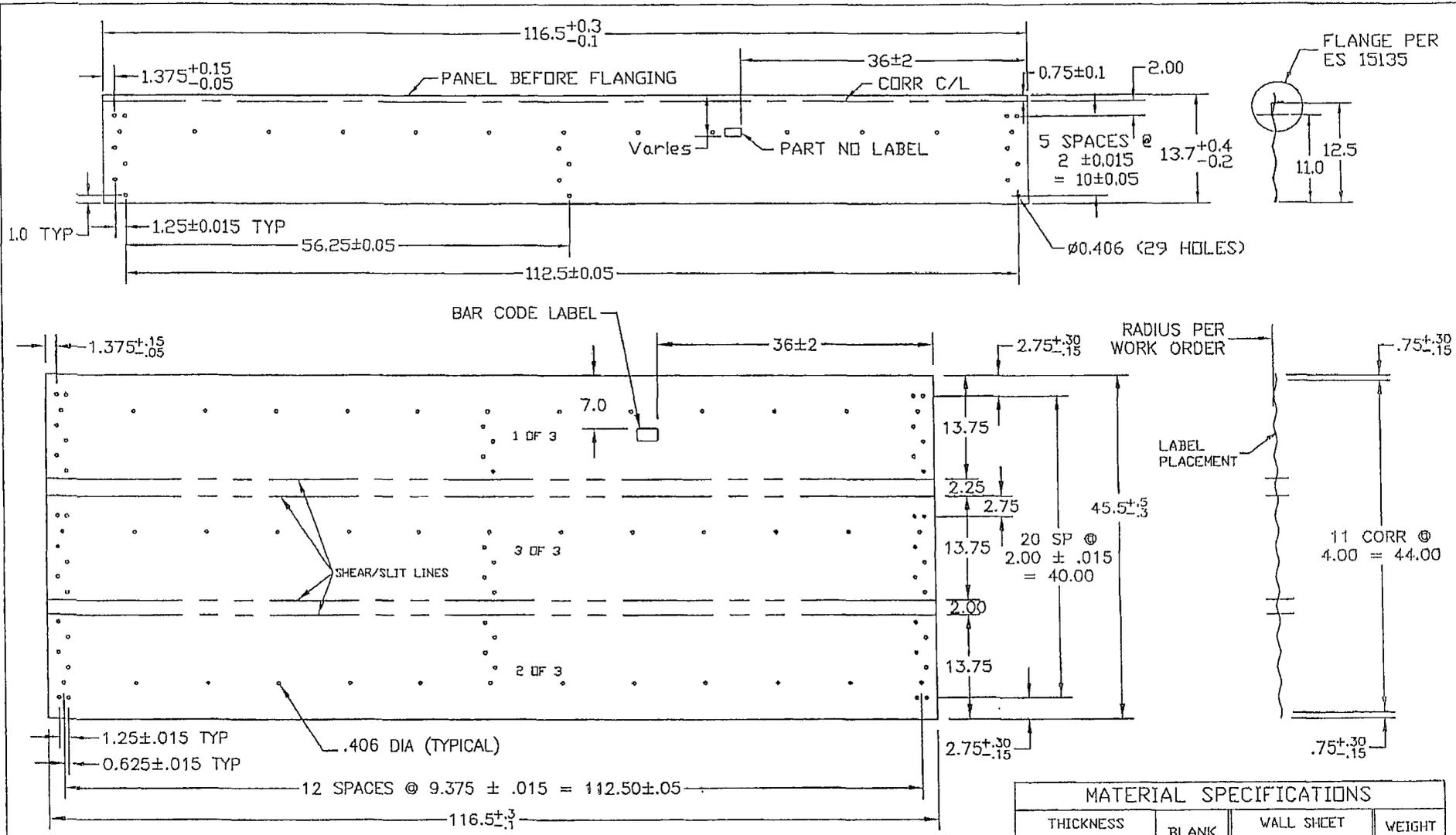


- MANUFACTURING NOTES:
1. CORRUGATION..... SEE DETAIL
  2. HOLE OFF CENTER OF CORR..... ± .05
  3. HOLE BURR MAX..... .01
  4. CUT OFF BURR MAX..... .01
  5. CORNER HOLE TO HOLE DIAGONAL ± .15

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

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)	DESND. BA	MATERIAL SEE CHART - ASTM A653 SS GR 50 G115 OIL	BLANK SIZE 46.5 x 116.5	SURFACE AREA	WEIGHT (LBS) see chart
									TOLERANCES (UNLESS OTHERWISE NOTED)		CHKB. BA APPD. BA		DRAWING TITLE 44' FULL PANEL - 57' ONLY CONTAINMENT RING CUSTOMER PRINTING DATE		SCALE nts C.C.R. A6834 SIZE DRAWING NO. B ES 15518 REV. NO. 0	

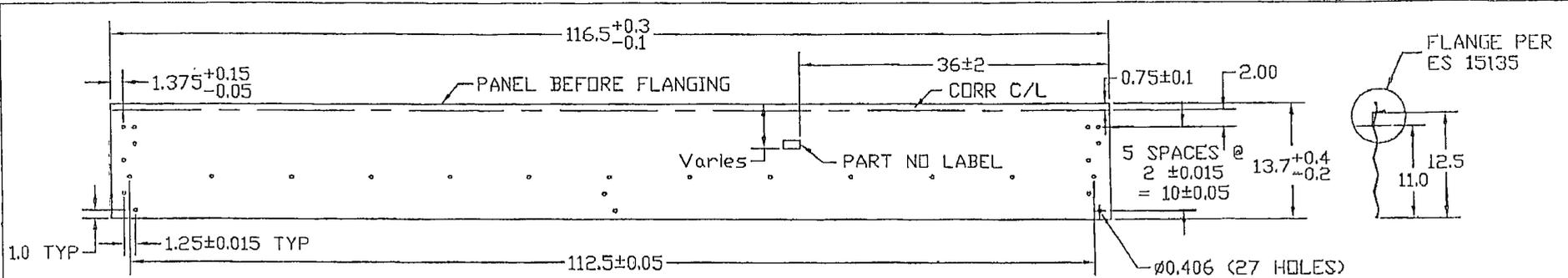
THIS DRAWING IS THE EXCLUSIVE PROPERTY OF VESTEEL AND ALL RIGHTS ARE RESERVED. NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM VESTEEL, a Division of JENISYS ENGINEERED PRODUCTS



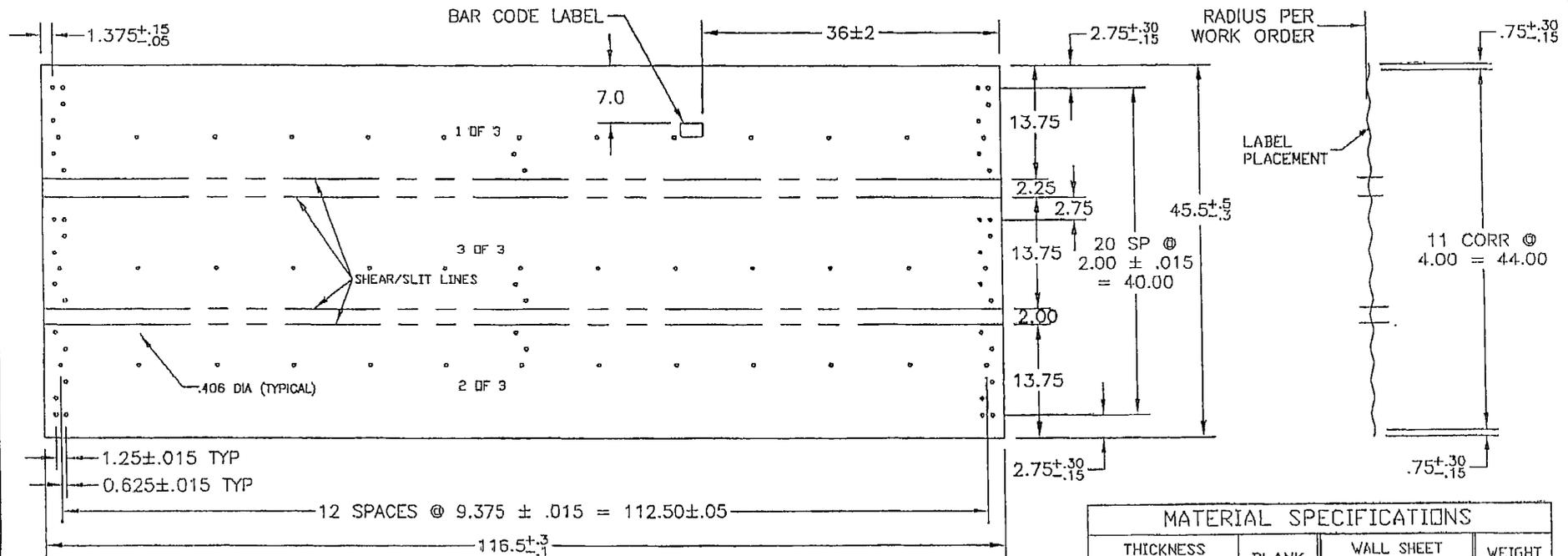
MATERIAL SPECIFICATIONS				
THICKNESS		BLANK WIDTH	WALL SHEET PART NO	WEIGHT (lb)
NOMINAL	MINIMUM			
0.066	0.061	14.75	019401	31.5

