18-268

OCD Hobbs

HOBBS OCD
APR 05 2018
RECEIVED

Form 3160-3
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☑ DRILL ☐ REENTER	5. Lease Serial No. NMNM0504364B
	6. If Indian, Allotee or Tribe Name
	7. If Unit or CA Agreement, Name and No.
1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone	8. Lease Name and Well No. 320768 SOUTH BOYD FEDERAL COM 16H
2. Name of Operator PERCUSSION PETROLEUM OPERATING LLC 371755	9. API Well No. 30-015-44883
3a. Address 919 Milam Street, Suite 2475 Houston TX 770 / 3b. Phone No. (include area code) (713)589-2337	10. Field and Pool, or Exploratory SEVEN RIVERS / GLORIETA YESO
4. Location of Well (Report location clearly and in accordance with any State requirements.*) At surface NENE / 340 FNL / 934 FEL / LAT 32.623488 / LONG -104.46697 At proposed prod. zone NENE / 20 FNL / 993 FEL / LAT 32.638697 / LONG -104.467425	11. Sec., T. R. M. or Blk. and Survey or Area SEC 19 / T19S / R25E / NMP
14. Distance in miles and direction from nearest town or post office* 16 miles	12. County or Parish LEA Eddy / 13. State NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 934 feet	16. No. of acres in lease 480	17. Spacing Unit dedicated to this well 160
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 20 feet	19. Proposed Depth 2855 feet / 8295 feet	20. BLM/BIA Bond No. on file FED: NMB001424
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3515 feet	22. Approximate date work will start* 01/02/2018	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.
2. A Drilling Plan.
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).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
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 11/03/2017
Title President		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 03/27/2018
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)

NM OIL CONSERVATION
ARTESIA DISTRICT
APR 09 2018
RECEIVED

APPROVED WITH CONDITIONS

Approval Date: 03/27/2018

RWP 4-13-18.

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.

(Continued on page 3)

Additional Operator Remarks

Location of Well

1. SHL: NENE / 340 FNL / 934 FEL / TWSP: 19S / RANGE: 25E / SECTION: 19 / LAT: 32.623488 / LONG: -104.46697 (TVD: 0 feet, MD: 0 feet)
   PPP: SENE / 2640 FSL / 1054 FEL / TWSP: 20S / RANGE: 25E / SECTION: 27 / LAT: 32.6316 / LONG: -104.467311 (TVD: 2855 feet, MD: 5730 feet)
   PPP: NENE / 340 FNL / 934 FEL / TWSP: 19S / RANGE: 25E / SECTION: 19 / LAT: 32.623488 / LONG: -104.46697 (TVD: 0 feet, MD: 0 feet)
   BHL: NENE / 20 FNL / 993 FEL / TWSP: 29S / RANGE: 25E / SECTION: 27 / LAT: 32.638697 / LONG: -104.467425 (TVD: 2855 feet, MD: 8295 feet)

BLM Point of Contact

Name: Tenille Ortiz
Title: Legal Instruments Examiner
Phone: 5752342224
Email: tortiz@blm.gov

Approval Date: 03/27/2018

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.

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Percussion Petroleum Operating
LEASE NO.:	NM0504364B
WELL NAME & NO.:	16H – South Boyd Federal Com
SURFACE HOLE FOOTAGE:	340'/N & 934'/E
BOTTOM HOLE FOOTAGE	020'/N & 993'/E, sec. 27
LOCATION:	Section 34, T. 19 S., R. 25 E.
COUNTY:	Eddy County, New Mexico

Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	○ Medium	◉ High
Variance	◉ None	○ Flex Hose	○ Other
Wellhead	◉ Conventional	○ Multibowl	
Other	☐4 String Area	☐Capitan Reef	☐WIPP

A. HYDROGEN SULFIDE

1. Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

HIGH CAVE/KARST – OPERATOR HAS PROPOSED A CONTINGENCY CASING IF LOST CIRCULATION OCCURS WHILE DRILLING THE SURFACE HOLE.

IF LOST CIRCULATION OCCURS WHILE DRILLING THE 8-3/4" 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 THE CASING. 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.

Approval Date: 03/27/2018

Contingency Surface Casing Plan:

1. The **13 3/8** inch contingency surface casing shall be set at approximately **400** 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.

Casing Plan without Contingency:

2. The **9 5/8** inch surface casing shall be set at approximately **1261** 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.

3. The minimum required fill of cement behind the **5 1/2** inch production casing is:

    - Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.**

C. PRESSURE CONTROL

1. **Contingency** - Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **13-3/8 inch** surface casing shoe shall be **3000 (3M)** psi.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8 inch** surface casing shoe shall be **3000 (3M)** psi.

D. SPECIAL REQUIREMENT(S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

Unorthodox Location

Operator will need to file a NSL (Non Standard Location) application with NMOCD.

MHH 03112018

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 2nd 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.

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.

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: 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. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. 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.

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.

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

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. The results of the test shall be reported to the appropriate BLM office.

f. 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.

g. 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 if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. 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.

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Percussion Petroleum Operating
LEASE NO.:	NM0504364B
WELL NAME & NO.:	16H – South Boyd Federal Com
SURFACE HOLE FOOTAGE:	340'/N & 934'/E
BOTTOM HOLE FOOTAGE	20'/N & 993'/E, sec. 27
LOCATION:	Section 34, T. 19 S., R. 25 E.
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.

Approval Date: 03/27/2018

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 24 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.)

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, situating values 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 values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

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 high 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.

Cattle Guard Requirement
Any new or existing cattle guards on the access 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. Once the road is abandoned, the fence would be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Livestock Watering Requirement
Structures that provide water to livestock, such as windmills, pipelines, drinking troughs, and earthen reservoirs, will be avoided by moving the proposed action.

Any damage to fences, cattle guards, and pipelines or structures that provide water to livestock during construction, throughout the life of the project, and caused by its operation, must be immediately corrected by Percussion. Percussion must notify the grazing allottee or the private surface landowner and the BLM-CFO (575-234-5972) if any damage occurs to pipelines or structures that provide water to livestock.

Production facilities on the three well pads would be bermed to prevent oil, salt, and other chemical contaminants from leaving the pads. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.

Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion.

Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control.

Standard mitigation measures and elements of the Proposed Action are designed to minimize these impacts to wildlife. These include: use of the NTL-RDO 93-1 guidelines (modification of open-vent exhaust stacks to prevent perching and entry from birds and bats), placing nets on open top production tanks, installing raptor-safe electric power lines, conducting interim reclamation, utilizing closed loop systems, using exhaust mufflers, installing berms around collection facilities, minimizing cut and fill, selectively placing roads, and avoiding wildlife waters, stick nests, drainages, playas and dunal features. These practices reduce mortality to wildlife and allow habitat to remain available in the immediate surrounding area; thus reducing stressors on wildlife populations at a localized level.

Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006. The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. The holder without liability or expense shall make such modifications and/or additions to the United States.

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.

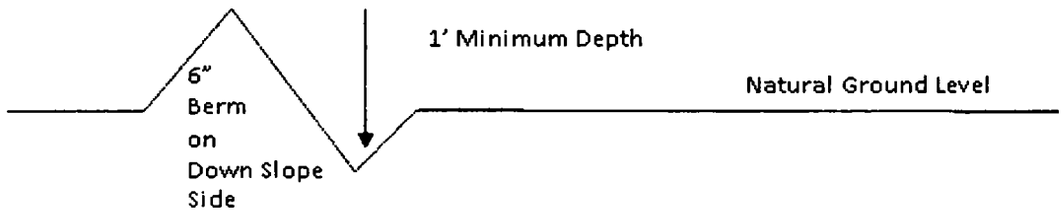
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

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 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ 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

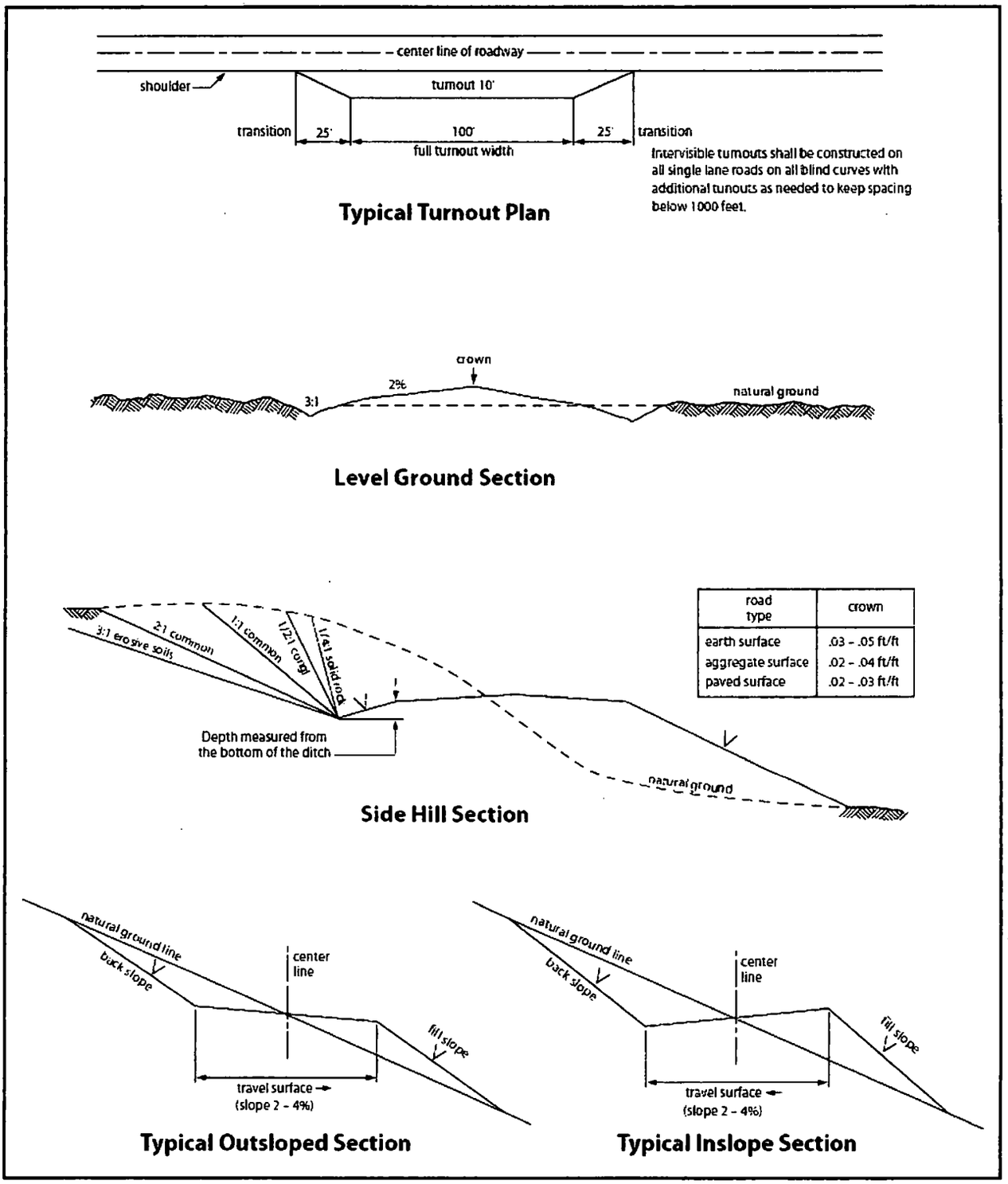


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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 of duney areas, the pipeline will be "snaked" around hummocks and dunes rather then 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.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant 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 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. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. 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 the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. 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 actions to prevent the loss of significant 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.

11. Special Stipulations:
    - For reclamation remove poles, lines, transformer, etc. and dispose of properly.
    - Fill in any holes from the poles removed.

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.

Seed Mixture 1 for Loamy Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed shall 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 shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

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

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

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Percussion Petroleum Operating
LEASE NO.:	NM0504364B
WELL NAME & NO.:	16H – South Boyd Federal Com
SURFACE HOLE FOOTAGE:	340'/N & 934'/E
BOTTOM HOLE FOOTAGE	20'/N & 993'/E, sec. 27
LOCATION:	Section 34, T. 19 S., R. 25 E.
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.

Approval Date: 03/27/2018

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 24 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.)

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, situating values 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 values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

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 high 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.

Cattle Guard Requirement
Any new or existing cattle guards on the access 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. Once the road is abandoned, the fence would be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Livestock Watering Requirement
Structures that provide water to livestock, such as windmills, pipelines, drinking troughs, and earthen reservoirs, will be avoided by moving the proposed action.

Any damage to fences, cattle guards, and pipelines or structures that provide water to livestock during construction, throughout the life of the project, and caused by its operation, must be immediately corrected by Percussion. Percussion must notify the grazing allottee or the private surface landowner and the BLM-CFO (575-234-5972) if any damage occurs to pipelines or structures that provide water to livestock.

Production facilities on the three well pads would be bermed to prevent oil, salt, and other chemical contaminants from leaving the pads. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.

Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion.

Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control.

Standard mitigation measures and elements of the Proposed Action are designed to minimize these impacts to wildlife. These include: use of the NTL-RDO 93-1 guidelines (modification of open-vent exhaust stacks to prevent perching and entry from birds and bats), placing nets on open top production tanks, installing raptor-safe electric power lines, conducting interim reclamation, utilizing closed loop systems, using exhaust mufflers, installing berms around collection facilities, minimizing cut and fill, selectively placing roads, and avoiding wildlife waters, stick nests, drainages, playas and dunal features. These practices reduce mortality to wildlife and allow habitat to remain available in the immediate surrounding area; thus reducing stressors on wildlife populations at a localized level.

Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006. The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. The holder without liability or expense shall make such modifications and/or additions to the United States.

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.

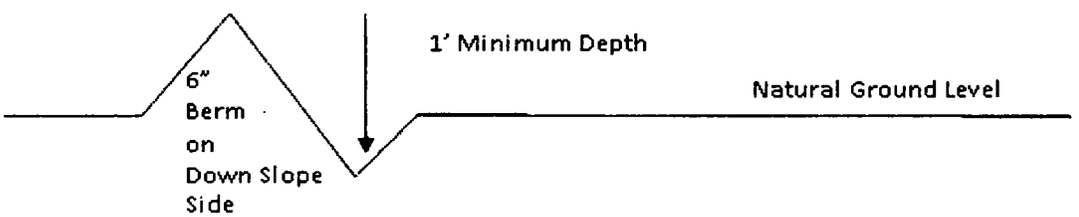
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

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 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ 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

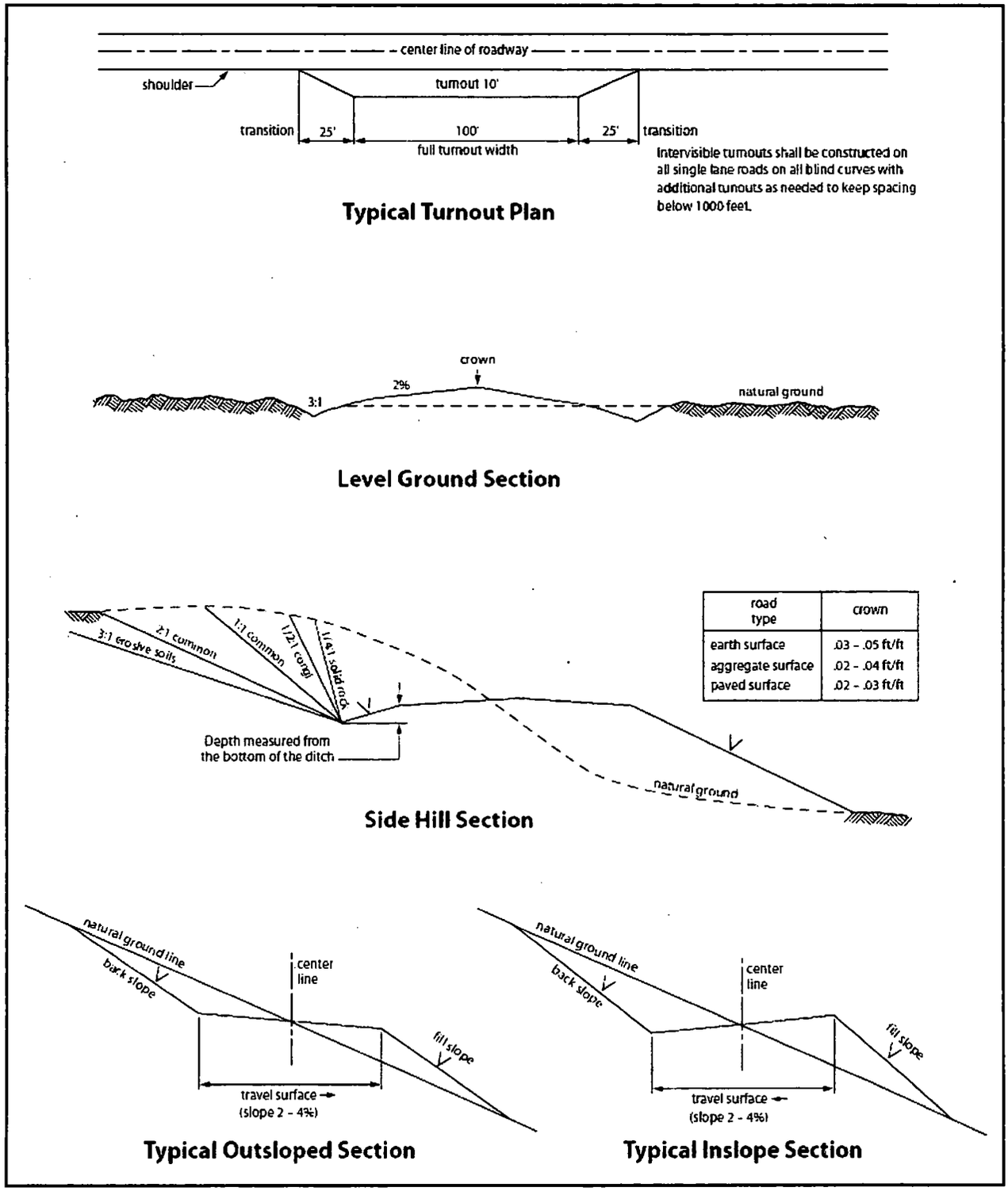


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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 of duney areas, the pipeline will be "snaked" around hummocks and dunes rather then 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.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant 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 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. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. 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 the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. 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 actions to prevent the loss of significant 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.

11. Special Stipulations:
- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

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.

Seed Mixture 1 for Loamy Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed shall 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 shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

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

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

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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

AFMSS

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

Operator Certification Data Report

03/30/2018

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:** 11/03/2017

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:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

AFMSS

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

Application Data Report

03/30/2018

APD ID: 10400024288 **Submission Date:** 11/03/2017

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400024288 **Tie to previous NOS?** **Submission Date:** 11/03/2017

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: NMNM0504364B **Lease Acres:** 480

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:** PERCUSSION PETROLEUM OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: PERCUSSION PETROLEUM OPERATING LLC

Operator Address: 919 Milam Street, Suite 2475

Zip: 77002

Operator PO Box:

Operator City: Houston **State:** TX

Operator Phone: (713)589-2337

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: SOUTH BOYD FEDERAL COM **Well Number:** 16H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** SEVEN RIVERS **Pool Name:** GLORIETA YESO

Is the proposed well in an area containing other mineral resources? USEABLE WATER,NATURAL GAS,CO2,OIL

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** SOUTH BOYD **Number:** 15H

Well Class: HORIZONTAL **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: 16 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 934 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: SB_16H_Plat_20171103151803.pdf

Well work start Date: 01/02/2018 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 7977

	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	340	FNL	934	FEL	19S	25E	19	Aliquot NENE	32.626348	-104.466967	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 050436 4B	3515	0	0
KOP Leg #1	340	FNL	934	FEL	19S	25E	19	Aliquot NENE	32.626348	-104.466967	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 050436 4B	1172	2350	2343
PPP Leg #1	340	FNL	934	FEL	19S	25E	19	Aliquot NENE	32.626348	-104.466967	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 050436 4B	3515	0	0

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

	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
PPP Leg #1	2640	FSL	1054	FEL	20S	25E	27	Aliquot SENE	32.6316	-104.467311	LEA	NEW MEXICO	NEW MEXICO	F	FEE	660	5730	2855
EXIT Leg #1	20	FNL	993	FEL	29S	25E	27	Aliquot NENE	32.638697	-104.467425	LEA	NEW MEXICO	NEW MEXICO	F	FEE	660	8295	2855
BHL Leg #1	20	FNL	993	FEL	29S	25E	27	Aliquot NENE	32.638697	-104.467425	LEA	NEW MEXICO	NEW MEXICO	F	FEE	660	8295	2855

APD ID: 10400024288 **Submission Date:** 11/03/2017

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	---	3515	0	0	OTHER : Quaternary caliche	USEABLE WATER	No
2	GRAYBURG	2985	531	531	DOLOMITE	NATURAL GAS,CO2,OIL	No
3	SAN ANDRES	2705	811	812	DOLOMITE	NATURAL GAS,CO2,OIL	No
4	GLORIETA	1126	2390	2396	DOLOMITE	NATURAL GAS,CO2,OIL	No
5	YESO	991	2525	2533	DOLOMITE	NATURAL GAS,CO2,OIL	Yes

Section 2 - Blowout Prevention

Pressure Rating (PSI): 3M **Rating Depth:** 5000

Equipment: A 3000-psi 5000' rated BOP stack consisting of annular preventer and double (blind and pipe) ram will be used below surface casing to TD. See attached BOP and choke manifold diagrams.

Requesting Variance? NO

Variance request:

Testing Procedure: Pressure tests will be conducted before drilling out from under all casing strings. Third party test crews will conduct all tests. All tests will be recorded for 10-minutes on low pressure (500 psi) and 10-minutes on high pressure (3000-psi). After BOP testing is complete, test casing (without test plug) to 2000-psi for 30 minutes. All tests will be charted on a plot. BOPs will be function tested every day.

Choke Diagram Attachment:

SB_16H_BOP_Choke_20171103152441.pdf

BOP Diagram Attachment:

SB_16H_BOP_Choke_20171103152447.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

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	SURFACE	12.25	9.625	NEW	API	N	0	1261	0	1258	3515		1261	J-55	36	STC	1.125	1.125	DRY	1.8	DRY	1.8
2	PRODUCTION	8.75	5.5	NEW	API	N	0	8295	0	2855	3516		8295	L-80	17	OTHER - BTC	1.125	1.125	DRY	1.8	DRY	1.8

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

SB_16H_Casing_Design_Assumptions_20171103152536.pdf

Casing ID: 2 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

SB_16H_Casing_Design_Assumptions_20171103152602.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1261	628	1.32	14.8	829	100	Class C	2% CaCl + ¼ pound per sack celloflake
PRODUCTION	Lead		0	8295	495	1.97	12.6	975	50	65/65/6 Class C	6% gel + 5% salt + ¼ pound per sack celloflake + 0.2% C41-P
PRODUCTION	Tail		0	8295	1676	1.32	14.8	2212	50	Class C	2% CaCl + ¼ pound per sack celloflake

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: All necessary mud products (LCM) will be on site to handle any abnormal hole condition that may be encountered while drilling this well.

Describe the mud monitoring system utilized: An electronic/mechanical mud monitor with a minimum pit volume totalizer, stroke counter, and flow sensor will be used.

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
2350	8295	OTHER : Cut brine	8.6	9.2							
0	1261	OTHER : Fresh water/gel	8.4	9.2							
1261	2350	OTHER : Fresh water/cut brine	8.3	9.2							

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

Section 6 - Test, Logging, Coring

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

A mud logger will be used from GL to TD. Samples will be collected every 10' in the lateral pay zone.

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

DS

Coring operation description for the well:

No core or drill stem test is planned.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 1231 **Anticipated Surface Pressure:** 602.9

Anticipated Bottom Hole Temperature(F): 113

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

SB_16H_H2S_Plan_20171103152848.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

SB_16H_Horizontal_Drill_Plan_20171103150830.pdf

Other proposed operations facets description:

Deficiency letter dated 12/13/17 requested revised Casing Design Contingency - see revised attachment

Other proposed operations facets attachment:

SB_16H_General_Drill_Plan_20171214112247.pdf

SB_16H_Casign_Design_Contingency_v3_20171214112256.pdf

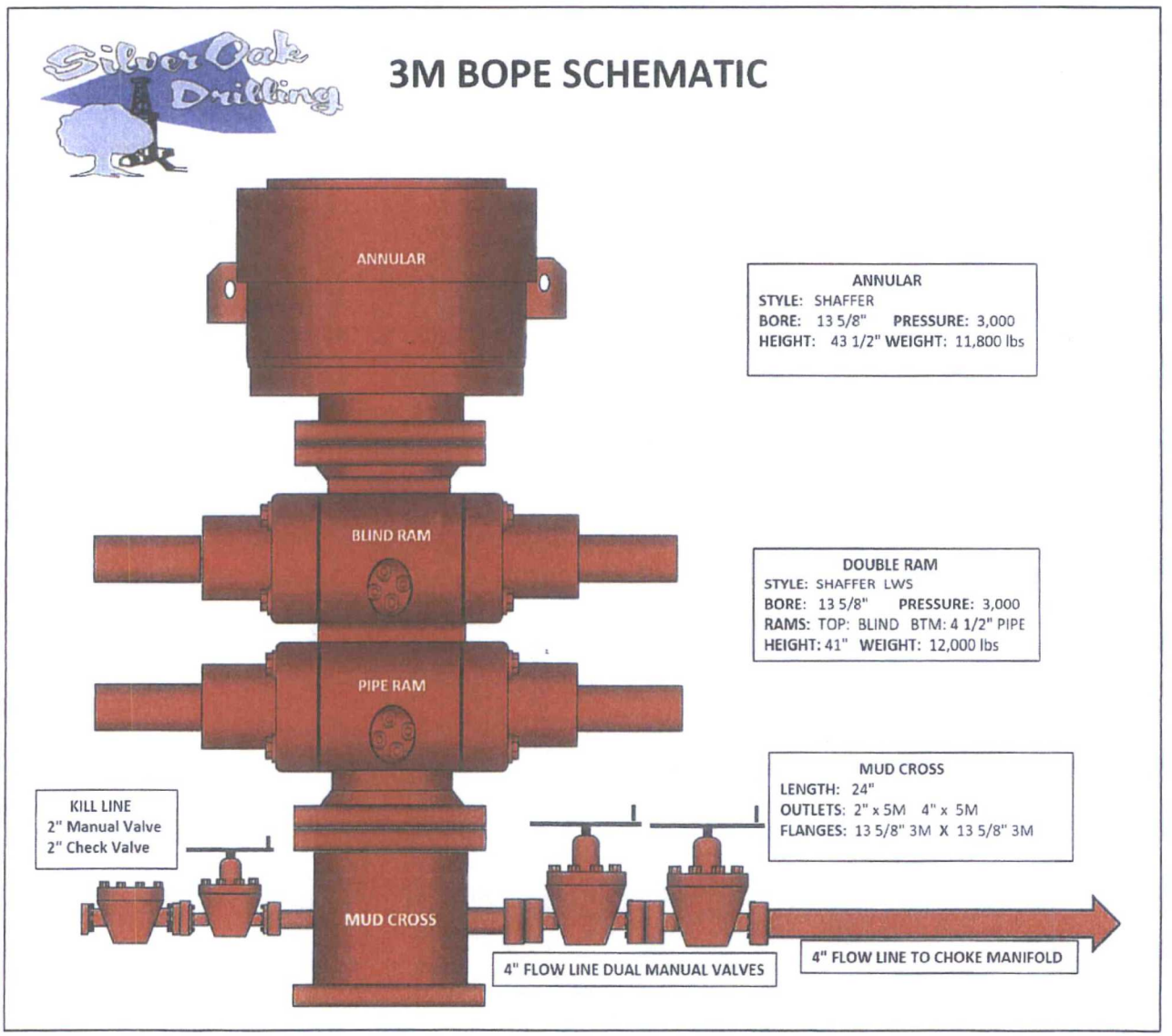
Other Variance attachment:

