

**MAR 12 2018**

**RECEIVED**

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

**APPLICATION FOR PERMIT TO DRILL OR REENTER**

FORM APPROVED  
OMB No. 1004-0137  
Expires October 31, 2014

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM97122
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other <input type="checkbox"/> Single Zone <input checked="" type="checkbox"/> Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator VANGUARD OPERATING LLC		7. If Unit or CA Agreement, Name and No.
3a. Address 5847 San Felipe, Suite 3000 Houston TX 7705		8. Lease Name and Well No. CHALK FEDERAL 8 <b>315552</b>
3b. Phone No. (include area code) (832)377-2236		9. API Well No. <b>30-015-44812</b>
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface SENW / 2300 FNL / 1650 FWL / LAT 32.7776086 / LONG -104.3038573 At proposed prod. zone SENW / 2300 FNL / 1650 FEL / LAT 32.7776086 / LONG -104.3038573		10. Field and Pool, or Exploratory RED LAKE / GLORIETA-YESO
14. Distance in miles and direction from nearest town or post office* 7 miles		11. Sec., T. R. M. or Blk. and Survey or Area SEC 5 / T18S / R27E / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 330 feet	16. No. of acres in lease 121	12. County or Parish EDDY
17. Spacing Unit dedicated to this well 40	18. Distance from proposed location* to nearest well, drilling, completed, 650 feet applied for, on this lease, ft.	13. State NM
19. Proposed Depth 4100 feet / 4100 feet	20. BLM/BIA Bond No. on file FED: NMB000797	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3490 feet	22. Approximate date work will start* 07/01/2017	23. Estimated duration 30 days

**24. Attachments**

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

- |  |   |
|--|---|
| 1. Well plat certified by a registered surveyor.   | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan.  | 5. Operator certification   |
| 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office). | 6. Such other site specific information and/or plans as may be required by the BLM.             |

25. Signature (Electronic Submission)	Name (Printed/Typed) Brian Wood / Ph: (505)466-8120	Date 03/03/2017
Title President		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 03/07/2018
Title Supervisor Multiple Resources		
Office CARLSBAD		

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

\*(Instructions on page 2)

Original API 30-015-42874  
Cancelled APD - 12-9-2016

**APPROVED WITH CONDITIONS**  
Approval Date: 03/07/2018

RWP 6-29-18



**Application for Permit to Drill** **Carlsbad Field** **Bureau of Land Management**  
**OCD Artesia**

**APD Package Report**

Date Printed: 03/07/2018 11:08 AM

APD ID: 10400012059	Well Status: AAPD
APD Received Date: 03/03/2017 02:44 PM	Well Name: CHALK FEDERAL
Operator: VANGUARD OPERATING LLC	Well Number: 8

APD Package Report Contents

- Form 3160-3
- Operator Certification Report
- Application Report
- Application Attachments
  - Well Plat: 2 file(s)
- Drilling Plan Report
- Drilling Plan Attachments
  - Blowout Prevention Choke Diagram Attachment: 1 file(s)
  - Blowout Prevention BOP Diagram Attachment: 1 file(s)
  - Casing Design Assumptions and Worksheet(s): 2 file(s)
  - Hydrogen sulfide drilling operations plan: 1 file(s)
  - Other Facets: 1 file(s)
- SUPO Report
- SUPO Attachments
  - Existing Road Map: 1 file(s)
  - Attach Well map: 1 file(s)
  - Production Facilities map: 1 file(s)
  - Water source and transportation map: 1 file(s)
  - Well Site Layout Diagram: 1 file(s)
  - Recontouring attachment: 1 file(s)
- PWD Report
- PWD Attachments
  - None
- Bond Report
- Bond Attachments
  - None

**NM OIL CONSERVATION**  
ARTESIA DISTRICT

**MAR 12 2018**

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## INSTRUCTIONS

**GENERAL:** This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws 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 local Federal offices.

**ITEM 1:** If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

**ITEM 4:** Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

**ITEM 14:** Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

**ITEMS 15 AND 18:** If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

**ITEM 22:** Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

## NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

**AUTHORITY:** 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

**PRINCIPAL PURPOSES:** The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

**ROUTINE USE:** Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

**EFFECT OF NOT PROVIDING INFORMATION:** Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

**BURDEN HOURS STATEMENT:** Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

## **Additional Operator Remarks**

### **Location of Well**

1. SHL: SENW / 2300 FNL / 1650 FWL / TWSP: 18S / RANGE: 27E / SECTION: 5 / LAT: 32.7776086 / LONG: -104.3038573 ( TVD: 4100 feet, MD: 4100 feet )

BHL: SENW / 2300 FNL / 1650 FEL / TWSP: 18S / RANGE: 27E / SECTION: 5 / LAT: 32.7776086 / LONG: -104.3038573 ( TVD: 4100 feet, MD: 4100 feet )

## **BLM Point of Contact**

Name: Priscilla Perez

Title: Legal Instruments Examiner

Phone: 5752345934

Email: pperez@blm.gov

## **Review and Appeal Rights**

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

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**Approval Date: 03/07/2018**

(Form 3160-3, page 4)

# PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	VANGUARD OPEARATING LLC.
LEASE NO.:	NMNM97122
WELL NAME & NO.:	8H -CHALK FEDERAL
SURFACE HOLE FOOTAGE:	2300'/N & 1650'/W
BOTTOM HOLE FOOTAGE:	2300'/N & 1650'/E
LOCATION:	Section 5 T.18 S., R.27E., NMP
COUNTY:	EDDY County, New Mexico

COA

H2S	<input checked="" type="radio"/> Yes	<input type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input type="radio"/> Low	<input type="radio"/> Medium	<input checked="" type="radio"/> High
Variance	<input checked="" type="radio"/> None	<input type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input checked="" type="radio"/> Conventional	<input type="radio"/> Multibowl	<input type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP

## A. Hydrogen Sulfide

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Delaware** formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

## B. CASING

**HIGH CAVE/KARST- OPERATOR HAS PROPOSE A CONTINGENCY CASING IF LOST CIRCULATION OCCURS WHILE DRILLING THE SURFACE HOLE.**

**IF LOST CIRCULATION OCCURS WHILE DRILLING THE 7 7/9 HOLE, THE CEMENT PROGRAM FOR THE 5 1/2 CASING WILL NEED TO BE MODIFIED AND THE BLM IS TO BE CONTACTED PRIOR TO RUNNING CAISNG. A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH THEREFORE, ONE INCH OPERATIONS WILL NOT BE PERMITTED. A DV TOOL WILL BE REQUIRED.**

### **Contingency Surface Casing Plan**

1. The **13-3/8** inch surface casing shall be set at approximately **375** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
  - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **8 5/8** inch intermediate casing is:
  - Cement to surface. If cement does not circulate see B.1.a, c-d above.Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
  - ❖ In High Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
3. The minimum required fill of cement behind the **5 1/2** inch production casing is:
  - Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

### **Casing Plan without Contingency**

1. The **8 5/8** inch surface casing shall be set at approximately **350** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
  - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
  - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement).

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
  - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **5-1/2** inch production casing is:
- Cement to surface. If cement does not circulate see B.1.a, c-d above.
- Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
- ❖ In High Cave/Karst Areas if cement does not circulate to surface on the first two casing strings , the cement on the 3rd casing string must come to surface.

### **C. PRESSURE CONTROL**

1. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **2000 (2M)** psi.

## **GENERAL REQUIREMENTS**

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
  - b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
  - c. BOPE tests (minimum of 4 hours)
- ☒ Chaves and Roosevelt Counties  
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.  
During office hours call (575) 627-0272.  
After office hours call (575)
- ☒ Eddy County  
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,  
(575) 361-2822
- ☒ Lea County  
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)  
393-3612



1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
  - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
  - b. When the operator proposes to set surface casing with Spudder Rig
    - Notify the BLM when moving in and removing the Spudder Rig.
    - Notify the BLM when moving in the 2<sup>nd</sup> Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
    - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

#### A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

#### **B. PRESSURE CONTROL**

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
  - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
  - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
  - c. Manufacturer representative shall install the test plug for the initial BOP test.
  - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
  - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
  - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
  - b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
  - c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.
  - d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE.

If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

- e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.
- g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

#### C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

#### D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

#### **Waste Minimization Plan (WMP)**

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

**ZS 022718**

**PECOS DISTRICT  
SURFACE USE  
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	VANGUARD OPEARATING LLC.
LEASE NO.:	NMNM97122
WELL NAME & NO.:	8H -CHALK FEDERAL
SURFACE HOLE	2300'/N & 1650'/W
FOOTAGE:	
BOTTOM HOLE FOOTAGE	2300'/N & 1650'/E
LOCATION:	Section 5 T.18 S., R.27E., NMP
COUNTY:	EDDY County, New Mexico

**TABLE OF CONTENTS**

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
  - Cave/Karst
- ☐ **Construction**
  - Notification
  - Topsoil
  - Closed Loop System
  - Federal Mineral Material Pits
  - Well Pads
  - Roads
- ☐ **Road Section Diagram**
- ☒ **Production (Post Drilling)**
  - Well Structures & Facilities
  - Pipelines
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

## **I. GENERAL PROVISIONS**

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

## **II. PERMIT EXPIRATION**

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## **III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES**

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## **IV. NOXIOUS WEEDS**

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for

acceptable weed control methods, which include following EPA and BLM requirements and policies.

## **V. SPECIAL REQUIREMENT(S)**

### **Cave and Karst Conditions of Approval for APDs**

**\*\*** Depending on location, additional Drilling, Casing, and Cementing procedures may be required by engineering to protect critical karst groundwater recharge areas.

#### **Cave/Karst Surface Mitigation**

The following stipulations will be applied to minimize impacts during construction, drilling and production:

##### **Construction:**

In the advent that any underground voids are opened up during construction activities, construction activities will be halted and the BLM will be notified immediately.

##### **No Blasting:**

No blasting will be utilized for pad construction. The pad will be constructed and leveled by adding the necessary fill and caliche.

##### **Pad Berming:**

- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.

- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised. (Any access road crossing the berm cannot be lower than the berm height.)
- Following a rain event, all fluids will be vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

#### **Tank Battery Liners and Berms:**

Tank battery locations and all facilities will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing, or equivalent, to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

#### **Leak Detection System:**

A method of detecting leaks is required. The method could incorporate gauges to measure loss, siting valves and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

#### **Automatic Shut-off Systems:**

Automatic shut off, check valves, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

#### **Pipelines:**

A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, siting valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

#### **Cave/Karst Subsurface Mitigation**

The following stipulations will be applied to protect cave/karst and ground water concerns:

#### **Rotary Drilling with Fresh Water:**

Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.



**Directional Drilling:**

Kick off for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

**Lost Circulation:**

ALL lost circulation zones from the surface to the base of the cave occurrence zone will be logged and reported in the drilling report.

Regardless of the type of drilling machinery used, if a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

**Abandonment Cementing:**

Upon well abandonment in cave karst areas additional plugging conditions of approval may be required. The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

**Pressure Testing:**

Annual pressure monitoring will be performed by the operator on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

**VI. CONSTRUCTION****A. NOTIFICATION**

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

## **B. TOPSOIL**

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

## **C. CLOSED LOOP SYSTEM**

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

## **D. FEDERAL MINERAL MATERIALS PIT**

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

## **E. WELL PAD SURFACING**

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

## **F. EXCLOSURE FENCING (CELLARS & PITS)**

### **Exclosure Fencing**

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

## **G. ON LEASE ACCESS ROADS**

### **Road Width**

The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

### **Surfacing**

Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

### **Crowning**

Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

### **Ditching**

Ditching shall be required on both sides of the road.