DIMENSIONS SHOWN ARE IMP				MATERIAL		BLANK SIZE		WEIGHT (LBS)				
MM UNITS SHOWN IN BRACKETS				SEE CHART - ASTM A653 SS GR50 G115 OIL		46.5x116.5 (3 pcs)		31.5				
TOLERANCES UNLESS OTHERWISE NOTED				DESND.	THIS DRAWING IS THE EXCLUSIVE PROPERTY OF WESTEEL AND ALL RIGHTS ARE RESERVED				SCALE	DWN. (Y.M.D.)	LOCATION	
				DIMENSIONS:				BA	NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM Westeel Limited			
IMPERIAL (in)				IMP	RF	DRAWING TITLE				SIZE	DRAWING NO.	REV. NO.
.x ? .1				RF	13.5" FULL PANEL - 4" RISER CONTAINMENT RING				A	019401	○	
.xx ? .03				BA	CUSTOMER				PRINTING DATE (Y.M.D.)			
.xxx ? .010				BA	-				-			
ANGULAR: ± 1°												

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



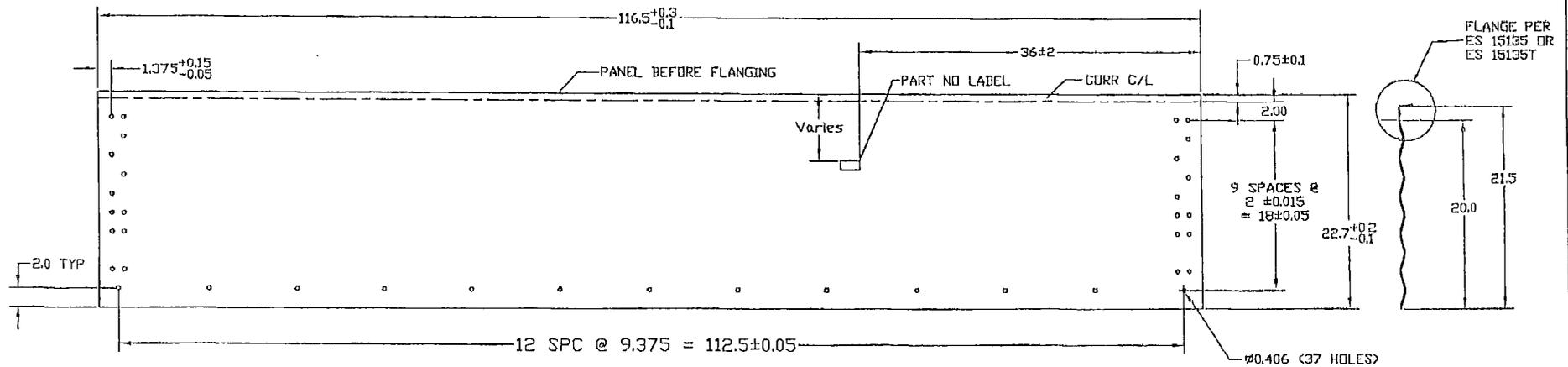
13 1/2" WALL PANEL LAYOUT BEFORE FLANGING



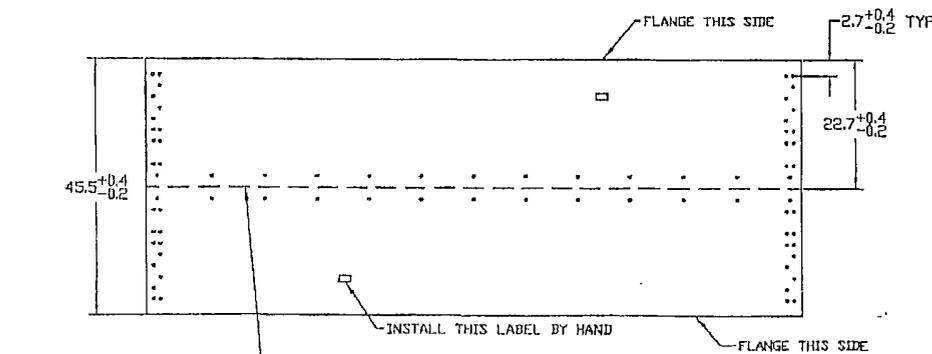
MANUFACTURING VIEW ONLY - TRIPLE PANEL AFTER CORR & PUNCH, BEFORE SLITTING & FLANGING

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

NO		DATE	REVISION	E.C.R.	BY	CH.	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. NO PART OF THIS DRAWING MAY BE USED OR REPRODUCED IN ANY MANNER WHATSOEVER WITHOUT WRITTEN PERMISSION FROM Westeel Limited			SCALE	DWN. CY.M.D.	LOCATION
							BA	WESTEEL			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			A	019419	0
							APPD.	CONTAINMENT RING					
							BA	CUSTOMER			PRINTING DATE (Y.M.D.)		



21 1/2' WALL PANEL LAYOUT BEFORE FLANGING



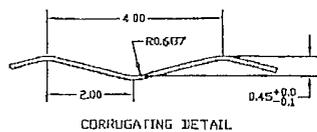
MANUFACTURING VIEW ONLY - DOUBLE PANEL AFTER CORR & PUNCH, BEFORE SLITTING & FLANGING

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 PART NO	WEIGHT (lb)
NOMINAL	MINIMUM			
0.066	0.061	23.3	C10514	49.4



CORRUGATING DETAIL

NO	DATE	REVISION	E.C.R.	BY	CHK
1	06/12/06	CORRECTED HOLE PATTERN ON BOTTOM BLANK	AG89B	RF	RF

DIMENSIONS SHOWN ARE IMPERIAL UNITS SHOWN IN BRACKETS

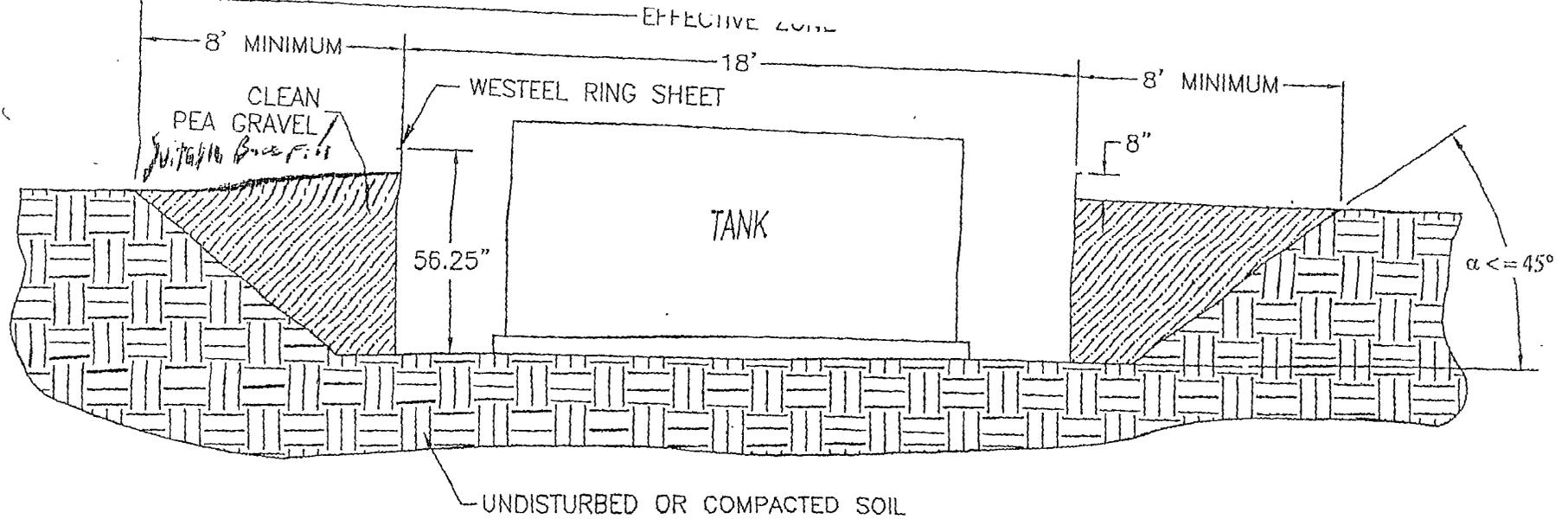
TOLERANCES UNLESS OTHERWISE NOTED

DIMENSIONS:

IMPERIAL (in)	METRIC (mm)
± .1	± 2
± .03	± 1.0
± .010	± .25

ANGULAR ± 1°

MATERIAL	SEE CHART - ASTM A653 SQ GR50 GL15 D1L	BLANK SIZE	46.6x116.5 (2 pcs)	SURFACE AREA	WEIGHT (LBS)
DISDR	RM	SCALE	1/8" = 1'	DRAWN (Y.M.O.)	49.4
DRAWING TITLE	CONTAINMENT RING 22" WALL PANEL	E.C.R.	A 6428	LOCATION	WINNIPEG
APPR	RM	EP. NO.	98-197	TYPE	ACAD14
CHECKED	YS	SIZE	B	DRAWING NO	C10514
CUSTOMER		PRINTING DATE		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.