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

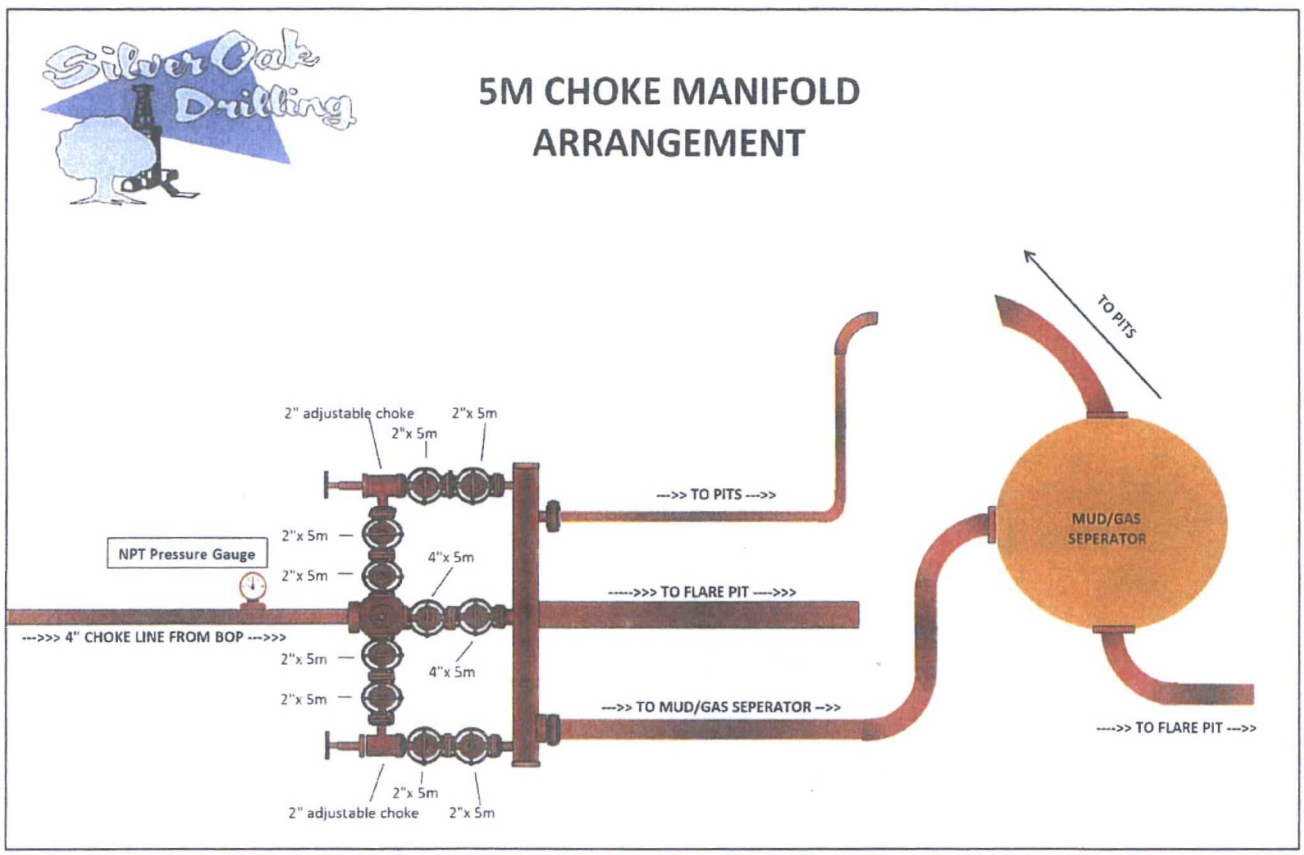
Nipple-Up

a. Raise stack and center over the wellhead
b. Install DSA and ring gaskets
c. Lower stack onto DSA
d. Torque DSA flange bolts in a star pattern to the specified torque
e. Verify BOP is centered to the rotary table
f. Install rotating head
g. Install hydraulic lines to BOP
h. Verify manifold line-up
i. Test BOP & manifold



PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002



Pressure Testing

a. All testing to be done with 3rd party testing crews
b. All tests should be done for each BOP/Valve/Choke Manifold:
    1. Recorded for 10 minutes on low pressure (500 psi)
    2. Recorded for 10 minutes on high pressure (3000 psi)
    3. All BOP testing will be completed with a test plug in place in wellhead
c. After BOP testing is complete, test casing (without test plug) to 2000 psi for 30 minutes
d. Company representative to email all copies of all plots to Drilling Engineer as well as save in the well file.
e. **BOP's shall be function tested every day.**

Gas Buster Operation

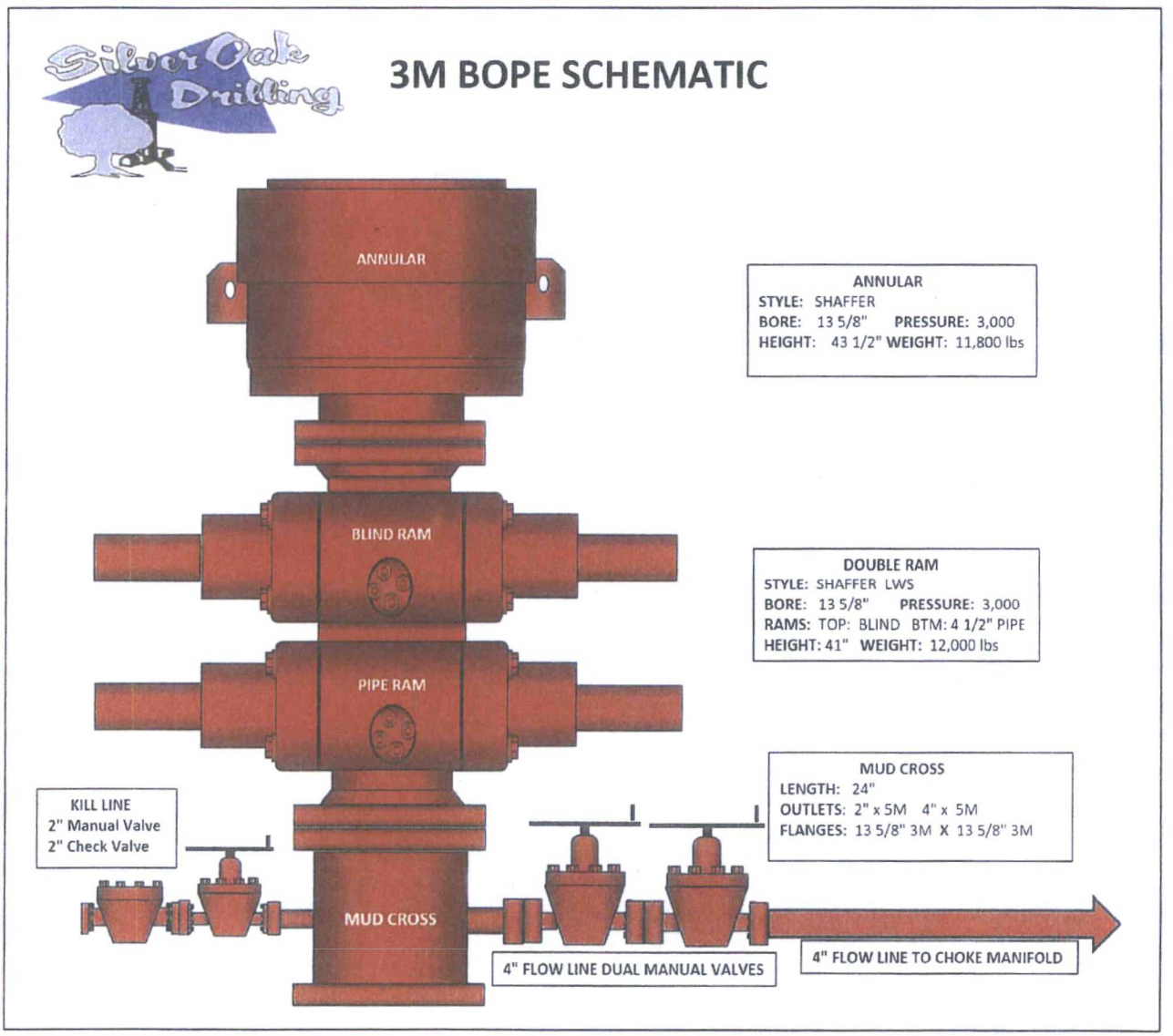
a. Flow should be directed to pits unless choke is needed to control gas
b. Adjustable choke to adjusted only by Percussion Rep on location
c. Flare should remain burning (pilot lit) anytime fluid is going through gas buster
d. Choke needs to be monitored to not overrun gas buster

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

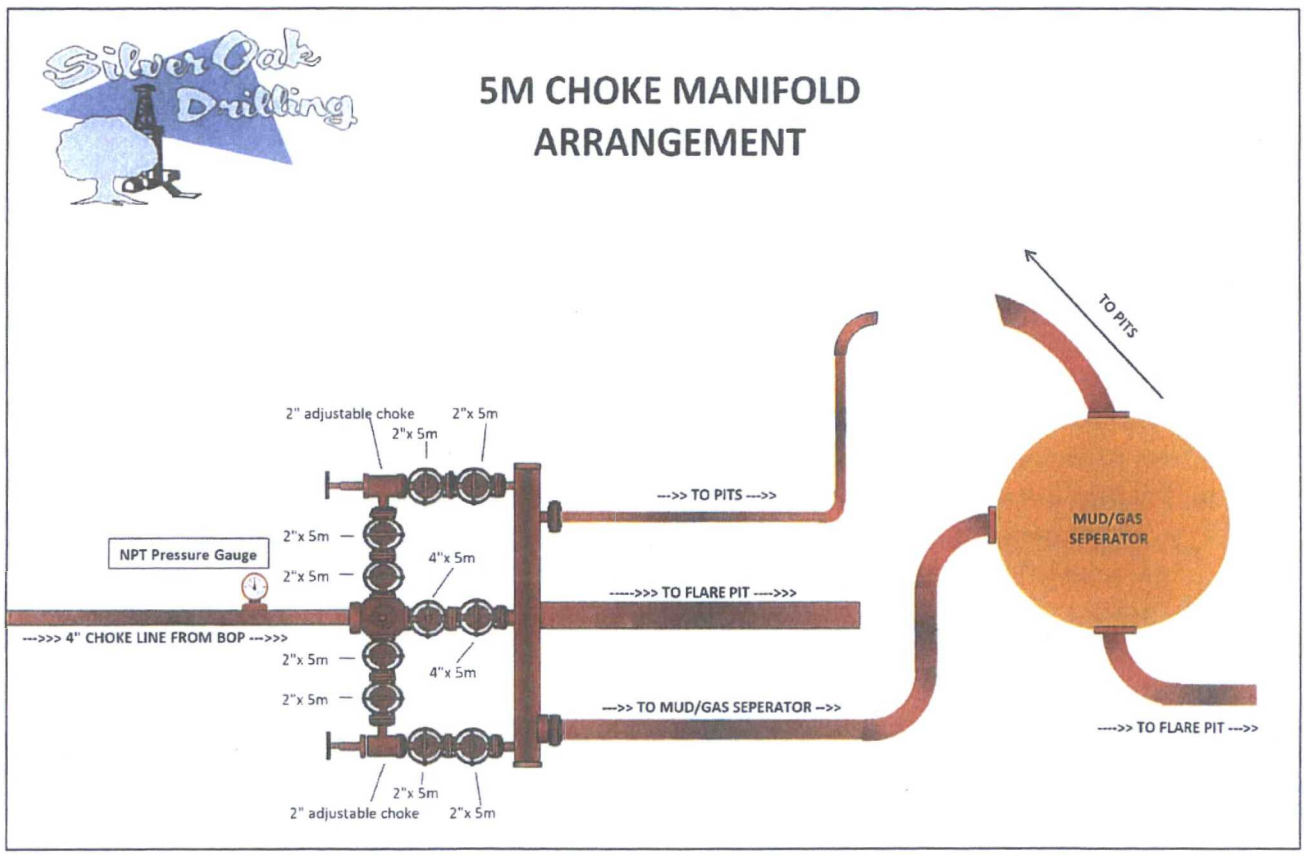
Nipple-Up

a. Raise stack and center over the wellhead
b. Install DSA and ring gaskets
c. Lower stack onto DSA
d. Torque DSA flange bolts in a star pattern to the specified torque
e. Verify BOP is centered to the rotary table
f. Install rotating head
g. Install hydraulic lines to BOP
h. Verify manifold line-up
i. Test BOP & manifold



PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002



Pressure Testing

a. All testing to be done with 3rd party testing crews
b. All tests should be done for each BOP/Valve/Choke Manifold:
    1. Recorded for 10 minutes on low pressure (500 psi)
    2. Recorded for 10 minutes on high pressure (3000 psi)
    3. All BOP testing will be completed with a test plug in place in wellhead
c. After BOP testing is complete, test casing (without test plug) to 2000 psi for 30 minutes
d. Company representative to email all copies of all plots to Drilling Engineer as well as save in the well file.
e. **BOP's shall be function tested every day.**

Gas Buster Operation

a. Flow should be directed to pits unless choke is needed to control gas
b. Adjustable choke to adjusted only by Percussion Rep on location
c. Flare should remain burning (pilot lit) anytime fluid is going through gas buster
d. Choke needs to be monitored to not overrun gas buster

PERCUSSION PETROLEUM

919 Milam Street, Suite 2475
Houston, TX 77002

Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC. – South Boyd Federal Com Wells

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)
2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
3. Tensile: DF_T=1.8
   a. Overpull: An overpull force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.5 ppg).

Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8"	36	J-55	STC	8.921	8.765	2,020	3,520	394	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.8	**2.80**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300' casing-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
5-1/2"	17	L-80	BTC	4.892	4.767	6,280	7,740	348	0.0232
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.8	**2.29**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***51,869 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)***

PERCUSSION PETROLEUM

919 Milam Street, Suite 2475
Houston, TX 77002

Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC. – South Boyd Federal Com Wells

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)
2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
3. Tensile: DF_T=1.8
   a. Overpull: An overpull force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (8.5 ppg).

Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8"	36	J-55	STC	8.921	8.765	2,020	3,520	394	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.8	**2.80**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300' casing-worst case scenario)***

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
5-1/2"	17	L-80	BTC	4.892	4.767	6,280	7,740	348	0.0232
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.75**	Lost Circulation		Mud		*None*		
Burst	1.125	**2.47**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.8	**2.29**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***51,869 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)***

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

Hydrogen Sulfide Drilling Operations Plan

Percussion Petroleum Operating, LLC.

1. H_2S Safety Instructions to the following:
   - Characteristics of H_2S.
   - Physical effects and hazards.
   - Principal and operation of H_2S detectors, warning system and briefing areas.
   - Evacuation procedures, routes and First Aid.
   - Proper use of safety equipment and life support systems.
   - Essential personnel meeting medical evaluation criteria will receive additional training on the proper use of 30 min pressure demand air packs.
2. H_2S Detection & Alarm Systems:
   - H_2S sensor/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud returns pits by the shale shaker. Additional H_2S monitors may be placed as deemed necessary.
   - An audio alarm system will be installed on the derrick, the floor, and in the doghouse.
3. Windsocks and Wind Streamers:
   - Windsocks at mud pit area should be high enough to be visible.
   - Windsock on the rig floor/top of doghouse should be high enough to be visible.
4. Condition Flags & Signs:
   - Warning sign on access road to location
   - Flags to be displayed on sign at entrance to location
     i. Green Flag – Normal Safe Operation Condition
     ii. Yellow Flag – Potential Pressure and Danger
     iii. Red Flag – Danger (H_2S present in dangerous concentrations) Only H_2S trained personnel admitted on location
5. Well Control Equipment:
   - See attached APD
6. Communications:
   - While working under masks, chalkboards will be used for communications
   - Hand signals will be used where chalk board is inappropriate
   - Two way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at drilling foreman's trailer or living quarters.
7. Drilling Stem Testing:
   - No Drill Stem Tests or hole coring is planned at this time.
8. Drilling contractor supervisor will be required to be familiar with the effects H_2S has on tubular goods and other mechanical equipment.
9. If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavenger chemicals if necessary.

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

10. Emergency Contacts:

Emergency Contact Information - H2S Contingency Plan				
Precussion Petroleum Operating, LLC	**713-518-1331**			
Key Parties at Percussion Petroleum		**Office**	**Mobile**	**Email**
Lelan J Anders	Vice President of Operations	713-429-1291	281-908-1752	Lelan@PercussionPetroleum.com
Lupe Carrillo	Chief Operating Officer	713-589-9509	832-776-1869	Lupe@PercussionPetroleum.com
John H. Campbell III	Chief Executive Officer	713-589-4683	936-718-6488	John@PercussionPetroleum.com

Artesia, New Mexico:	
Ambulance	911
State Police	575-746-2703
City Police	575-746-2703
Sheriff's Office	575-746-9888
Fire Department	575-746-2701
Local Emergency Planning Committee	575-746-2122
New Mexico Oil Conservation Division	575-748-1283

Carlsbad, New Mexico:	
Ambulance	911
State Police	575-885-3137
City Police	575-885-2111
Sheriff's Office	575-887-7551
Fire Department	575-887-3798
Local Emergency Planning Committee	575-887-6544
New Mexico Oil Conservation Division	575-887-6544

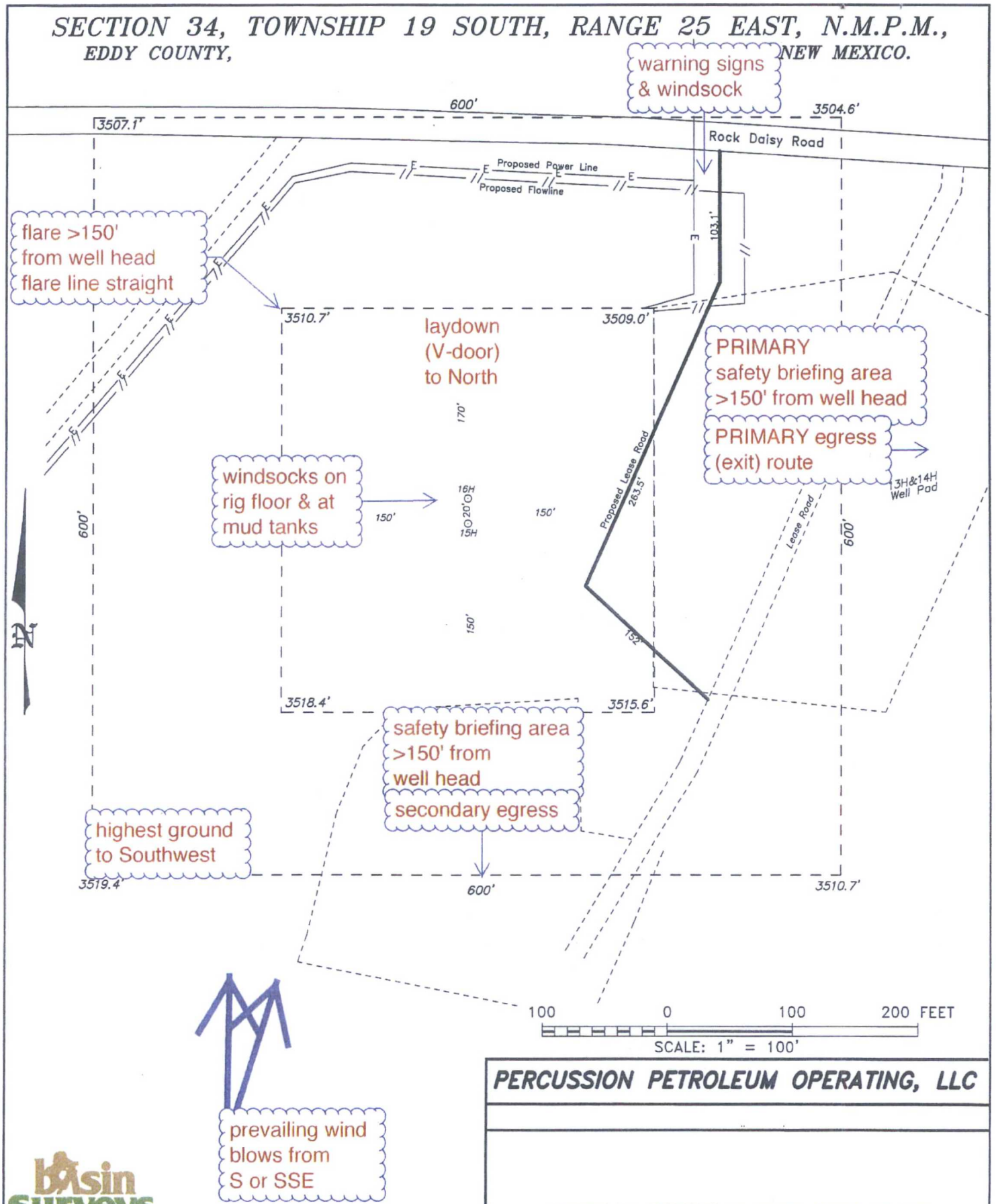
Santa Fe, New Mexico:	
New Mexico Emergency Response Commission	505-476-9600
New Mexico Emergency Response Commission (24 hr)	505-827-9126
New Mexico State Emergency Operations Center	505-476-9635

Federal Contacts:	
Carlsbad BLM Office	575-234-5972
National Emergency Response Center (Washington, DC)	800-424-8802

Medical:	
Flight for Life - Lubbock, TX	806-743-9911
AeroCare - Lubbock, TX	806-747-8923
Med Flight Air Ambulance - Albuquerque, NM	505-842-4433
SB Air Med Service - Albuquerque, NM	505-842-4949

Well Control/Other:	
Wild Well Control	281-784-4700
Boots & Coots IWC	800-256-9688
B.J. Services	575-746-3569
Halliburton	575-746-2757

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.



PERCUSSION PETROLEUM OPERATING, LLC

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,
N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 33173	Drawn By: K GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 1 Sheets

Percussion Petroleum Operating LLC

South Boyd Fed Com #16H
H_2S Contingency Plan:
2 Mile Radius Map

Section 34, Township 19S, Range 25E
Eddy County, New Mexico

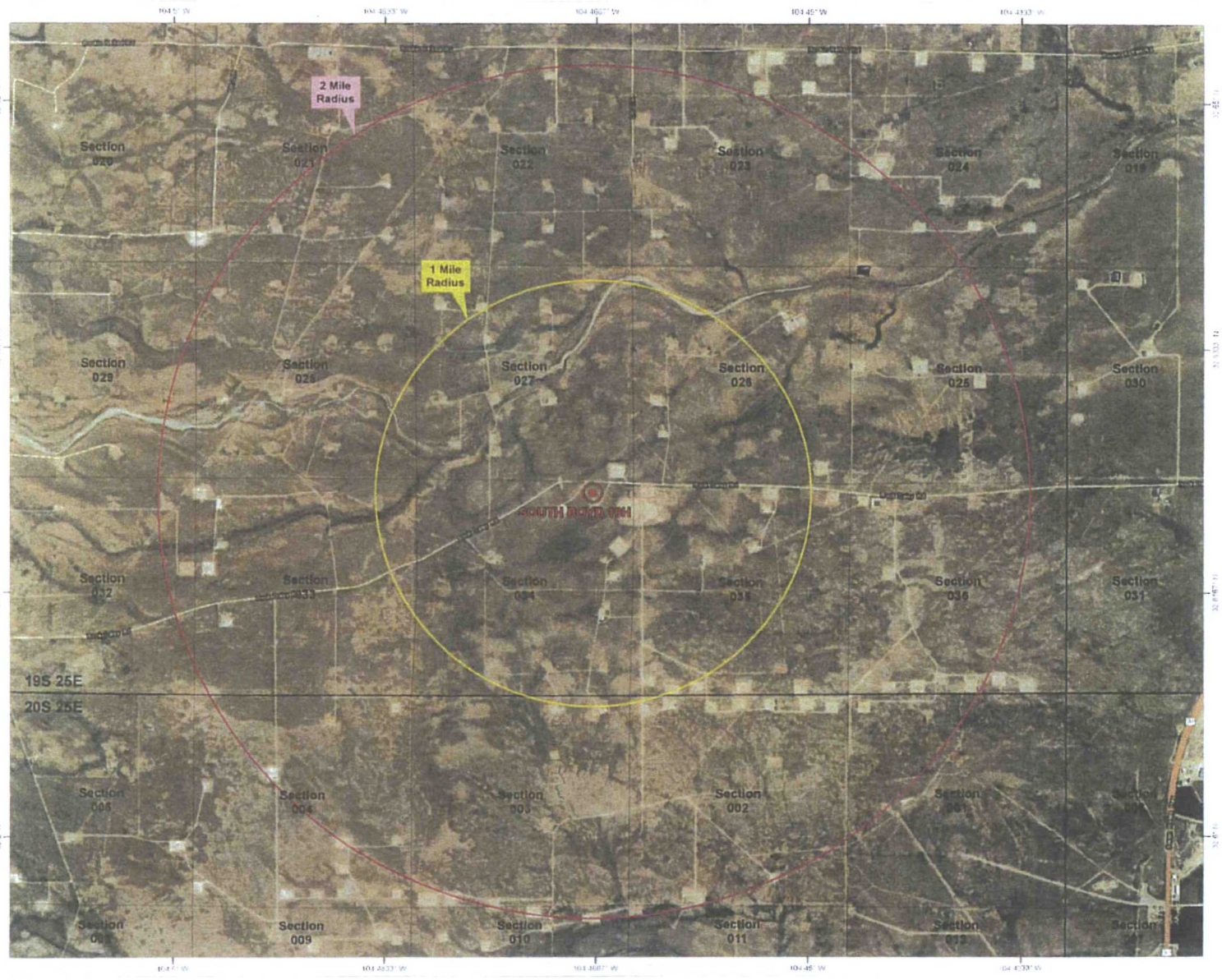
Surface Hole Location

1:27,000
0 0.25 0.5 1
Miles

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST

Prepared by Permits West, Inc., September 11, 2017
for Percussion Petroleum Operating LLC



PERCUSSION PETROLEUM

WELLBENDERS DIRECTIONAL SERVICES LLC

Company: Percussion
Project: Eddy County, NM
Site: South Boyd
Well: 16H
Wellbore: OH
Rig:
Design: Plan #1 / 14:10, July 05 2017

TOTAL CORRECTION
Magnetic North is 7.47° East of Grid North (Magnetic Convergence)

WELL DETAILS: 16H

RKB=25' @ 3540.00usft
3515.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	590581.60	500194.60	32.623488	-104.466970

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00
3	549.92	5.00	202.53	549.60	-10.06	-4.17	2.00	-10.00
4	1951.61	5.00	202.53	1945.96	-122.87	-50.97	0.00	-122.15
5	2201.53	0.00	0.00	2195.56	-132.93	-55.15	2.00	-132.16
6	2301.53	0.00	0.00	2295.56	-132.93	-55.15	0.00	-132.16
7	3203.03	90.15	359.21	2868.52	441.47	-63.07	10.00	442.30
8	7985.03	90.15	359.21	2856.00	5223.00	-129.00	0.00	5224.28
9	8295.36	90.15	359.21	2855.19	5533.30	-133.28	0.00	5534.61

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

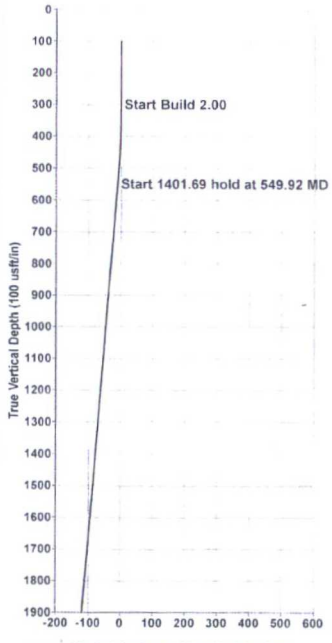
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
South Boyd 16H: BHL	2855.19	5533.30	-133.30	596114.90	500061.30	Point
South Boyd 16H: LTP	2856.00	5223.00	-129.00	595804.60	500065.60	Point
South Boyd 16H: FTP	2868.00	670.70	-66.40	591252.30	500128.20	Point