### **Turnouts**

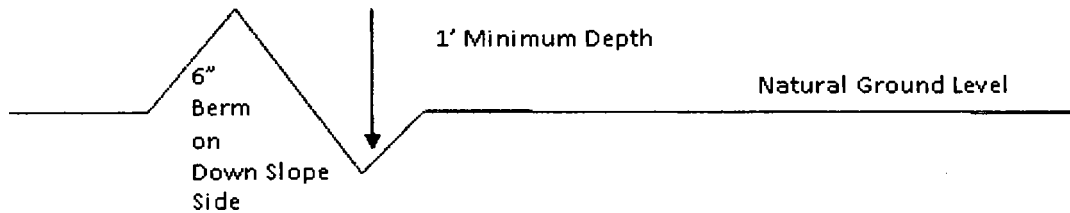
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

### **Drainage**

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

### Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

### Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

$$400 \text{ foot road with } 4\% \text{ road slope: } \frac{400'}{4\%} + 100' = 200' \text{ lead-off ditch interval}$$

### Cattle guards

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

### Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

### Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

### Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

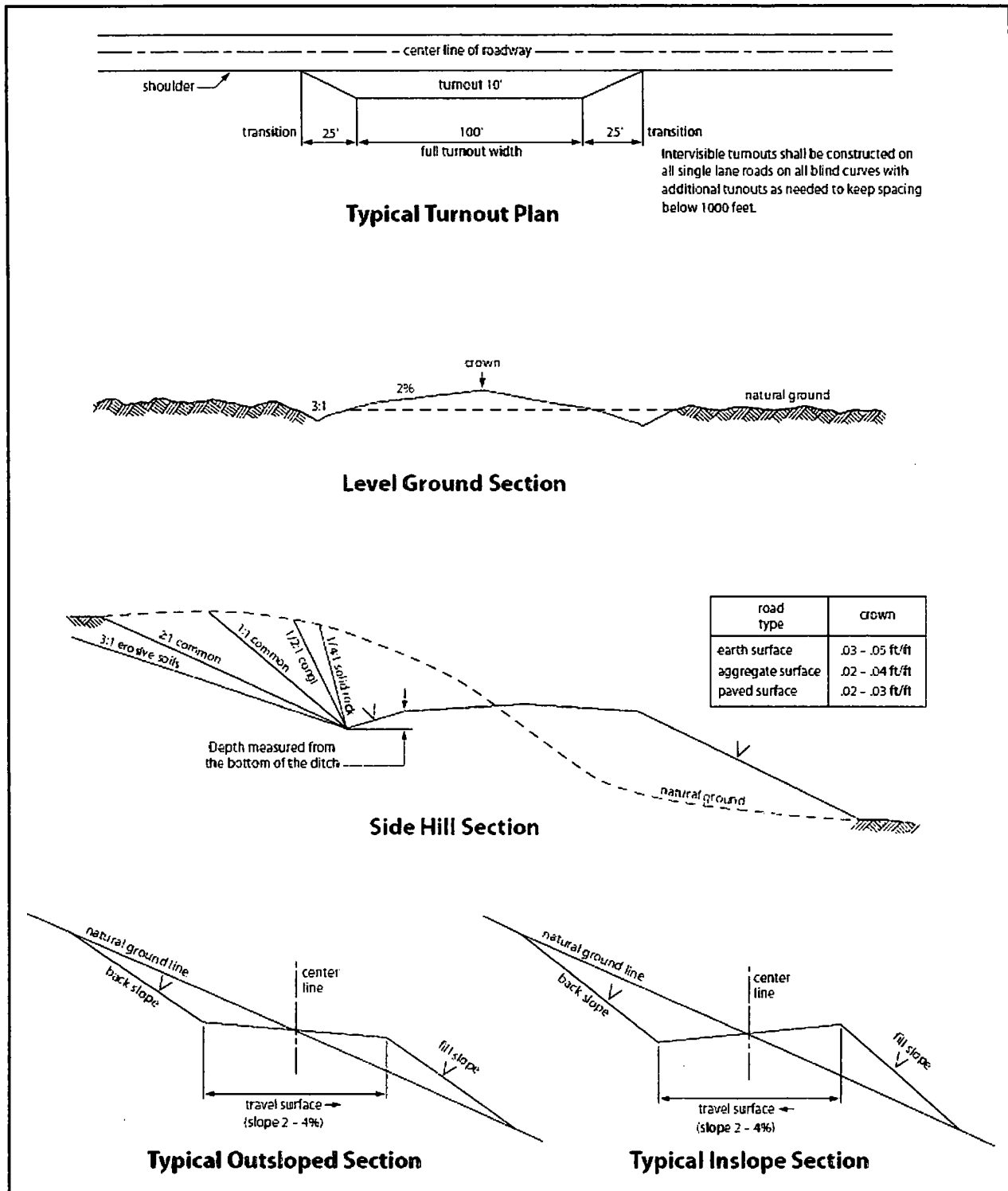


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

## **VII. PRODUCTION (POST DRILLING)**

### **A. WELL STRUCTURES & FACILITIES**

#### **Placement of Production Facilities**

Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

#### **Exclosure Netting (Open-top Tanks)**

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

#### **Chemical and Fuel Secondary Containment and Exclosure Screening**

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

#### **Open-Vent Exhaust Stack Exclosures**

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production

equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

### **Containment Structures**

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

### **Painting Requirement**

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

## **B. PIPELINES**

### **STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES**

**A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.**

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these

terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
- b. Activities of other parties including, but not limited to:
  - (1) Land clearing.
  - (2) Earth-disturbing and earth-moving work.
  - (3) Blasting.
  - (4) Vandalism and sabotage.
- c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized



right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

## **VIII. INTERIM RECLAMATION**

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of

vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

## **IX. FINAL ABANDONMENT & RECLAMATION**

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

#### Mixture 4, for Gypsum Sites

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

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

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

<u>Species</u>	<u>lb/acre</u>
Alkali Sacaton ( <i>Sporobolus airoides</i> )	1.5
DWS~ Four-wing saltbush ( <i>Atriplex canescens</i> )	8.0

DWS: DeWinged Seed

\*Pounds of pure live seed:

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



U.S. Department of the Interior  
BUREAU OF LAND MANAGEMENT

## Operator Certification Data Report

03/07/2018

### Operator Certification

*I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.*

**NAME:** Brian Wood

**Signed on:** 03/03/2017

**Title:** President

**Street Address:** 37 Verano Loop

**City:** Santa Fe

**State:** NM

**Zip:** 87508

**Phone:** (505)466-8120

**Email address:** afmss@permitswest.com

### Field Representative

**Representative Name:** Kyle Zimmerman

**Street Address:** 4001 Penbrook, Suite

**City:** Odessa

**State:** TX

**Zip:** 79762

**Phone:** (432)248-8150

**Email address:**



U.S. Department of the Interior  
BUREAU OF LAND MANAGEMENT

## Application Data Report

03/07/2018

APD ID: 10400012059

Submission Date: 03/03/2017

Operator Name: VANGUARD OPERATING LLC

Well Name: CHALK FEDERAL

Well Number: 8

Well Type: OIL WELL

Well Work Type: Drill



[Show Final Text](#)

### Section 1 - General

APD ID: 10400012059

Tie to previous NOS?

Submission Date: 03/03/2017

BLM Office: CARLSBAD

User: Brian Wood

Title: President

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM97122

Lease Acres: 121

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? NO

Permitting Agent? YES

APD Operator: VANGUARD OPERATING LLC

Operator letter of designation:

### Operator Info

Operator Organization Name: VANGUARD OPERATING LLC

Operator Address: 5847 San Felipe, Suite 3000

Zip: 77057

Operator PO Box:

Operator City: Houston

State: TX

Operator Phone: (832)377-2236

Operator Internet Address:

### Section 2 - Well Information

Well in Master Development Plan? NO

Mater Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: CHALK FEDERAL

Well Number: 8

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: RED LAKE

Pool Name: GLORIETA-YESO

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Operator Name: VANGUARD OPERATING LLC

Well Name: CHALK FEDERAL

Well Number: 8

Describe other minerals:

Is the proposed well in a Helium production area? N Use Existing Well Pad? YES New surface disturbance?

Type of Well Pad: SINGLE WELL

Multiple Well Pad Name:

Number:

Well Class: VERTICAL

Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 7 Miles

Distance to nearest well: 650 FT

Distance to lease line: 330 FT

Reservoir well spacing assigned acres Measurement: 40 Acres

Well plat: Plat\_20171218082555.pdf

Gas\_Cap\_Plan\_20171218082623.pdf

Well work start Date: 07/01/2017

Duration: 30 DAYS

### Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 1089A

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	230 0	FNL	165 0	FWL	18S	27E	5	Aliquot SENW	32.77760 86	- 104.3038 573	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 97122	349 0	410 0	410 0
BHL Leg #1	230 0	FNL	165 0	FEL	18S	27E	5	Aliquot SENW	32.77760 86	- 104.3038 573	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 97122	-610	410 0	410 0

APD ID: 10400012059

Submission Date: 03/03/2017

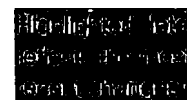
Operator Name: VANGUARD OPERATING LLC

Well Name: CHALK FEDERAL

Well Number: 8

Well Type: OIL WELL

Well Work Type: Drill



Show Final Text

## Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	YATES	3490	0	0	SANDSTONE	NONE	No
2	SEVEN RIVERS	3019	471	471	GYPSUM	NONE	No
3	QUEEN	2830	660	660	DOLOMITE	NATURAL GAS,OIL	No
4	GRAYBURG	2412	1078	1078	DOLOMITE	NATURAL GAS,OIL	No
5	SAN ANDRES	2179	1311	1311	LIMESTONE	NATURAL GAS	No
6	GLORIETA	708	2782	2782	SANDSTONE	NATURAL GAS,OIL	Yes
7	YESO	624	2866	2866	SANDSTONE	NATURAL GAS,OIL	Yes

## Section 2 - Blowout Prevention

Pressure Rating (PSI): 2M

Rating Depth: 5000

**Equipment:** Double ram with blind rams (top) and pipe rams (bottom), Drilling spool, or blowout preventer with 2 side outlets (choke side and kill side will be at least 2" diameter), Kill line (2" minimum), At least 2 choke line valves (2" minimum), 2" diameter choke line, 2 kill valves, one of which will be a check valve (2" minimum), 2 chokes, one of which will be capable of remote operation, Pressure gauge on choke manifold, Upper Kelly cock valve with handle available, Safety valve and subs to fit all drill string connections in use, All BOPE connections subjected to well pressure will be flanged, welded, or clamped, A fill-up line above the uppermost preventer.

**Requesting Variance?** NO

**Variance request:**

**Testing Procedure:** All casing strings will be tested as per Onshore Order #2. This also includes a thirty-day test, should the rig still be operating on the same well in thirty days. Pipe rams will be operated and checked each 24-hour period and each time the drill pipe is out of the hole. These functional tests will be documented on the daily drilling logs.

**Choke Diagram Attachment:**

BOPChoke\_03-03-2017.xlsx

**BOP Diagram Attachment:**

BOPChoke\_03-03-2017.xlsx



**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

### Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	CONDUCTOR	26	14.0	NEW	API	N	0	40	0	40	-610	-650	40	OTHER	68.7	OTHER - Weld						
2	SURFACE	11	8.625	NEW	API	N	0	425	0	425	-610	-1035	425	J-55	24	STC	1.18	1.18	DRY	2	DRY	2
3	PRODUCTION	7.75	5.5	NEW	API	N	0	4100	0	4100	-610	-4710	4100	HCP-110	17	LTC	1.18	1.18	DRY	2	DRY	2

#### Casing Attachments

**Casing ID:** 1      **String Type:** CONDUCTOR

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

**Casing ID:** 2      **String Type:** SURFACE

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

**Casing Design Assumptions and Worksheet(s):**

Casing\_Design\_03-03-2017.pdf

Operator Name: VANGUARD OPERATING LLC

Well Name: CHALK FEDERAL

Well Number: 8

#### Casing Attachments

Casing ID: 3 String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Casing\_Design\_03-03-2017.pdf

#### Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
CONDUCTOR	Lead		0	40	235	0.67	12	157	50	Ready Mix	None

SURFACE	Lead		0	425	300	1.35	14.8	405	200	Class C	1/4 lb/sack cello flake + 2% CaCl <sub>2</sub>
---------	------	--	---	-----	-----	------	------	-----	-----	---------	--

PRODUCTION	Lead		0	4100	300	1.9	12.8	571	80	35:65 poz Class C	5% NaCl _ 1/4 lb/sack cello flake + 5 lb/sack LCM-1 + 0.2% R-3 + 6% gel.
PRODUCTION	Tail		0	4100	415	1.33	14.8	552	50	Class C	0.6% R-3 + 1/4lb/sack cello flake

**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

### Section 5 - Circulating Medium

**Mud System Type:** Closed

**Will an air or gas system be Used?** NO

**Description of the equipment for the circulating system in accordance with Onshore Order #2:**

**Diagram of the equipment for the circulating system in accordance with Onshore Order #2:**

**Describe what will be on location to control well or mitigate other conditions:** Barite, bentonite, cedar bark

**Describe the mud monitoring system utilized:** Electronic/mechanical with a minimum pit volume totalizer, stroke counter, and flow sensor

### Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
425	3950	SALT SATURATED	9.9	10.2			11	24		0	
0	425	SPUD MUD	8.5	9.2			10	24		0	
3950	4100	OTHER : Brine with gel & starch	9.9	10.2			11	24		0	

### Section 6 - Test, Logging, Coring

**List of production tests including testing procedures, equipment and safety measures:**

No core or DST

**List of open and cased hole logs run in the well:**

CDL,CNL,DS,DLL,EL,GR,SN

**Coring operation description for the well:**

No core

**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

## **Section 7 - Pressure**

**Anticipated Bottom Hole Pressure:** 1775

**Anticipated Surface Pressure:** 873

**Anticipated Bottom Hole Temperature(F):** 135

**Anticipated abnormal pressures, temperatures, or potential geologic hazards?** NO

**Describe:**

**Contingency Plans geohazards description:**

**Contingency Plans geohazards attachment:**

**Hydrogen Sulfide drilling operations plan required?** YES

**Hydrogen sulfide drilling operations plan:**

H2S\_Plan\_03-03-2017.pdf

## **Section 8 - Other Information**

**Proposed horizontal/directional/multi-lateral plan submission:**

**Other proposed operations facets description:**

Deficiency Letter dated 10/20/17 requested:

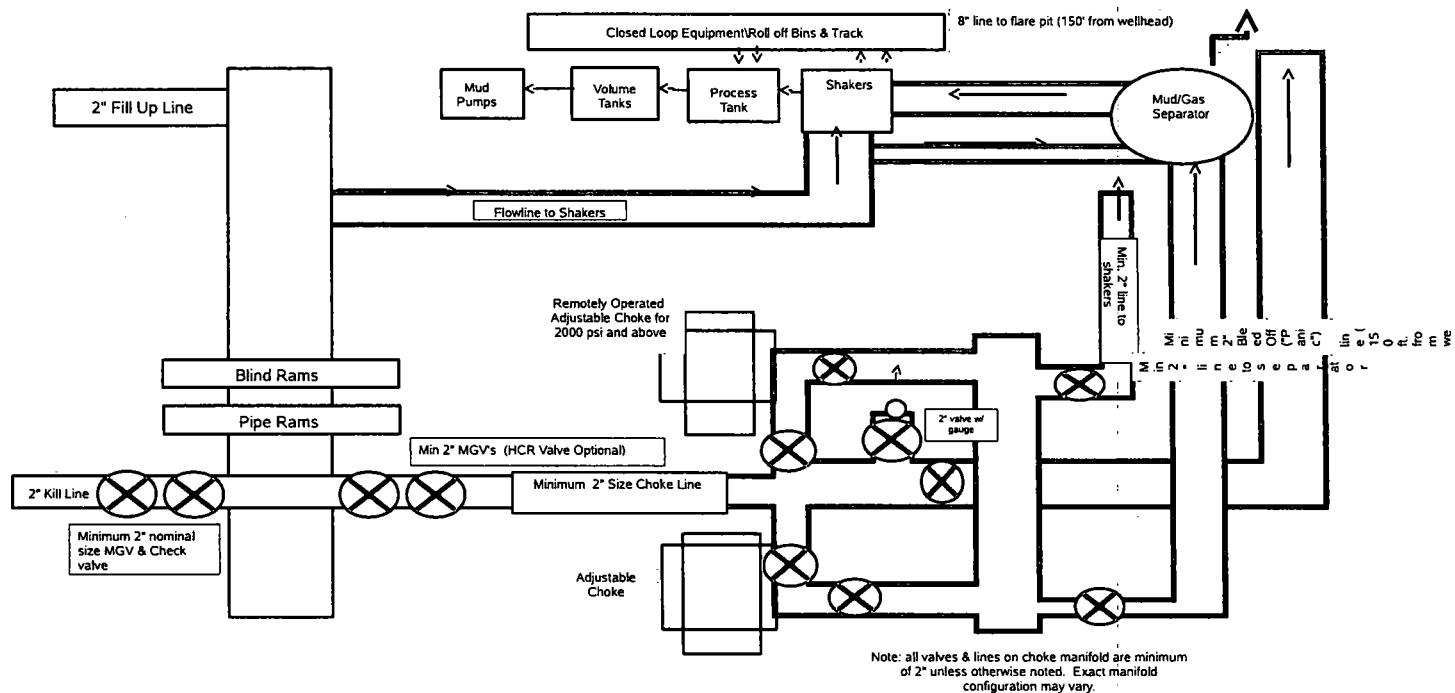
1) Gas Capture Plan - see revised Plat attachment;

2) Contingency casing for high cave area - cement and mud - see General Drill Plan attachment

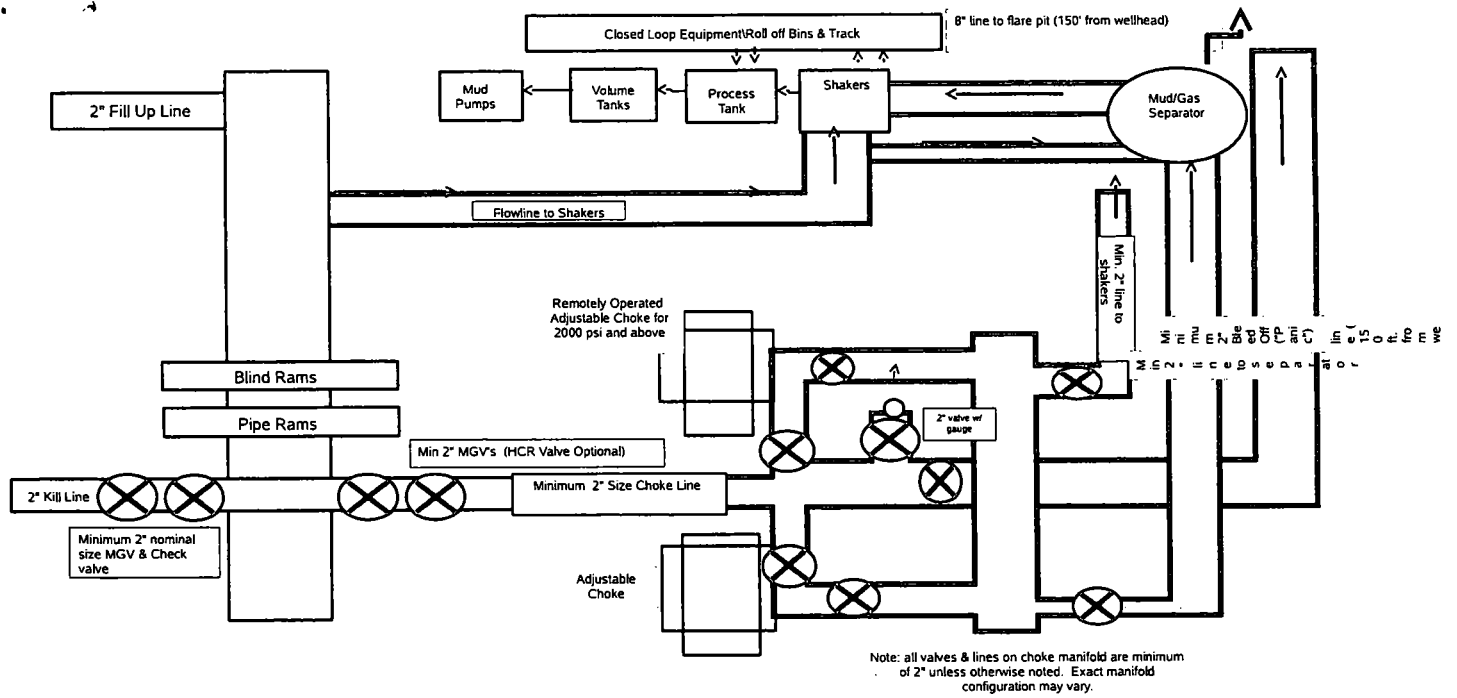
**Other proposed operations facets attachment:**

General\_Drill\_Plan\_20171026112238.pdf

**Other Variance attachment:**



**11" Minimum 2000 psi BOP and  
Minimum 2000 psi BOPE System Schematic  
W/ Closed Loop System Equipment**



**11" Minimum 2000 psi BOP and  
Minimum 2000 psi BOPE System Schematic  
W/ Closed Loop System Equipment**

Contingency String (If Necessary)							Length	Weight	Mud Weight
Size	Grade	#/ft	Collapse	Yield	Tensile	Coupling			
13.375	H-40		48	770	1730	322 ST&C	375	18000	8.5

Surface Casing							Length	Weight	Mud Weight
Size	Grade	#/ft	Collapse	Yield	Tensile	Coupling			
8.625	J-55		24	1370	2950	244 ST&C	425	10200	9.9

Production Casing							Length	Weight	Mud Weight
Size	Grade	#/ft	Collapse	Yield	Tensile	Coupling			
5.5	J-55		17	4910	5320	272 LT&C	4100	69700	9.9

#### Casing Parameters

##### Tensile

$SF_t = \text{Tensile} / \text{Weight}$  ; Must exceed 2.0

13.375 Contingency	322000	/	18000	=	17.89
8.625 Surface	244000	/	10200	=	23.92
5.5 Production	272000	/	69700	=	3.90

##### Collapse

$SF_c = \text{Collapse} / (\text{Mud Gradient} \times \text{TVD})$  ; Must exceed 1.18

13.375 Contingency	770	/	165.5588	=	4.65
8.625 Surface	1370	/	218.5376	=	6.27
5.5 Production	4910	/	2108.245	=	2.33

##### Burst

$SF_b = \text{Burst} / (\text{Mud Gradient} \times \text{TVD})$ ; Must exceed 1.18

13.375 Contingency	1730	/	165.5588	=	10.45
8.625 Surface	2950	/	218.5376	=	13.50
5.5 Production	5320	/	2108.245	=	2.52

Contingency String (If Necessary)								Length	Weight	Mud Weight
Size	Grade	#/ft	Collapse	Yield	Tensile	Coupling				
13.375	H-40		48	770	1730	322 ST&C			18000	

Surface Casing								Length	Weight	Mud Weight
Size	Grade	#/ft	Collapse	Yield	Tensile	Coupling				
8.625	J-55		24	1370	2950	244 ST&C			10200	

Production Casing								Length	Weight	Mud Weight
Size	Grade	#/ft	Collapse	Yield	Tensile	Coupling				
5.5	J-55		17	4910	5320	272 LT&C			69700	

#### Casing Parameters

##### Tensile

$SF_t = \text{Tensile} / \text{Weight}$  ; Must exceed 2.0

13.375 Contingency	322000	/	18000	=	17.89
8.625 Surface	244000	/	10200	=	23.92
5.5 Production	272000	/	69700	=	3.90

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$SF_c = \text{Collapse} / (\text{Mud Gradient} \times \text{TVD})$  ; Must exceed 1.18

13.375 Contingency	770	/	165.5588	=	4.65
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13.375 Contingency	1730	/	165.5588	=	10.45
8.625 Surface	2950	/	218.5376	=	13.50
5.5 Production	5320	/	2108.245	=	2.52



# Hydrogen Sulfide Drilling Plan Summary

- A. All personnel shall receive proper H<sub>2</sub>S training in accordance with Onshore Order 6 III.C.3.a.
- B. Briefing Area: two perpendicular areas will be designated by signs and readily accessible.
- C. Required Emergency Equipment:

- Well control equipment
  - a. Flare line 150' from wellhead to be ignited by flare gun
  - b. Choke manifold with a remotely operated choke
  - c. Mud/gas separator
- Protective equipment for essential personnel.

## Breathing apparatus:

- a. Rescue Packs (SCBA) — 1 unit shall be placed at each breathing area, 2 shall be stored in the safety trailer.
- b. Work/Escape packs — 4 packs shall be stored on the rig floor and contain sufficiently long air hoses as to not restrict work activity.
- c. Emergency Escape Packs — 4 packs shall be stored in the doghouse for emergency evacuation.

## Auxiliary Rescue Equipment:

- a. Stretcher
- b. Two OSHA full body harness
- c. 100 ft 5/8 inch OSHA approved rope
- d. 1-20# class ABC fire extinguisher

- H<sub>2</sub>S detection and monitoring equipment:

The stationary detector with three sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible @ 14 ppm. Calibrate a minimum of every 30 days or as needed. The sensors will be placed in the following places: Rig floor / Bell nipple / End of flow line or where well bore fluid is being discharged.  
(Gas sample tubes will be stored in the safety trailer)

- Visual warning systems.
  - a. One color code condition sign will be placed at the entrance to the site reflecting the possible conditions at the site.
  - b. A colored condition flag will be on display, reflecting the current condition at the site at the time.
  - c. Two windsocks will be placed in strategic locations, visible from all angles.

- Mud program:

The mud program has been designed to minimize the volume of H<sub>2</sub>S circulated to surface. The operator will have the necessary mud products to minimize hazards while drilling in H<sub>2</sub>S bearing zones.

- ❑ Metallurgy:
  - a. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.
  - b. All elastomers used for packing and seals shall be H2S trim.
- ❑ Communication:

Communication will be via cell phones and 2-way radio in emergency and company trucks.