## 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





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 lbs/MSF (oz/yd <sup>2</sup> )	ASTM D5261	126 lbs (18.14)	140 lbs (20.16)	151 lbs (21.74)	166 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

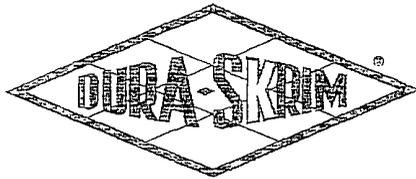
MD = Machine Direction  
DD = Diagonal Directions

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.ravengeo.com



# 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 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 Standard Geomembrane

TESTED PROPERTY	TEST METHOD	FREQUENCY	MINIMUM AVERAGE VALUE				
			30 mil	40 mil	60 mil	80 mil	100 mil
Thickness, (minimum average) mil (mm) Lowest individual reading (-10%)	ASTM D 5199	every roll	30 (0.75) 27 (0.69)	40 (1.00) 36 (0.91)	60 (1.50) 54 (1.40)	80 (2.00) 72 (1.80)	100 (2.50) 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	120 (21) 66 (11)	152 (26) 84 (14)	243 (42) 132 (23)	327 (57) 177 (30)	410 (71) 212 (37)
Strength at Break, lb/in-width (N/mm)			700	700	700	700	700
Strength at Yield, lb/in-width (N/mm)			700	700	700	700	700
Elongation at Break, %	G.L. 2.0 in (51 mm)		13	13	13	13	13
Elongation at Yield, %	G.L. 1.3 in (33 mm)		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>				
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 9,900 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 below-grade 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 extend 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 C #004E API 30-039-08139**

The above referenced well is located at UL M, Sec 24, 26N, 05W at an elevation of 6578'. Surface casing was set to a depth of 285' or at a depth of 6293'.

According to the Office of State Engineer, one water well drilled was CR 01543 about 5.6 miles SE of our location. Drilled to 120 feet at an unknown elevation, it shows water encountered at 70 feet.

According to the Office of State Engineer, another water well drilled was CR 01909 about 5.6 miles SE of our location. Drilled to 100 feet at an unknown elevation, it shows water encountered at 60 feet.

According to the Office of State Engineer, another water well drilled was CR 03087 about 4.5 miles SE of our location. Drilled to 141 feet at an unknown elevation, it shows water encountered at 72 feet.

In 2006, the Jicarilla C #4F (30-039-29590) was drilled about 300 feet North of our location. It was at an elevation of 6588 feet with no indication of water being encountered. Surface casing was set at 316 feet which would be at 6272 feet. This would be 316 feet below our well. We believe that the sand and limestone will prevent any migration of fluids.

In 1958, the Jicarilla 108 No. 003 (30-039-06360) was drilled about 1000 feet North of our location. It was at an elevation of 6586' with no indication of water being encountered. Surface casing was set at 113 feet which would be at 6473. This would be 113 feet above our well. We believe that the sand and limestone will prevent any migration of fluids.

The groundwater at our well site would be greater than 100 feet at a minimum. This should allow ample protection for any groundwater in the area.

**UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY**

SUBMIT IN DUPLICATE\*

(See other instructions on reverse side)

Form approved.  
Budget Bureau No. 42-R355.5.

**WELL COMPLETION OR RECOMPLETION REPORT AND LOG \***

1a. TYPE OF WELL: OIL WELL  GAS WELL  DRY  Other \_\_\_\_\_

b. TYPE OF COMPLETION: NEW WELL  WORK OVER  DEEP-EN  PLUG BACK  DIFF. RESVR.  Other \_\_\_\_\_

2. NAME OF OPERATOR  
Tenneco Oil Company

3. ADDRESS OF OPERATOR  
Box 3249, Englewood, CO 80155

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\*  
At surface 790' FSL, 990' FWL "M"

At top prod. interval reported below

At total depth

5. LEASE DESIGNATION AND SERIAL NO.  
Contract #108

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME  
Jicarilla C

9. WELL NO.  
4E

10. FIELD AND POOL, OR WILDCAT  
Basin Dakota

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA  
Section 24, T26N, R5W

12. COUNTY OR PARISH  
Rio Arriba

13. STATE  
New Mexico

15. DATE SPUNDED 1/6/81 16. DATE T.D. REACHED 1/17/81 17. DATE COMPL. (Ready to prod.) 3/9/81 18. ELEVATIONS (DF, RBE, RT, GR, ETC.)\* 6578' gr. 19. ELEV. CASINGHEAD --

20. TOTAL DEPTH, MD & TVD 7525' 21. PLUG, BAGK T.D., MD & TVD 7515' 22. IF MULTIPLE COMPL., HOW MANY\* 23. INTERVALS DRILLED BY 0'-TD 24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)\* 7294-7500' Dakota

25. WAS DIRECTIONAL SURVEY MADE No  
26. TYPE ELECTRIC AND OTHER LOGS RUN GR/CCL IEL 27. WAS WELL CORED No

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
9-5/8"	36#	285'	12-1/4"	225sx Class-B w/2% CACL <sub>2</sub>	
4-1/2"	10.5, 11.6#	7525'	7-7/8"	1st: 400sx 65/35 POZ, 4% gel, 150 sx CL-B. 2nd: 900sx 65/35 POZ, 4% gel 50 sx CL-B neat.	

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"	7281'	

31. PERFORATION RECORD (Interval, size and number)

7294-7300'	7462-64'
7306-08'	7490-7500'
7410-20'	
7452-56'	

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
7294-7500'	1400 gals 15# HCL 102 balls sealers 80,000 gals 30# X-L gel, 80,000# 20/40 sand, 25,000# 10/20 sand

33.\* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)	WELL STATUS (Producing or shut-in)
3/19/81	Flowing	Shut-in

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
3/9/81	3 hrs.	3/4"	→		1182		

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
75	405	→		1269		

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

TEST WITNESSED BY

35. LIST OF ATTACHMENTS  
Electric logs forwarded by Gearhart-Owens.

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

SIGNED Carley Station TITLE Asst. Div. Adm. Mgr. DATE 3/10/81

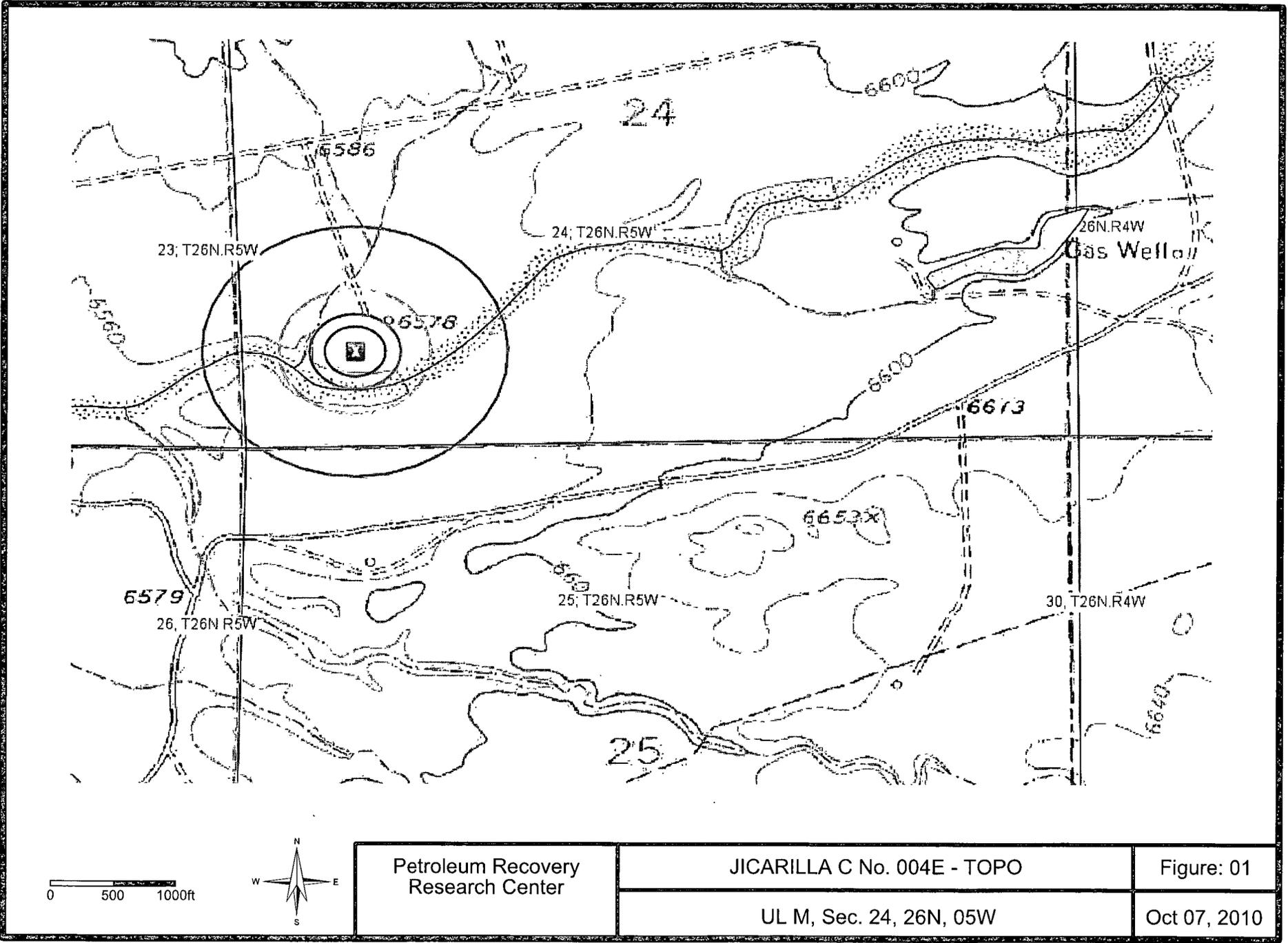
\*(See Instructions and Spaces for Additional Data on Reverse Side)