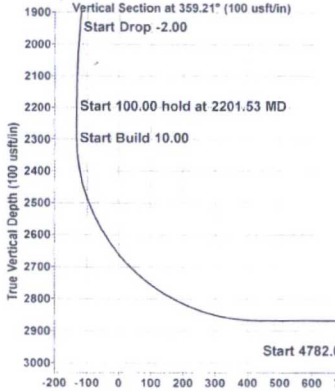
Azimuths to Grid North
True North: 0.07°
Magnetic North: 7.47°

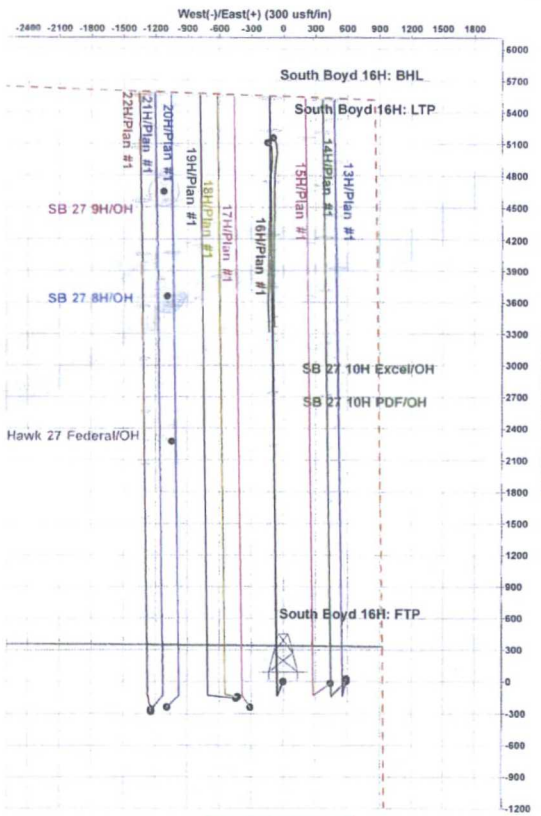
Magnetic Field
Strength: 48076.2snT
Dip Angle: 60.28°
Date: 6/20/2017
Model: IGRF2015

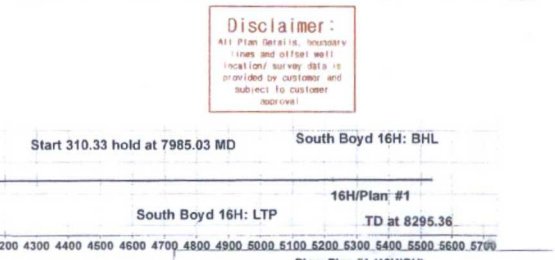
PROJECT DETAILS: Eddy County, NM

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level









Disclaimer:
All Plan Details, boundary lines and offset well location/ survey data is provided by customer and subject to customer approval

Plan: Plan #1 (16H/OH)

Created By: Daniel Benn Date: 14:10, July 05 2017

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 16H
Company:	Percussion	**TVD Reference:**	RKB=25' @ 3540.00usft
Project:	Eddy County, NM	**MD Reference:**	RKB=25' @ 3540.00usft
Site:	South Boyd	**North Reference:**	Grid
Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Project	Eddy County, NM		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	South Boyd				
Site Position:		**Northing:**	596,083.74 usft	**Latitude:**	32.638611
From:	Lat/Long	**Easting:**	500,025.61 usft	**Longitude:**	-104.467541
Position Uncertainty:	0.00 usft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-0.07 °

Well	16H					
Well Position	**+N/-S**	-5,502.14 usft	**Northing:**	590,581.60 usft	**Latitude:**	32.623488
	+E/-W	168.99 usft	**Easting:**	500,194.60 usft	**Longitude:**	-104.466970
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	3,515.00 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	6/20/2017	7.40	60.28	48,076.18212391

Design	Plan #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	359.21	

Plan Survey Tool Program **Date** 7/5/2017

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	8,295.36	Plan #1 (OH)	MWD+IGRF	
				OWSG MWD + IGRF or WM	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
549.92	5.00	202.53	549.60	-10.06	-4.17	2.00	2.00	0.00	202.53	
1,951.61	5.00	202.53	1,945.96	-122.87	-50.97	0.00	0.00	0.00	0.00	
2,201.53	0.00	0.00	2,195.56	-132.93	-55.15	2.00	-2.00	0.00	180.00	
2,301.53	0.00	0.00	2,295.56	-132.93	-55.15	0.00	0.00	0.00	0.00	
3,203.03	90.15	359.21	2,868.52	441.47	-63.07	10.00	10.00	0.00	0.00	
7,985.03	90.15	359.21	2,856.00	5,223.00	-129.00	0.00	0.00	0.00	0.00	South Boyd 16H: L
8,295.36	90.15	359.21	2,855.19	5,533.30	-133.28	0.00	0.00	0.00	0.00	South Boyd 16H: B

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 16H
Company:	Percussion	**TVD Reference:**	RKB=25' @ 3540.00usft
Project:	Eddy County, NM	**MD Reference:**	RKB=25' @ 3540.00usft
Site:	South Boyd	**North Reference:**	Grid
Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	2.00	202.53	399.98	-1.61	-0.67	-1.60	2.00	2.00	0.00
500.00	4.00	202.53	499.84	-6.45	-2.67	-6.41	2.00	2.00	0.00
549.92	5.00	202.53	549.60	-10.06	-4.17	-10.00	2.00	2.00	0.00
600.00	5.00	202.53	599.49	-14.09	-5.85	-14.01	0.00	0.00	0.00
700.00	5.00	202.53	699.11	-22.14	-9.19	-22.01	0.00	0.00	0.00
800.00	5.00	202.53	798.73	-30.19	-12.52	-30.01	0.00	0.00	0.00
900.00	5.00	202.53	898.35	-38.24	-15.86	-38.01	0.00	0.00	0.00
1,000.00	5.00	202.53	997.97	-46.28	-19.20	-46.02	0.00	0.00	0.00
1,100.00	5.00	202.53	1,097.59	-54.33	-22.54	-54.02	0.00	0.00	0.00
1,200.00	5.00	202.53	1,197.21	-62.38	-25.88	-62.02	0.00	0.00	0.00
1,300.00	5.00	202.53	1,296.83	-70.43	-29.22	-70.02	0.00	0.00	0.00
1,400.00	5.00	202.53	1,396.45	-78.48	-32.56	-78.02	0.00	0.00	0.00
1,500.00	5.00	202.53	1,496.07	-86.52	-35.89	-86.02	0.00	0.00	0.00
1,600.00	5.00	202.53	1,595.69	-94.57	-39.23	-94.02	0.00	0.00	0.00
1,700.00	5.00	202.53	1,695.31	-102.62	-42.57	-102.02	0.00	0.00	0.00
1,800.00	5.00	202.53	1,794.93	-110.67	-45.91	-110.02	0.00	0.00	0.00
1,900.00	5.00	202.53	1,894.55	-118.71	-49.25	-118.02	0.00	0.00	0.00
1,951.61	5.00	202.53	1,945.96	-122.87	-50.97	-122.15	0.00	0.00	0.00
2,000.00	4.03	202.53	1,994.20	-126.39	-52.43	-125.65	2.00	-2.00	0.00
2,100.00	2.03	202.53	2,094.06	-131.27	-54.46	-130.51	2.00	-2.00	0.00
2,201.53	0.00	0.00	2,195.56	-132.93	-55.15	-132.16	2.00	-2.00	0.00
2,301.53	0.00	0.00	2,295.56	-132.93	-55.15	-132.16	0.00	0.00	0.00
2,350.00	4.85	359.21	2,343.98	-130.88	-55.18	-130.11	10.00	10.00	0.00
2,400.00	9.85	359.21	2,393.55	-124.49	-55.26	-123.72	10.00	10.00	0.00
2,450.00	14.85	359.21	2,442.38	-113.80	-55.41	-113.03	10.00	10.00	0.00
2,500.00	19.85	359.21	2,490.09	-98.90	-55.62	-98.13	10.00	10.00	0.00
2,550.00	24.85	359.21	2,536.32	-79.90	-55.88	-79.12	10.00	10.00	0.00
2,600.00	29.85	359.21	2,580.72	-56.94	-56.20	-56.16	10.00	10.00	0.00
2,650.00	34.85	359.21	2,622.95	-30.20	-56.56	-29.41	10.00	10.00	0.00
2,700.00	39.85	359.21	2,662.68	0.12	-56.98	0.91	10.00	10.00	0.00
2,750.00	44.85	359.21	2,699.62	33.79	-57.45	34.58	10.00	10.00	0.00
2,800.00	49.85	359.21	2,733.49	70.55	-57.95	71.34	10.00	10.00	0.00
2,850.00	54.85	359.21	2,764.03	110.12	-58.50	110.91	10.00	10.00	0.00
2,900.00	59.85	359.21	2,790.99	152.20	-59.08	153.00	10.00	10.00	0.00
2,950.00	64.85	359.21	2,814.19	196.47	-59.69	197.27	10.00	10.00	0.00
3,000.00	69.85	359.21	2,833.44	242.59	-60.33	243.40	10.00	10.00	0.00
3,050.00	74.85	359.21	2,848.60	290.22	-60.98	291.03	10.00	10.00	0.00
3,100.00	79.85	359.21	2,859.55	338.98	-61.65	339.80	10.00	10.00	0.00
3,150.00	84.85	359.21	2,866.21	388.52	-62.34	389.34	10.00	10.00	0.00
3,203.03	90.15	359.21	2,868.52	441.47	-63.07	442.30	10.00	10.00	0.00
3,300.00	90.15	359.21	2,868.27	538.43	-64.40	539.27	0.00	0.00	0.00
3,400.00	90.15	359.21	2,868.00	638.42	-65.78	639.27	0.00	0.00	0.00
3,500.00	90.15	359.21	2,867.74	738.41	-67.16	739.27	0.00	0.00	0.00
3,600.00	90.15	359.21	2,867.48	838.40	-68.54	839.27	0.00	0.00	0.00
3,700.00	90.15	359.21	2,867.22	938.39	-69.92	939.27	0.00	0.00	0.00
3,800.00	90.15	359.21	2,866.96	1,038.39	-71.30	1,039.27	0.00	0.00	0.00
3,900.00	90.15	359.21	2,866.69	1,138.38	-72.68	1,139.27	0.00	0.00	0.00
4,000.00	90.15	359.21	2,866.43	1,238.37	-74.06	1,239.27	0.00	0.00	0.00
4,100.00	90.15	359.21	2,866.17	1,338.36	-75.43	1,339.27	0.00	0.00	0.00
4,200.00	90.15	359.21	2,865.91	1,438.35	-76.81	1,439.27	0.00	0.00	0.00

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 16H
Company:	Percussion	**TVD Reference:**	RKB=25' @ 3540.00usft
Project:	Eddy County, NM	**MD Reference:**	RKB=25' @ 3540.00usft
Site:	South Boyd	**North Reference:**	Grid
Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,300.00	90.15	359.21	2,865.65	1,538.34	-78.19	1,539.27	0.00	0.00	0.00
4,400.00	90.15	359.21	2,865.39	1,638.33	-79.57	1,639.27	0.00	0.00	0.00
4,500.00	90.15	359.21	2,865.12	1,738.32	-80.95	1,739.27	0.00	0.00	0.00
4,600.00	90.15	359.21	2,864.86	1,838.31	-82.33	1,839.27	0.00	0.00	0.00
4,700.00	90.15	359.21	2,864.60	1,938.30	-83.71	1,939.27	0.00	0.00	0.00
4,800.00	90.15	359.21	2,864.34	2,038.29	-85.09	2,039.27	0.00	0.00	0.00
4,900.00	90.15	359.21	2,864.08	2,138.28	-86.46	2,139.27	0.00	0.00	0.00
5,000.00	90.15	359.21	2,863.81	2,238.27	-87.84	2,239.27	0.00	0.00	0.00
5,100.00	90.15	359.21	2,863.55	2,338.26	-89.22	2,339.26	0.00	0.00	0.00
5,200.00	90.15	359.21	2,863.29	2,438.25	-90.60	2,439.26	0.00	0.00	0.00
5,300.00	90.15	359.21	2,863.03	2,538.24	-91.98	2,539.26	0.00	0.00	0.00
5,400.00	90.15	359.21	2,862.77	2,638.23	-93.36	2,639.26	0.00	0.00	0.00
5,500.00	90.15	359.21	2,862.51	2,738.22	-94.74	2,739.26	0.00	0.00	0.00
5,600.00	90.15	359.21	2,862.24	2,838.21	-96.12	2,839.26	0.00	0.00	0.00
5,700.00	90.15	359.21	2,861.98	2,938.20	-97.49	2,939.26	0.00	0.00	0.00
5,800.00	90.15	359.21	2,861.72	3,038.19	-98.87	3,039.26	0.00	0.00	0.00
5,900.00	90.15	359.21	2,861.46	3,138.18	-100.25	3,139.26	0.00	0.00	0.00
6,000.00	90.15	359.21	2,861.20	3,238.17	-101.63	3,239.26	0.00	0.00	0.00
6,100.00	90.15	359.21	2,860.94	3,338.16	-103.01	3,339.26	0.00	0.00	0.00
6,200.00	90.15	359.21	2,860.67	3,438.15	-104.39	3,439.26	0.00	0.00	0.00
6,300.00	90.15	359.21	2,860.41	3,538.14	-105.77	3,539.26	0.00	0.00	0.00
6,400.00	90.15	359.21	2,860.15	3,638.13	-107.15	3,639.26	0.00	0.00	0.00
6,500.00	90.15	359.21	2,859.89	3,738.12	-108.53	3,739.26	0.00	0.00	0.00
6,600.00	90.15	359.21	2,859.63	3,838.11	-109.90	3,839.26	0.00	0.00	0.00
6,700.00	90.15	359.21	2,859.36	3,938.10	-111.28	3,939.26	0.00	0.00	0.00
6,800.00	90.15	359.21	2,859.10	4,038.09	-112.66	4,039.26	0.00	0.00	0.00
6,900.00	90.15	359.21	2,858.84	4,138.08	-114.04	4,139.26	0.00	0.00	0.00
7,000.00	90.15	359.21	2,858.58	4,238.07	-115.42	4,239.26	0.00	0.00	0.00
7,100.00	90.15	359.21	2,858.32	4,338.06	-116.80	4,339.26	0.00	0.00	0.00
7,200.00	90.15	359.21	2,858.06	4,438.05	-118.18	4,439.26	0.00	0.00	0.00
7,300.00	90.15	359.21	2,857.79	4,538.04	-119.56	4,539.26	0.00	0.00	0.00
7,400.00	90.15	359.21	2,857.53	4,638.03	-120.93	4,639.26	0.00	0.00	0.00
7,500.00	90.15	359.21	2,857.27	4,738.02	-122.31	4,739.26	0.00	0.00	0.00
7,600.00	90.15	359.21	2,857.01	4,838.01	-123.69	4,839.26	0.00	0.00	0.00
7,700.00	90.15	359.21	2,856.75	4,938.00	-125.07	4,939.26	0.00	0.00	0.00
7,800.00	90.15	359.21	2,856.48	5,037.99	-126.45	5,039.26	0.00	0.00	0.00
7,900.00	90.15	359.21	2,856.22	5,137.98	-127.83	5,139.26	0.00	0.00	0.00
7,985.03	90.15	359.21	2,856.00	5,223.00	-129.00	5,224.28	0.00	0.00	0.00
8,000.00	90.15	359.21	2,855.96	5,237.97	-129.21	5,239.26	0.00	0.00	0.00
8,100.00	90.15	359.21	2,855.70	5,337.96	-130.59	5,339.25	0.00	0.00	0.00
8,200.00	90.15	359.21	2,855.44	5,437.95	-131.96	5,439.25	0.00	0.00	0.00
8,295.36	90.15	359.21	2,855.19	5,533.30	-133.28	5,534.61	0.00	0.00	0.00

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 16H
Company:	Percussion	**TVD Reference:**	RKB=25' @ 3540.00usft
Project:	Eddy County, NM	**MD Reference:**	RKB=25' @ 3540.00usft
Site:	South Boyd	**North Reference:**	Grid
Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
South Boyd 16H: BHL - plan misses target center by 0.02usft at 8295.36usft MD (2855.19 TVD, 5533.30 N, -133.28 E) - Point	0.00	0.00	2,855.19	5,533.30	-133.30	596,114.90	500,061.30	32.638697	-104.467426
South Boyd 16H: LTP - plan hits target center - Point	0.00	360.00	2,856.00	5,223.00	-129.00	595,804.60	500,065.60	32.637844	-104.467410
South Boyd 16H: FTP - plan misses target center by 0.19usft at 3432.28usft MD (2867.92 TVD, 670.70 N, -66.23 E) - Point	0.00	0.00	2,868.00	670.70	-66.40	591,252.30	500,128.20	32.625331	-104.467188

PERCUSSION PETROLEUM LLC

Percussion

Eddy County, NM
South Boyd
16H

OH
Plan #1

Anticollision Report

05 July, 2017

WELLBENDERS DIRECTIONAL SERVICES LLC

PERCUSSION PETROLEUM LLC

Wellbenders
Anticollision Report

WELLBENDERS DIRECTIONAL SERVICES

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum separation factor of 20.00	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 7/5/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	8,295.36	Plan #1 (OH)	MWD+IGRF	OWSG MWD + IGRF or WMM

Summary

Site Name / Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
South Boyd						
13H - OH - Plan #1	8,272.78	8,296.13	612.99	399.87	2.876	CC, ES, SF
14H - OH - Plan #1	3,500.00	3,234.15	572.45	541.62	18.569	CC
14H - OH - Plan #1	8,295.36	8,005.51	573.82	382.40	2.998	ES, SF
15H - OH - Plan #1	2,700.00	2,663.03	346.80	329.12	19.625	CC
15H - OH - Plan #1	8,295.36	8,171.00	357.46	152.55	1.744	ES, SF
17H - OH - Plan #1	2,400.00	2,393.46	328.32	311.57	19.604	CC
17H - OH - Plan #1	8,295.36	8,164.84	354.23	151.42	1.747	ES, SF
18H - OH - Plan #1	3,400.00	3,084.62	570.70	541.51	19.552	CC
18H - OH - Plan #1	8,295.36	7,979.94	580.57	393.75	3.108	ES, SF
19H - OH - Plan #1	8,295.36	8,285.19	649.58	433.26	3.003	CC, ES, SF
20H - OH - Plan #1	3,800.00	3,658.66	931.09	883.32	19.490	CC
20H - OH - Plan #1	8,295.36	8,153.99	932.05	717.05	4.335	ES, SF
21H - OH - Plan #1	4,100.00	3,807.12	1,114.41	1,057.09	19.443	CC
21H - OH - Plan #1	8,295.36	7,988.12	1,122.22	913.12	5.367	ES, SF
22H - OH - Plan #1	8,295.36	8,257.96	1,214.33	996.05	5.563	CC, ES, SF
Hawk 27 Federal - OH - OH	5,050.88	2,810.32	955.91	863.08	10.296	CC, ES
Hawk 27 Federal - OH - OH	5,200.00	2,810.71	967.48	872.27	10.162	SF
SB 27 10H Excel - OH - OH	6,762.83	3,442.28	329.52	288.32	7.999	CC, ES, SF
SB 27 10H PDF - OH - OH	6,800.27	3,450.85	329.81	288.04	7.896	CC, ES, SF
SB 27 8H - OH - OH	6,433.24	2,817.94	979.33	860.22	8.222	CC, ES
SB 27 8H - OH - OH	6,500.00	2,818.11	981.60	861.34	8.162	SF
SB 27 9H - OH - OH	7,422.91	2,816.53	996.83	858.90	7.227	CC, ES
SB 27 9H - OH - OH	7,500.00	2,816.73	999.81	860.62	7.183	SF

Offset Design South Boyd - 13H - OH - Plan #1

Survey Program: 0-MWD+IGRF

Offset Site Error: 0.00 usft

Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,400.00	2,868.00	3,423.35	2,896.04	16.06	16.00	92.62	647.02	547.07	613.55	581.51	32.04	19.152	
3,500.00	2,867.74	3,523.35	2,895.84	17.63	17.56	92.62	747.01	545.67	613.54	578.37	35.16	17.448	
3,600.00	2,867.48	3,623.35	2,895.64	19.27	19.18	92.63	847.00	544.28	613.53	575.11	38.42	15.969	
3,700.00	2,867.22	3,723.35	2,895.44	20.95	20.86	92.64	946.99	542.89	613.52	571.74	41.77	14.686	
3,800.00	2,866.96	3,823.35	2,895.24	22.67	22.57	92.64	1,046.98	541.49	613.50	568.30	45.20	13.572	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 13H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,900.00	2,866.69	3,923.35	2,895.05	24.42	24.31	92.65	1,146.97	540.10	613.49	564.80	48.70	12.599	
4,000.00	2,866.43	4,023.35	2,894.85	26.19	26.08	92.65	1,246.96	538.71	613.48	561.25	52.23	11.745	
4,100.00	2,866.17	4,123.35	2,894.65	27.98	27.87	92.66	1,346.95	537.31	613.47	557.66	55.81	10.992	
4,200.00	2,865.91	4,223.34	2,894.45	29.79	29.68	92.67	1,446.94	535.92	613.46	554.04	59.42	10.324	
4,300.00	2,865.65	4,323.34	2,894.25	31.61	31.49	92.67	1,546.93	534.52	613.44	550.39	63.06	9.729	
4,400.00	2,865.39	4,423.34	2,894.05	33.44	33.32	92.68	1,646.92	533.13	613.43	546.72	66.71	9.195	
4,500.00	2,865.12	4,523.34	2,893.86	35.29	35.16	92.68	1,746.91	531.74	613.42	543.03	70.39	8.715	
4,600.00	2,864.86	4,623.34	2,893.66	37.13	37.01	92.69	1,846.90	530.34	613.41	539.33	74.08	8.280	
4,700.00	2,864.60	4,723.34	2,893.46	38.99	38.86	92.70	1,946.89	528.95	613.40	535.61	77.79	7.886	
4,800.00	2,864.34	4,823.34	2,893.26	40.85	40.72	92.70	2,046.88	527.56	613.39	531.88	81.50	7.526	
4,900.00	2,864.08	4,923.34	2,893.06	42.72	42.59	92.71	2,146.87	526.16	613.37	528.14	85.23	7.197	
5,000.00	2,863.81	5,023.34	2,892.86	44.59	44.46	92.71	2,246.86	524.77	613.36	524.40	88.97	6.894	
5,100.00	2,863.55	5,123.34	2,892.66	46.46	46.33	92.72	2,346.85	523.38	613.35	520.64	92.71	6.616	
5,200.00	2,863.29	5,223.34	2,892.47	48.34	48.21	92.73	2,446.84	521.98	613.34	516.88	96.46	6.358	
5,300.00	2,863.03	5,323.34	2,892.27	50.22	50.09	92.73	2,546.83	520.59	613.33	513.11	100.22	6.120	
5,400.00	2,862.77	5,423.34	2,892.07	52.10	51.97	92.74	2,646.82	519.20	613.32	509.34	103.98	5.898	
5,500.00	2,862.51	5,523.34	2,891.87	53.99	53.85	92.74	2,746.81	517.80	613.30	505.56	107.75	5.692	
5,600.00	2,862.24	5,623.34	2,891.67	55.88	55.74	92.75	2,846.80	516.41	613.29	501.77	111.52	5.499	
5,700.00	2,861.98	5,723.34	2,891.47	57.77	57.63	92.76	2,946.79	515.02	613.28	497.99	115.30	5.319	
5,800.00	2,861.72	5,823.34	2,891.28	59.66	59.52	92.76	3,046.78	513.62	613.27	494.20	119.07	5.150	
5,900.00	2,861.46	5,923.34	2,891.08	61.55	61.42	92.77	3,146.77	512.23	613.26	490.40	122.86	4.992	
6,000.00	2,861.20	6,023.34	2,890.88	63.45	63.31	92.77	3,246.76	510.84	613.25	486.60	126.64	4.842	
6,100.00	2,860.94	6,123.34	2,890.68	65.34	65.21	92.78	3,346.75	509.44	613.24	482.81	130.43	4.702	
6,200.00	2,860.67	6,223.34	2,890.48	67.24	67.10	92.79	3,446.74	508.05	613.22	479.00	134.22	4.569	
6,300.00	2,860.41	6,323.34	2,890.28	69.14	69.00	92.79	3,546.73	506.66	613.21	475.20	138.01	4.443	
6,400.00	2,860.15	6,423.34	2,890.08	71.04	70.90	92.80	3,646.72	505.26	613.20	471.39	141.81	4.324	
6,500.00	2,859.89	6,523.34	2,889.89	72.94	72.80	92.80	3,746.71	503.87	613.19	467.58	145.60	4.211	
6,600.00	2,859.63	6,623.34	2,889.69	74.84	74.70	92.81	3,846.70	502.48	613.18	463.77	149.40	4.104	
6,700.00	2,859.36	6,723.34	2,889.49	76.75	76.60	92.82	3,946.69	501.08	613.17	459.96	153.20	4.002	
6,800.00	2,859.10	6,823.34	2,889.29	78.65	78.51	92.82	4,046.68	499.69	613.15	456.15	157.00	3.905	
6,900.00	2,858.84	6,923.34	2,889.09	80.55	80.41	92.83	4,146.67	498.30	613.14	452.34	160.81	3.813	
7,000.00	2,858.58	7,023.34	2,888.89	82.46	82.31	92.83	4,246.66	496.90	613.13	448.52	164.61	3.725	
7,100.00	2,858.32	7,123.34	2,888.70	84.36	84.22	92.84	4,346.65	495.51	613.12	444.70	168.42	3.640	
7,200.00	2,858.06	7,223.34	2,888.50	86.27	86.12	92.85	4,446.64	494.12	613.11	440.88	172.22	3.560	
7,300.00	2,857.79	7,323.34	2,888.30	88.17	88.03	92.85	4,546.63	492.72	613.10	437.07	176.03	3.483	
7,400.00	2,857.53	7,423.34	2,888.10	90.08	89.94	92.86	4,646.62	491.33	613.09	433.25	179.84	3.409	
7,500.00	2,857.27	7,523.34	2,887.90	91.99	91.84	92.86	4,746.61	489.94	613.07	429.42	183.65	3.338	
7,600.00	2,857.01	7,623.34	2,887.70	93.90	93.75	92.87	4,846.60	488.54	613.06	425.60	187.46	3.270	
7,700.00	2,856.75	7,723.34	2,887.51	95.80	95.66	92.88	4,946.59	487.15	613.05	421.78	191.27	3.205	
7,800.00	2,856.48	7,823.34	2,887.31	97.71	97.57	92.88	5,046.58	485.75	613.04	417.96	195.08	3.142	
7,900.00	2,856.22	7,923.34	2,887.11	99.62	99.48	92.89	5,146.57	484.36	613.03	414.13	198.89	3.082	
8,000.00	2,855.96	8,023.34	2,886.91	101.53	101.39	92.89	5,246.56	482.97	613.02	410.31	202.71	3.024	
8,100.00	2,855.70	8,123.34	2,886.71	103.44	103.29	92.90	5,346.55	481.57	613.00	406.48	206.52	2.968	
8,200.00	2,855.44	8,223.34	2,886.51	105.35	105.20	92.91	5,446.54	480.18	612.99	402.66	210.34	2.914	
8,272.78	2,855.25	8,296.13	2,886.37	106.74	106.59	92.91	5,519.32	479.17	612.99	399.87	213.11	2.876	CC, ES, SF
8,295.36	2,855.19	8,288.31	2,886.38	107.17	106.44	92.91	5,511.50	479.28	613.74	400.66	213.08	2.880	