## H2S CONTINGENCY DRILLING PLAN EMERGENCY CONTACTS

<u>Company Offices</u> -	Vanguard Houston Office	832 327-2255
	Vanguard Odessa Office	432 362-2209
	Kyle Zimmerman, Engineer	432 202-0145

Agency Call List		
City	Agency or Office	Phone
Artesia	Ambulance	911
Artesia	State Police	575-746-2703
Artesia	Sheriff's Office	575-746-9888
Artesia	City Police	575-746-2703
Artesia	Fire Department	575-746-2701
Artesia	Local Emergency Planning Committee	575-746-2122
Artesia	New Mexico OCD District II	575-748-1283
Carlsbad	Ambulance	911
Carlsbad	State Police	575-885-3137
Carlsbad	Sheriff's Office	575-887-7551
Carlsbad	City Police	575-885-2111
Carlsbad	Fire Department	575-885-2111
Carlsbad	Local Emergency Planning Committee	575-887-3798
Carlsbad	US DOI Bureau of Land Management	575-887-6544
State Wide	New Mexico Emergency Response Commission ("NMERC")	505-476-9600
State Wide	NMERC 24 hour Number	505-827-9126
State Wide	New Mexico State Emergency Operations Center	505-476-9635
National	National Emergency Response Center (Washington, D.C.)	800-424-8802

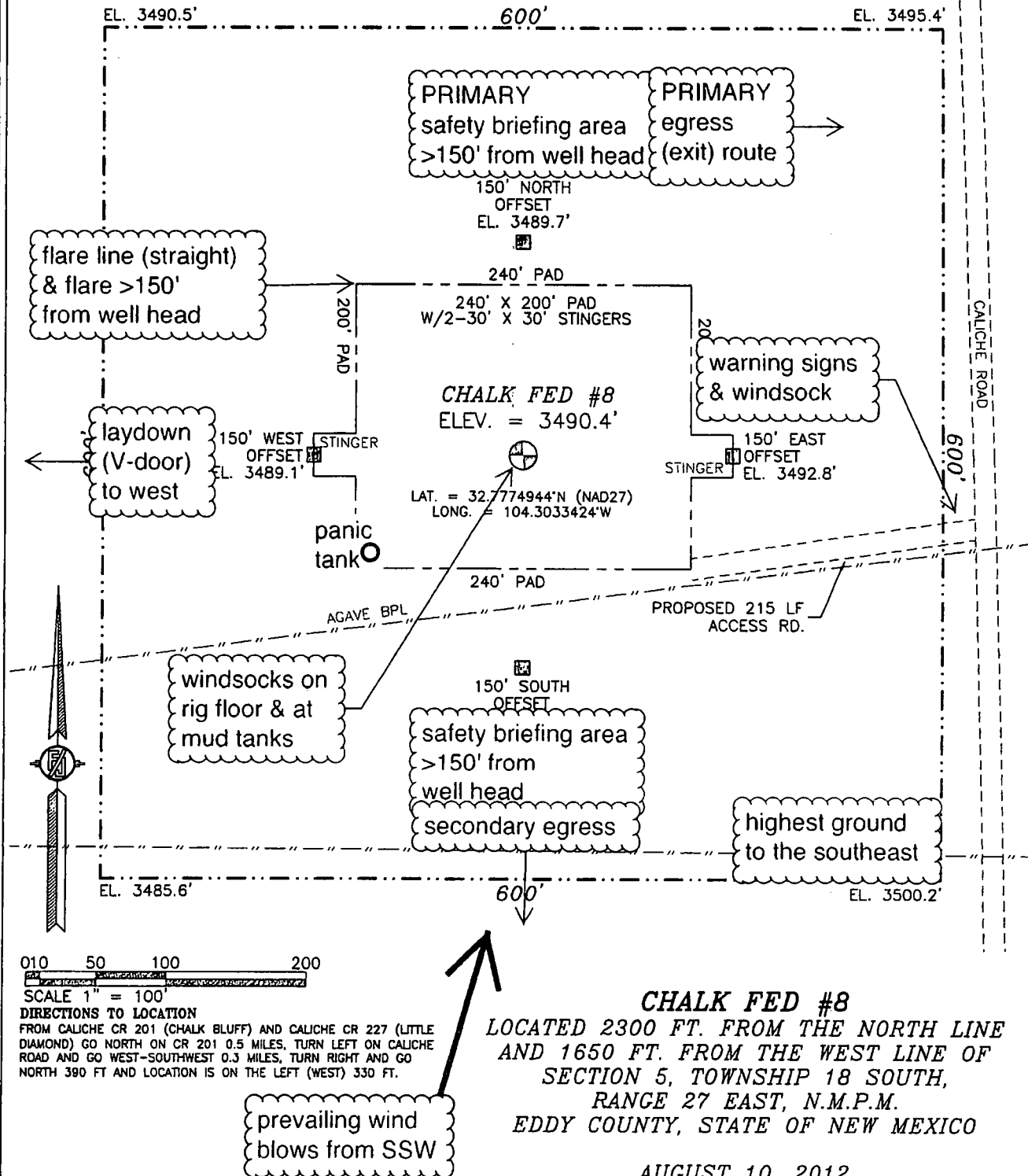
## H2S CONTINGENCY DRILLING PLAN EMERGENCY CONTACTS

Emergency Services				
Who	What	Where	Phone	Alternate
Boots & Coots International Well Control	Well Control	Houston / Odessa	1-800-256-9688	281-931-8884
Cudd Pressure Control	Well Control & Pumping	Odessa	915-699-0139	915-563-3356
Baker Hughes Inc.	Pumping Service	Artesia, Hobbs, & Odessa	575-746-2757	SAME
Total Safety	Safety Equipment and Personnel	Artesia	575-746-2847	SAME
Cutter Oilfield Services	Drilling Systems Equipment	Midland	432-488-6707	SAME
Assurance Fire & Safety	Safety Equipment and Personnel	Artesia	575-396-9702	575-441-2224
Flight for Life	Emergency Helicopter Evacuation	Lubbock	806-743-9911	SAME
Aerocare	Emergency Helicopter Evacuation	Lubbock	806-747-8923	SAME
Med Flight Air Ambulance	Emergency Helicopter Evacuation	Albuquerque	505-842-4433	SAME
Artesia General Hospital	Emergency Medical Care	Artesia	575-748-3333	702 North 13 Street

SECTION 5, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

H2S PAGE 5

NOTE: THE LATITUDE AND LONGITUDE COORDINATES ARE SHOWN  
USING THE NORTH AMERICAN DATUM OF 1927 (NAD27), AND ARE IN  
DECIMAL DEGREE FORMAT.



**CHALK FED #8**  
LOCATED 2300 FT. FROM THE NORTH LINE  
AND 1650 FT. FROM THE WEST LINE OF  
SECTION 5, TOWNSHIP 18 SOUTH,  
RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

AUGUST 10, 2012

SURVEY NO. 1089

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

**Chalk Federal #8  
H<sub>2</sub>S Contingency Plan:  
1 Mile Radius Map**

Section 5, Township 18S, Range 27E  
Eddy County, New Mexico

● Chalk Federal #8

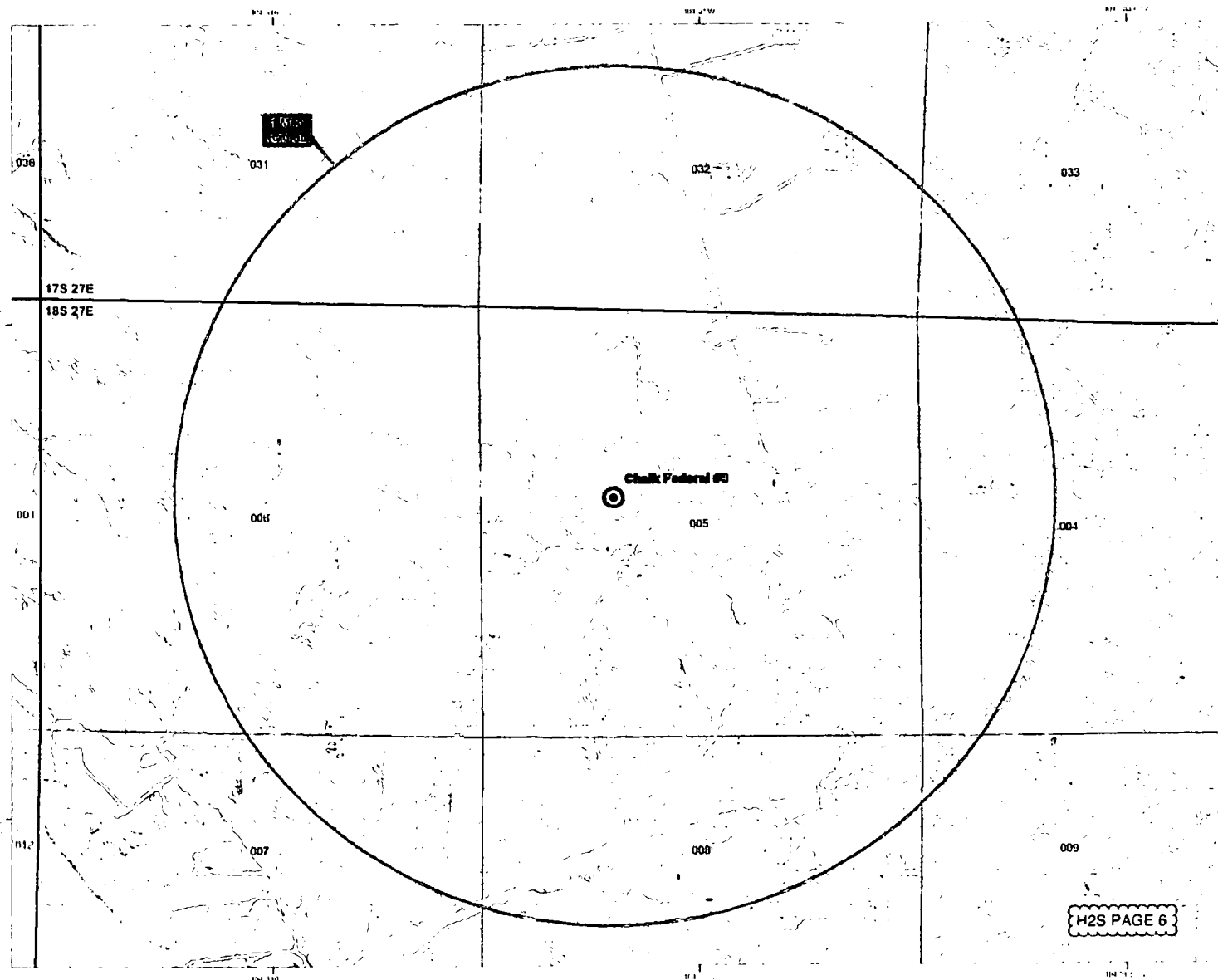
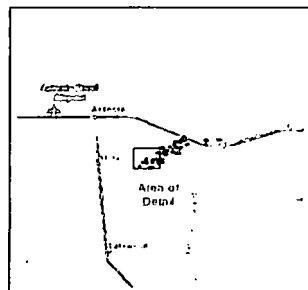
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Miles



NAD 1927 New Mexico State Plane East  
FIPS 3001 Feet

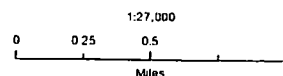
PERMITS UNIT

Prepared by Permats West, Inc., June 13, 2014



**Chalk Federal #8  
H<sub>2</sub>S Contingency Plan:  
2 Mile Radius Map**

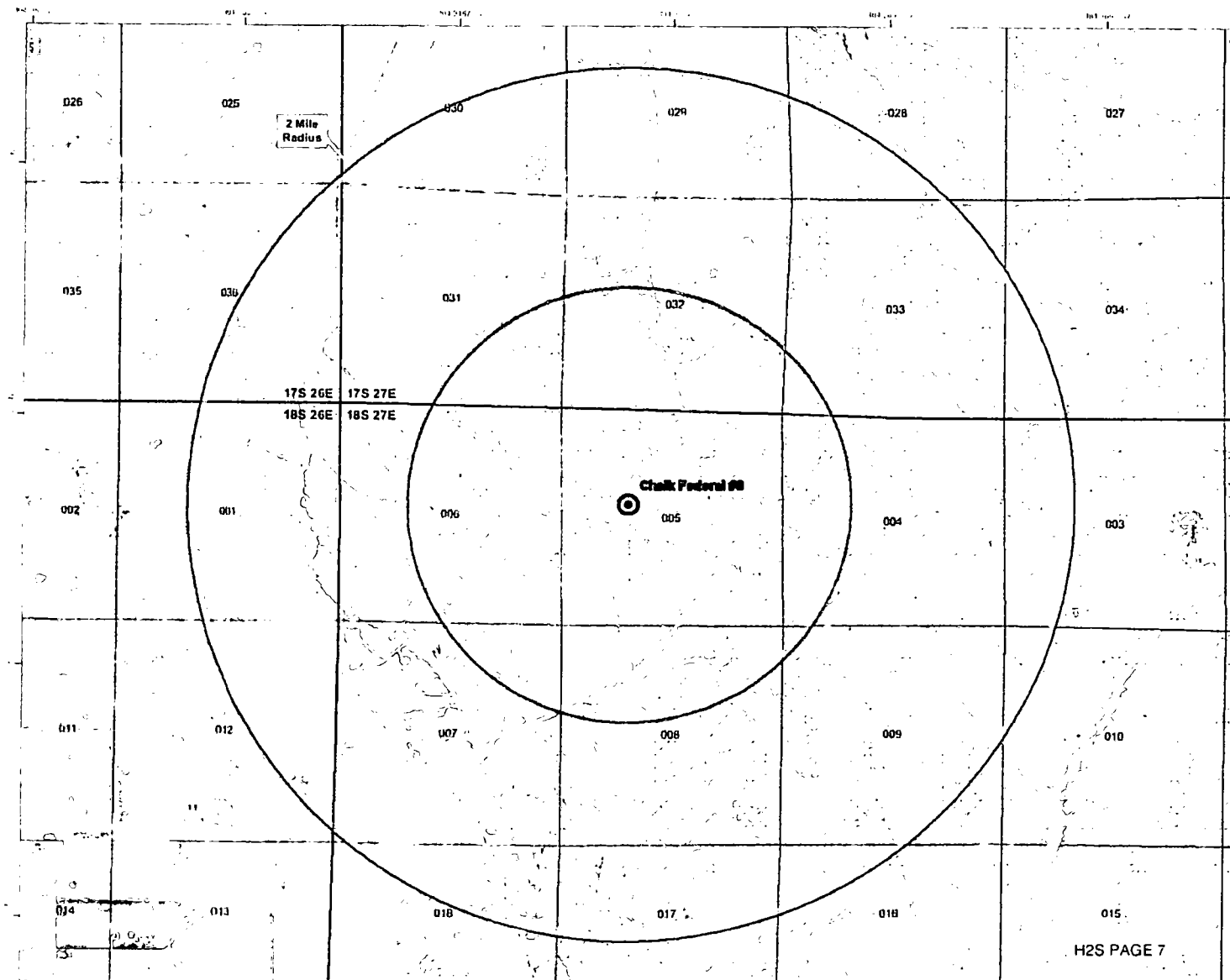
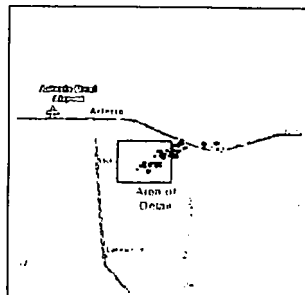
Section 5, Township 18S, Range 27E  
Eddy County, New Mexico



NAD 1927 New Mexico State Plane East  
FIPS 3001 Feet

PERMITS WEST

Prepared by Permits West, Inc., June 13, 2014



Vanguard Operating, LLC  
Chalk Federal 8  
2300' FNL & 1650' FWL  
Sec. 5, T. 18 S., R. 27 E.  
Eddy County, NM

DRILLING PLAN PAGE 1

Drilling Program

1. ESTIMATED TOPS

<u>Name</u>	<u>TVD</u>	<u>Subsea</u>	<u>Content</u>
Yates sandstone*	0'	3,490'	fresh water
Seven Rivers gypsum	471'	3,019'	---
Queen dolomite	660'	2,830'	oil, gas, saltwater
Grayburg dolomite	1,078'	2,412'	oil, gas, saltwater
San Andres limestone	1,311'	2,179'	oil, gas
Glorieta sandstone	2,782'	708'	oil, gas
Yeso sandstone	2,866'	624'	oil, gas
Total Depth	4,100'	-610'	oil, gas

\* in which surface casing will be set at 425' & contingency string, if needed, will be set at 375'

2. NOTABLE ZONES

Water zones will be protected with casing, cement, and weighted mud. Closest water well (RA 03661) is 3,909' north. Water bearing strata was reported in that well at 140'. Water sands were found at a depth of 265' in a well (30-015-00790) that is 1,320' east.