NMOCC

RB

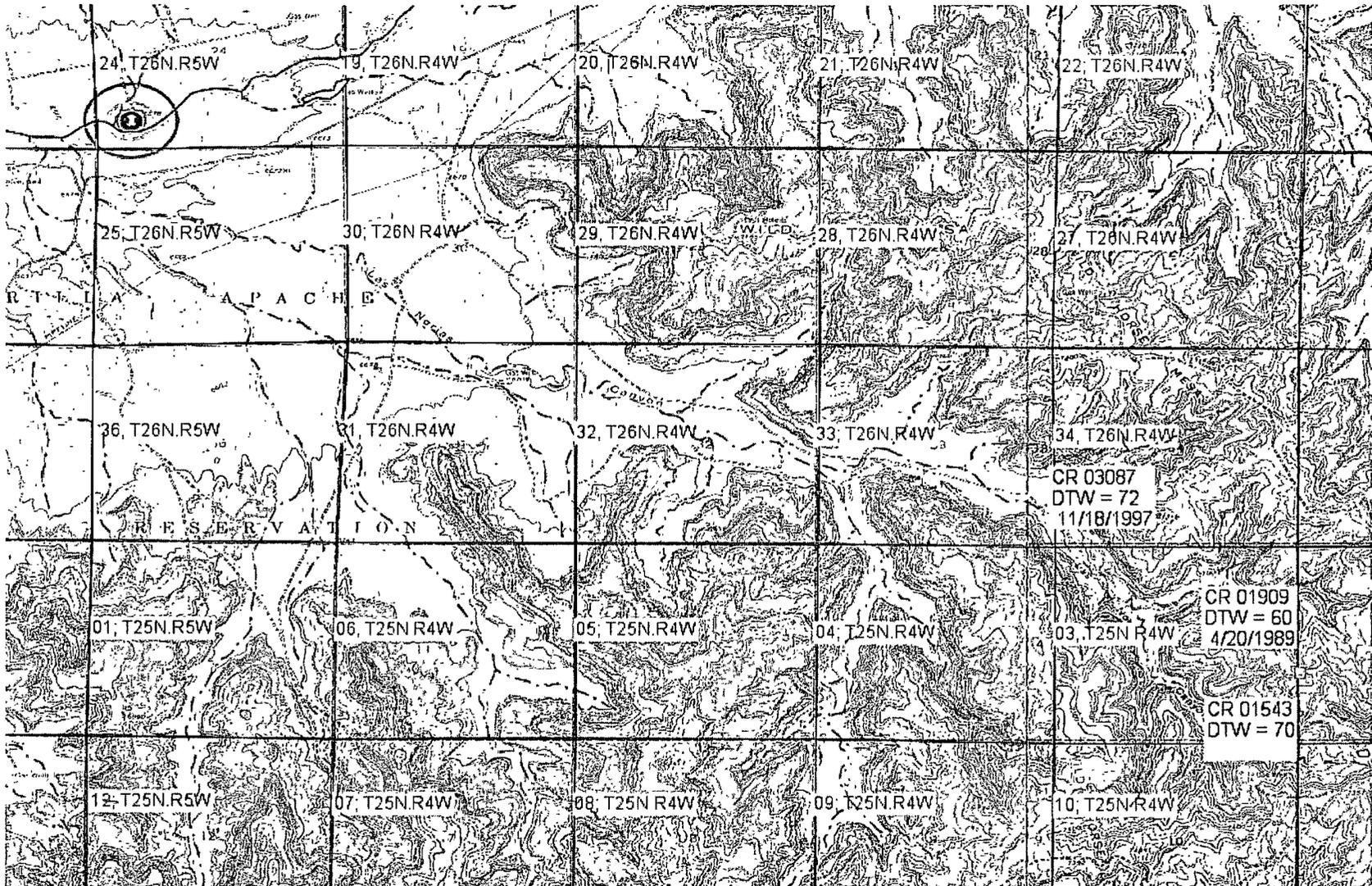
# Appendix 01

U.S. 7.5 Minute TOPO Map



# Appendix 02

## Ground Water Depth



Petroleum Recovery  
Research Center

JICARILLA C No. 004E - OSE Water Wells

Figure: 02

UL M, Sec. 24, 26N, 05W

Oct 07, 2010

API 30-039-22298



# New Mexico Office of the State Engineer

## Water Right Summary

**WR File Number:** CR 01543  
**Primary Purpose:** DOM 72-12-1 DOMESTIC ONE HOUSEHOLD  
**Primary Status:** PMT PERMIT  
**Total Acres:**  
**Total Diversion:** 3  
**Owner:** DAVID BOLSINGER

### Documents on File

Doc	File/Act	Status			Transaction Desc.	From/To	Acres	Diversion	Consumptive
		1	2	3					
72121	1984-07-03	PMT	APR	CNV	CONVERSION CR 01543	T		3	

---For more information on Conversion Transactions, please see Help---

### Point of Diversion

Pod Number	Source	Q Q Q			X	Y	Other Location Desc
		64	16	4			
CR 01543	Shallow				300037	4033531	

(NAD83 UTM in meters)

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.



# 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

CR 01543

300037 4033531

Driller License: COOK, ROBERT R.

Driller Name:

Drill Start Date:

Drill Finish Date:

07/31/1984

Plug Date:

Log File Date: 05/14/1985

PCW Rcv Date:

Source:

Shallow

Pump Type:

Pipe Discharge Size:

Estimated Yield:

Casing Size:

Depth Well:

120 feet

Depth Water:

70 feet

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.



# 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
CR 01909		02	25N	15E	300037	4033531

Driller License: COOK, ROBERT R.

Driller Name:

Drill Start Date:	04/20/1989	Drill Finish Date:	04/20/1989	Plug Date:	
Log File Date:	05/05/1989	PCW Rcv Date:		Source:	Shallow
Pump Type:		Pipe Discharge Size:		Estimated Yield:	
Casing Size:		Depth Well:	100 feet	Depth Water:	60 feet

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.



# 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
CR 03087		299120	4034533

Driller License: MAHONEY, J.H. CONSTRUCTION

Driller Name: MAHONEY, JOHN H.

Drill Start Date: 11/18/1997	Drill Finish Date: 11/18/1997	Plug Date:
Log File Date: 11/26/1997	PCW Rcv Date:	Source: Shallow
Pump Type:	Pipe Discharge Size:	Estimated Yield: 20
Casing Size: 5.00	Depth Well: 141 feet	Depth Water: 72 feet

Water Bearing Stratifications:	Top	Bottom	Description
	120	124	Sandstone/Gravel/Conglomerate
	130	135	Sandstone/Gravel/Conglomerate

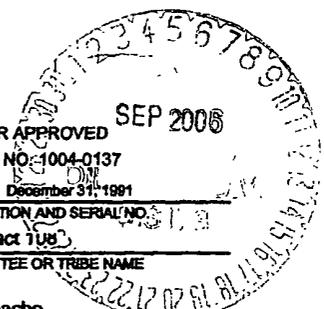
Casing Perforations:	Top	Bottom
	80	120

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.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE\*  
(See other instructions on reverse side)

FOR APPROVED  
OMB NO: 1004-0137  
Expires: December 31, 1991



**WELL COMPLETION OR RECOMPLETION REPORT AND LOG\***

1a. TYPE OF WELL: OIL WELL  GAS WELL  DRY  Other \_\_\_\_\_

b. TYPE OF COMPLETION: NEW WELL  WORK OVER  DEEP-EN  PLUG BACK  DIFF. RESVR  Other \_\_\_\_\_

2. NAME OF OPERATOR  
CDX RIO, LLC

3. ADDRESS AND TELEPHONE NO.  
2010 Afton Place, Farmington, New Mexico 87401 (505) 326-3003

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)\*  
At surface 660' FSL, 2100' FWL  
At top prod. interval reported below  
At total depth NSL-5291, DHC-2130az

5. LEASE DESIGNATION AND SERIAL NO.  
JICARILLA CONTRACT TUB

6. IF INDIAN, ALLOTTEE OR TRIBE NAME  
Jicarilla Apache

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME, WELL NO.  
Jicarilla C #4F

9. API WELL NO.  
30-030-29590

10. FIELD AND POOL OR WILDCAT  
Blanco Mesaverde Basin-Dakota

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA  
Section 24, T-26-N, R-5-W

12. COUNTY OR PARISH  
Rio Arriba

13. STATE  
New Mexico

14. PERMIT NO. \_\_\_\_\_ DATE ISSUED \_\_\_\_\_

15. DATE SPUNDED 3-5-06

16. DATE T.D. REACHED 3-25-06

17. DATE COMPL. (Ready to prod.) 8-21-06

18. ELEVATIONS (DF, RKB, RT, BR, ETC.)\* 6588' GR

19. ELEV. CASINGHEAD

20. TOTAL DEPTH, MD & TVD 7550'

21. PLUG, BACK T.D., MD & TVD Fish @ 6751'

22. IF MULTIPLE COMPL. HOW MANY\* 2

23. INTERVALS DRILLED BY 0-7550'

24. PRODUCTION INTERVAL (S) OF THIS COMPLETION-TOP, BOTTOM, NAME (MD AND TVD)\*  
4812-5277' Mesaverde

25. WAS DIRECTIONAL SURVEY MADE

26. TYPE ELECTRIC AND OTHER LOGS RUN  
CBL-CCL-GR, Gas Spectrum

27. WAS WELL CORED  
No

28. CASING RECORD (Report all strings set in well)

CASING SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	TOP OF CEMENT, CEMENTING RECORD	AMOUNT FULLED
9 5/8"	36#	316'	12 1/4"	218 cu.ft.	
7"	26#	3460'	8 3/4"	1130 cu.ft.	

28. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)
4 1/2"	3233'	7546'	790 cu.ft.	