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 14H - OH - Plan #1 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+IGRF — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,500.00	2,867.74	3,234.15	2,594.79	17.63	17.21	61.52	744.54	435.99	572.45	541.62	30.83	18.569	CC
3,600.00	2,867.48	3,334.15	2,594.46	19.27	18.88	61.52	844.52	434.59	572.47	538.65	33.82	16.928	
3,700.00	2,867.22	3,434.15	2,594.13	20.95	20.60	61.51	944.51	433.19	572.48	535.59	36.89	15.519	
3,800.00	2,866.96	3,534.15	2,593.80	22.67	22.34	61.50	1,044.50	431.80	572.50	532.48	40.02	14.304	
3,900.00	2,866.69	3,634.15	2,593.47	24.42	24.12	61.49	1,144.49	430.40	572.52	529.31	43.20	13.251	
4,000.00	2,866.43	3,734.15	2,593.14	26.19	25.91	61.49	1,244.48	429.00	572.54	526.11	46.42	12.333	
4,100.00	2,866.17	3,834.15	2,592.80	27.98	27.72	61.48	1,344.47	427.61	572.55	522.88	49.68	11.526	
4,200.00	2,865.91	3,934.15	2,592.47	29.79	29.54	61.47	1,444.46	426.21	572.57	519.62	52.95	10.813	
4,300.00	2,865.65	4,034.15	2,592.14	31.61	31.38	61.47	1,544.45	424.82	572.59	516.34	56.25	10.180	
4,400.00	2,865.39	4,134.15	2,591.81	33.44	33.22	61.46	1,644.44	423.42	572.61	513.05	59.56	9.614	
4,500.00	2,865.12	4,234.15	2,591.48	35.29	35.07	61.45	1,744.43	422.02	572.63	509.74	62.89	9.105	
4,600.00	2,864.86	4,334.15	2,591.15	37.13	36.93	61.45	1,844.42	420.63	572.65	506.42	66.23	8.646	
4,700.00	2,864.60	4,434.15	2,590.81	38.99	38.80	61.44	1,944.41	419.23	572.66	503.08	69.58	8.230	
4,800.00	2,864.34	4,534.15	2,590.48	40.85	40.66	61.43	2,044.40	417.83	572.68	499.74	72.94	7.852	
4,900.00	2,864.08	4,634.15	2,590.15	42.72	42.54	61.42	2,144.39	416.44	572.70	496.39	76.31	7.505	
5,000.00	2,863.81	4,734.15	2,589.82	44.59	44.42	61.42	2,244.38	415.04	572.72	493.04	79.68	7.188	
5,100.00	2,863.55	4,834.15	2,589.49	46.46	46.30	61.41	2,344.37	413.65	572.74	489.68	83.06	6.896	
5,200.00	2,863.29	4,934.15	2,589.16	48.34	48.18	61.40	2,444.36	412.25	572.75	486.31	86.44	6.626	
5,300.00	2,863.03	5,034.15	2,588.82	50.22	50.07	61.40	2,544.35	410.85	572.77	482.94	89.83	6.376	
5,400.00	2,862.77	5,134.15	2,588.49	52.10	51.96	61.39	2,644.34	409.46	572.79	479.57	93.22	6.144	
5,500.00	2,862.51	5,234.15	2,588.16	53.99	53.85	61.38	2,744.33	408.06	572.81	476.19	96.62	5.928	
5,600.00	2,862.24	5,334.15	2,587.83	55.88	55.74	61.38	2,844.32	406.66	572.83	472.81	100.02	5.727	
5,700.00	2,861.98	5,434.15	2,587.50	57.77	57.63	61.37	2,944.31	405.27	572.84	469.42	103.42	5.539	
5,800.00	2,861.72	5,534.15	2,587.17	59.66	59.53	61.36	3,044.30	403.87	572.86	466.04	106.83	5.363	
5,900.00	2,861.46	5,634.15	2,586.83	61.55	61.43	61.36	3,144.29	402.48	572.88	462.65	110.23	5.197	
6,000.00	2,861.20	5,734.15	2,586.50	63.45	63.32	61.35	3,244.28	401.08	572.90	459.26	113.64	5.041	
6,100.00	2,860.94	5,834.15	2,586.17	65.34	65.22	61.34	3,344.27	399.68	572.92	455.87	117.05	4.895	
6,200.00	2,860.67	5,934.15	2,585.84	67.24	67.12	61.33	3,444.26	398.29	572.93	452.47	120.46	4.756	
6,300.00	2,860.41	6,034.15	2,585.51	69.14	69.03	61.33	3,544.25	396.89	572.95	449.08	123.88	4.625	
6,400.00	2,860.15	6,134.15	2,585.18	71.04	70.93	61.32	3,644.24	395.50	572.97	445.68	127.29	4.501	
6,500.00	2,859.89	6,234.15	2,584.84	72.94	72.83	61.31	3,744.23	394.10	572.99	442.28	130.71	4.384	
6,600.00	2,859.63	6,334.15	2,584.51	74.84	74.74	61.31	3,844.22	392.70	573.01	438.88	134.12	4.272	
6,700.00	2,859.36	6,434.15	2,584.18	76.75	76.64	61.30	3,944.20	391.31	573.03	435.48	137.54	4.166	
6,800.00	2,859.10	6,534.15	2,583.85	78.65	78.55	61.29	4,044.19	389.91	573.04	432.08	140.96	4.065	
6,900.00	2,858.84	6,634.15	2,583.52	80.55	80.45	61.29	4,144.18	388.51	573.06	428.68	144.38	3.969	
7,000.00	2,858.58	6,734.15	2,583.19	82.46	82.36	61.28	4,244.17	387.12	573.08	425.28	147.80	3.877	
7,100.00	2,858.32	6,834.15	2,582.86	84.36	84.27	61.27	4,344.16	385.72	573.10	421.88	151.22	3.790	
7,200.00	2,858.06	6,934.15	2,582.52	86.27	86.17	61.26	4,444.15	384.33	573.12	418.48	154.64	3.706	
7,300.00	2,857.79	7,034.15	2,582.19	88.17	88.08	61.26	4,544.14	382.93	573.14	415.07	158.06	3.626	
7,400.00	2,857.53	7,134.15	2,581.86	90.08	89.99	61.25	4,644.13	381.53	573.15	411.67	161.48	3.549	
7,500.00	2,857.27	7,234.15	2,581.53	91.99	91.90	61.24	4,744.12	380.14	573.17	408.27	164.90	3.476	
7,600.00	2,857.01	7,334.15	2,581.20	93.90	93.81	61.24	4,844.11	378.74	573.19	404.86	168.33	3.405	
7,700.00	2,856.75	7,434.15	2,580.87	95.80	95.72	61.23	4,944.10	377.34	573.21	401.46	171.75	3.337	
7,800.00	2,856.48	7,534.15	2,580.53	97.71	97.63	61.22	5,044.09	375.95	573.23	398.05	175.17	3.272	
7,900.00	2,856.22	7,634.15	2,580.20	99.62	99.54	61.22	5,144.08	374.55	573.24	394.65	178.60	3.210	
8,000.00	2,855.96	7,734.15	2,579.87	101.53	101.45	61.21	5,244.07	373.16	573.26	391.24	182.02	3.149	
8,100.00	2,855.70	7,834.15	2,579.54	103.44	103.36	61.20	5,344.06	371.76	573.28	387.84	185.44	3.091	
8,200.00	2,855.44	7,934.15	2,579.21	105.35	105.27	61.20	5,444.05	370.36	573.30	384.43	188.87	3.035	
8,200.04	2,855.44	7,934.19	2,579.21	105.35	105.27	61.20	5,444.09	370.36	573.30	384.43	188.87	3.035	
8,295.36	2,855.19	8,005.51	2,578.97	107.17	106.63	61.19	5,515.40	369.37	573.82	382.40	191.42	2.998	ES, SF

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 15H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,700.00	2,662.68	2,663.03	2,611.10	9.03	9.16	78.40	52.53	281.93	346.80	329.12	17.67	19.625	CC
2,800.00	2,733.49	2,750.66	2,665.46	9.43	9.59	76.49	121.13	280.98	349.38	330.92	18.45	18.934	
2,900.00	2,790.99	2,837.07	2,708.22	10.05	10.27	74.95	196.12	279.95	351.74	332.18	19.56	17.984	
3,000.00	2,833.44	2,922.59	2,738.97	10.89	11.11	73.82	275.83	278.85	353.65	332.63	21.02	16.826	
3,100.00	2,859.55	3,007.49	2,757.44	11.96	12.09	73.10	358.61	277.71	354.94	332.11	22.83	15.550	
3,200.00	2,868.52	3,092.07	2,763.48	13.20	13.18	72.81	442.89	276.55	355.48	330.53	24.94	14.251	
3,300.00	2,868.27	3,208.08	2,763.11	14.57	14.83	72.80	542.73	275.17	355.51	327.64	27.86	12.758	
3,400.00	2,868.00	3,308.08	2,762.74	16.06	16.36	72.78	642.72	273.79	355.54	324.76	30.78	11.552	
3,500.00	2,867.74	3,408.08	2,762.38	17.63	17.96	72.76	742.71	272.41	355.57	321.73	33.84	10.506	
3,600.00	2,867.48	3,508.08	2,762.01	19.27	19.62	72.75	842.70	271.03	355.60	318.58	37.02	9.605	
3,700.00	2,867.22	3,608.08	2,761.65	20.95	21.32	72.73	942.69	269.65	355.63	315.34	40.29	8.827	
3,800.00	2,866.96	3,708.08	2,761.28	22.67	23.05	72.71	1,042.68	268.28	355.66	312.04	43.62	8.153	
3,900.00	2,866.69	3,808.08	2,760.91	24.42	24.81	72.70	1,142.67	266.90	355.69	308.68	47.01	7.566	
4,000.00	2,866.43	3,908.08	2,760.55	26.19	26.60	72.68	1,242.66	265.52	355.73	305.29	50.44	7.053	
4,100.00	2,866.17	4,008.08	2,760.18	27.98	28.40	72.67	1,342.65	264.14	355.76	301.86	53.90	6.600	
4,200.00	2,865.91	4,108.08	2,759.81	29.79	30.21	72.65	1,442.64	262.76	355.79	298.40	57.39	6.199	
4,300.00	2,865.65	4,208.08	2,759.45	31.61	32.04	72.63	1,542.63	261.38	355.82	294.92	60.90	5.842	
4,400.00	2,865.39	4,308.08	2,759.08	33.44	33.88	72.62	1,642.62	260.00	355.85	291.41	64.44	5.523	
4,500.00	2,865.12	4,408.08	2,758.71	35.29	35.72	72.60	1,742.61	258.62	355.88	287.90	67.98	5.235	
4,600.00	2,864.86	4,508.08	2,758.35	37.13	37.57	72.59	1,842.60	257.25	355.91	284.37	71.55	4.975	
4,700.00	2,864.60	4,608.08	2,757.98	38.99	39.43	72.57	1,942.59	255.87	355.94	280.83	75.12	4.738	
4,800.00	2,864.34	4,708.08	2,757.61	40.85	41.30	72.55	2,042.58	254.49	355.98	277.27	78.70	4.523	
4,900.00	2,864.08	4,808.08	2,757.25	42.72	43.17	72.54	2,142.57	253.11	356.01	273.71	82.29	4.326	
5,000.00	2,863.81	4,908.08	2,756.88	44.59	45.04	72.52	2,242.56	251.73	356.04	270.15	85.89	4.145	
5,100.00	2,863.55	5,008.08	2,756.51	46.46	46.92	72.51	2,342.55	250.35	356.07	266.57	89.50	3.979	
5,200.00	2,863.29	5,108.08	2,756.15	48.34	48.80	72.49	2,442.54	248.97	356.10	262.99	93.11	3.825	
5,300.00	2,863.03	5,191.92	2,755.78	50.22	50.37	72.47	2,542.53	247.59	356.13	259.70	96.43	3.693	
5,400.00	2,862.77	5,308.08	2,755.41	52.10	52.56	72.46	2,642.52	246.22	356.17	255.82	100.34	3.549	
5,500.00	2,862.51	5,408.08	2,755.05	53.99	54.45	72.44	2,742.51	244.84	356.20	252.23	103.97	3.426	
5,600.00	2,862.24	5,508.08	2,754.68	55.88	56.34	72.43	2,842.50	243.46	356.23	248.64	107.59	3.311	
5,700.00	2,861.98	5,608.08	2,754.32	57.77	58.23	72.41	2,942.49	242.08	356.26	245.04	111.22	3.203	
5,800.00	2,861.72	5,708.08	2,753.95	59.66	60.13	72.39	3,042.48	240.70	356.29	241.44	114.86	3.102	
5,900.00	2,861.46	5,808.08	2,753.58	61.55	62.02	72.38	3,142.47	239.32	356.32	237.83	118.49	3.007	
6,000.00	2,861.20	5,908.08	2,753.22	63.45	63.92	72.36	3,242.46	237.94	356.35	234.23	122.13	2.918	
6,100.00	2,860.94	6,008.08	2,752.85	65.34	65.81	72.34	3,342.44	236.56	356.39	230.62	125.77	2.834	
6,200.00	2,860.67	6,108.08	2,752.48	67.24	67.71	72.33	3,442.43	235.19	356.42	227.01	129.41	2.754	
6,300.00	2,860.41	6,208.08	2,752.12	69.14	69.61	72.31	3,542.42	233.81	356.45	223.40	133.05	2.679	
6,400.00	2,860.15	6,308.08	2,751.75	71.04	71.51	72.30	3,642.41	232.43	356.48	219.79	136.69	2.608	
6,500.00	2,859.89	6,408.08	2,751.38	72.94	73.41	72.28	3,742.40	231.05	356.51	216.18	140.34	2.540	
6,600.00	2,859.63	6,491.92	2,751.02	74.84	75.01	72.26	3,842.39	229.67	356.55	212.86	143.69	2.481	
6,700.00	2,859.36	6,608.08	2,750.65	76.75	77.22	72.25	3,942.38	228.29	356.58	208.95	147.63	2.415	
6,800.00	2,859.10	6,708.08	2,750.28	78.65	79.12	72.23	4,042.37	226.91	356.61	205.33	151.28	2.357	
6,900.00	2,858.84	6,791.92	2,749.92	80.55	80.72	72.22	4,142.36	225.53	356.64	202.01	154.63	2.306	
7,000.00	2,858.58	6,908.08	2,749.55	82.46	82.93	72.20	4,242.35	224.16	356.67	198.10	158.57	2.249	
7,100.00	2,858.32	7,008.08	2,749.18	84.36	84.84	72.18	4,342.34	222.78	356.71	194.48	162.22	2.199	
7,200.00	2,858.06	7,108.08	2,748.82	86.27	86.74	72.17	4,442.33	221.40	356.74	190.87	165.87	2.151	
7,300.00	2,857.79	7,208.08	2,748.45	88.17	88.65	72.15	4,542.32	220.02	356.77	187.25	169.52	2.105	
7,400.00	2,857.53	7,308.08	2,748.08	90.08	90.56	72.14	4,642.31	218.64	356.80	183.63	173.17	2.060	
7,500.00	2,857.27	7,391.92	2,747.72	91.99	92.16	72.12	4,742.30	217.26	356.83	180.31	176.53	2.021	
7,600.00	2,857.01	7,508.08	2,747.35	93.90	94.37	72.10	4,842.29	215.88	356.87	176.39	180.47	1.977	
7,700.00	2,856.75	7,608.08	2,746.98	95.80	96.28	72.09	4,942.28	214.50	356.90	172.77	184.13	1.938	
7,800.00	2,856.48	7,708.08	2,746.62	97.71	98.19	72.07	5,042.27	213.13	356.93	169.15	187.78	1.901	

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 15H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,900.00	2,856.22	7,791.92	2,746.25	99.62	99.79	72.06	5,142.26	211.75	356.96	165.83	191.13	1.868	
8,000.00	2,855.96	7,908.08	2,745.89	101.53	102.01	72.04	5,242.25	210.37	357.00	161.92	195.08	1.830	
8,100.00	2,855.70	8,008.08	2,745.52	103.44	103.92	72.02	5,342.24	208.99	357.03	158.30	198.73	1.797	
8,200.00	2,855.44	8,091.92	2,745.15	105.35	105.52	72.01	5,442.23	207.61	357.06	154.97	202.09	1.767	
8,203.59	2,855.43	8,104.49	2,745.14	105.42	105.76	72.01	5,445.82	207.56	357.06	154.68	202.38	1.764	
8,295.36	2,855.19	8,171.00	2,744.86	107.17	107.03	72.00	5,521.30	206.52	357.46	152.55	204.91	1.744	ES, SF

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 17H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,400.00	2,393.55	2,393.46	2,378.11	8.36	8.56	-82.68	-89.23	-381.32	328.32	311.57	16.75	19.604	CC
2,500.00	2,490.09	2,483.45	2,459.09	8.58	9.08	-79.46	-50.17	-381.85	331.31	313.87	17.44	18.996	
2,600.00	2,580.72	2,571.23	2,531.24	8.79	9.70	-76.59	-0.33	-382.53	334.88	316.72	18.16	18.437	
2,700.00	2,662.68	2,657.21	2,593.73	9.03	10.43	-74.13	58.60	-383.33	338.64	319.65	18.99	17.829	
2,800.00	2,733.49	2,741.75	2,645.90	9.43	11.29	-72.13	125.02	-384.24	342.20	322.17	20.03	17.083	
2,900.00	2,790.99	2,825.21	2,687.28	10.05	12.27	-70.60	197.40	-385.22	345.21	323.85	21.36	16.161	
3,000.00	2,833.44	2,907.89	2,717.48	10.89	13.35	-69.55	274.29	-386.27	347.41	324.38	23.03	15.085	
3,100.00	2,859.55	2,990.12	2,736.23	11.96	14.52	-69.01	354.27	-387.36	348.60	323.55	25.05	13.914	
3,200.00	2,868.52	3,072.17	2,743.35	13.20	15.75	-68.96	435.93	-388.47	348.69	321.30	27.40	12.728	
3,209.52	2,868.54	3,079.99	2,743.42	13.33	15.87	-68.97	443.75	-388.58	348.67	321.03	27.64	12.616	
3,300.00	2,868.27	3,169.51	2,742.90	14.57	17.29	-68.93	533.26	-389.79	348.74	318.59	30.15	11.567	
3,400.00	2,868.00	3,269.50	2,742.31	16.06	18.93	-68.88	633.25	-391.16	348.85	315.75	33.09	10.541	
3,500.00	2,867.74	3,369.50	2,741.71	17.63	20.62	-68.83	733.24	-392.52	348.95	312.79	36.16	9.650	
3,600.00	2,867.48	3,469.50	2,741.12	19.27	22.34	-68.78	833.23	-393.88	349.05	309.73	39.32	8.878	
3,700.00	2,867.22	3,569.50	2,740.53	20.95	24.09	-68.72	933.21	-395.24	349.16	306.61	42.55	8.206	
3,800.00	2,866.96	3,669.50	2,739.93	22.67	25.87	-68.67	1,033.20	-396.60	349.26	303.43	45.83	7.620	
3,900.00	2,866.69	3,769.50	2,739.34	24.42	27.66	-68.62	1,133.19	-397.96	349.36	300.20	49.16	7.106	
4,000.00	2,866.43	3,869.50	2,738.75	26.19	29.48	-68.57	1,233.18	-399.32	349.47	296.94	52.53	6.653	
4,100.00	2,866.17	3,969.50	2,738.15	27.98	31.30	-68.52	1,333.17	-400.68	349.57	293.66	55.92	6.251	
4,200.00	2,865.91	4,069.50	2,737.56	29.79	33.13	-68.47	1,433.16	-402.05	349.68	290.35	59.33	5.893	
4,300.00	2,865.65	4,169.50	2,736.97	31.61	34.98	-68.41	1,533.14	-403.41	349.79	287.02	62.77	5.573	
4,400.00	2,865.39	4,269.50	2,736.37	33.44	36.83	-68.36	1,633.13	-404.77	349.89	283.67	66.22	5.284	
4,500.00	2,865.12	4,369.50	2,735.78	35.29	38.69	-68.31	1,733.12	-406.13	350.00	280.32	69.68	5.023	
4,600.00	2,864.86	4,469.50	2,735.19	37.13	40.55	-68.26	1,833.11	-407.49	350.10	276.95	73.15	4.786	
4,700.00	2,864.60	4,569.50	2,734.59	38.99	42.42	-68.21	1,933.10	-408.85	350.21	273.58	76.63	4.570	
4,800.00	2,864.34	4,669.50	2,734.00	40.85	44.29	-68.16	2,033.09	-410.21	350.32	270.20	80.12	4.372	
4,900.00	2,864.08	4,769.50	2,733.41	42.72	46.17	-68.11	2,133.08	-411.57	350.43	266.81	83.62	4.191	
5,000.00	2,863.81	4,869.50	2,732.81	44.59	48.04	-68.05	2,233.06	-412.94	350.53	263.42	87.12	4.024	
5,100.00	2,863.55	4,969.50	2,732.22	46.46	49.93	-68.00	2,333.05	-414.30	350.64	260.02	90.62	3.869	
5,200.00	2,863.29	5,069.49	2,731.63	48.34	51.81	-67.95	2,433.04	-415.66	350.75	256.62	94.13	3.726	
5,300.00	2,863.03	5,169.49	2,731.03	50.22	53.70	-67.90	2,533.03	-417.02	350.86	253.22	97.64	3.593	
5,400.00	2,862.77	5,269.49	2,730.44	52.10	55.59	-67.85	2,633.02	-418.38	350.97	249.81	101.15	3.470	
5,500.00	2,862.51	5,369.49	2,729.85	53.99	57.48	-67.80	2,733.01	-419.74	351.08	246.41	104.67	3.354	
5,600.00	2,862.24	5,469.49	2,729.25	55.88	59.37	-67.75	2,832.99	-421.10	351.18	243.00	108.18	3.246	
5,700.00	2,861.98	5,569.49	2,728.66	57.77	61.27	-67.70	2,932.98	-422.46	351.29	239.59	111.70	3.145	
5,800.00	2,861.72	5,669.49	2,728.07	59.66	63.16	-67.64	3,032.97	-423.83	351.40	236.19	115.22	3.050	
5,900.00	2,861.46	5,769.49	2,727.47	61.55	65.06	-67.59	3,132.96	-425.19	351.51	232.78	118.74	2.960	
6,000.00	2,861.20	5,869.49	2,726.88	63.45	66.96	-67.54	3,232.95	-426.55	351.62	229.37	122.26	2.876	
6,100.00	2,860.94	5,969.49	2,726.29	65.34	68.86	-67.49	3,332.94	-427.91	351.74	225.96	125.78	2.797	
6,200.00	2,860.67	6,069.49	2,725.69	67.24	70.76	-67.44	3,432.92	-429.27	351.85	222.55	129.30	2.721	
6,300.00	2,860.41	6,169.49	2,725.10	69.14	72.66	-67.39	3,532.91	-430.63	351.96	219.14	132.82	2.650	
6,400.00	2,860.15	6,269.49	2,724.51	71.04	74.56	-67.34	3,632.90	-431.99	352.07	215.74	136.33	2.582	
6,500.00	2,859.89	6,369.49	2,723.91	72.94	76.47	-67.29	3,732.89	-433.36	352.18	212.33	139.85	2.518	
6,600.00	2,859.63	6,469.49	2,723.32	74.84	78.37	-67.24	3,832.88	-434.72	352.29	208.92	143.37	2.457	
6,700.00	2,859.36	6,569.49	2,722.73	76.75	80.27	-67.19	3,932.87	-436.08	352.41	205.52	146.89	2.399	
6,800.00	2,859.10	6,669.49	2,722.13	78.65	82.18	-67.14	4,032.86	-437.44	352.52	202.12	150.40	2.344	
6,900.00	2,858.84	6,769.49	2,721.54	80.55	84.09	-67.08	4,132.84	-438.80	352.63	198.71	153.92	2.291	
7,000.00	2,858.58	6,869.49	2,720.95	82.46	85.99	-67.03	4,232.83	-440.16	352.74	195.31	157.43	2.241	
7,100.00	2,858.32	6,969.48	2,720.35	84.36	87.90	-66.98	4,332.82	-441.52	352.86	191.92	160.94	2.192	
7,200.00	2,858.06	7,069.48	2,719.76	86.27	89.81	-66.93	4,432.81	-442.88	352.97	188.52	164.45	2.146	
7,300.00	2,857.79	7,169.48	2,719.17	88.17	91.71	-66.88	4,532.80	-444.25	353.09	185.12	167.96	2.102	
7,400.00	2,857.53	7,269.48	2,718.57	90.08	93.62	-66.83	4,632.79	-445.61	353.20	181.73	171.47	2.060	

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 17H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,500.00	2,857.27	7,369.48	2,717.98	91.99	95.53	-66.78	4,732.77	-446.97	353.31	178.34	174.98	2.019	
7,600.00	2,857.01	7,469.48	2,717.38	93.90	97.44	-66.73	4,832.76	-448.33	353.43	174.94	178.48	1.980	
7,700.00	2,856.75	7,569.48	2,716.79	95.80	99.35	-66.68	4,932.75	-449.69	353.54	171.56	181.99	1.943	
7,800.00	2,856.48	7,669.48	2,716.20	97.71	101.26	-66.63	5,032.74	-451.05	353.66	168.17	185.49	1.907	
7,900.00	2,856.22	7,769.48	2,715.60	99.62	103.17	-66.58	5,132.73	-452.41	353.77	164.78	188.99	1.872	
8,000.00	2,855.96	7,873.25	2,715.01	101.53	105.15	-66.53	5,232.72	-453.77	353.89	161.33	192.56	1.838	
8,100.00	2,855.70	7,969.48	2,714.42	103.44	106.99	-66.48	5,332.70	-455.14	354.01	158.02	195.99	1.806	
8,200.00	2,855.44	8,069.48	2,713.82	105.35	108.90	-66.43	5,432.69	-456.50	354.12	154.64	199.48	1.775	
8,295.36	2,855.19	8,164.84	2,713.26	107.17	110.72	-66.38	5,528.04	-457.80	354.23	151.42	202.81	1.747	ES, SF