3. PRESSURE CONTROL

A 2,000 psi BOP stack and manifold system will be used. A typical 2,000 system is attached behind the directional plan. If the equipment changes, then a Sundry Notice will be filed. System will meet Onshore Orders 2 (BOP) and 6 (H<sub>2</sub>S) requirements.



Vanguard Operating, LLC  
Chalk Federal 8  
2300' FNL & 1650' FWL  
Sec. 5, T. 18 S., R. 27 E.  
Eddy County, NM

DRILLING PLAN PAGE 2

Blowout preventer equipment (BOP) will consist of a 2000 psi rated, "XLT" type, National VARCO double ram preventer that will be tested to a maximum pressure of 2000 psi. The unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top and drill pipe rams on bottom. The 2M BOP will be installed on the 8-5/8" surface casing and utilized continuously until total depth is reached. All casing strings will be tested as per Onshore Order #2. This also includes a thirty-day test, should the rig still be operating on the same well in thirty days.

Pipe rams will be operated and checked each 24-hour period and each time the drill pipe is out of the hole. These functional tests will be documented on the daily drilling logs.

BOP equipment will consist of the following:

- Double ram with blind rams (top) and pipe rams (bottom),
- Drilling spool, or blowout preventer with 2 side outlets (choke side and kill side will be at least 2" diameter),
- Kill line (2" minimum),
- At least 2 choke line valves (2" minimum),
- 2" diameter choke line,
- 2 kill valves, one of which will be a check valve (2" minimum),
- 2 chokes, one of which will be capable of remote operation,
- Pressure gauge on choke manifold,
- Upper Kelly cock valve with handle available,
- Safety valve and subs to fit all drill string connections in use,
- All BOPE connections subjected to well pressure will be flanged, welded, or clamped,
- A fill-up line above the uppermost preventer.

Vanguard Operating, LLC  
 Chalk Federal 8  
 2300' FNL & 1650' FWL  
 Sec. 5, T. 18 S., R. 27 E.  
 Eddy County, NM

DRILLING PLAN PAGE 3

4. CASING & CEMENT

Type	Setting Depth	Hole	Casing	#/ft	Grade	Casing Thread	API	Age
Conductor	40'	26"	14"	68.7	B	Weld	Yes	New
Surface	425'	11"	8.625"	24	J-55	S T & C	Yes	New
Production	4100'	7.785"	5.5"	17	J-55	L T & C	Yes	New

All casing designed with a minimum of:

Burst Safety Factor  
1.18

Collapse Safety Factor  
1.18

Tension Safety Factor  
2.00

casing	depth set	sacks cement	top	gallons per sack	density (ppg)	yield (cu ft per sack)	total cubic feet	% excess	blend
conductor	40'	N/A	GL	ready mix	ready mix	ready mix	ready mix	ready mix	ready mix
surface	425'	300	GL	6.2	14.8	1.35	405	200	1
production lead	4100'	300	GL	9.8	12.8	1.903	571	80	2
production tail	4100'	415	GL	6.2	14.8	1.33	552	50	3

Surface casing blend (1) will be Class C + ¼ pound/sack cello flake + 2% CaCl<sub>2</sub>. Centralizers will be installed as required by Onshore Order 2.

Production casing lead blend (2) will be 35:65 poz Class C + 5% NaCl + 1/4 pound/sack cello flake + 5 pounds per sack LCM-1 + 0.2% R-3 + 6% gel.

Production casing tail blend (3) will be Class C + 0.6% R-3 + ¼ pound/sack cello flake.

Vanguard Operating, LLC  
Chalk Federal 8  
2300' FNL & 1650' FWL  
Sec. 5, T. 18 S., R. 27 E.  
Eddy County, NM

DRILLING PLAN PAGE 4

Cement volumes will be adjusted based on caliper log volumes and depths of casing and adjusted proportionately for depth changes of the multi stage tool if applicable.

A 13-3/8", 48#, H-40, ST&C, New, API contingency string will be set at 375' in the Yates in a reamed 17-1/2" hole if circulation is lost in cave or karst (cave & karst potential to 350') and not regained. Contingency string will be cemented to the surface with 400 sacks (536 cubic feet) Class C + 1/4 pound per sack cello flake + 2% CaCl<sub>2</sub> mixed with 6.2 gallons per sack to yield 1.34 cubic feet per sack and 14.8 pounds per gallon. Excess >100%

Upon the setting of a 13-3/8" contingency casing string, a 13-5/8" x 13-3/8" weld on wellhead will be installed. A 13-3/8" to 11" adapter flange will be installed and the 11" XLT 2000 psi NOV double ram BOP/BOPE (Schematic attached) will be installed. The BOP will be tested against the casing to 70% of the internal yield pressure of the 13-3/8", 48#, H-40, ST&C (1211 psi) casing and held for 30 minutes before drilling out the 13-3/8" casing shoe. The formation will be drilled with a 10-3/4" bit approximately 50 feet past the 13-3/8" casing shoe into a competent formation and 8-5/8" casing will be set at approximately 425' (≥50' beyond the previous casing shoe) in the Yates and cemented with 410 sacks (549 cubic feet) Class C + 1/4 pound per sack cello flake + 2% CaCl<sub>2</sub> mixed with 6.2 gallons per sack to yield 1.34 cubic feet per sack and 14.8 pounds per gallon. Excess >125%

##### 5. MUD PROGRAM

An electronic/mechanical mud monitor will with a minimum pit volume totalizer, stroke counter, and flow sensor will be used. All necessary mud products will be on site to handle any abnormal hole condition that could possibly be encountered during the drilling of this well. Circulation could be lost in the Grayburg and San Andres.

Vanguard Operating, LLC  
 Chalk Federal 8  
 2300' FNL & 1650' FWL  
 Sec. 5, T. 18 S., R. 27 E.  
 Eddy County, NM

DRILLING PLAN PAGE 5

Interval	0 - 425'	425' - 3950'	3950' - TD
Type	fresh water	brine	brine with gel & starch
weight	8.5 - 9.2	9.9 - 10.2	9.9 - 10.2
pH	10	10 - 11.5	10 - 11.5
WL	NC	NC	15 - 20
viscosity	28-34	30-32	32 - 35
MC	NC	NV	1
solids	NC	<2%	<3%
pump rate	300 - 350 gpm	350 - 400 gpm	400 - 450 gpm
other	LCM as needed	salt gel & MF as needed, pump high viscosity sweeps to control solids	salt gel, acid, & MF as needed; pump high viscosity sweeps to control solids

## 6. CORES, TESTS, & LOGS

No core or drill stem test is planned. A triple combo with spectral GR - dual lateral log, micro spherical focused log, & spectral density log will be run after tagging total depth. Will log from total depth to surface. A dual spaced neutron log and compensated spectral natural GR log will be run from total depth to surface.

## 7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is 1,775 psi. No H<sub>2</sub>S is expected during the drilling phase. Nevertheless, H<sub>2</sub>S monitoring equipment will be on the rig floor and air packs will be available before drilling out of the surface casing. The mud logger will be warned to use a gas trap to detect H<sub>2</sub>S. If any H<sub>2</sub>S is detected, then the mud weight will be increased and H<sub>2</sub>S inhibitors will be added to control the gas. An H<sub>2</sub>S drilling operations contingency plan is attached.

Vanguard Operating, LLC  
Chalk Federal 8  
2300' FNL & 1650' FWL  
Sec. 5, T. 18 S., R. 27 E.  
Eddy County, NM

DRILLING PLAN PAGE 6

The well is located in a potential cave or karst area. Thus, lost circulation is possible down to 350'. See the contingency casing string and cement plan on Page 4.

8. OTHER INFORMATION

The anticipated spud date is upon approval. It is expected it will take  $\approx$ 1 month to drill and complete the well.



U.S. Department of the Interior  
BUREAU OF LAND MANAGEMENT

## SUPO Data Report

03/07/2018

APD ID: 10400012059

Submission Date: 03/03/2017

Operator Name: VANGUARD OPERATING LLC

Well Name: CHALK FEDERAL

Well Number: 8

Well Type: OIL WELL

Well Work Type: Drill



[Show Final Text](#)

### Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Road\_Map\_03-03-2017.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT

Row(s) Exist? NO

#### ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

### Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

### Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Well\_Map\_03-03-2017.pdf

**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

**Existing Wells description:**

#### **Section 4 - Location of Existing and/or Proposed Production Facilities**

**Submit or defer a Proposed Production Facilities plan?** SUBMIT

**Production Facilities description:** Two 3" poly surface pipelines will be laid all on lease east, south, west, and south 1,302.7' to Vanguard's existing Chalk Federal battery in the NESW 5-18s-27e. Operating pressure will be 50 psi. Power line (NMNM-133978) has already been built to the pad.

**Production Facilities map:**

Production\_Facilities\_Map\_03-03-2017.pdf

#### **Section 5 - Location and Types of Water Supply**

##### **Water Source Table**

**Water source use type:** DUST CONTROL,  
INTERMEDIATE/PRODUCTION CASING, STIMULATION, SURFACE  
CASING

**Water source type:** GW WELL

**Describe type:**

**Source longitude:**

**Source latitude:**

**Source datum:**

**Water source permit type:** WATER WELL

**Source land ownership:** PRIVATE

**Water source transport method:** TRUCKING

**Source transportation land ownership:** PRIVATE

**Water source volume (barrels):** 4100

**Source volume (acre-feet):** 0.5284617

**Source volume (gal):** 172200

**Water source and transportation map:**

Water\_Source\_Map\_03-03-2017.pdf

**Water source comments:**

**New water well?** NO

##### **New Water Well Info**

**Well latitude:**

**Well Longitude:**

**Well datum:**

**Well target aquifer:**

**Est. depth to top of aquifer(ft):**

**Est thickness of aquifer:**

**Aquifer comments:**

**Aquifer documentation:**

**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

**Well depth (ft):**

**Well casing type:**

**Well casing outside diameter (in.):**

**Well casing inside diameter (in.):**

**New water well casing?**

**Used casing source:**

**Drilling method:**

**Drill material:**

**Grout material:**

**Grout depth:**

**Casing length (ft.):**

**Casing top depth (ft.):**

**Well Production type:**

**Completion Method:**

**Water well additional information:**

**State appropriation permit:**

**Additional information attachment:**

### **Section 6 - Construction Materials**

**Construction Materials description:**

**Construction Materials source location attachment:**

### **Section 7 - Methods for Handling Waste**

**Waste type:** DRILLING

**Waste content description:** Mud

**Amount of waste:** 4100 barrels

**Waste disposal frequency :** Daily

**Safe containment description:** Steel tanks

**Safe containmant attachment:**

**Waste disposal type:** HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** PRIVATE

**Disposal type description:**

**Disposal location description:** Halfway, NM

### **Reserve Pit**

**Reserve Pit being used?** NO

**Temporary disposal of produced water into reserve pit?**

**Reserve pit length (ft.)** **Reserve pit width (ft.)**

**Reserve pit depth (ft.)** **Reserve pit volume (cu. yd.)**

**Is at least 50% of the reserve pit in cut?**

**Reserve pit liner**

**Reserve pit liner specifications and installation description**



**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

### **Cuttings Area**

**Cuttings Area being used?** NO

**Are you storing cuttings on location?** YES

**Description of cuttings location** Steel tanks on site

**Cuttings area length (ft.)**

**Cuttings area width (ft.)**

**Cuttings area depth (ft.)**

**Cuttings area volume (cu. yd.)**

**Is at least 50% of the cuttings area in cut?**

**WCuttings area liner**

**Cuttings area liner specifications and installation description**

### **Section 8 - Ancillary Facilities**

**Are you requesting any Ancillary Facilities?:** NO

**Ancillary Facilities attachment:**

**Comments:**

### **Section 9 - Well Site Layout**

**Well Site Layout Diagram:**

Well\_Site\_Layout\_20170926104244.pdf

**Comments:**

### **Section 10 - Plans for Surface Reclamation**

**Type of disturbance:** No New Surface Disturbance **Multiple Well Pad Name:**

**Multiple Well Pad Number:**

**Recontouring attachment:**

Recontouring\_Interim\_Reclamation\_Plats\_20170926104545.pdf

**Drainage/Erosion control construction:** Berm

**Drainage/Erosion control reclamation:** Original shape

**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

**Wellpad long term disturbance (acres):** 1.14

**Wellpad short term disturbance (acres):** 0.96

**Access road long term disturbance (acres):** 0.01

**Access road short term disturbance (acres):** 0.01

**Pipeline long term disturbance (acres):** 0.59811753

**Pipeline short term disturbance (acres):** 0.59811753

**Other long term disturbance (acres):** 0

**Other short term disturbance (acres):** 0

**Total long term disturbance:** 1.7481176

**Total short term disturbance:** 1.5681175

**Reconstruction method:** Interim reclamation will consist of removing caliche from the stingers and a 30' wide swath on the west and shrinking the pad 15% from 1.14 acre to a 210' x 200' (=0.96 acre) area around the pump jack. Disturbed areas will be contoured to the original shape. Soil and brush will be evenly spread over disturbed areas. Seeded areas will be ripped or harrowed. A BLM approved seed mix will be sown in a BLM approved manner.