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2 3/8"	5116'	Fish @ 6751' after down hole fire

31. PERFORATION RECORD (Interval, size and number)

4812, 4814, 4817, 4824, 4826, 4828, 4830, 4832, 4834, 4836, 4838, 4846, 4848, 5083, 5087, 5113, 5116, 5130, 5133, 5136, 5233, 5235, 5259, 5271, 5300, 5303, 5305, 5320, 5323, 5326, 5329, 5332, 5336, 5344, 5347, 5355, 5360, 5377' w/38 0.38" diameter holes total

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

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
4812-4846'	643 bbl 20# x-link gel, 62,260# 16/30 Brady sd
5083-5377'	1785 bbl 20# x-link gel, 185,000# 16/30 Brady sd

33. PRODUCTION

DATE FIRST PRODUCTION 8-24-06

PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump) Flowing

WELL STATUS (Producing or shut-in) Producing

DATE OF TEST 8-24-06

HOURS TESTED 1

CHOKE SIZE 2"

PROOF FOR TEST PERIOD

FLOW. TUBING PRESS. SI 1068

CASING PRESSURE SI 1077

CALCULATED 24-HOUR RATE

OIL-BBL 0 BOPD

GAS-MCF 212 MCF/D

WATER-BBL 3 BWPD

OIL GRAVITY-API (CORR.)

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

TEST WITNESSED BY

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 Nancy Oltmanns TITLE Agent DATE 8/29/06

(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 of agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

SEP 0 2006

FARMINGTON HEAD OFFICE

NMOCDD

NEW MEXICO OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico

(Form C-104)  
Revised 7/1/57

REQUEST FOR (OIL) - (GAS) ALLOWABLE

New Well  
~~Recompletion~~

This form shall be submitted by the operator before an initial allowable will be assigned to any completed Oil or Gas well. Form C-104 is to be submitted in QUADRUPPLICATE to the same District Office to which Form C-101 was sent. The allowable will be assigned effective 7:00 A.M. on date of completion or recompletion, provided this form is filed during calendar month of completion or recompletion. The completion date shall be that date in the case of an oil well when new oil is delivered into the stock tanks. Gas must be reported on 15.025 psia at 60° Fahrenheit.

Farmington, New Mexico (Place) 6-17-58 (Date)

WE ARE HEREBY REQUESTING AN ALLOWABLE FOR A WELL KNOWN AS:

KL PASO NATURAL GAS COMPANY (Company or Operator) JICARILLA (Lease), Well No. 3-6, in SW 1/4, NW 1/4, N, Sec. 24, T. 26N, R. 5W, NMPM, S. Blanco PG Ext. Pool

Rio Arriba

Please indicate location:

D	G	B	A
E	F	G	H
L	K	J	I
M	N	O	P
X			

County. Date Spudded 4-21-58 Date Drilling Completed 5-3-58  
Elevation 6586 Total Depth 3201 PBD 3160  
Top Oil/Gas Pay 3058 Name of Prod. Form. Pictured Cliffs

PRODUCING INTERVAL -

Perforations 3112-28', 3140-52'  
Open Hole Depth Casing Shoe 3200 Depth Tubing 3147

OIL WELL TEST -

Natural Prod. Test: \_\_\_\_\_ bbls. oil, \_\_\_\_\_ bbls water in \_\_\_\_\_ hrs, \_\_\_\_\_ min. Size \_\_\_\_\_ Choke  
Test After Acid or Fracture Treatment (after recovery of volume of oil equal to volume of Choke load oil used): \_\_\_\_\_ bbls. oil, \_\_\_\_\_ bbls water in \_\_\_\_\_ hrs, \_\_\_\_\_ min. Size \_\_\_\_\_

GAS WELL TEST -

Natural Prod. Test: None MCF/Day; Hours flowed \_\_\_\_\_ Choke Size \_\_\_\_\_

Tubing, Casing and Cementing Record

Size	Feet	San
8-5/8"	113	124
5-1/2"	3192	100
1-1/4"	3138	-

Method of Testing (pitot, back pressure, etc.): \_\_\_\_\_

Test After Acid or Fracture Treatment: 2.271 MCF/Day; Hours flowed 3

Choke Size 3/4 Method of Testing: Back pressure

Acid or Fracture Treatment (Give amounts of materials used, such as acid, water, oil, and sand): 26,000 gallons water, 30,000# sand  
Casing Tubing Date first new Press. \_\_\_\_\_ oil run to tanks

Oil Transporter \_\_\_\_\_

Gas Transporter El Paso Natural Gas Company

Remarks:

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

Approved JUN 18 1958, 19.....

KL PASO NATURAL GAS COMPANY (Company or Operator)

OIL CONSERVATION COMMISSION

By: D. C. Houston (Signature)

By: \_\_\_\_\_

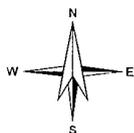
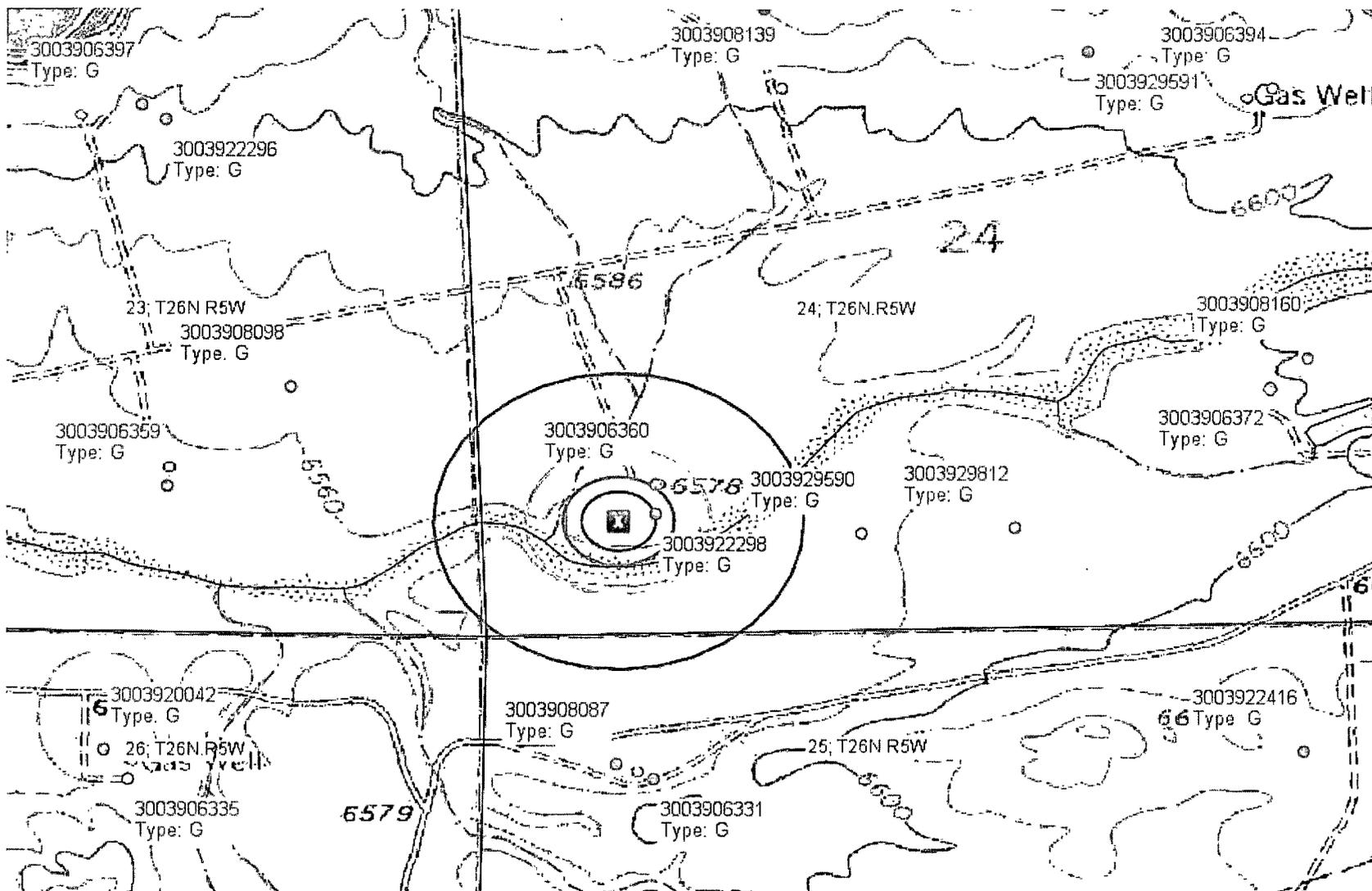
Title: Petroleum Engineer

Title: Supervisor Dist. # 3

Send Communications regarding well to:

Name: E. S. Oberly

Address: Box 997, Farmington, New Mexico



Petroleum Recovery  
Research Center

JICARILLA C No. 004E - Offset Wells

Figure: 02A

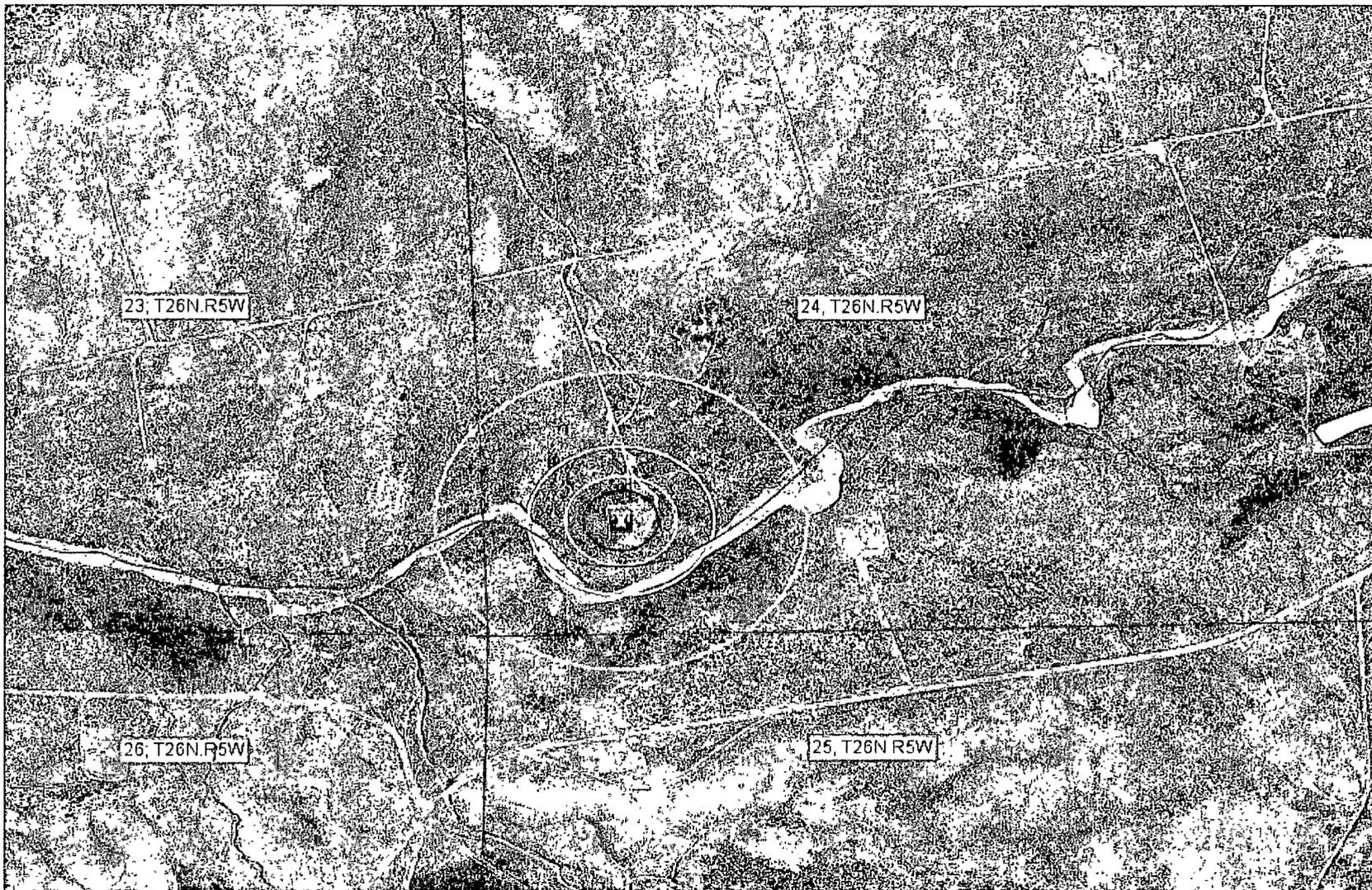
UL M, Sec. 24, 26N, 05W

Oct 07, 2010

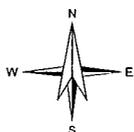
API 30-039-22298

# Appendix 03

Aerial Photo



0 500 1000ft



Petroleum Recovery  
Research Center

JICARILLA C No. 004E - Aerial View

Figure: 03

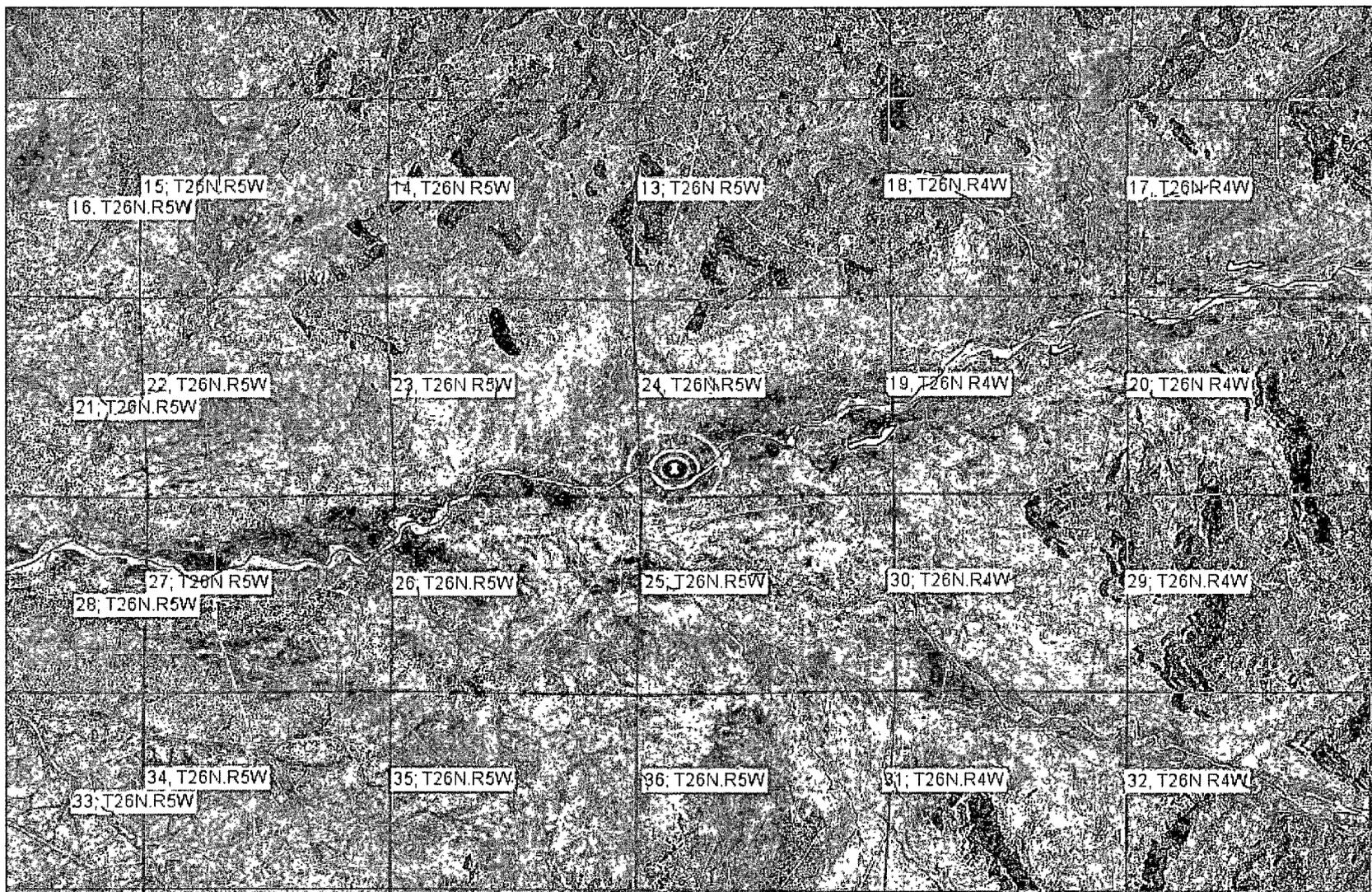
UL M, Sec. 24, 26N, 05W

Oct 07, 2010

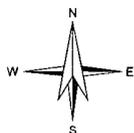
API 30-039-22298

# Appendix 04

Municipality Boundary Map



0 2000 4000ft



Petroleum Recovery  
Research Center

JICARILLA C No. 004E - Municipalities

Figure: 04

UL M, Sec. 24, 26N, 05W

Oct 07, 2010

API 30-039-22298

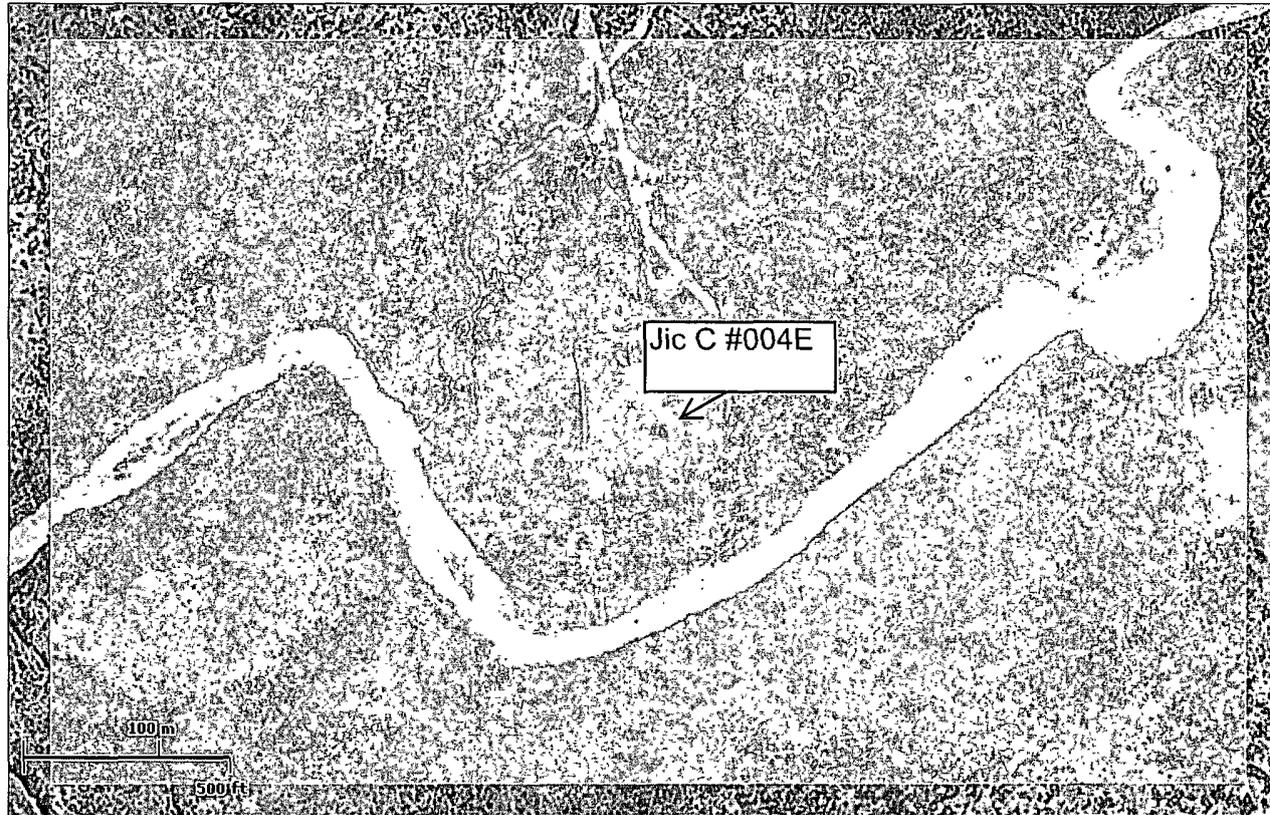
# Appendix 05

U.S. Fish & Wildlife Wetland Identification Map