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 18H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,400.00	2,868.00	3,084.62	2,567.58	16.06	17.07	-58.24	629.83	-550.93	570.70	541.51	29.19	19.552	CC
3,500.00	2,867.74	3,184.62	2,566.92	17.63	18.74	-58.20	729.81	-552.29	570.89	538.87	32.03	17.826	
3,600.00	2,867.48	3,284.62	2,566.25	19.27	20.46	-58.17	829.80	-553.65	571.09	536.14	34.95	16.339	
3,700.00	2,867.22	3,384.62	2,565.59	20.95	22.20	-58.13	929.79	-555.01	571.29	533.34	37.95	15.054	
3,800.00	2,866.96	3,484.62	2,564.93	22.67	23.98	-58.10	1,029.78	-556.38	571.49	530.49	41.00	13.939	
3,900.00	2,866.69	3,584.62	2,564.27	24.42	25.77	-58.06	1,129.77	-557.74	571.68	527.59	44.09	12.966	
4,000.00	2,866.43	3,684.62	2,563.60	26.19	27.58	-58.03	1,229.75	-559.10	571.88	524.67	47.21	12.113	
4,100.00	2,866.17	3,784.62	2,562.94	27.98	29.41	-57.99	1,329.74	-560.46	572.08	521.71	50.36	11.359	
4,200.00	2,865.91	3,884.61	2,562.28	29.79	31.24	-57.96	1,429.73	-561.82	572.28	518.74	53.54	10.689	
4,300.00	2,865.65	3,984.61	2,561.61	31.61	33.09	-57.92	1,529.72	-563.18	572.47	515.75	56.73	10.092	
4,400.00	2,865.39	4,084.61	2,560.95	33.44	34.94	-57.89	1,629.70	-564.54	572.67	512.74	59.93	9.555	
4,500.00	2,865.12	4,184.61	2,560.29	35.29	36.80	-57.85	1,729.69	-565.91	572.87	509.72	63.15	9.072	
4,600.00	2,864.86	4,284.61	2,559.62	37.13	38.67	-57.82	1,829.68	-567.27	573.07	506.70	66.37	8.634	
4,700.00	2,864.60	4,384.61	2,558.96	38.99	40.54	-57.78	1,929.67	-568.63	573.27	503.66	69.61	8.236	
4,800.00	2,864.34	4,484.61	2,558.30	40.85	42.41	-57.75	2,029.65	-569.99	573.47	500.62	72.85	7.872	
4,900.00	2,864.08	4,584.61	2,557.63	42.72	44.29	-57.71	2,129.64	-571.35	573.67	497.57	76.10	7.539	
5,000.00	2,863.81	4,684.61	2,556.97	44.59	46.17	-57.68	2,229.63	-572.71	573.87	494.52	79.35	7.232	
5,100.00	2,863.55	4,784.61	2,556.31	46.46	48.05	-57.64	2,329.62	-574.07	574.07	491.46	82.60	6.950	
5,200.00	2,863.29	4,884.61	2,555.64	48.34	49.94	-57.61	2,429.61	-575.43	574.27	488.41	85.86	6.688	
5,300.00	2,863.03	4,984.61	2,554.98	50.22	51.83	-57.57	2,529.59	-576.80	574.47	485.35	89.12	6.446	
5,400.00	2,862.77	5,084.60	2,554.32	52.10	53.72	-57.54	2,629.58	-578.16	574.67	482.28	92.39	6.220	
5,500.00	2,862.51	5,184.60	2,553.65	53.99	55.61	-57.50	2,729.57	-579.52	574.87	479.22	95.65	6.010	
5,600.00	2,862.24	5,284.60	2,552.99	55.88	57.51	-57.47	2,829.56	-580.88	575.07	476.15	98.92	5.814	
5,700.00	2,861.98	5,384.60	2,552.33	57.77	59.40	-57.43	2,929.54	-582.24	575.27	473.09	102.19	5.630	
5,800.00	2,861.72	5,484.60	2,551.66	59.66	61.30	-57.40	3,029.53	-583.60	575.47	470.02	105.46	5.457	
5,900.00	2,861.46	5,584.60	2,551.00	61.55	63.20	-57.36	3,129.52	-584.96	575.68	466.95	108.72	5.295	
6,000.00	2,861.20	5,684.60	2,550.34	63.45	65.10	-57.33	3,229.51	-586.32	575.88	463.89	111.99	5.142	
6,100.00	2,860.94	5,784.60	2,549.67	65.34	67.00	-57.29	3,329.50	-587.69	576.08	460.82	115.26	4.998	
6,200.00	2,860.67	5,884.60	2,549.01	67.24	68.90	-57.26	3,429.48	-589.05	576.28	457.75	118.53	4.862	
6,300.00	2,860.41	5,984.60	2,548.35	69.14	70.81	-57.23	3,529.47	-590.41	576.49	454.69	121.80	4.733	
6,400.00	2,860.15	6,084.60	2,547.68	71.04	72.71	-57.19	3,629.46	-591.77	576.69	451.62	125.07	4.611	
6,500.00	2,859.89	6,184.60	2,547.02	72.94	74.61	-57.16	3,729.45	-593.13	576.89	448.56	128.34	4.495	
6,600.00	2,859.63	6,284.60	2,546.36	74.84	76.52	-57.12	3,829.43	-594.49	577.09	445.49	131.60	4.385	
6,700.00	2,859.36	6,384.59	2,545.70	76.75	78.42	-57.09	3,929.42	-595.85	577.30	442.43	134.87	4.280	
6,800.00	2,859.10	6,484.59	2,545.03	78.65	80.33	-57.05	4,029.41	-597.21	577.50	439.37	138.13	4.181	
6,900.00	2,858.84	6,584.59	2,544.37	80.55	82.24	-57.02	4,129.40	-598.58	577.70	436.31	141.40	4.086	
7,000.00	2,858.58	6,684.59	2,543.71	82.46	84.15	-56.99	4,229.39	-599.94	577.91	433.25	144.66	3.995	
7,100.00	2,858.32	6,784.59	2,543.04	84.36	86.05	-56.95	4,329.37	-601.30	578.11	430.19	147.93	3.908	
7,200.00	2,858.06	6,884.59	2,542.38	86.27	87.96	-56.92	4,429.36	-602.66	578.32	427.13	151.19	3.825	
7,300.00	2,857.79	6,984.59	2,541.72	88.17	89.87	-56.88	4,529.35	-604.02	578.52	424.07	154.45	3.746	
7,400.00	2,857.53	7,084.59	2,541.05	90.08	91.78	-56.85	4,629.34	-605.38	578.73	421.02	157.71	3.670	
7,500.00	2,857.27	7,184.59	2,540.39	91.99	93.69	-56.81	4,729.32	-606.74	578.93	417.97	160.96	3.597	
7,600.00	2,857.01	7,284.59	2,539.73	93.90	95.60	-56.78	4,829.31	-608.10	579.14	414.92	164.22	3.527	
7,700.00	2,856.75	7,384.59	2,539.06	95.80	97.51	-56.75	4,929.30	-609.47	579.34	411.87	167.48	3.459	
7,800.00	2,856.48	7,484.59	2,538.40	97.71	99.42	-56.71	5,029.29	-610.83	579.55	408.82	170.73	3.395	
7,900.00	2,856.22	7,584.58	2,537.74	99.62	101.33	-56.68	5,129.27	-612.19	579.75	405.77	173.98	3.332	
8,000.00	2,855.96	7,684.58	2,537.07	101.53	103.24	-56.64	5,229.26	-613.55	579.96	402.73	177.23	3.272	
8,100.00	2,855.70	7,784.58	2,536.41	103.44	105.15	-56.61	5,329.25	-614.91	580.17	399.69	180.48	3.215	
8,200.00	2,855.44	7,884.58	2,535.75	105.35	107.06	-56.58	5,429.24	-616.27	580.37	396.64	183.73	3.159	
8,295.36	2,855.19	7,979.94	2,535.11	107.17	108.89	-56.54	5,524.58	-617.57	580.57	393.75	186.82	3.108	ES, SF

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 19H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,400.00	2,868.00	3,389.83	2,848.31	16.06	18.30	-88.26	629.51	-715.75	650.32	616.45	33.88	19.198	
3,500.00	2,867.74	3,489.83	2,847.98	17.63	19.89	-88.26	729.50	-717.11	650.31	613.23	37.08	17.538	
3,600.00	2,867.48	3,589.83	2,847.65	19.27	21.54	-88.25	829.49	-718.47	650.29	609.90	40.40	16.098	
3,700.00	2,867.22	3,689.83	2,847.32	20.95	23.23	-88.25	929.48	-719.83	650.28	606.48	43.80	14.848	
3,800.00	2,866.96	3,789.83	2,846.98	22.67	24.95	-88.24	1,029.47	-721.19	650.26	603.00	47.26	13.758	
3,900.00	2,866.69	3,889.83	2,846.65	24.42	26.70	-88.23	1,129.46	-722.55	650.25	599.46	50.78	12.804	
4,000.00	2,866.43	3,989.83	2,846.32	26.19	28.47	-88.23	1,229.45	-723.91	650.23	595.88	54.35	11.964	
4,100.00	2,866.17	4,089.83	2,845.99	27.98	30.26	-88.22	1,329.44	-725.28	650.22	592.27	57.95	11.221	
4,200.00	2,865.91	4,189.83	2,845.66	29.79	32.07	-88.22	1,429.43	-726.64	650.20	588.63	61.57	10.560	
4,300.00	2,865.65	4,289.83	2,845.33	31.61	33.88	-88.21	1,529.42	-728.00	650.18	584.96	65.22	9.969	
4,400.00	2,865.39	4,389.83	2,844.99	33.44	35.71	-88.20	1,629.41	-729.36	650.17	581.28	68.89	9.437	
4,500.00	2,865.12	4,489.83	2,844.66	35.29	37.54	-88.20	1,729.40	-730.72	650.15	577.57	72.58	8.958	
4,600.00	2,864.86	4,589.83	2,844.33	37.13	39.39	-88.19	1,829.39	-732.08	650.14	573.86	76.28	8.523	
4,700.00	2,864.60	4,689.83	2,844.00	38.99	41.24	-88.18	1,929.38	-733.44	650.12	570.13	80.00	8.127	
4,800.00	2,864.34	4,789.83	2,843.67	40.85	43.09	-88.18	2,029.37	-734.80	650.11	566.39	83.72	7.765	
4,900.00	2,864.08	4,889.83	2,843.34	42.72	44.96	-88.17	2,129.36	-736.17	650.09	562.64	87.46	7.433	
5,000.00	2,863.81	4,989.83	2,843.01	44.59	46.82	-88.17	2,229.35	-737.53	650.08	558.88	91.20	7.126	
5,100.00	2,863.55	5,089.83	2,842.67	46.46	48.69	-88.16	2,329.34	-738.89	650.06	555.11	94.95	6.846	
5,200.00	2,863.29	5,189.83	2,842.34	48.34	50.56	-88.15	2,429.33	-740.25	650.05	551.34	98.70	6.586	
5,300.00	2,863.03	5,289.83	2,842.01	50.22	52.44	-88.15	2,529.32	-741.61	650.03	547.57	102.47	6.344	
5,400.00	2,862.77	5,389.83	2,841.68	52.10	54.32	-88.14	2,629.31	-742.97	650.02	543.78	106.23	6.119	
5,500.00	2,862.51	5,489.83	2,841.35	53.99	56.20	-88.13	2,729.30	-744.33	650.00	540.00	110.01	5.909	
5,600.00	2,862.24	5,589.83	2,841.02	55.88	58.09	-88.13	2,829.29	-745.70	649.99	536.20	113.78	5.713	
5,700.00	2,861.98	5,689.83	2,840.68	57.77	59.97	-88.12	2,929.28	-747.06	649.97	532.41	117.56	5.529	
5,800.00	2,861.72	5,789.83	2,840.35	59.66	61.86	-88.12	3,029.27	-748.42	649.96	528.61	121.35	5.356	
5,900.00	2,861.46	5,889.83	2,840.02	61.55	63.75	-88.11	3,129.26	-749.78	649.94	524.81	125.13	5.194	
6,000.00	2,861.20	5,989.83	2,839.69	63.45	65.65	-88.10	3,229.25	-751.14	649.93	521.01	128.92	5.041	
6,100.00	2,860.94	6,089.83	2,839.36	65.34	67.54	-88.10	3,329.24	-752.50	649.91	517.20	132.71	4.897	
6,200.00	2,860.67	6,189.83	2,839.03	67.24	69.43	-88.09	3,429.23	-753.86	649.90	513.39	136.51	4.761	
6,300.00	2,860.41	6,289.83	2,838.69	69.14	71.33	-88.09	3,529.22	-755.22	649.88	509.58	140.30	4.632	
6,400.00	2,860.15	6,389.83	2,838.36	71.04	73.23	-88.08	3,629.22	-756.59	649.87	505.77	144.10	4.510	
6,500.00	2,859.89	6,489.83	2,838.03	72.94	75.12	-88.07	3,729.21	-757.95	649.85	501.95	147.90	4.394	
6,600.00	2,859.63	6,589.83	2,837.70	74.84	77.02	-88.07	3,829.20	-759.31	649.84	498.13	151.70	4.284	
6,700.00	2,859.36	6,689.83	2,837.37	76.75	78.92	-88.06	3,929.19	-760.67	649.82	494.32	155.51	4.179	
6,800.00	2,859.10	6,789.83	2,837.04	78.65	80.82	-88.05	4,029.18	-762.03	649.81	490.50	159.31	4.079	
6,900.00	2,858.84	6,889.83	2,836.70	80.55	82.73	-88.05	4,129.17	-763.39	649.79	486.67	163.12	3.984	
7,000.00	2,858.58	6,989.83	2,836.37	82.46	84.63	-88.04	4,229.16	-764.75	649.78	482.85	166.92	3.893	
7,100.00	2,858.32	7,089.83	2,836.04	84.36	86.53	-88.04	4,329.15	-766.11	649.76	479.03	170.73	3.806	
7,200.00	2,858.06	7,189.83	2,835.71	86.27	88.44	-88.03	4,429.14	-767.48	649.75	475.20	174.54	3.723	
7,300.00	2,857.79	7,289.83	2,835.38	88.17	90.34	-88.02	4,529.13	-768.84	649.73	471.38	178.35	3.643	
7,400.00	2,857.53	7,389.83	2,835.05	90.08	92.24	-88.02	4,629.12	-770.20	649.72	467.55	182.16	3.567	
7,500.00	2,857.27	7,489.83	2,834.71	91.99	94.15	-88.01	4,729.11	-771.56	649.70	463.73	185.97	3.493	
7,600.00	2,857.01	7,589.83	2,834.38	93.90	96.06	-88.00	4,829.10	-772.92	649.69	459.90	189.79	3.423	
7,700.00	2,856.75	7,689.83	2,834.05	95.80	97.96	-88.00	4,929.09	-774.28	649.67	456.07	193.60	3.356	
7,800.00	2,856.48	7,789.83	2,833.72	97.71	99.87	-87.99	5,029.08	-775.64	649.66	452.24	197.42	3.291	
7,900.00	2,856.22	7,910.17	2,833.39	99.62	102.16	-87.99	5,129.07	-777.01	649.64	448.02	201.62	3.222	
8,000.00	2,855.96	7,989.83	2,833.06	101.53	103.68	-87.98	5,229.06	-778.37	649.63	444.58	205.05	3.168	
8,100.00	2,855.70	8,089.83	2,832.73	103.44	105.59	-87.97	5,329.05	-779.73	649.61	440.75	208.86	3.110	
8,200.00	2,855.44	8,189.83	2,832.39	105.35	107.50	-87.97	5,429.04	-781.09	649.60	436.91	212.68	3.054	
8,295.36	2,855.19	8,285.19	2,832.08	107.17	109.32	-87.96	5,524.39	-782.39	649.58	433.26	216.32	3.003	CC, ES, SF

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 20H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,800.00	2,866.96	3,658.66	2,725.85	22.67	25.69	-81.28	1,025.16	-991.54	931.09	883.32	47.77	19.490	CC
3,900.00	2,866.69	3,758.66	2,725.24	24.42	27.48	-81.26	1,125.14	-992.88	931.11	879.83	51.28	18.157	
4,000.00	2,866.43	3,858.66	2,724.62	26.19	29.29	-81.24	1,225.13	-994.23	931.13	876.30	54.83	16.983	
4,100.00	2,866.17	3,958.66	2,724.01	27.98	31.11	-81.22	1,325.12	-995.57	931.15	872.74	58.41	15.943	
4,200.00	2,865.91	4,058.65	2,723.40	29.79	32.94	-81.20	1,425.11	-996.92	931.17	869.16	62.01	15.017	
4,300.00	2,865.65	4,158.65	2,722.79	31.61	34.78	-81.18	1,525.10	-998.26	931.19	865.55	65.63	14.187	
4,400.00	2,865.39	4,258.65	2,722.18	33.44	36.63	-81.15	1,625.09	-999.60	931.21	861.93	69.28	13.442	
4,500.00	2,865.12	4,358.65	2,721.57	35.29	38.49	-81.13	1,725.07	-1,000.95	931.22	858.29	72.94	12.768	
4,600.00	2,864.86	4,458.65	2,720.96	37.13	40.35	-81.11	1,825.06	-1,002.29	931.24	854.64	76.61	12.156	
4,700.00	2,864.60	4,558.65	2,720.35	38.99	42.22	-81.09	1,925.05	-1,003.64	931.26	850.97	80.29	11.599	
4,800.00	2,864.34	4,658.65	2,719.74	40.85	44.09	-81.07	2,025.04	-1,004.98	931.28	847.30	83.98	11.089	
4,900.00	2,864.08	4,758.65	2,719.13	42.72	45.96	-81.05	2,125.03	-1,006.32	931.30	843.62	87.68	10.621	
5,000.00	2,863.81	4,858.65	2,718.52	44.59	47.84	-81.02	2,225.02	-1,007.67	931.32	839.93	91.39	10.191	
5,100.00	2,863.55	4,958.65	2,717.91	46.46	49.72	-81.00	2,325.01	-1,009.01	931.34	836.24	95.10	9.793	
5,200.00	2,863.29	5,058.65	2,717.29	48.34	51.60	-80.98	2,424.99	-1,010.35	931.36	832.54	98.82	9.425	
5,300.00	2,863.03	5,158.65	2,716.68	50.22	53.49	-80.96	2,524.98	-1,011.70	931.38	828.84	102.55	9.083	
5,400.00	2,862.77	5,258.65	2,716.07	52.10	55.38	-80.94	2,624.97	-1,013.04	931.40	825.13	106.28	8.764	
5,500.00	2,862.51	5,358.65	2,715.46	53.99	57.27	-80.92	2,724.96	-1,014.39	931.42	821.42	110.01	8.467	
5,600.00	2,862.24	5,458.65	2,714.85	55.88	59.16	-80.90	2,824.95	-1,015.73	931.44	817.70	113.74	8.189	
5,700.00	2,861.98	5,558.65	2,714.24	57.77	61.06	-80.87	2,924.94	-1,017.07	931.47	813.98	117.48	7.929	
5,800.00	2,861.72	5,658.65	2,713.63	59.66	62.95	-80.85	3,024.92	-1,018.42	931.49	810.26	121.22	7.684	
5,900.00	2,861.46	5,758.64	2,713.02	61.55	64.85	-80.83	3,124.91	-1,019.76	931.51	806.54	124.97	7.454	
6,000.00	2,861.20	5,858.64	2,712.41	63.45	66.75	-80.81	3,224.90	-1,021.11	931.53	802.81	128.72	7.237	
6,100.00	2,860.94	5,958.64	2,711.80	65.34	68.65	-80.79	3,324.89	-1,022.45	931.55	799.09	132.46	7.032	
6,200.00	2,860.67	6,058.64	2,711.19	67.24	70.55	-80.77	3,424.88	-1,023.79	931.57	795.36	136.21	6.839	
6,300.00	2,860.41	6,158.64	2,710.57	69.14	72.45	-80.74	3,524.87	-1,025.14	931.59	791.63	139.97	6.656	
6,400.00	2,860.15	6,258.64	2,709.96	71.04	74.35	-80.72	3,624.86	-1,026.48	931.62	787.90	143.72	6.482	
6,500.00	2,859.89	6,358.64	2,709.35	72.94	76.25	-80.70	3,724.84	-1,027.82	931.64	784.16	147.47	6.317	
6,600.00	2,859.63	6,458.64	2,708.74	74.84	78.15	-80.68	3,824.83	-1,029.17	931.66	780.43	151.23	6.161	
6,700.00	2,859.36	6,558.64	2,708.13	76.75	80.06	-80.66	3,924.82	-1,030.51	931.68	776.69	154.99	6.011	
6,800.00	2,859.10	6,658.64	2,707.52	78.65	81.96	-80.64	4,024.81	-1,031.86	931.70	772.96	158.74	5.869	
6,900.00	2,858.84	6,758.64	2,706.91	80.55	83.87	-80.62	4,124.80	-1,033.20	931.73	769.22	162.50	5.734	
7,000.00	2,858.58	6,858.64	2,706.30	82.46	85.77	-80.59	4,224.79	-1,034.54	931.75	765.49	166.26	5.604	
7,100.00	2,858.32	6,958.64	2,705.69	84.36	87.68	-80.57	4,324.78	-1,035.89	931.77	761.75	170.02	5.480	
7,200.00	2,858.06	7,058.64	2,705.08	86.27	89.59	-80.55	4,424.76	-1,037.23	931.79	758.01	173.78	5.362	
7,300.00	2,857.79	7,158.64	2,704.47	88.17	91.49	-80.53	4,524.75	-1,038.57	931.82	754.27	177.55	5.248	
7,400.00	2,857.53	7,258.64	2,703.86	90.08	93.40	-80.51	4,624.74	-1,039.92	931.84	750.53	181.31	5.140	
7,500.00	2,857.27	7,358.63	2,703.24	91.99	95.31	-80.49	4,724.73	-1,041.26	931.86	746.79	185.07	5.035	
7,600.00	2,857.01	7,458.63	2,702.63	93.90	97.22	-80.46	4,824.72	-1,042.61	931.89	743.05	188.83	4.935	
7,700.00	2,856.75	7,558.63	2,702.02	95.80	99.13	-80.44	4,924.71	-1,043.95	931.91	739.32	192.59	4.839	
7,800.00	2,856.48	7,658.63	2,701.41	97.71	101.04	-80.42	5,024.69	-1,045.29	931.93	735.58	196.36	4.746	
7,900.00	2,856.22	7,758.63	2,700.80	99.62	102.95	-80.40	5,124.68	-1,046.64	931.96	731.84	200.12	4.657	
8,000.00	2,855.96	7,858.63	2,700.19	101.53	104.86	-80.38	5,224.67	-1,047.98	931.98	728.10	203.89	4.571	
8,100.00	2,855.70	7,958.63	2,699.58	103.44	106.77	-80.36	5,324.66	-1,049.33	932.01	724.36	207.65	4.488	
8,200.00	2,855.44	8,058.63	2,698.97	105.35	108.68	-80.34	5,424.65	-1,050.67	932.03	720.62	211.41	4.409	
8,295.36	2,855.19	8,153.99	2,698.39	107.17	110.50	-80.31	5,520.00	-1,051.95	932.05	717.05	215.00	4.335	ES, SF

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 21H - OH - Plan #1 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,100.00	2,866.17	3,807.12	2,554.89	27.98	31.48	-73.78	1,320.82	-1,145.34	1,114.41	1,057.09	57.32	19.443	CC
4,200.00	2,865.91	3,907.12	2,553.88	29.79	33.32	-73.74	1,420.81	-1,146.69	1,114.58	1,053.74	60.84	18.320	
4,300.00	2,865.65	4,007.13	2,552.87	31.61	35.17	-73.70	1,520.79	-1,148.03	1,114.76	1,050.38	64.38	17.314	
4,400.00	2,865.39	4,107.13	2,551.86	33.44	37.03	-73.67	1,620.77	-1,149.37	1,114.94	1,047.00	67.94	16.410	
4,500.00	2,865.12	4,207.13	2,550.84	35.29	38.89	-73.63	1,720.76	-1,150.72	1,115.12	1,043.60	71.51	15.593	
4,600.00	2,864.86	4,307.13	2,549.83	37.13	40.76	-73.59	1,820.74	-1,152.06	1,115.30	1,040.20	75.09	14.852	
4,700.00	2,864.60	4,407.14	2,548.82	38.99	42.64	-73.55	1,920.72	-1,153.41	1,115.47	1,036.79	78.69	14.176	
4,800.00	2,864.34	4,507.14	2,547.81	40.85	44.51	-73.52	2,020.71	-1,154.75	1,115.65	1,033.37	82.29	13.558	
4,900.00	2,864.08	4,607.14	2,546.79	42.72	46.40	-73.48	2,120.69	-1,156.09	1,115.83	1,029.94	85.89	12.991	
5,000.00	2,863.81	4,707.14	2,545.78	44.59	48.28	-73.44	2,220.67	-1,157.44	1,116.01	1,026.51	89.50	12.469	
5,100.00	2,863.55	4,807.15	2,544.77	46.46	50.17	-73.40	2,320.65	-1,158.78	1,116.19	1,023.07	93.12	11.987	
5,200.00	2,863.29	4,892.85	2,543.76	48.34	51.78	-73.37	2,420.64	-1,160.12	1,116.37	1,019.89	96.48	11.571	
5,300.00	2,863.03	5,007.15	2,542.75	50.22	53.94	-73.33	2,520.62	-1,161.47	1,116.56	1,016.19	100.37	11.125	
5,400.00	2,862.77	5,107.16	2,541.73	52.10	55.84	-73.29	2,620.60	-1,162.81	1,116.74	1,012.74	103.99	10.738	
5,500.00	2,862.51	5,207.16	2,540.72	53.99	57.73	-73.26	2,720.59	-1,164.16	1,116.92	1,009.30	107.62	10.378	
5,600.00	2,862.24	5,307.16	2,539.71	55.88	59.63	-73.22	2,820.57	-1,165.50	1,117.10	1,005.85	111.26	10.041	
5,700.00	2,861.98	5,407.16	2,538.70	57.77	61.52	-73.18	2,920.55	-1,166.84	1,117.29	1,002.40	114.89	9.725	
5,800.00	2,861.72	5,507.17	2,537.68	59.66	63.42	-73.14	3,020.54	-1,168.19	1,117.47	998.94	118.53	9.428	
5,900.00	2,861.46	5,607.17	2,536.67	61.55	65.32	-73.11	3,120.52	-1,169.53	1,117.66	995.49	122.17	9.149	
6,000.00	2,861.20	5,707.17	2,535.66	63.45	67.22	-73.07	3,220.50	-1,170.87	1,117.84	992.03	125.81	8.885	
6,100.00	2,860.94	5,807.18	2,534.65	65.34	69.12	-73.03	3,320.49	-1,172.22	1,118.03	988.58	129.45	8.637	
6,200.00	2,860.67	5,907.18	2,533.63	67.24	71.03	-72.99	3,420.47	-1,173.56	1,118.21	985.13	133.09	8.402	
6,300.00	2,860.41	6,007.18	2,532.62	69.14	72.93	-72.96	3,520.45	-1,174.91	1,118.40	981.67	136.73	8.180	
6,400.00	2,860.15	6,107.18	2,531.61	71.04	74.83	-72.92	3,620.43	-1,176.25	1,118.59	978.22	140.37	7.969	
6,500.00	2,859.89	6,207.19	2,530.60	72.94	76.74	-72.88	3,720.42	-1,177.59	1,118.77	974.76	144.01	7.769	
6,600.00	2,859.63	6,292.81	2,529.59	74.84	78.37	-72.84	3,820.40	-1,178.94	1,118.96	971.57	147.39	7.592	
6,700.00	2,859.36	6,407.19	2,528.57	76.75	80.55	-72.81	3,920.38	-1,180.28	1,119.15	967.85	151.30	7.397	
6,800.00	2,859.10	6,507.20	2,527.56	78.65	82.46	-72.77	4,020.37	-1,181.62	1,119.34	964.40	154.94	7.224	
6,900.00	2,858.84	6,607.20	2,526.55	80.55	84.36	-72.73	4,120.35	-1,182.97	1,119.53	960.94	158.58	7.060	
7,000.00	2,858.58	6,707.20	2,525.54	82.46	86.27	-72.70	4,220.33	-1,184.31	1,119.72	957.49	162.22	6.902	
7,100.00	2,858.32	6,807.20	2,524.52	84.36	88.18	-72.66	4,320.32	-1,185.66	1,119.91	954.04	165.87	6.752	
7,200.00	2,858.06	6,907.21	2,523.51	86.27	90.09	-72.62	4,420.30	-1,187.00	1,120.10	950.59	169.51	6.608	
7,300.00	2,857.79	7,007.21	2,522.50	88.17	92.00	-72.58	4,520.28	-1,188.34	1,120.29	947.14	173.15	6.470	
7,400.00	2,857.53	7,107.21	2,521.49	90.08	93.91	-72.55	4,620.26	-1,189.69	1,120.48	943.69	176.79	6.338	
7,500.00	2,857.27	7,207.22	2,520.48	91.99	95.81	-72.51	4,720.25	-1,191.03	1,120.67	940.24	180.43	6.211	
7,600.00	2,857.01	7,307.22	2,519.46	93.90	97.72	-72.47	4,820.23	-1,192.37	1,120.86	936.79	184.07	6.089	
7,700.00	2,856.75	7,407.22	2,518.45	95.80	99.63	-72.44	4,920.21	-1,193.72	1,121.06	933.35	187.71	5.972	
7,800.00	2,856.48	7,507.22	2,517.44	97.71	101.55	-72.40	5,020.20	-1,195.06	1,121.25	929.90	191.35	5.860	
7,900.00	2,856.22	7,607.23	2,516.43	99.62	103.46	-72.36	5,120.18	-1,196.41	1,121.44	926.46	194.99	5.751	
8,000.00	2,855.96	7,692.77	2,515.41	101.53	105.09	-72.32	5,220.16	-1,197.75	1,121.64	923.28	198.36	5.655	
8,100.00	2,855.70	7,807.23	2,514.40	103.44	107.28	-72.29	5,320.15	-1,199.09	1,121.83	919.58	202.26	5.547	
8,200.00	2,855.44	7,907.24	2,513.39	105.35	109.19	-72.25	5,420.13	-1,200.44	1,122.03	916.14	205.89	5.450	
8,295.36	2,855.19	7,988.12	2,512.42	107.17	110.74	-72.22	5,515.47	-1,201.72	1,122.22	913.12	209.09	5.367	ES, SF