**Topsoil redistribution:** Enough stockpiled topsoil will be retained to cover the remainder of the pad when the well is plugged. Once the well is plugged, then the remainder of the pad will be similarly reclaimed. Noxious weeds will be controlled.

**Soil treatment:** None

**Existing Vegetation at the well pad:**

**Existing Vegetation at the well pad attachment:**

**Existing Vegetation Community at the road:**

**Existing Vegetation Community at the road attachment:**

**Existing Vegetation Community at the pipeline:**

**Existing Vegetation Community at the pipeline attachment:**

**Existing Vegetation Community at other disturbances:**

**Existing Vegetation Community at other disturbances attachment:**

**Non native seed used?**

**Non native seed description:**

**Seedling transplant description:**

**Will seedlings be transplanted for this project?**

**Seedling transplant description attachment:**

**Will seed be harvested for use in site reclamation?**

**Seed harvest description:**

**Seed harvest description attachment:**

**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

### **Seed Management**

#### **Seed Table**

**Seed type:**

**Seed source:**

**Seed name:**

**Source name:**

**Source address:**

**Source phone:**

**Seed cultivar:**

**Seed use location:**

**PLS pounds per acre:**

**Proposed seeding season:**

#### **Seed Summary**

**Total pounds/Acre:**

**Seed Type**

**Pounds/Acre**

**Seed reclamation attachment:**

#### **Operator Contact/Responsible Official Contact Info**

**First Name:**

**Last Name:**

**Phone:**

**Email:**

**Seedbed prep:**

**Seed BMP:**

**Seed method:**

**Existing invasive species?** NO

**Existing invasive species treatment description:**

**Existing invasive species treatment attachment:**

**Weed treatment plan description:** As required by BLM

**Weed treatment plan attachment:**

**Monitoring plan description:** As required by BLM

**Monitoring plan attachment:**

**Success standards:** As required by BLM

**Pit closure description:** No pit

**Pit closure attachment:**

**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8

## **Section 11 - Surface Ownership**

**Disturbance type:** WELL PAD

**Describe:**

**Surface Owner:** BUREAU OF LAND MANAGEMENT

**Other surface owner description:**

**BIA Local Office:**

**BOR Local Office:**

**COE Local Office:**

**DOD Local Office:**

**NPS Local Office:**

**State Local Office:**

**Military Local Office:**

**USFWS Local Office:**

**Other Local Office:**

**USFS Region:**

**USFS Forest/Grassland:**

**USFS Ranger District:**

## **Section 12 - Other Information**

**Right of Way needed?** NO

**Use APD as ROW?**

**ROW Type(s):**

### **ROW Applications**

**SUPO Additional Information:** Deficiency Letter dated 9/25/17 requested: 1) Revised Well Site Layout diagram - see revised attachment; 2) Revised Reclamation Diagram - see revised attachment.

**Use a previously conducted onsite?** YES

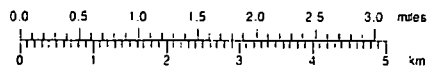
**Previous Onsite information:** Inspection held with John Fast on 6/21/2012. Boone Arch Services filed report NMCRIS 125504 for the well site and road on October 24, 2012. Boone met with BLM archaeologist Stacy Galassini on July 16, 2014. They determined no further survey was required for the pipeline due to 9 previous surveys.

### **Other SUPO Attachment**

**Operator Name:** VANGUARD OPERATING LLC

**Well Name:** CHALK FEDERAL

**Well Number:** 8







Chalk  
Federal 8

1302.68' pipeline route

201

201

MAP 3





MAP 4

EL. 3490.5' 600' EL. 3495.4'

150' NORTH  
OFFSET  
EL. 3489.7'

240' PAD

240' X 200' PAD  
W/2-30' X 30' STINGERS

200' PAD

120'

CHALK FED #8  
ELEV. = 3490.4'

120'

150' WEST  
OFFSET  
EL. 3489.1'

STINGER

120'

LAT. = 32.7774944°N (NAD27)  
LONG. = 104.3013424°W

80'

240' PAD

150' EAST  
OFFSET  
EL. 3492.8'

STINGER

200' PAD

AGAVE BPL

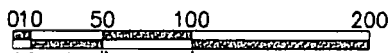
PROPOSED 215 LF  
ACCESS RD.

150' SOUTH  
OFFSET  
EL. 3490.8'

DCP BPL

EL. 3485.6' 600' EL. 3500.2'

009



**CHALK FED #8**  
**LOCATED 2300 FT. FROM THE NORTH LINE**  
**AND 1650 FT. FROM THE WEST LINE OF**  
**SECTION 5, TOWNSHIP 18 SOUTH,**  
**RANGE 27 EAST, N.M.P.M.**  
**EDDY COUNTY, STATE OF NEW MEXICO**

*AUGUST 10, 2012*

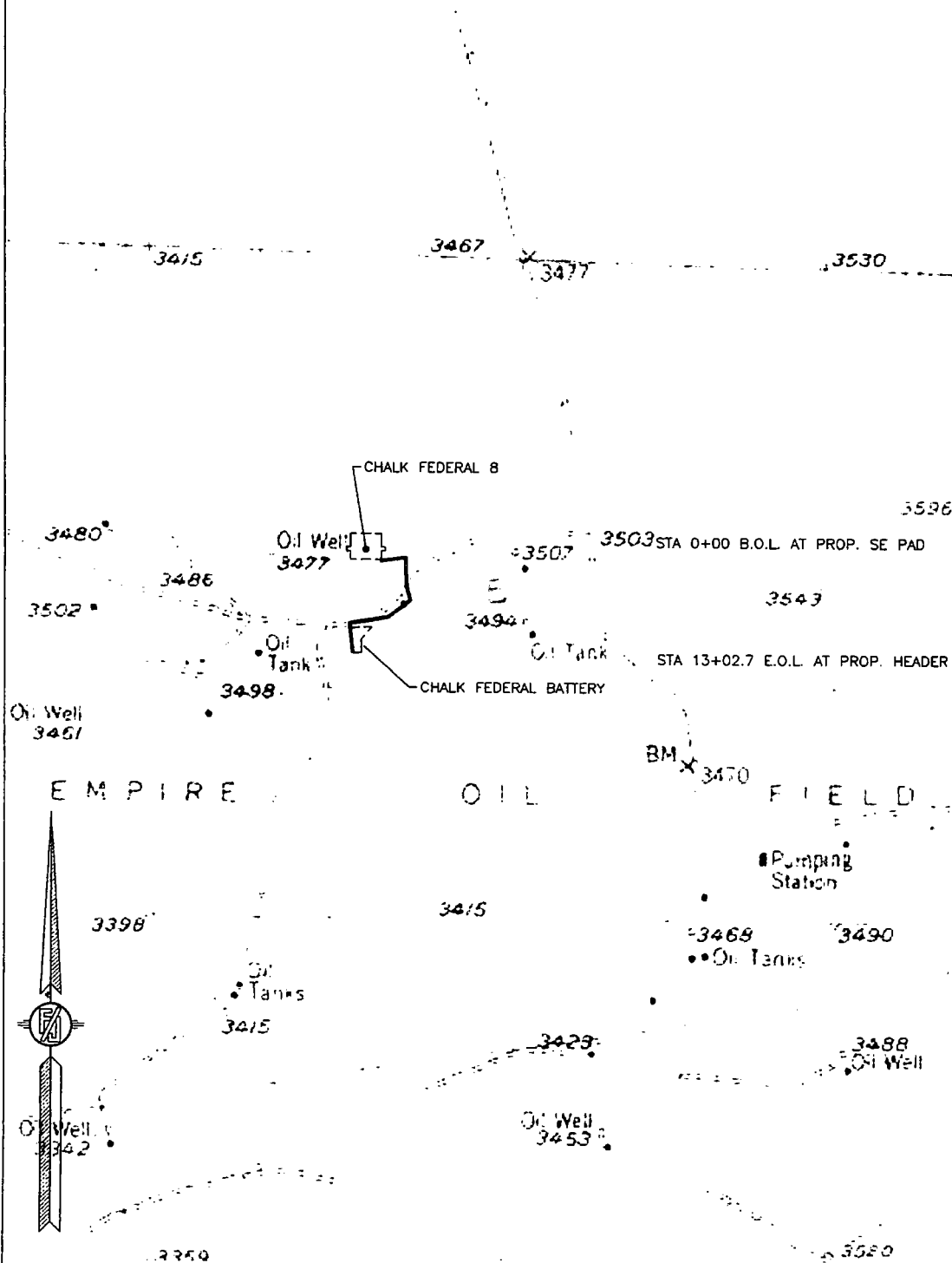
SURVEY NO. 1089  
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO



RIGHT-OF-WAY FOR TWO 3" SDR 7 POLY SURFACE LINES  
(ONE GAS & ONE PRODUCTION) FROM THE CHALK FEDERAL 8 WELL  
TO THE CHALK FEDERAL BATTERY

MAP 5

CENTERLINE SURVEY OF A PIPELINE CROSSING  
SECTION 5, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
JUNE 16, 2014



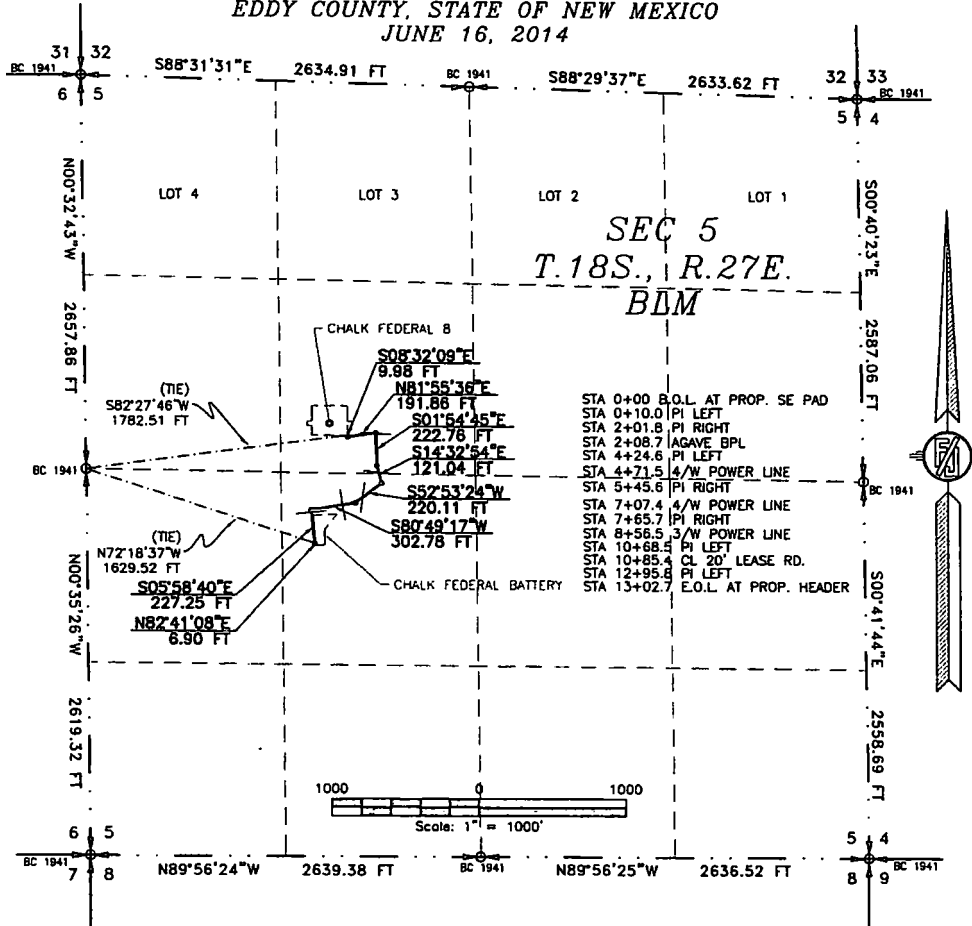
MADRON SURVEYING, INC. 301 SOUTH CANYON CARLSBAD, NEW MEXICO

SURVEY NO. 3081

RIGHT-OF-WAY FOR TWO 3" SDR 7 POLY SURFACE LINES  
(ONE GAS & ONE PRODUCTION) FROM THE CHALK FEDERAL 8 WELL  
TO THE CHALK FEDERAL BATTERY