# U.S. Fish and Wildlife Service National Wetlands Inventory

Oct 25, 2010



## Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deetwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Rivorine
- Other

## Status

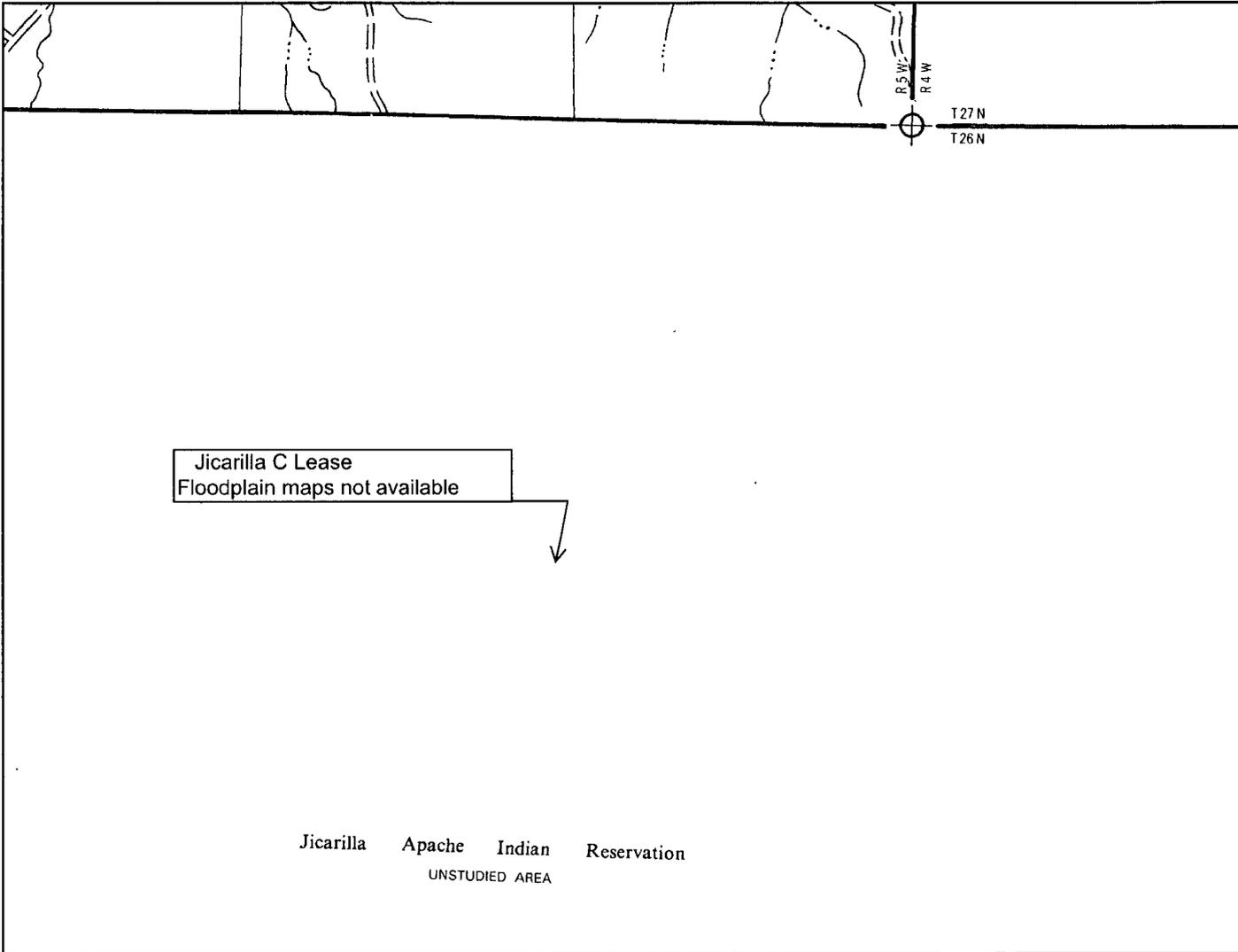
- Digital
- Scan
- Non-Digital
- No Data

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

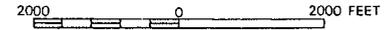
User Remarks:

# Appendix 06

FEMA 100-year Floodplain Map



APPROXIMATE SCALE

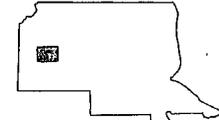


NATIONAL FLOOD INSURANCE PROGRAM

**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

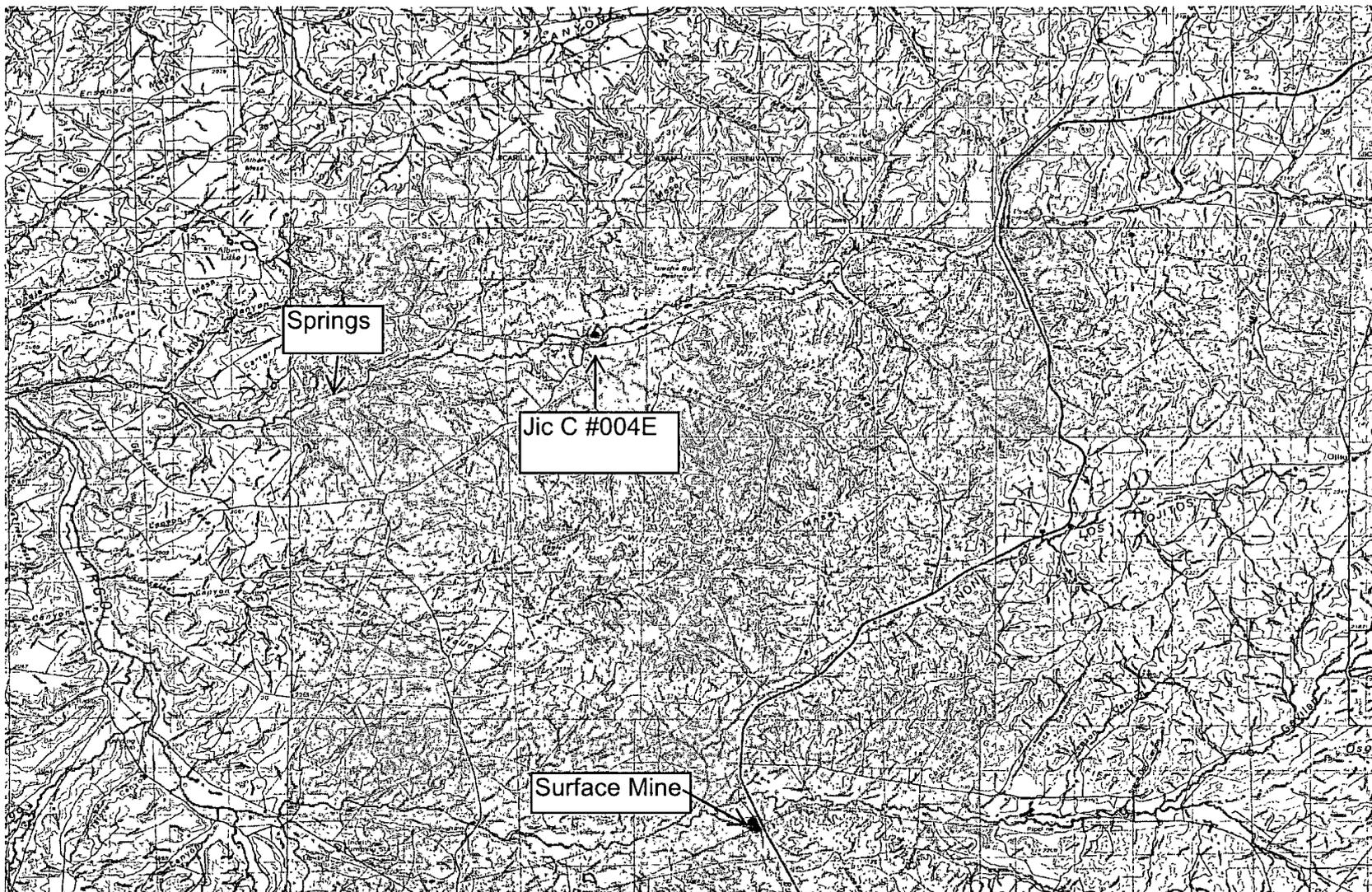


Federal Emergency Management Agency

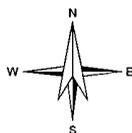
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program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