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - 22H - OH - Plan #1 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+IGRF — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,200.00	2,865.91	4,162.63	2,836.83	29.79	33.70	-88.63	1,421.83	-1,291.63	1,215.28	1,151.81	63.47	19.148	
4,300.00	2,865.65	4,262.63	2,836.18	31.61	35.54	-88.61	1,521.82	-1,292.97	1,215.25	1,148.12	67.13	18.103	
4,400.00	2,865.39	4,362.63	2,835.54	33.44	37.38	-88.59	1,621.81	-1,294.32	1,215.23	1,144.42	70.81	17.162	
4,500.00	2,865.12	4,462.63	2,834.89	35.29	39.24	-88.57	1,721.80	-1,295.66	1,215.20	1,140.70	74.50	16.311	
4,600.00	2,864.86	4,562.63	2,834.25	37.13	41.10	-88.56	1,821.78	-1,297.01	1,215.18	1,136.97	78.21	15.537	
4,700.00	2,864.60	4,662.63	2,833.60	38.99	42.96	-88.54	1,921.77	-1,298.35	1,215.15	1,133.22	81.93	14.832	
4,800.00	2,864.34	4,762.63	2,832.95	40.85	44.83	-88.52	2,021.76	-1,299.69	1,215.13	1,129.47	85.66	14.186	
4,900.00	2,864.08	4,862.63	2,832.31	42.72	46.71	-88.50	2,121.75	-1,301.04	1,215.10	1,125.70	89.40	13.592	
5,000.00	2,863.81	4,962.63	2,831.66	44.59	48.59	-88.48	2,221.74	-1,302.38	1,215.08	1,121.93	93.14	13.045	
5,100.00	2,863.55	5,062.63	2,831.02	46.46	50.47	-88.47	2,321.72	-1,303.73	1,215.05	1,118.15	96.90	12.540	
5,200.00	2,863.29	5,162.63	2,830.37	48.34	52.35	-88.45	2,421.71	-1,305.07	1,215.03	1,114.37	100.66	12.071	
5,300.00	2,863.03	5,262.62	2,829.73	50.22	54.23	-88.43	2,521.70	-1,306.41	1,215.00	1,110.58	104.42	11.636	
5,400.00	2,862.77	5,362.62	2,829.08	52.10	56.12	-88.41	2,621.69	-1,307.76	1,214.98	1,106.79	108.19	11.230	
5,500.00	2,862.51	5,462.62	2,828.43	53.99	58.01	-88.39	2,721.68	-1,309.10	1,214.95	1,102.99	111.96	10.851	
5,600.00	2,862.24	5,562.62	2,827.79	55.88	59.90	-88.37	2,821.66	-1,310.44	1,214.93	1,099.19	115.74	10.497	
5,700.00	2,861.98	5,662.62	2,827.14	57.77	61.80	-88.36	2,921.65	-1,311.79	1,214.91	1,095.38	119.52	10.165	
5,800.00	2,861.72	5,762.62	2,826.50	59.66	63.69	-88.34	3,021.64	-1,313.13	1,214.88	1,091.57	123.31	9.852	
5,900.00	2,861.46	5,862.62	2,825.85	61.55	65.59	-88.32	3,121.63	-1,314.48	1,214.86	1,087.76	127.10	9.559	
6,000.00	2,861.20	5,962.62	2,825.21	63.45	67.48	-88.30	3,221.62	-1,315.82	1,214.83	1,083.95	130.89	9.282	
6,100.00	2,860.94	6,062.62	2,824.56	65.34	69.38	-88.28	3,321.61	-1,317.16	1,214.81	1,080.13	134.68	9.020	
6,200.00	2,860.67	6,162.62	2,823.91	67.24	71.28	-88.27	3,421.59	-1,318.51	1,214.79	1,076.32	138.47	8.773	
6,300.00	2,860.41	6,262.62	2,823.27	69.14	73.18	-88.25	3,521.58	-1,319.85	1,214.76	1,072.50	142.27	8.539	
6,400.00	2,860.15	6,362.62	2,822.62	71.04	75.08	-88.23	3,621.57	-1,321.20	1,214.74	1,068.67	146.07	8.316	
6,500.00	2,859.89	6,462.62	2,821.98	72.94	76.99	-88.21	3,721.56	-1,322.54	1,214.72	1,064.85	149.87	8.105	
6,600.00	2,859.63	6,562.61	2,821.33	74.84	78.89	-88.19	3,821.55	-1,323.88	1,214.70	1,061.03	153.67	7.905	
6,700.00	2,859.36	6,662.61	2,820.69	76.75	80.79	-88.18	3,921.53	-1,325.23	1,214.67	1,057.20	157.47	7.714	
6,800.00	2,859.10	6,762.61	2,820.04	78.65	82.70	-88.16	4,021.52	-1,326.57	1,214.65	1,053.37	161.28	7.531	
6,900.00	2,858.84	6,862.61	2,819.39	80.55	84.60	-88.14	4,121.51	-1,327.91	1,214.63	1,049.55	165.08	7.358	
7,000.00	2,858.58	6,962.61	2,818.75	82.46	86.51	-88.12	4,221.50	-1,329.26	1,214.61	1,045.72	168.89	7.192	
7,100.00	2,858.32	7,062.61	2,818.10	84.36	88.41	-88.10	4,321.49	-1,330.60	1,214.58	1,041.89	172.70	7.033	
7,200.00	2,858.06	7,162.61	2,817.46	86.27	90.32	-88.08	4,421.48	-1,331.95	1,214.56	1,038.05	176.51	6.881	
7,300.00	2,857.79	7,262.61	2,816.81	88.17	92.23	-88.07	4,521.46	-1,333.29	1,214.54	1,034.22	180.32	6.736	
7,400.00	2,857.53	7,362.61	2,816.16	90.08	94.13	-88.05	4,621.45	-1,334.63	1,214.52	1,030.39	184.13	6.596	
7,500.00	2,857.27	7,462.61	2,815.52	91.99	96.04	-88.03	4,721.44	-1,335.98	1,214.50	1,026.56	187.94	6.462	
7,600.00	2,857.01	7,562.61	2,814.87	93.90	97.95	-88.01	4,821.43	-1,337.32	1,214.47	1,022.72	191.75	6.334	
7,700.00	2,856.75	7,662.61	2,814.23	95.80	99.86	-87.99	4,921.42	-1,338.66	1,214.45	1,018.89	195.56	6.210	
7,800.00	2,856.48	7,762.61	2,813.58	97.71	101.77	-87.98	5,021.40	-1,340.01	1,214.43	1,015.05	199.38	6.091	
7,900.00	2,856.22	7,862.61	2,812.94	99.62	103.68	-87.96	5,121.39	-1,341.35	1,214.41	1,011.22	203.19	5.977	
8,000.00	2,855.96	7,962.60	2,812.29	101.53	105.59	-87.94	5,221.38	-1,342.70	1,214.39	1,007.38	207.01	5.866	
8,100.00	2,855.70	8,062.60	2,811.64	103.44	107.50	-87.92	5,321.37	-1,344.04	1,214.37	1,003.55	210.82	5.760	
8,200.00	2,855.44	8,162.60	2,811.00	105.35	109.41	-87.90	5,421.36	-1,345.38	1,214.35	999.71	214.64	5.658	
8,295.36	2,855.19	8,257.96	2,810.38	107.17	111.23	-87.89	5,516.70	-1,346.67	1,214.33	996.05	218.28	5.563	CC, ES, SF

PERCUSSION PETROLEUM LLC

Wellbenders
Anticollision Report

WELLBENDERS DIRECTIONAL SERVICES LLC

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - Hawk 27 Federal - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 200-INC-ONLY — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
4,100.00	2,866.17	2,807.83	2,866.17	27.98	47.26	-90.15	2,275.97	-1,044.37	1,348.31	1,280.52	67.79	19.890	
4,200.00	2,865.91	2,808.09	2,865.91	29.79	47.27	-90.13	2,275.97	-1,044.37	1,279.75	1,209.76	69.99	18.284	
4,300.00	2,865.65	2,808.35	2,865.65	31.61	47.27	-90.12	2,275.97	-1,044.37	1,215.56	1,143.14	72.43	16.783	
4,400.00	2,865.39	2,808.61	2,865.39	33.44	47.27	-90.10	2,275.97	-1,044.37	1,156.47	1,081.40	75.07	15.405	
4,500.00	2,865.12	2,808.88	2,865.12	35.29	47.28	-90.09	2,275.97	-1,044.37	1,103.29	1,025.40	77.89	14.165	
4,600.00	2,864.86	2,809.14	2,864.86	37.13	47.28	-90.07	2,275.97	-1,044.37	1,056.91	976.09	80.82	13.077	
4,700.00	2,864.60	2,809.40	2,864.60	38.99	47.29	-90.06	2,275.97	-1,044.37	1,018.28	934.48	83.80	12.152	
4,800.00	2,864.34	2,809.66	2,864.34	40.85	47.29	-90.04	2,275.97	-1,044.37	988.29	901.59	86.70	11.399	
4,900.00	2,864.08	2,809.92	2,864.08	42.72	47.30	-90.02	2,275.97	-1,044.37	967.75	878.35	89.40	10.825	
5,000.00	2,863.81	2,810.19	2,863.81	44.59	47.30	-90.01	2,275.97	-1,044.37	957.27	865.48	91.78	10.429	
5,050.88	2,863.68	2,810.32	2,863.68	45.54	47.30	-90.00	2,275.97	-1,044.37	955.91	863.08	92.84	10.296	CC, ES
5,100.00	2,863.55	2,810.45	2,863.55	46.46	47.31	-89.99	2,275.97	-1,044.37	957.18	863.44	93.74	10.211	
5,200.00	2,863.29	2,810.71	2,863.29	48.34	47.31	-89.98	2,275.97	-1,044.37	967.48	872.27	95.20	10.162	SF
5,300.00	2,863.03	2,810.97	2,863.03	50.22	47.32	-89.96	2,275.97	-1,044.37	987.84	891.69	96.16	10.273	
5,400.00	2,862.77	2,811.23	2,862.77	52.10	47.32	-89.95	2,275.97	-1,044.37	1,017.67	921.04	96.63	10.532	
5,500.00	2,862.51	2,811.49	2,862.51	53.99	47.32	-89.93	2,275.97	-1,044.37	1,056.16	959.48	96.68	10.924	
5,600.00	2,862.24	2,811.76	2,862.24	55.88	47.33	-89.91	2,275.97	-1,044.37	1,102.41	1,006.01	96.40	11.436	
5,700.00	2,861.98	2,812.02	2,861.98	57.77	47.33	-89.90	2,275.97	-1,044.37	1,155.48	1,059.61	95.87	12.053	
5,800.00	2,861.72	2,812.28	2,861.72	59.66	47.34	-89.88	2,275.97	-1,044.37	1,214.47	1,119.31	95.16	12.762	
5,900.00	2,861.46	2,812.54	2,861.46	61.55	47.34	-89.87	2,275.97	-1,044.37	1,278.58	1,184.24	94.34	13.553	
6,000.00	2,861.20	2,812.80	2,861.20	63.45	47.35	-89.85	2,275.97	-1,044.37	1,347.07	1,253.61	93.46	14.413	
6,100.00	2,860.94	2,813.07	2,860.94	65.34	47.35	-89.84	2,275.97	-1,044.37	1,419.30	1,326.74	92.56	15.335	
6,200.00	2,860.67	2,813.33	2,860.67	67.24	47.36	-89.82	2,275.97	-1,044.37	1,494.74	1,403.09	91.65	16.309	
6,300.00	2,860.41	2,813.59	2,860.41	69.14	47.36	-89.80	2,275.97	-1,044.37	1,572.91	1,482.15	90.76	17.330	
6,400.00	2,860.15	2,813.85	2,860.15	71.04	47.37	-89.79	2,275.97	-1,044.37	1,653.44	1,563.54	89.91	18.390	
6,500.00	2,859.89	2,814.11	2,859.89	72.94	47.37	-89.77	2,275.97	-1,044.37	1,736.00	1,646.91	89.09	19.486	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - SB 27 10H Excel - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 2188-MWD+IGRF — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,700.00	2,861.98	4,125.28	2,526.92	57.77	34.34	-4.83	3,317.16	-130.94	506.95	479.36	27.59	18.373	
5,800.00	2,861.72	4,125.28	2,526.92	59.66	34.34	-4.83	3,317.16	-130.94	436.97	405.49	31.48	13.881	
5,900.00	2,861.46	4,125.28	2,526.92	61.55	34.34	-4.83	3,317.16	-130.94	380.65	344.75	35.90	10.604	
6,000.00	2,861.20	4,125.28	2,526.92	63.45	34.34	-4.83	3,317.16	-130.94	344.73	304.94	39.79	8.665	
6,082.59	2,860.98	4,133.50	2,527.20	65.01	34.49	-4.86	3,308.95	-130.97	335.18	293.76	41.42	8.093	
6,100.00	2,860.94	4,112.69	2,526.57	65.34	34.10	-4.81	3,329.74	-131.04	335.64	294.25	41.39	8.109	
6,200.00	2,860.67	3,998.66	2,527.34	67.24	31.91	-5.44	3,443.63	-136.24	334.89	293.39	41.50	8.070	
6,265.77	2,860.50	3,939.66	2,528.12	68.49	30.77	-5.72	3,502.58	-138.56	334.04	292.38	41.66	8.019	
6,300.00	2,860.41	3,911.23	2,527.87	69.14	30.23	-5.83	3,530.99	-139.63	334.34	292.60	41.74	8.011	
6,400.00	2,860.15	3,806.16	2,526.24	71.04	28.21	-5.80	3,636.02	-141.04	335.63	293.92	41.71	8.046	
6,500.00	2,859.89	3,698.25	2,526.60	72.94	26.16	-5.01	3,743.87	-137.82	334.63	293.22	41.41	8.081	
6,600.00	2,859.63	3,594.09	2,527.92	74.84	24.17	-4.45	3,848.01	-135.87	332.87	291.63	41.24	8.072	
6,700.00	2,859.36	3,499.72	2,530.06	76.75	22.37	-4.01	3,942.35	-134.42	330.15	288.94	41.21	8.012	
6,762.83	2,859.20	3,442.28	2,530.36	77.94	21.27	-3.69	3,999.77	-133.33	329.52	288.32	41.20	7.999	CC, ES, SF
6,800.00	2,859.10	3,410.64	2,529.98	78.65	20.67	-3.58	4,031.41	-133.16	329.83	288.61	41.22	8.002	
6,900.00	2,858.84	3,309.02	2,527.64	80.55	18.72	-3.32	4,133.00	-133.19	331.79	290.59	41.20	8.053	
7,000.00	2,858.58	3,215.36	2,526.06	82.46	16.94	-2.92	4,226.63	-132.23	333.14	291.93	41.21	8.085	
7,100.00	2,858.32	3,127.97	2,521.22	84.36	15.27	-2.48	4,313.88	-131.04	338.27	297.06	41.21	8.209	
7,200.00	2,858.06	3,044.13	2,513.95	86.27	13.68	-1.87	4,397.36	-128.83	346.67	305.53	41.14	8.427	
7,300.00	2,857.79	2,942.06	2,501.06	88.17	11.74	-1.56	4,498.61	-128.74	359.02	317.81	41.21	8.711	
7,400.00	2,857.53	2,851.44	2,489.42	90.08	10.02	-1.39	4,588.47	-129.21	371.52	330.26	41.26	9.004	
7,500.00	2,857.27	2,726.18	2,476.13	91.99	7.64	-0.91	4,712.98	-128.05	382.01	340.47	41.53	9.197	
7,600.00	2,857.01	2,617.02	2,471.08	93.90	5.61	0.33	4,821.77	-121.25	386.27	344.49	41.78	9.246	
7,700.00	2,856.75	2,512.17	2,467.11	95.80	3.79	2.38	4,925.78	-108.71	390.17	347.86	42.31	9.222	
7,800.00	2,856.48	2,447.00	2,464.08	97.71	2.75	2.76	4,990.66	-106.89	395.73	353.11	42.62	9.286	
7,900.00	2,856.22	2,421.43	2,458.87	99.62	2.52	2.55	5,015.60	-108.43	416.23	374.56	41.66	9.990	
8,000.00	2,855.96	2,394.00	2,448.36	101.53	2.23	2.08	5,040.66	-111.68	453.18	413.26	39.92	11.352	
8,100.00	2,855.70	2,384.00	2,443.40	103.44	2.10	1.80	5,049.12	-113.64	503.69	466.56	37.13	13.566	
8,200.00	2,855.44	2,367.50	2,433.55	105.35	1.88	1.32	5,061.90	-117.04	565.35	530.73	34.63	16.327	
8,295.36	2,855.19	2,353.00	2,423.41	107.17	1.67	0.91	5,071.79	-120.07	632.14	599.69	32.45	19.483	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - SB 27 10H PDF - OH - OH — **Offset Site Error:** 0.00 usft

Survey Program: 2251-MWD+IGRF — **Offset Well Error:** 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,800.00	2,861.72	4,125.28	2,526.92	59.66	34.34	3.43	3,363.83	-83.34	467.30	437.61	29.69	15.738	
5,900.00	2,861.46	4,125.28	2,526.92	61.55	34.34	3.43	3,363.83	-83.34	403.88	369.96	33.92	11.906	
6,000.00	2,861.20	4,125.28	2,526.92	63.45	34.34	3.43	3,363.83	-83.34	357.58	319.37	38.21	9.357	
6,100.00	2,860.94	4,125.28	2,526.92	65.34	34.34	3.43	3,363.83	-83.34	335.58	294.53	41.05	8.176	
6,129.72	2,860.86	4,133.42	2,527.20	65.91	34.49	3.41	3,355.69	-83.37	334.49	293.11	41.38	8.084	
6,200.00	2,860.67	4,044.62	2,526.31	67.24	32.79	3.10	3,444.41	-86.35	334.91	293.69	41.22	8.125	
6,300.00	2,860.41	3,948.51	2,528.10	69.14	30.94	2.61	3,540.41	-90.64	332.66	291.48	41.18	8.078	
6,317.37	2,860.37	3,934.06	2,528.11	69.47	30.67	2.55	3,554.84	-91.18	332.58	291.39	41.20	8.073	
6,400.00	2,860.15	3,855.47	2,526.76	71.04	29.16	2.32	3,633.38	-93.58	333.70	292.50	41.20	8.100	
6,500.00	2,859.89	3,750.27	2,526.00	72.94	27.15	2.86	3,738.55	-91.82	334.31	293.04	41.27	8.100	
6,600.00	2,859.63	3,650.42	2,527.06	74.84	25.25	3.57	3,838.36	-89.14	333.22	291.78	41.43	8.043	
6,700.00	2,859.36	3,543.77	2,529.34	76.75	23.21	4.12	3,944.97	-87.59	330.95	289.41	41.54	7.968	
6,800.00	2,859.10	3,451.08	2,530.38	78.65	21.44	4.66	4,037.63	-85.87	329.81	288.04	41.77	7.897	
6,800.27	2,859.10	3,450.85	2,530.38	78.65	21.44	4.66	4,037.87	-85.86	329.81	288.04	41.77	7.896	CC, ES, SF
6,900.00	2,858.84	3,358.49	2,528.66	80.55	19.67	4.86	4,130.20	-85.87	331.48	289.58	41.90	7.911	
7,000.00	2,858.58	3,255.57	2,527.04	82.46	17.70	5.23	4,233.11	-85.02	332.96	290.92	42.04	7.919	
7,100.00	2,858.32	3,169.96	2,523.98	84.36	16.07	5.52	4,318.65	-84.20	336.48	294.26	42.22	7.969	
7,200.00	2,858.06	3,079.47	2,517.47	86.27	14.35	5.98	4,408.87	-82.11	343.73	301.31	42.42	8.103	
7,300.00	2,857.79	2,997.73	2,507.63	88.17	12.80	6.18	4,489.99	-80.97	355.55	313.09	42.45	8.375	
7,400.00	2,857.53	2,897.36	2,495.64	90.08	10.89	6.13	4,589.64	-81.37	367.25	324.70	42.55	8.631	
7,500.00	2,857.27	2,789.38	2,481.69	91.99	8.84	6.09	4,696.71	-81.68	380.02	337.28	42.74	8.891	
7,600.00	2,857.01	2,667.44	2,473.17	93.90	6.54	6.74	4,818.26	-78.06	387.04	343.75	43.29	8.941	
7,700.00	2,856.75	2,570.79	2,469.12	95.80	4.79	8.25	4,914.34	-68.54	392.44	348.23	44.21	8.876	
7,800.00	2,856.48	2,467.32	2,465.77	97.71	3.02	9.89	5,017.13	-58.02	397.21	351.72	45.49	8.732	
7,900.00	2,856.22	2,426.00	2,460.15	99.62	2.58	9.46	5,057.88	-60.68	409.63	364.59	45.04	9.095	
8,000.00	2,855.96	2,404.00	2,452.69	101.53	2.33	9.08	5,078.47	-62.46	438.77	395.48	43.29	10.135	
8,100.00	2,855.70	2,384.00	2,443.40	103.44	2.10	8.43	5,095.78	-66.04	482.50	441.83	40.67	11.863	
8,200.00	2,855.44	2,373.00	2,437.05	105.35	1.95	8.02	5,104.48	-68.29	538.80	501.21	37.58	14.336	
8,295.36	2,855.19	2,363.00	2,430.54	107.17	1.81	7.64	5,111.77	-70.38	601.64	566.84	34.80	17.291	

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - SB 27 8H - OH - OH — Offset Site Error: 0.00 usft

Survey Program: 200-INC-ONLY — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,300.00	2,863.03	2,814.97	2,863.03	50.22	47.39	-90.17	3,657.86	-1,086.84	1,497.76	1,417.22	80.54	18.596	
5,400.00	2,862.77	2,815.23	2,862.77	52.10	47.39	-90.16	3,657.86	-1,086.84	1,423.60	1,340.16	83.44	17.061	
5,500.00	2,862.51	2,815.49	2,862.51	53.99	47.39	-90.14	3,657.86	-1,086.84	1,352.78	1,266.18	86.59	15.622	
5,600.00	2,862.24	2,815.76	2,862.24	55.88	47.40	-90.13	3,657.86	-1,086.84	1,285.83	1,195.84	89.99	14.289	
5,700.00	2,861.98	2,816.02	2,861.98	57.77	47.40	-90.11	3,657.86	-1,086.84	1,223.40	1,129.80	93.61	13.070	
5,800.00	2,861.72	2,816.28	2,861.72	59.66	47.41	-90.10	3,657.86	-1,086.84	1,166.22	1,068.81	97.41	11.972	
5,900.00	2,861.46	2,816.54	2,861.46	61.55	47.41	-90.08	3,657.86	-1,086.84	1,115.09	1,013.75	101.34	11.004	
6,000.00	2,861.20	2,816.80	2,861.20	63.45	47.42	-90.07	3,657.86	-1,086.84	1,070.87	965.59	105.29	10.171	
6,100.00	2,860.94	2,817.07	2,860.94	65.34	47.42	-90.05	3,657.86	-1,086.84	1,034.47	925.34	109.13	9.479	
6,200.00	2,860.67	2,817.33	2,860.67	67.24	47.43	-90.04	3,657.86	-1,086.84	1,006.72	894.01	112.71	8.932	
6,300.00	2,860.41	2,817.59	2,860.41	69.14	47.43	-90.02	3,657.86	-1,086.84	988.35	872.50	115.85	8.531	
6,400.00	2,860.15	2,817.85	2,860.15	71.04	47.44	-90.01	3,657.86	-1,086.84	979.89	861.48	118.41	8.276	
6,433.24	2,860.06	2,817.94	2,860.06	71.67	47.44	-90.00	3,657.86	-1,086.84	979.33	860.22	119.11	8.222	CC, ES
6,500.00	2,859.89	2,818.11	2,859.89	72.94	47.44	-89.99	3,657.86	-1,086.84	981.60	861.34	120.26	8.162	SF
6,600.00	2,859.63	2,818.37	2,859.63	74.84	47.44	-89.97	3,657.86	-1,086.84	993.42	872.05	121.37	8.185	
6,700.00	2,859.36	2,818.64	2,859.36	76.75	47.45	-89.96	3,657.86	-1,086.84	1,015.01	893.27	121.74	8.337	
6,800.00	2,859.10	2,818.90	2,859.10	78.65	47.45	-89.94	3,657.86	-1,086.84	1,045.75	924.29	121.46	8.610	
6,900.00	2,858.84	2,819.16	2,858.84	80.55	47.46	-89.93	3,657.86	-1,086.84	1,084.87	964.23	120.64	8.993	
7,000.00	2,858.58	2,819.42	2,858.58	82.46	47.46	-89.91	3,657.86	-1,086.84	1,131.50	1,012.10	119.41	9.476	
7,100.00	2,858.32	2,819.68	2,858.32	84.36	47.47	-89.90	3,657.86	-1,086.84	1,184.76	1,066.87	117.89	10.050	
7,200.00	2,858.06	2,819.94	2,858.06	86.27	47.47	-89.88	3,657.86	-1,086.84	1,243.78	1,127.60	116.19	10.705	
7,300.00	2,857.79	2,779.79	2,857.79	88.17	46.77	-89.87	3,657.86	-1,086.84	1,307.80	1,194.11	113.69	11.503	
7,400.00	2,857.53	2,779.53	2,857.53	90.08	46.77	-89.85	3,657.86	-1,086.84	1,376.12	1,264.26	111.86	12.302	
7,500.00	2,857.27	2,779.27	2,857.27	91.99	46.76	-89.84	3,657.86	-1,086.84	1,448.12	1,338.07	110.05	13.158	
7,600.00	2,857.01	2,779.01	2,857.01	93.90	46.76	-89.82	3,657.86	-1,086.84	1,523.29	1,414.99	108.29	14.066	
7,700.00	2,856.75	2,778.75	2,856.75	95.80	46.75	-89.81	3,657.86	-1,086.84	1,601.17	1,494.57	106.60	15.020	
7,800.00	2,856.48	2,778.48	2,856.48	97.71	46.75	-89.79	3,657.86	-1,086.84	1,681.40	1,576.40	105.00	16.014	
7,900.00	2,856.22	2,778.22	2,856.22	99.62	46.74	-89.78	3,657.86	-1,086.84	1,763.65	1,660.17	103.48	17.044	
8,000.00	2,855.96	2,777.96	2,855.96	101.53	46.74	-89.76	3,657.86	-1,086.84	1,847.65	1,745.60	102.05	18.106	
8,100.00	2,855.70	2,777.70	2,855.70	103.44	46.73	-89.74	3,657.86	-1,086.84	1,933.17	1,832.47	100.70	19.197	

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Offset Design South Boyd - SB 27 9H - OH - OH — Offset Site Error: 0.00 usft