MAP 6

CENTERLINE SURVEY OF A PIPELINE CROSSING  
SECTION 5, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
JUNE 16, 2014



DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING STATE LAND IN SECTION 5, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SE/4 NW/4 OF SAID SECTION 5, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M., WHENCE THE WEST QUARTER CORNER OF SAID SECTION 5, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M. BEARS S82°27'46"W, A DISTANCE OF 1782.51 FEET;

THENCE S08°32'09"E A DISTANCE OF 9.98 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE N81°55'36"E A DISTANCE OF 191.86 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE S01°54'45"E A DISTANCE OF 222.76 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE S14°32'54"E A DISTANCE OF 121.04 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE S52°53'24"W A DISTANCE OF 220.11 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE S80°49'17"W A DISTANCE OF 302.78 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE S05°58'40"E A DISTANCE OF 227.25 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;  
THENCE N82°41'08"E A DISTANCE OF 6.90 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE WEST QUARTER CORNER OF SAID SECTION 5, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M. BEARS N72°18'37"W, A DISTANCE OF 1629.52 FEET;

SAID STRIP OF LAND BEING 1302.68 FEET OR 78.95 RODS IN LENGTH, CONTAINING 0.897 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SE/4 NW/4	479.46 L.F.	29.06 RODS	0.330 ACRES
NE/4 SW/4	823.22 L.F.	49.89 RODS	0.567 ACRES

SURVEYOR CERTIFICATE

I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED, AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 30 DAY OF JUNE 2014

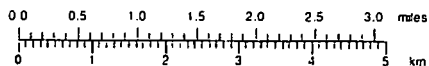
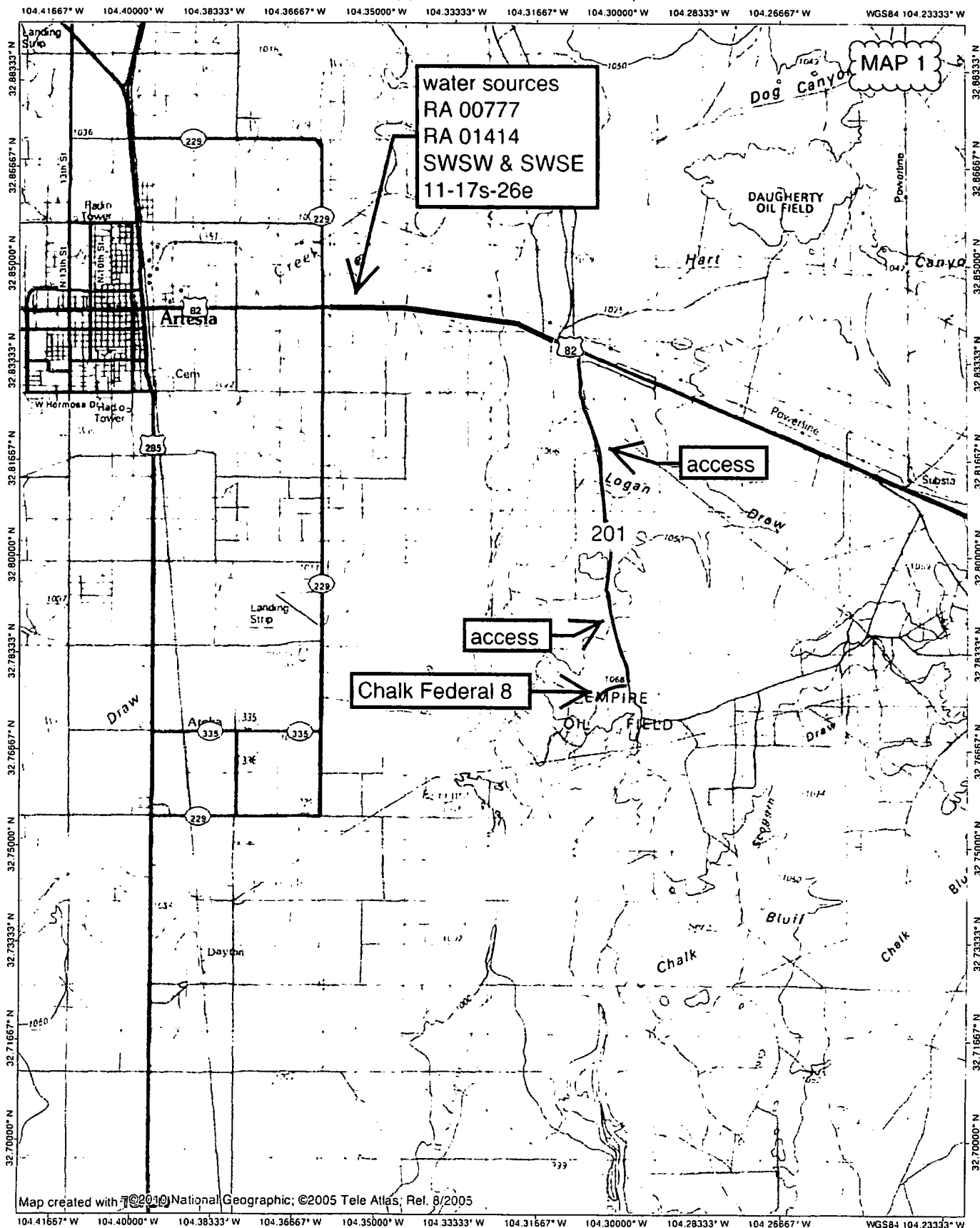
GENERAL NOTES

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING IS NMSP EAST MODIFIED TO SURFACE COORDINATES.

MADRON SURVEYING, INC.  
301 SOUTH CANAL  
CARLSBAD, NEW MEXICO 88220  
Phone (575) 234-3341

SURVEY NO. 3081

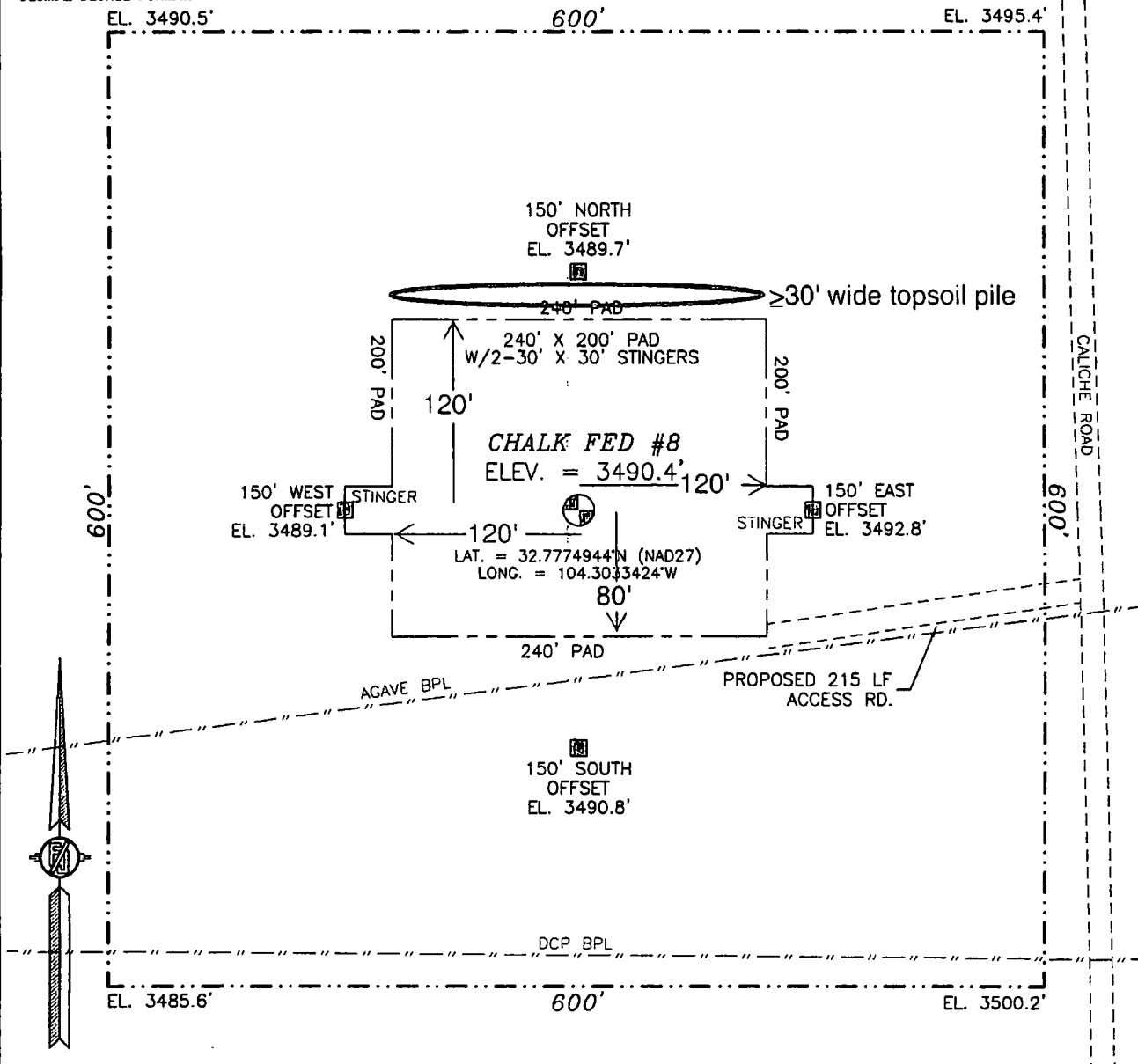
MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO



SECTION 5, TOWNSHIP 18 SOUTH, RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

MAP 4

NOTE: THE LATITUDE AND LONGITUDE COORDINATES ARE SHOWN  
USING THE NORTH AMERICAN DATUM OF 1927 (NAD27), AND ARE IN  
DECIMAL DEGREE FORMAT.



0 10 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM CALICHE CR 201 (CHALK BLUFF) AND CALICHE CR 227 (LITTLE  
DIAMOND) GO NORTH ON CR 201 0.5 MILES, TURN LEFT ON CALICHE  
ROAD AND GO WEST-SOUTHWEST 0.3 MILES, TURN RIGHT AND GO  
NORTH 390 FT AND LOCATION IS ON THE LEFT (WEST) 330 FT.

CHALK FED #8

LOCATED 2300 FT. FROM THE NORTH LINE  
AND 1650 FT. FROM THE WEST LINE OF  
SECTION 5, TOWNSHIP 18 SOUTH,  
RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