# Appendix 07

Mines, Mills, & Quarries Map



0 2 4mi



Petroleum Recovery  
Research Center

JICARILLA C NO. 004E - Mines, Mills, Quarries

Figure: 07

UL M, Sec. 24, 26N, 05W

Oct 07, 2010

# Appendix 08

C-203 Location Plat  
Site Physical Inspection Sheet

**ENERVEST OPERATING LLC**

**Below Grade Tank  
Observed Sighting Requirements**

Lease Name & Well Number C-4E NEW

API No. 30-039-22294-22258

Observed by LIE GARDNER

Date Observed 9/24/10

Latitude 36.467055 EL 6587

Longitude 107.316614

MEASURED FROM THE BELOW-GRADE TANK:	Yes	No	If not within limits, 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 type="checkbox"/>	<input checked="" type="checkbox"/>	<u>NOT A WETLAND/R1 TAPICITO CREEK &lt; 500 FT</u>
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 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**

**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  
Tenneco Oil Company

3. ADDRESS OF OPERATOR  
P.O. Box 3249, Englewood, CO 80155

4. LOCATION OF WELL (REPORT LOCATION CLEARLY. See space 17 below.)  
AT SURFACE: 790' FSL, 990' FWL "M"  
AT TOP PROD. INTERVAL:  
AT TOTAL DEPTH:

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

REQUEST FOR APPROVAL TO:	SUBSEQUENT REPORT OF:
TEST WATER SHUT-OFF <input type="checkbox"/>	<input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	<input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	<input checked="" type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	<input type="checkbox"/>
PULL OR ALTER CASING <input type="checkbox"/>	<input type="checkbox"/>
MULTIPLE COMPLETE <input type="checkbox"/>	<input type="checkbox"/>
CHANGE ZONES <input type="checkbox"/>	<input type="checkbox"/>
ABANDON* <input type="checkbox"/>	<input type="checkbox"/>
(other) <input type="checkbox"/>	<input type="checkbox"/>

5. LEASE  
Contract #108

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

7. UNIT AGREEMENT NAME

8. FARM OR LEASE NAME  
Jicarilla C

9. WELL NO.  
4E

10. FIELD OR WILDCAT NAME  
Basin Dakota

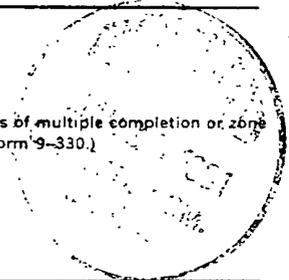
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA  
Section 24, T26N, R5W

12. COUNTY OR PARISH | 13. STATE  
Rio Arriba | New Mexico

14. API NO.

15. ELEVATIONS (SHOW DF, KDB, AND WD)  
6578' gr.

(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.)\*

2/10/81. RIH w/balance of tbq. Drill to top of DV tool. Tagged cmt. @ 7420'. Drill to PBD @ 7515'. Pressure test csg. to 3500 PSI. Circ'd hole w/1% KCL water. Spotted 500 gals. 7 1/2% DI-HCL over perms. TOO H w/tbg.

2/11/81. Ran GR/CCL. Perf'd Dakota w/3-1/8" premium chg. csg. gun @ 2 JSPF as follows: 7294-7300', 7306-08', 7410-20', 7452-56', 7462-64', 7490-7500', 34', 68 holes. Established rate of 32 BPM @ 2700 PSI. Acidized w/1400 gals 15% HCL & 102 ball sealers. Balled off complete. RIH w/junk basket to PBD. Knocked balls off perms. Frac Dakota w/80,000 gals 30# XL gel, 80,000# 20/40 sand & 25,000# 10/20 sand. AIR: 46 BPM, AIP: 3000 PSI, ISIP: 1750 PSI, 15 min SIP: 1450 PSI.

Subsurface Safety Valve: Manu. and Type \_\_\_\_\_ Set @ \_\_\_\_\_ Ft.

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

SIGNED Carley Statten TITLE Asst. Div. Adm. Mgr. DATE 2/17/81

(This space for Federal or State office use)

APPROVED BY \_\_\_\_\_ TITLE \_\_\_\_\_ DATE 2/17/81 **FOR RECORD**  
CONDITIONS OF APPROVAL, IF ANY:

NMOCC

MAR 21 1981

\*See Instructions on Reverse Side

FARMINGTON DISTRICT  
RV 665

## Instructions

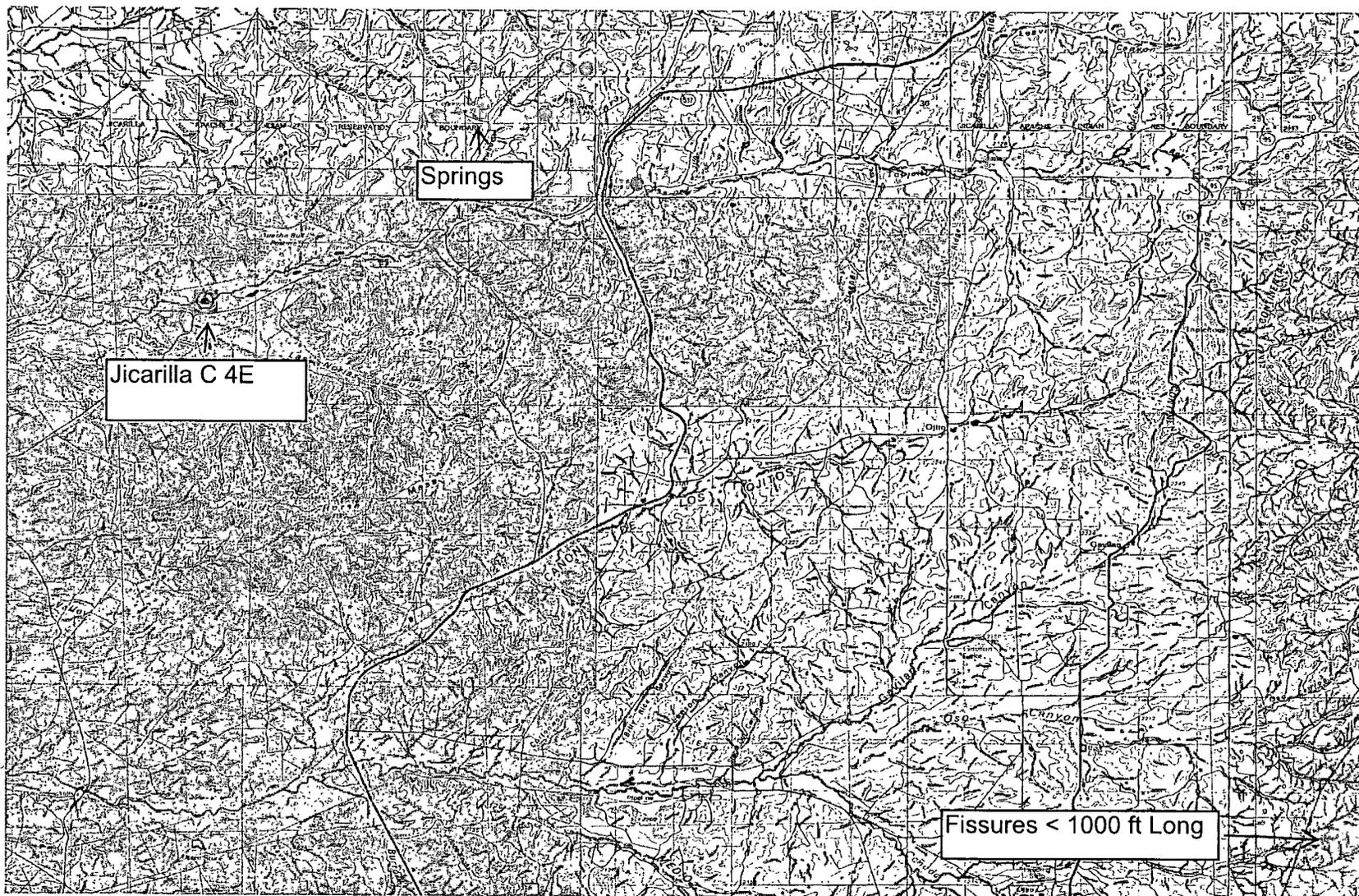
**General:** This form is designed for submitting proposals to perform certain well operations, and reports of such operations when completed, as indicated, on Federal and Indian lands pursuant to applicable Federal law and regulations, and, if approved or accepted by any State, on all lands in such State, pursuant to applicable State law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office.

**Item 4:** If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

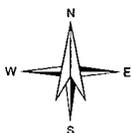
**Item 17:** Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by local Federal and/or State offices. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones, or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to top of any left in the hole; method of closing top of well; and date well site conditioned for final inspection looking to approval of the abandonment.

# Appendix 09

Karst Map



0 2 4mi



Petroleum Recovery  
Research Center

JICARILLA C NO. 004E - Karst

Figure: 09

UL M, Sec. 24, 26N, 05W

Oct 07, 2010

## 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)