AUGUST 10, 2012

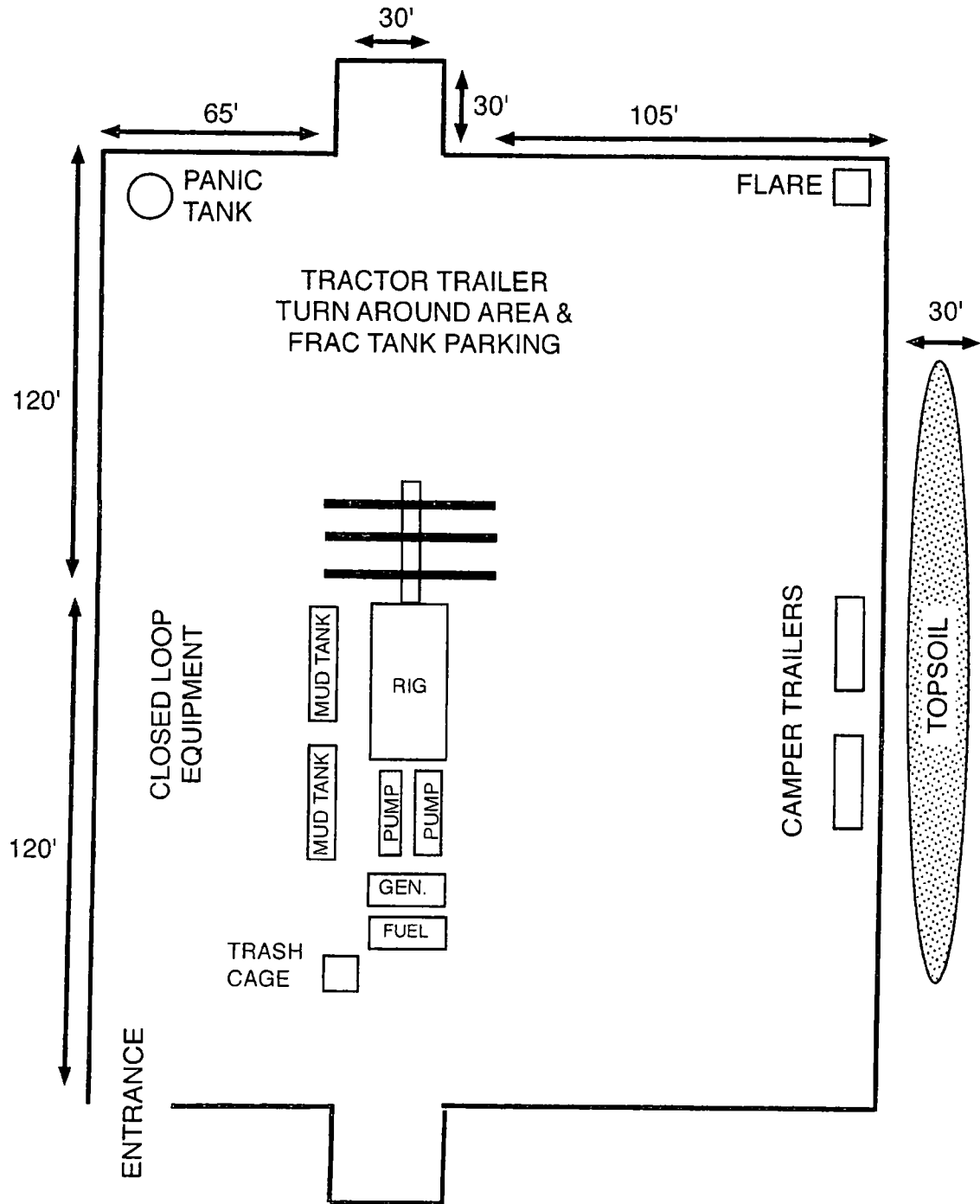
SURVEY NO. 1089

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

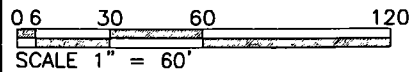
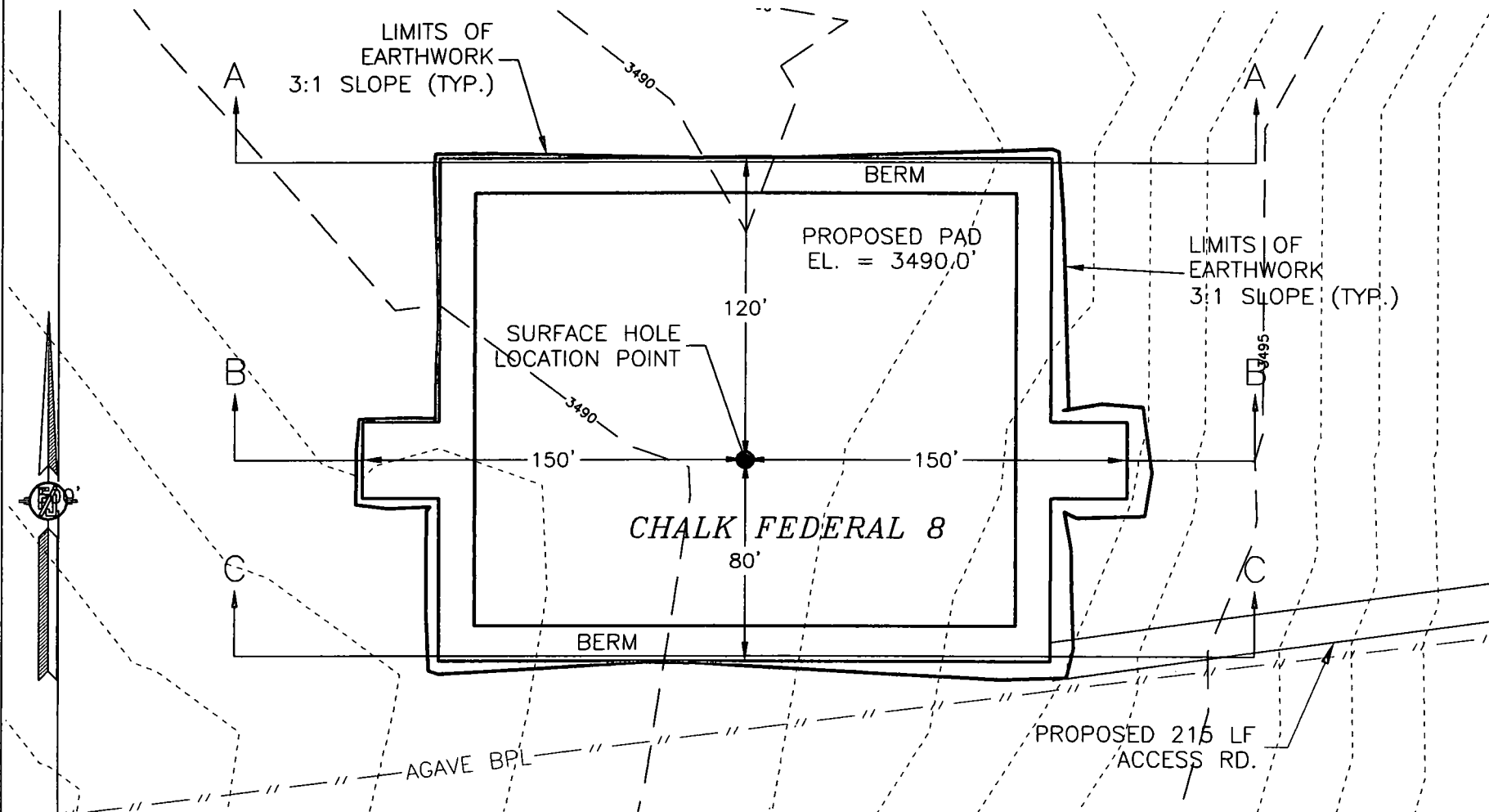
Vanguard's  
Chalk Federal 8  
rig diagram

1" = 40'

NORTH



# PLAN VIEW



CUT	FILL	NET
1263 CU. YD	612 CU. YD	651 CU. YD (FILL)

EARTHWORK QUANTITIES ARE ESTIMATED  
10% SOIL EXPANSION ASSUMED

VANGUARD OPERATING, LLC  
**CHALK FEDERAL 8**  
LOCATED 2300 FT. FROM THE NORTH LINE  
AND 1650 FT. FROM THE WEST LINE OF  
SECTION 5, TOWNSHIP 18 SOUTH,  
RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 2, 2017

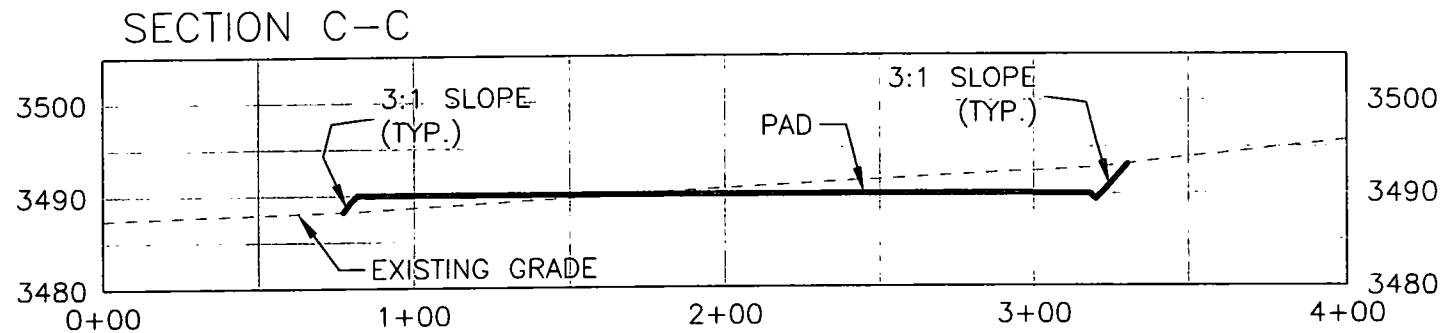
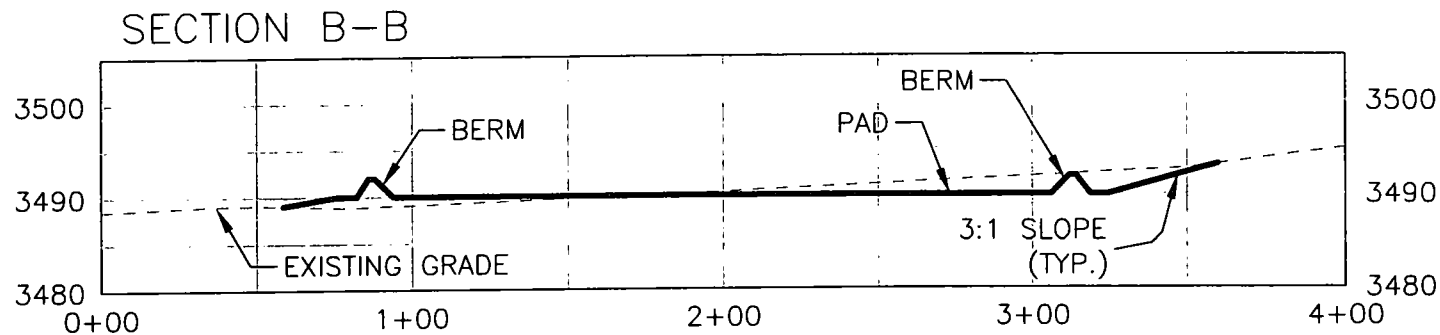
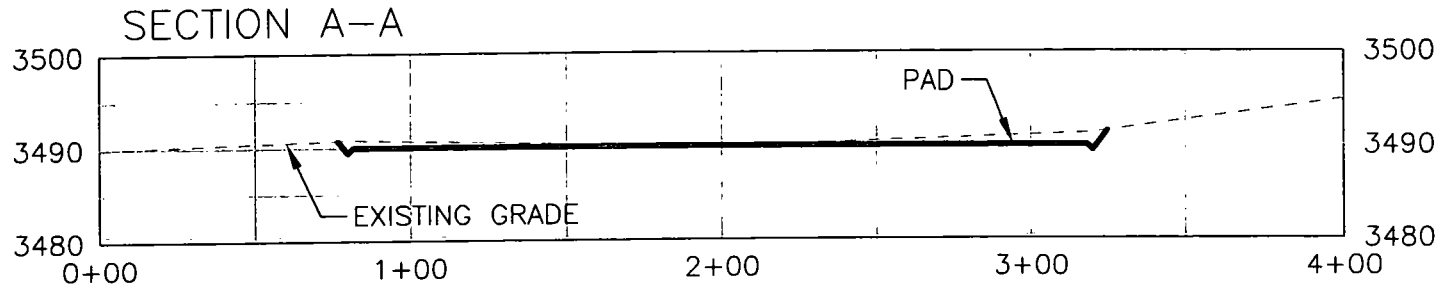
SHEET 1-2

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

SURVEY NO. 1089A



# CROSS SECTIONS



0.6 30 60 120

SCALE 1" = 60' HORZ.

SCALE 1" = 20' VER.

CUT	FILL	NET
1263 CU. YD	612 CU. YD	651 CU. YD (FILL)

EARTHWORK QUANTITIES ARE ESTIMATED  
10% SOIL EXPANSION ASSUMED

VANGUARD OPERATING, LLC  
**CHALK FEDERAL 8**  
LOCATED 2300 FT. FROM THE NORTH LINE  
AND 1650 FT. FROM THE WEST LINE OF  
SECTION 5, TOWNSHIP 18 SOUTH,  
RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

MARCH 2, 2017

SHEET 2-2

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

SURVEY NO. 1089A

NOTE: THE LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1927 (NAD27), AND ARE IN DECIMAL DEGREE FORMAT.



SCALE 1" = 100'

### DIRECTIONS TO LOCATION

**DIRECTIONS TO LOCATION**  
FROM CALICHE CR 201 (CHALK BLUFF) AND CALICHE CR 227 (LITTLE DIAMOND) GO NORTH ON CR 201 0.5 MILES, TURN LEFT ON CALICHE ROAD AND GO WEST-SOUTHWEST 0.3 MILES, TURN RIGHT AND GO NORTH 390 FT AND LOCATION IS ON THE LEFT (WEST) 330 FT.

**CHALK FED #8**

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SECTION 5, TOWNSHIP 18 SOUTH,  
RANGE 27 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

AUGUST 10, 2012

*SURVEY NO. 1089*

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



## Section 1 - General

Would you like to address long-term produced water disposal? NO

## Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

### **Section 3 - Unlined Pits**

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

### **Section 4 - Injection**

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

**Injection well type:**

**Injection well number:**

**Injection well name:**

**Assigned injection well API number?**

**Injection well API number:**

**Injection well new surface disturbance (acres):**

**Minerals protection information:**

**Mineral protection attachment:**

**Underground Injection Control (UIC) Permit?**

**UIC Permit attachment:**

### **Section 5 - Surface Discharge**

**Would you like to utilize Surface Discharge PWD options? NO**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Surface discharge PWD discharge volume (bbl/day):**

**Surface Discharge NPDES Permit?**

**Surface Discharge NPDES Permit attachment:**

**Surface Discharge site facilities information:**

**Surface discharge site facilities map:**

### **Section 6 - Other**

**Would you like to utilize Other PWD options? NO**

**Produced Water Disposal (PWD) Location:**

**PWD surface owner:**

**PWD disturbance (acres):**

**Other PWD discharge volume (bbl/day):**

**Other PWD type description:**

**Other PWD type attachment:**

**Have other regulatory requirements been met?**

**Other regulatory requirements attachment:**



U.S. Department of the Interior  
BUREAU OF LAND MANAGEMENT

## Bond Info Data Report

03/07/2018

### Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB000797

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