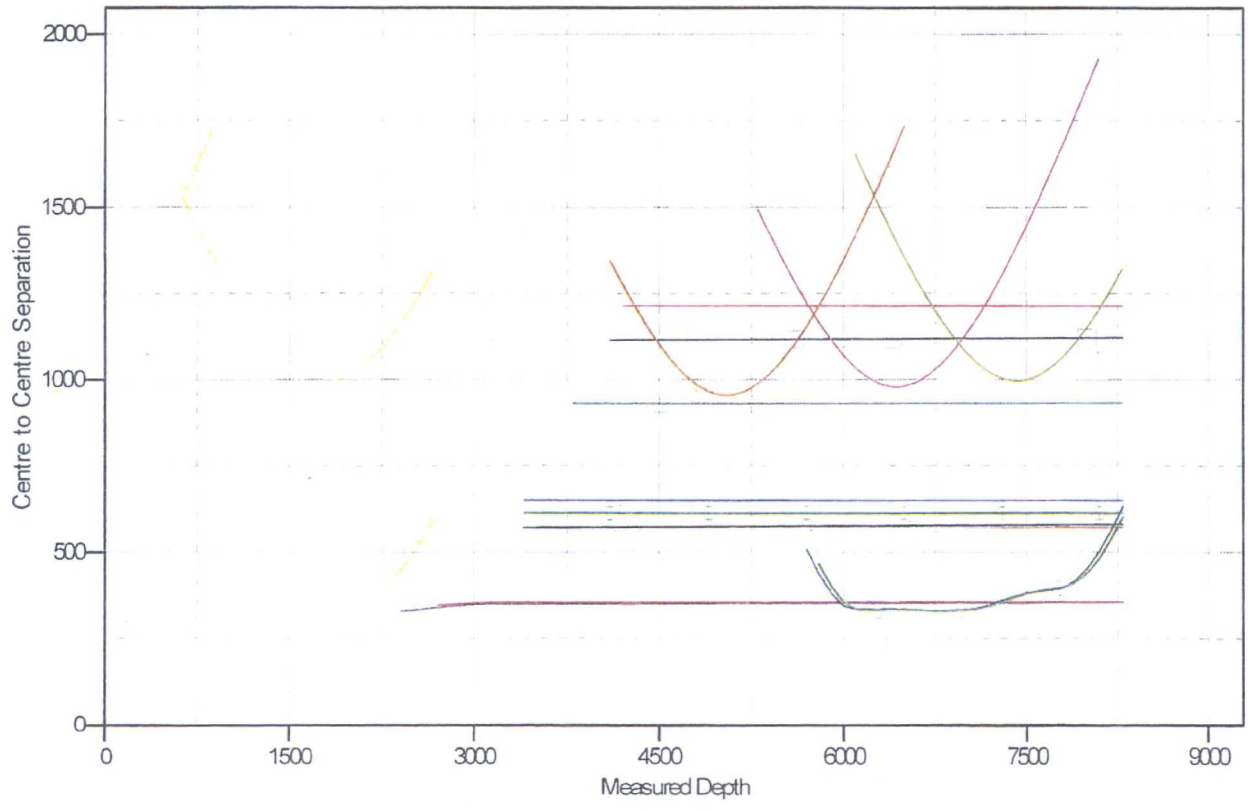
Survey Program: 200-INC-ONLY — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,100.00	2,860.94	2,813.07	2,860.94	65.34	47.35	-90.20	4,647.20	-1,117.98	1,656.43	1,569.48	86.95	19.050	
6,200.00	2,860.67	2,813.33	2,860.67	67.24	47.36	-90.18	4,647.20	-1,117.98	1,577.71	1,487.68	90.03	17.524	
6,300.00	2,860.41	2,813.59	2,860.41	69.14	47.36	-90.17	4,647.20	-1,117.98	1,501.53	1,408.16	93.37	16.082	
6,400.00	2,860.15	2,813.85	2,860.15	71.04	47.37	-90.15	4,647.20	-1,117.98	1,428.29	1,331.31	96.98	14.727	
6,500.00	2,859.89	2,814.11	2,859.89	72.94	47.37	-90.14	4,647.20	-1,117.98	1,358.47	1,257.60	100.87	13.468	
6,600.00	2,859.63	2,814.37	2,859.63	74.84	47.37	-90.12	4,647.20	-1,117.98	1,292.61	1,187.60	105.01	12.310	
6,700.00	2,859.36	2,814.64	2,859.36	76.75	47.38	-90.11	4,647.20	-1,117.98	1,231.37	1,121.99	109.38	11.258	
6,800.00	2,859.10	2,814.90	2,859.10	78.65	47.38	-90.09	4,647.20	-1,117.98	1,175.45	1,061.53	113.92	10.318	
6,900.00	2,858.84	2,815.16	2,858.84	80.55	47.39	-90.08	4,647.20	-1,117.98	1,125.66	1,007.11	118.55	9.496	
7,000.00	2,858.58	2,815.42	2,858.58	82.46	47.39	-90.06	4,647.20	-1,117.98	1,082.83	959.71	123.12	8.795	
7,100.00	2,858.32	2,815.68	2,858.32	84.36	47.40	-90.05	4,647.20	-1,117.98	1,047.83	920.34	127.49	8.219	
7,200.00	2,858.06	2,815.94	2,858.06	86.27	47.40	-90.03	4,647.20	-1,117.98	1,021.45	889.99	131.46	7.770	
7,300.00	2,857.79	2,816.21	2,857.79	88.17	47.41	-90.02	4,647.20	-1,117.98	1,004.38	869.55	134.83	7.449	
7,400.00	2,857.53	2,816.47	2,857.53	90.08	47.41	-90.00	4,647.20	-1,117.98	997.09	859.64	137.45	7.254	
7,422.91	2,857.47	2,816.53	2,857.47	90.52	47.41	-90.00	4,647.20	-1,117.98	996.83	858.90	137.93	7.227	CC, ES
7,500.00	2,857.27	2,816.73	2,857.27	91.99	47.42	-89.99	4,647.20	-1,117.98	999.81	860.62	139.19	7.183	SF
7,600.00	2,857.01	2,816.99	2,857.01	93.90	47.42	-89.97	4,647.20	-1,117.98	1,012.44	872.42	140.02	7.231	
7,700.00	2,856.75	2,817.25	2,856.75	95.80	47.43	-89.96	4,647.20	-1,117.98	1,034.62	894.65	139.98	7.391	
7,800.00	2,856.48	2,817.52	2,856.48	97.71	47.43	-89.94	4,647.20	-1,117.98	1,065.77	926.60	139.17	7.658	
7,900.00	2,856.22	2,817.78	2,856.22	99.62	47.43	-89.93	4,647.20	-1,117.98	1,105.12	967.37	137.75	8.023	
8,000.00	2,855.96	2,818.04	2,855.96	101.53	47.44	-89.91	4,647.20	-1,117.98	1,151.82	1,015.96	135.87	8.478	
8,100.00	2,855.70	2,818.30	2,855.70	103.44	47.44	-89.90	4,647.20	-1,117.98	1,205.04	1,071.36	133.67	9.015	
8,200.00	2,855.44	2,818.56	2,855.44	105.35	47.45	-89.88	4,647.20	-1,117.98	1,263.93	1,132.64	131.30	9.627	
8,295.36	2,855.19	2,818.81	2,855.19	107.17	47.45	-89.87	4,647.20	-1,117.98	1,324.70	1,195.75	128.95	10.273	

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=25' @ 3540.00usft	Coordinates are relative to: 16H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334	Grid Convergence at Surface is: -0.07°

Ladder Plot

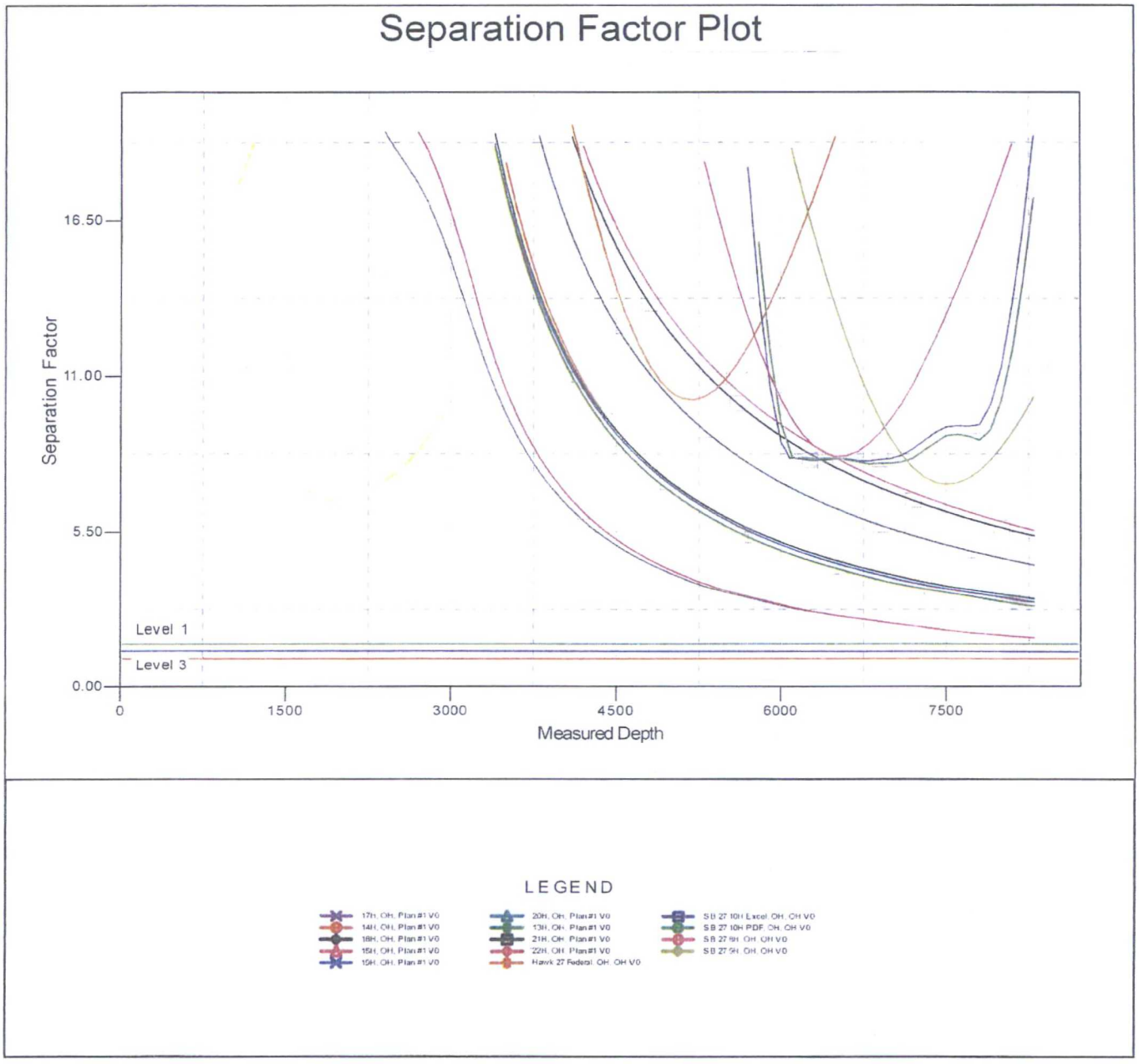


LEGEND

Company:	Percussion	**Local Co-ordinate Reference:**	Well 16H
Project:	Eddy County, NM	**TVD Reference:**	RKB=25' @ 3540.00usft
Reference Site:	South Boyd	**MD Reference:**	RKB=25' @ 3540.00usft
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	16H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #1	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=25' @ 3540.00usft	Coordinates are relative to: 16H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334	Grid Convergence at Surface is: -0.07°

Separation Factor Plot



Drilling Program

1. ESTIMATED TOPS

Formation/Lithology	TVD	MD	Contents
Quaternary caliche	000'	000'	water
Grayburg dolomite	531'	531'	hydrocarbons
San Andres dolomite	811'	812'	hydrocarbons
(KOP	2344'	2350'	hydrocarbons)
Glorieta silty dolomite	2390'	2396'	hydrocarbons
Yeso dolomite	2525'	2533'	hydrocarbons & goal
TD	2855'	8295'	hydrocarbons

2. NOTABLE ZONES

Yeso is the goal. Closest water well (RA 02958) is 3237'. Depth to water was not recorded in this 450' deep well.

3. PRESSURE CONTROL

A 3000-psi 5000' rated BOP stack consisting of annular preventer and double (blind and pipe) ram will be used below surface casing to TD. See attached BOP and choke manifold diagrams.

Pressure tests will be conducted before drilling out from under all casing strings. Third party test crews will conduct all tests. All tests will be recorded for 10-minutes on low pressure (500 psi) and 10-minutes on high pressure (3000-psi). After BOP testing is complete, test casing (without test plug) to 2000-psi for 30 minutes. All tests will be charted on a plot. BOPs will be function tested every day.

4. CASING & CEMENT

All casing will be API and new. A contingency plan is attached.

Hole O. D.	Set MD	Set TVD	Casing O. D.	Weight (lb/ft)	Grade	Joint	Collapse	Burst	Tension
12.25"	0' - 1261'	0' - 1258'	Surface 9.625"	36	J-55	STC	1.125	1.125	1.8
8.75"	0' - 8295'	0' – 2855'	Product. 5.5"	17	L-80	BTC	1.125	1.125	1.8

Casing Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Lead	628	1.32	829	14.8	Class C + 2% CaCl + ¼ pound per sack celloflake
TOC = GL		100% Excess			centralizers per Onshore Order 2	
Production	Lead	495	1.97	975	12.6	65/65/6 Class C + 6% gel + 5% salt + ¼ pound per sack celloflake + 0.2% C41-P
	Tail	1676	1.32	2212	14.8	Class C + 2% CaCl + ¼ pound per sack celloflake
TOC = GL		50% Excess			1 centralizer on 1st collar and every 10th collar to 1200' + 1 inside the surface casing	

5. MUD PROGRAM

An electronic/mechanical mud monitor with a minimum pit volume totalizer, stroke counter, and flow sensor will be used. All necessary mud products (LCM) will be on site to handle any abnormal hole condition that may be encountered while drilling this well. A closed loop system will be used.

Type	Interval (MD)	lb/gal	Viscosity	Fluid Loss	Plastic Viscosity	Yield Point
fresh water/gel	0' - 1261'	8.4 - 9.2	36-42	NC	3-5	5-7
fresh water/cut brine	1261' - 2350'	8.3 - 9.2	28-30	NC	1	1
cut brine	2350' - 8295'	8.6 - 9.2	29-32	NC	4-5	6-10

6. CORES, TESTS, & LOGS

No core or drill stem test is planned.

A mud logger will be used from GL to TD. Samples will be collected every 10' in the lateral pay zone.

No electric logs are planned at this time.

7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is ≈1231 psi. Expected bottom hole temperature is ≈113° F.

A Hydrogen Sulfide Drilling Operation Plan is attached.

8. OTHER INFORMATION

Anticipated spud date is upon approval. It is expected it will take ≈1 month to drill and complete the well.

St. Devote LLC has operating rights in NMNM-504364B. St. Devote LLC is a subsidiary of Percussion.

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

Contingency Planning – South Boyd Area Wells

Prepared by Lelan J. Anders, Percussion Petroleum Operating, LLC.

INTRODUCTION:

This document is designed to address the issues that could arise at any time drilling horizontal Yeso wells. Percussion Petroleum Operating (PPO) is going to follow regularly used practices and procedures in order to drill the wells to TD and still keep them economical to operate.

SENERIO:

If a complete loss of circulation occurs while drilling above 400 ft MD.

CORRECTIVE ACTIONS:

1. Pump an LCM sweep and attempt to regain circulation – if unsuccessful go to step 2

2. Continue drilling at attempt to seal off lost circulation zone with drill cuttings
    1. Monitor torque and drag on drill string to determine if pipe is sticking
    2. Have contingency plan to 'drill dry' – have plenty of water on hand and well control in place
    3. Continue to 'dry drill' until torque and drag dictate a different plan

3. If 'dry drilling' is unsuccessful – Run contingency surface casing string
    1. Ream out 12-1/4" open hole to 17-1/2" open hole
    2. Run contingency 13-3/8" 48# H-40, STC casing to no more than 400' MD
    3. Cement 13-3/8" casing using Class C cement
        i. Pump at minimum 100% excess cement
            1. 65/35/6 Class C Cement, 12.8 ppg, 1.87 yield, 10.15 gal/sk to be used on initial cement job.
        ii. Top off cement from surface using 1" if necessary
            1. Top off will be 200 sks of 65/35/6 Class C Cement, 12.8 ppg, 1.87 yield, 10.15 gal/sk
            2. Second top off will be performed with same cement if needed.
        iii. Insure that cement has cured for a minimum of 12 hours prior to drilling out
    4. Install 13-3/8" 3M wellhead and drill to surface casing depth with 12-1/4" OD bit
    5. Run and cement surface casing as planned

APD ID: 10400024288 **Submission Date:** 11/03/2017

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

Well Type: OIL WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

SB_16H_Road_Map_20171103152927.pdf

Existing Road Purpose: ACCESS **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? YES

New Road Map:

SB_16H_New_Road_Map_20171103152947.pdf

New road type: RESOURCE

Length: 103.1 Feet **Width (ft.):** 30

Max slope (%): 0 **Max grade (%):** 3

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: Crowned and ditched

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Grader

Access other construction information:

Access miscellaneous information:

Number of access turnouts: **Access turnout map:**

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Crowned and ditched

Road Drainage Control Structures (DCS) description: None

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

SB_16H_Well_Map_20171103153007.pdf

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: An 862' long 4" O D. HDPE flow line will be laid on the surface east, north, west, and southwest to a proposed central tank battery on the proposed 17H/18H/19H pad. A 241.6' long overhead raptor safe 3-phase power line will be built south and southwest from an existing power line.
Production Facilities map:

SB_16H_Production_Facilities_20171103153027.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

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: PIPELINE

Source transportation land ownership: FEDERAL

Water source volume (barrels): 10000

Source volume (acre-feet): 1.288931

Source volume (gal): 420000

Water source and transportation map:

SB_16H_Water_Source_Map_20171103153055.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:

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:

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

Section 6 - Construction Materials

Construction Materials description: NM One Call (811) will be notified before construction starts. Top 6" of soil and brush will be stockpiled north of the pad. V-door will face north. Closed loop drilling system will be used. Caliche will be hauled from existing caliche pits on private land. Arkland caliche pit is in NWNE 23-19s-25e. Seven Rivers caliche pit is in SWSW 6-20s-26e. Griffin caliche pit is in NWNE 14-20s-25e.

Construction Materials source location attachment:

SB_16H_Construction_Methods_20171103153112.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drill cuttings, mud, salts, and other chemicals

Amount of waste: 2000 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: R360's state approved (NM-01-0006) disposal site at 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

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

Description of cuttings location Steel tanks on pad

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:

SB_16H_Well_Site_Layout_20171103153139.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** SOUTH BOYD

Multiple Well Pad Number: 15H

Recontouring attachment:

SB_16H_Recontour_Plat_20171103153154.pdf
SB_16H_Interim_Reclamation_Diagram_20171103153203.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

Well pad proposed disturbance (acres):	**Well pad interim reclamation (acres):** 2.34	**Well pad long term disturbance (acres):** 1.68
Road proposed disturbance (acres):	**Road interim reclamation (acres):** 0.07	**Road long term disturbance (acres):** 0.07
Powerline proposed disturbance (acres):	**Powerline interim reclamation (acres):**	**Powerline long term disturbance (acres):**
Pipeline proposed disturbance (acres):	**Pipeline interim reclamation (acres):** 0.59366393	**Pipeline long term disturbance (acres):** 0
Other proposed disturbance (acres):	**Other interim reclamation (acres):** 12.92	**Other long term disturbance (acres):** 2.75
Total proposed disturbance:	**Total interim reclamation:** 15.923664	**Total long term disturbance:** 4.5

Reconstruction method: Interim reclamation will be completed within 6 months of completing the well. Interim reclamation

will consist of shrinking the pad 29% (0.66 acre) by removing caliche and reclaiming 50' on the west and south sides. This will leave 1.68 acres for the anchors, pump jacks, and tractor-trailer turn around. Disturbed areas will be contoured to match pre-construction grades. Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM's requirements.
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 rest of the pad and new road will be similarly reclaimed within 6 months of plugging. 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? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

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: To BLM standards

Weed treatment plan attachment:

Monitoring plan description: To BLM standards

Monitoring plan attachment:

Success standards: To BLM satisfaction

Pit closure description: No pit

Pit closure attachment:

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:

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

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:**

Disturbance type: NEW ACCESS ROAD

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:**

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: SOUTH BOYD FEDERAL COM **Well Number:** 16H

Disturbance type: EXISTING ACCESS ROAD

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:**

Disturbance type: OTHER

Describe: Power Line

Surface Owner: PRIVATE OWNERSHIP

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:**

Fee Owner: Ross Ranch **Fee Owner Address:** PO Box 216 Lakewood NM 88254

Phone: (575)365-4797 **Email:**

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: Agreement

Surface Access Agreement Need description: See attachment at end of SUPO

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Section 12 - Other Information

Right of Way needed? NO **Use APD as ROW?**

ROW Type(s):

ROW Applications

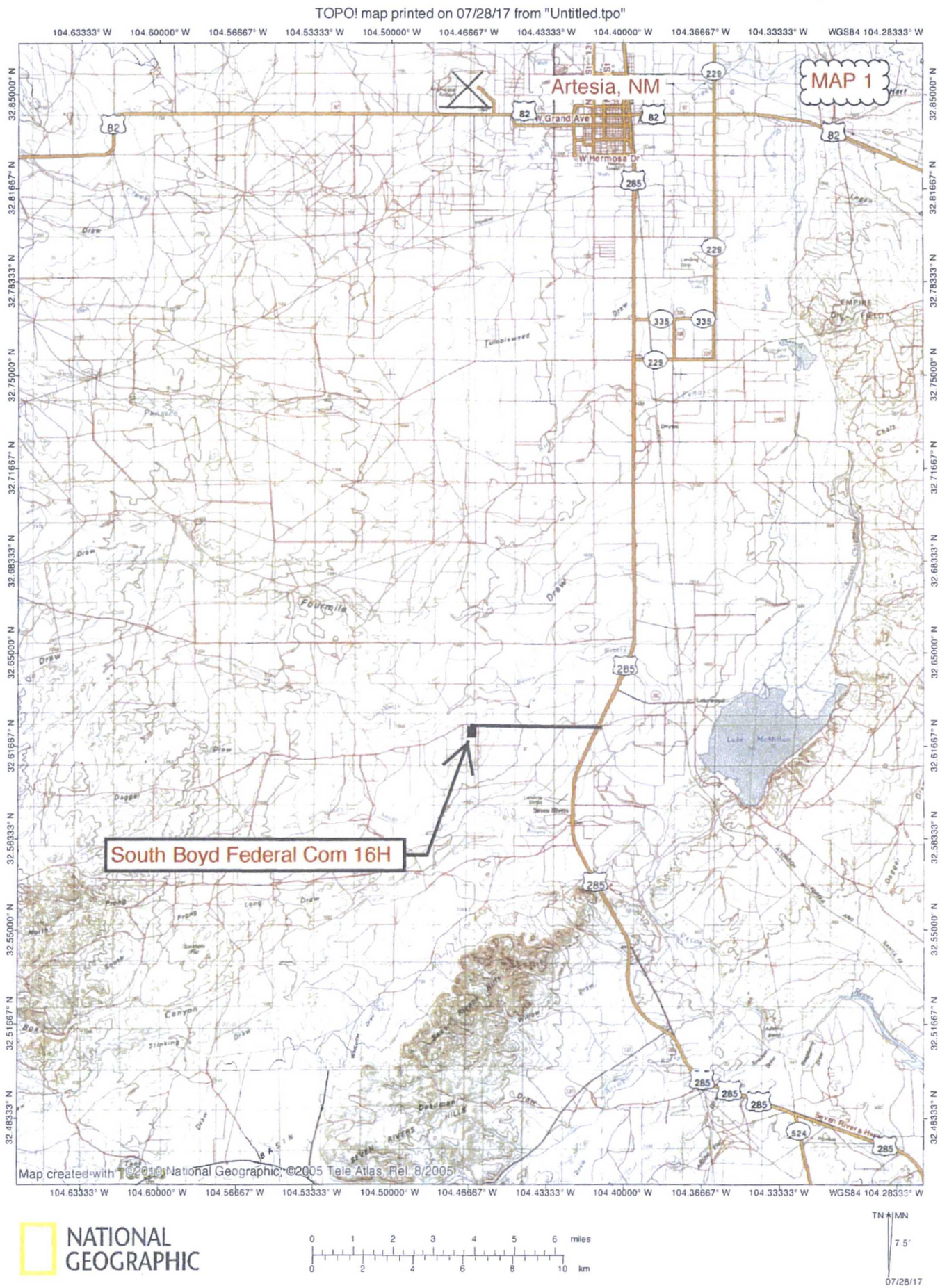
SUPO Additional Information:

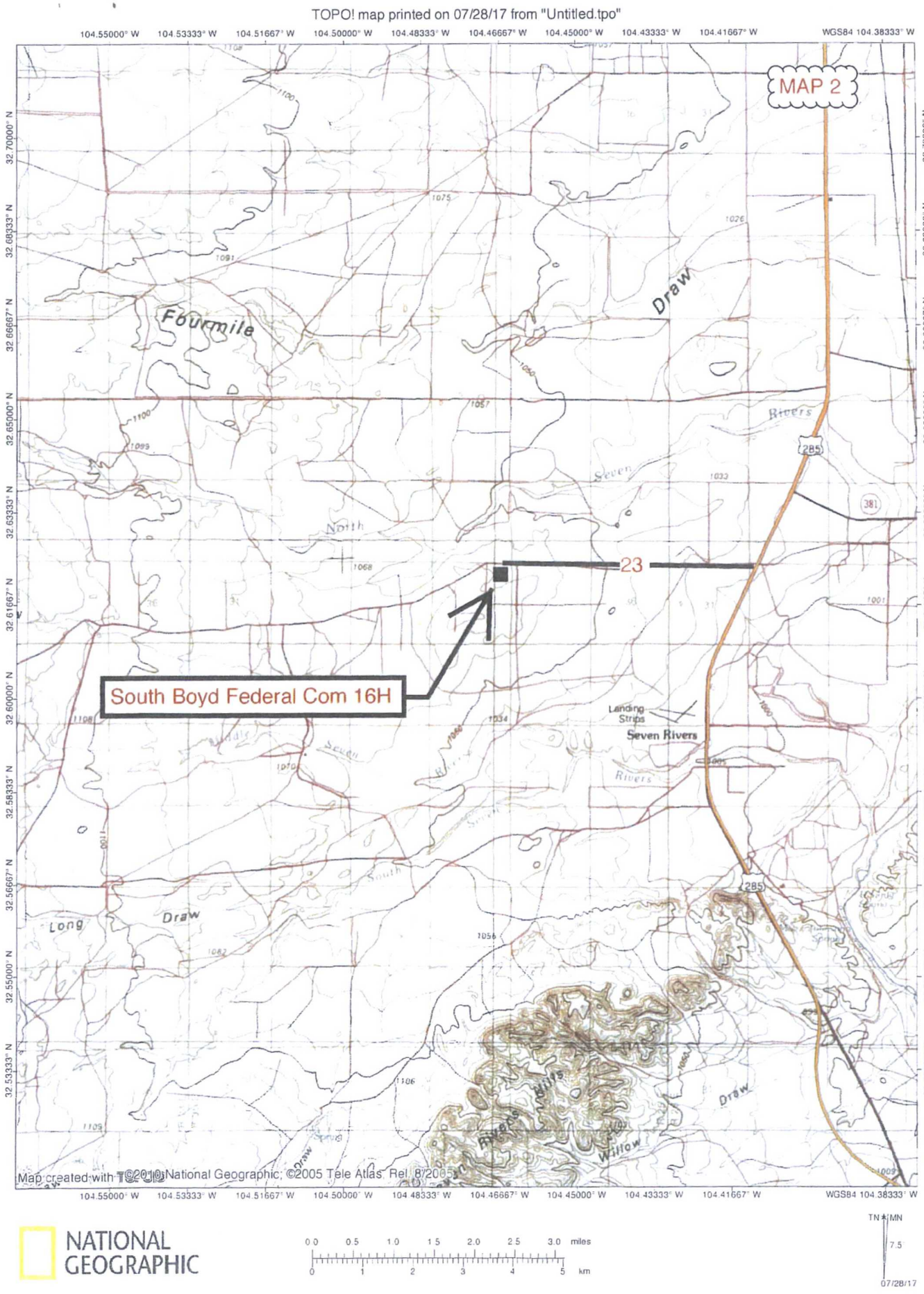
Use a previously conducted onsite? YES

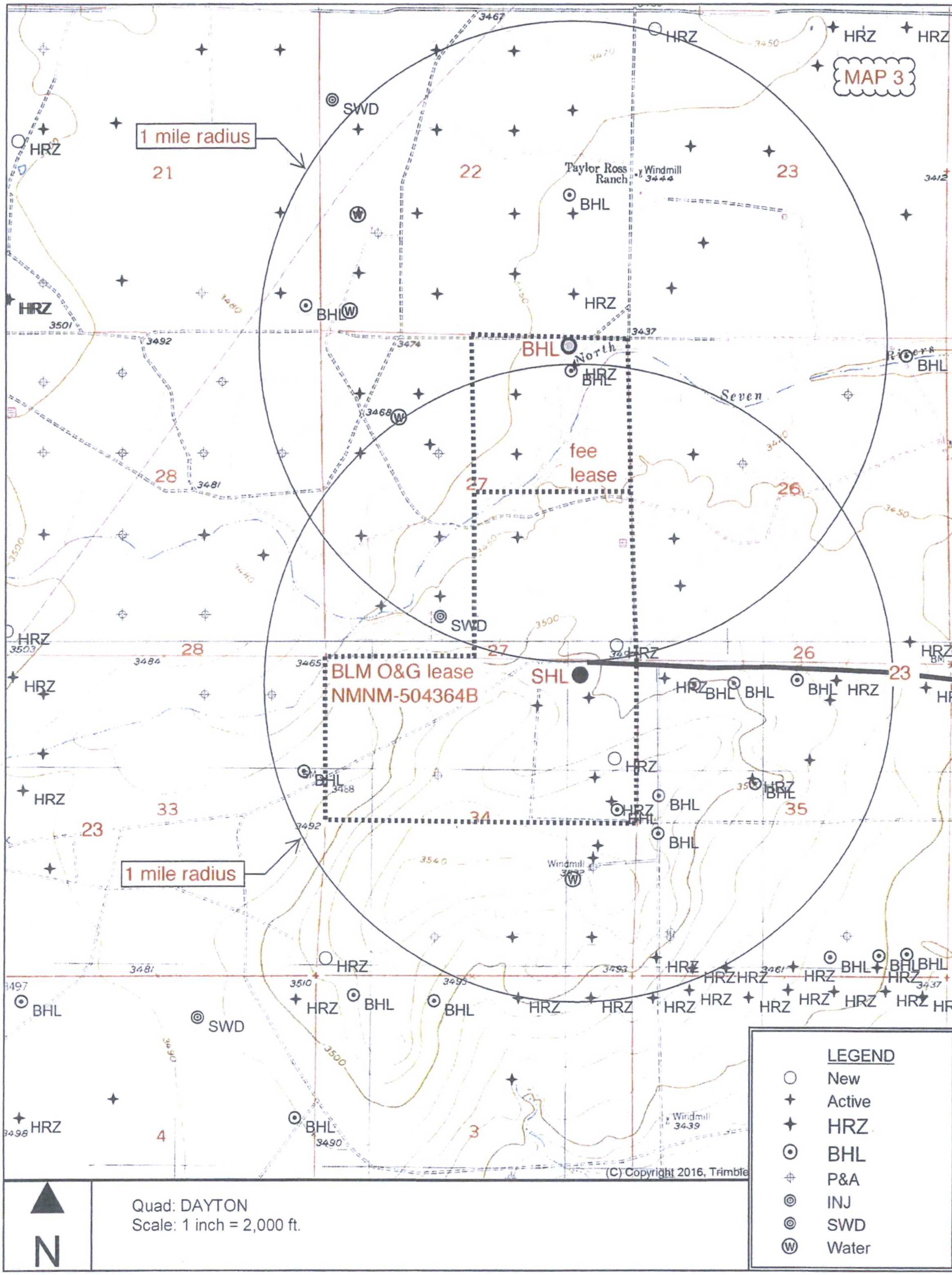
Previous Onsite information: On site inspection was held with Jim Goodbar and Jessie Bassett (both BLM) on July 18, 2017. Lone Mountain has inspected the project area and will submit an archaeology report.

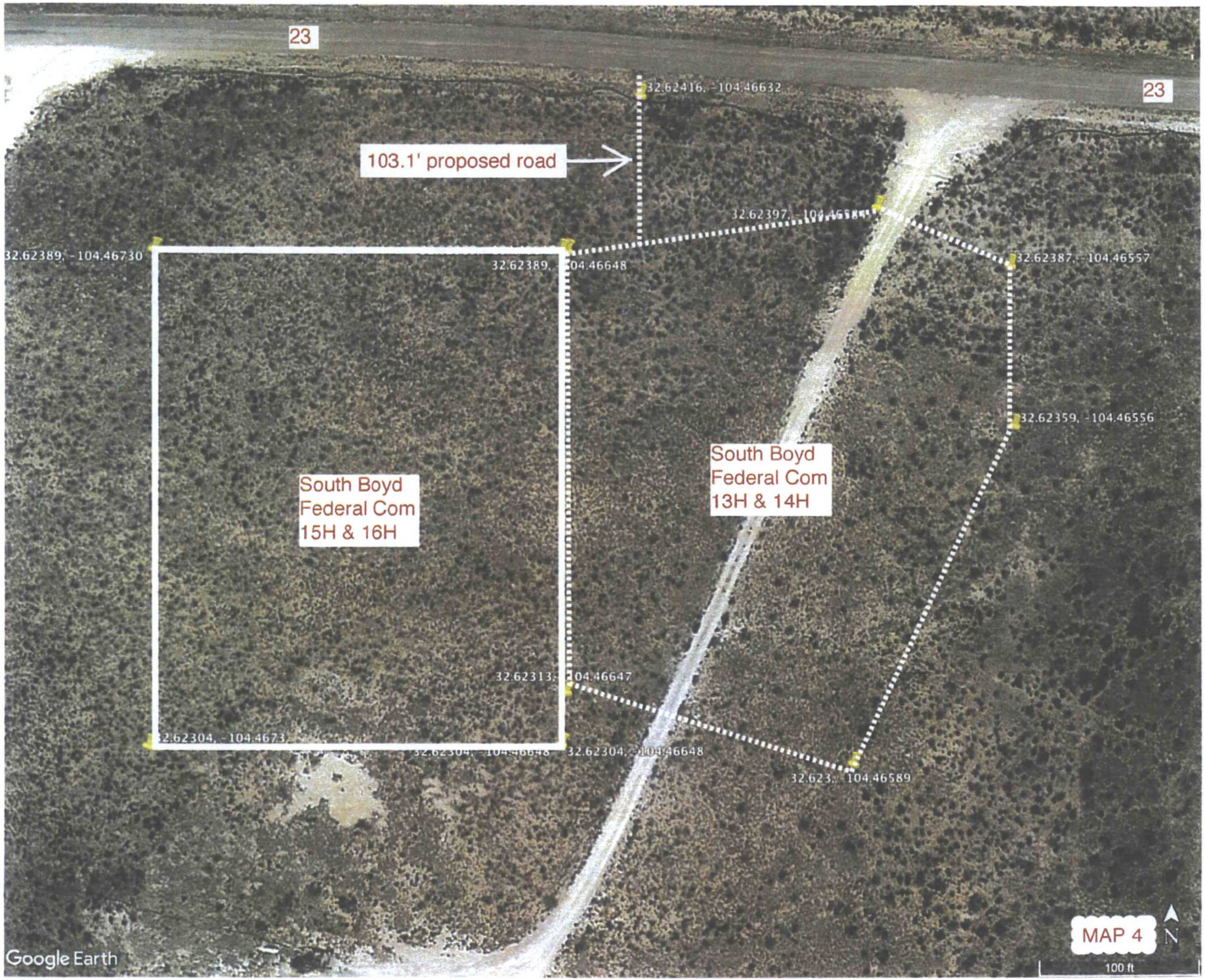
Other SUPO Attachment

SB_16H_General_SUPO_20171103153306.pdf
SB_16H_Surface_Use_Agreement_20171103153313.pdf


TOPO! map printed on 07/28/17 from "Untitled.tpo"
104.63333° W
104.60000° W
104.56667° W
104.53333° W
104.50000° W
104.46667° W
104.43333° W
104.40000° W
104.36667° W
104.33333° W
WGS84 104.28333° W
32.85000° N
32.81667° N
32.78333° N
32.75000° N
32.71667° N
32.68333° N
32.65000° N
32.61667° N
32.58333° N
32.55000° N
32.51667° N
32.48333° N
Artesia, NM
MAP 1
W Grand Ave
W Hermosa Dr
South Boyd Federal Com 16H
Map created with TOPO! ©2010 National Geographic, ©2005 Tele Atlas, Rel. 8/2005
NATIONAL GEOGRAPHIC
0 1 2 3 4 5 6 miles
0 2 4 6 8 10 km
TN + MN
7.5°
07/28/17


TOPO! map printed on 07/28/17 from "Untitled.tpo"
104.55000° W
104.53333° W
104.51667° W
104.50000° W
104.48333° W
104.46667° W
104.45000° W
104.43333° W
104.41667° W
WGS84 104.38333° W
32.70000° N
32.68333° N
32.66667° N
32.65000° N
32.63333° N
32.61667° N
32.60000° N
32.58333° N
32.56667° N
32.55000° N
32.53333° N
MAP 2
Fourmile
Draw
Rivers
Seven
North
23
South Boyd Federal Com 16H
Landing Strips
Seven Rivers
Long
Draw
Willow
Draw
285
381
Map created with TOPO! ©2010 National Geographic; ©2005 Tele Atlas Rel. 8/2005
NATIONAL GEOGRAPHIC
0.0 0.5 1.0 1.5 2.0 2.5 3.0 miles
0 1 2 3 4 5 km
TN MN
7.5
07/28/17

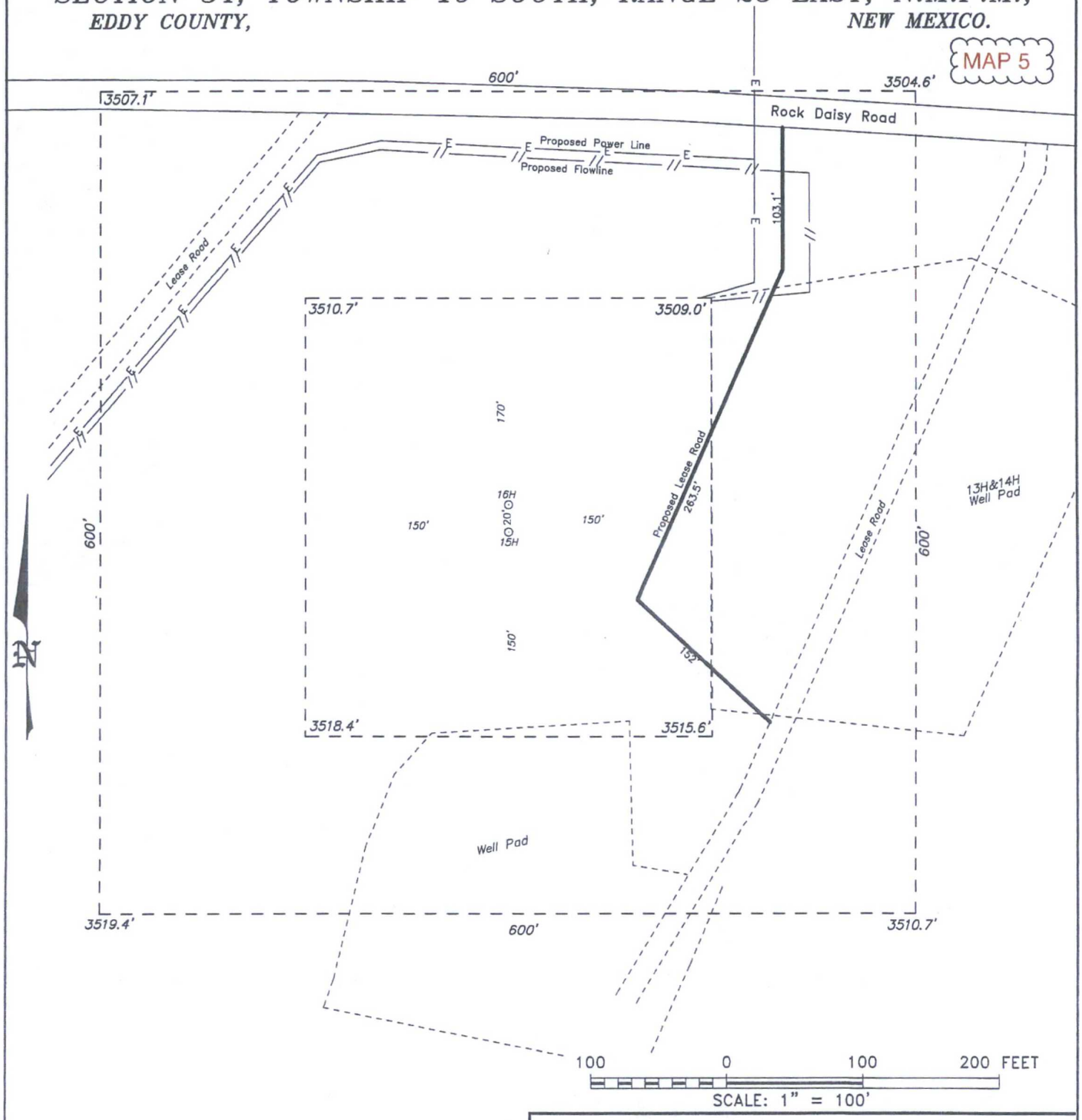

MAP 3
1 mile radius
1 mile radius
Taylor Ross Ranch
Windmill 3444
fee lease
BLM O&G lease
NMNM-504364B
SHL
BHL
HRZ
SWD
North Seven Rivers
21
22
23
28
27
26
33
34
35
4
3
Windmill 3439
(C) Copyright 2016, Trimble
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Water
N
Quad: DAYTON
Scale: 1 inch = 2,000 ft.


23
23
32.62416, -104.46632
103.1' proposed road
32.62397, -104.46584
32.62389, -104.46730
32.62389, -104.46648
32.62387, -104.46557
32.62359, -104.46556
South Boyd
Federal Com
15H & 16H
South Boyd
Federal Com
13H & 14H
32.62313, -104.46647
32.62304, -104.4673
32.62304, -104.46648
32.623, -104.46589
MAP 4
N
100 ft
Google Earth

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO.

MAP 5



PERCUSSION PETROLEUM OPERATING, LLC

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,

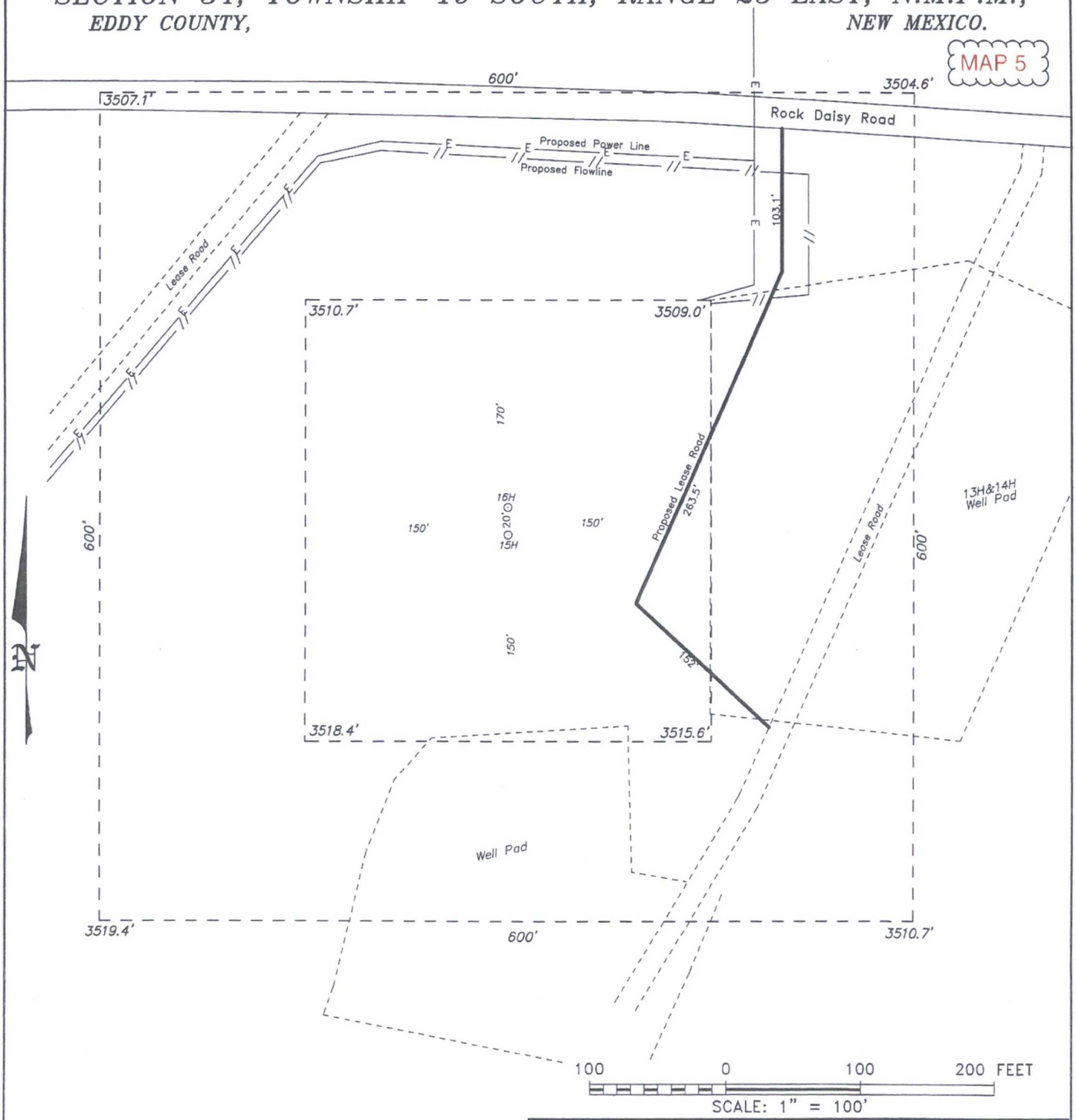
N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 33173	Drawn By: K GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 1 Sheets

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

MAP 5

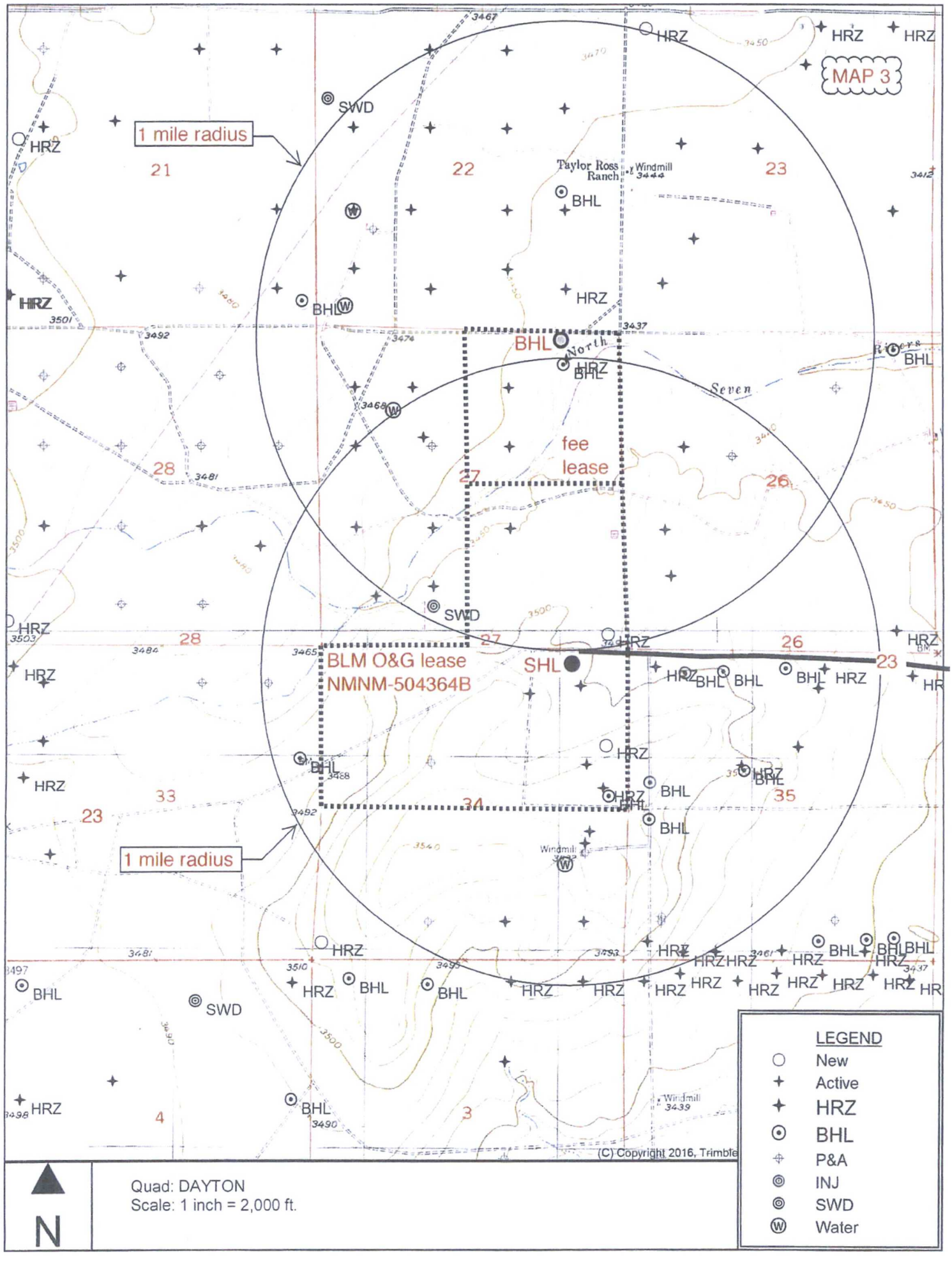


PERCUSSION PETROLEUM OPERATING, LLC

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,
N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

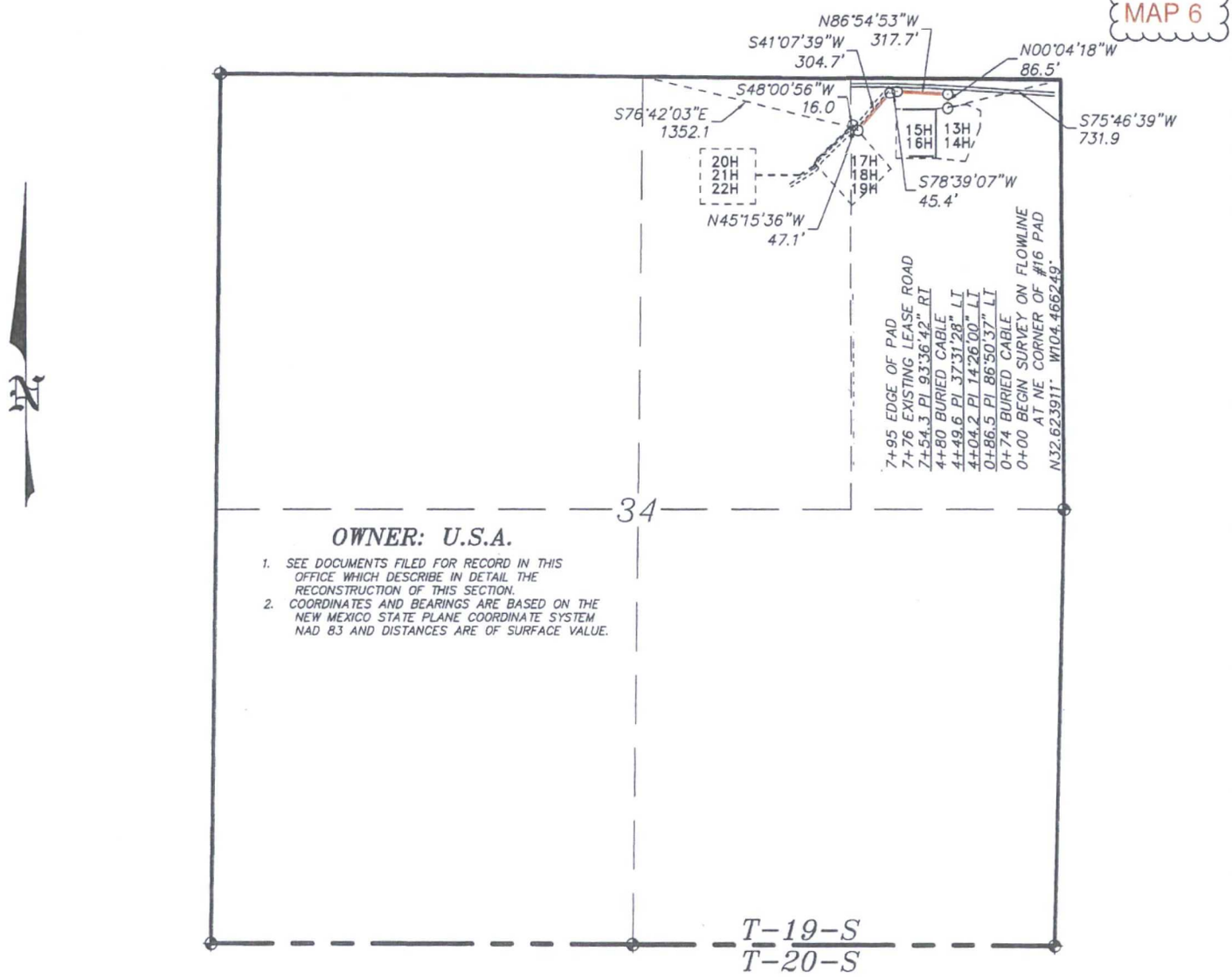
W.O. Number: 33173	Drawn By: K GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 1 Sheets


MAP 3
1 mile radius
1 mile radius
BHL
SHL
fee
lease
BLM O&G lease
NMNM-504364B
Taylor Ross Ranch
Windmill 3444
Windmill 3439
Seven Rivers
North
21
22
23
26
27
28
33
34
35
4
3
HRZ
BHL
SWD
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Water
(C) Copyright 2016, Trimble
Quad: DAYTON
Scale: 1 inch = 2,000 ft.
N

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST. N.M.P.M.,

EDDY COUNTY, NEW MEXICO.

MAP 6



OWNER: U.S.A.

1. SEE DOCUMENTS FILED FOR RECORD IN THIS OFFICE WHICH DESCRIBE IN DETAIL THE RECONSTRUCTION OF THIS SECTION.
2. COORDINATES AND BEARINGS ARE BASED ON THE NEW MEXICO STATE PLANE COORDINATE SYSTEM NAD 83 AND DISTANCES ARE OF SURFACE VALUE.

LEGAL DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE, LOCATED IN SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

GARY L. JONES, N.M. P.S. No. 7977
TEXAS P.S. No. 5074

GARY L. JONES NEW MEXICO 7977 REGISTERED PROFESSIONAL LAND SURVEYOR

1000 0 1000 2000 FEET

PERCUSSION PETROLEUM, LLC

REF: PROPOSED SOUTH BOYD 13H TO THE 20H FLOWLINE

A FLOWLINE CROSSING USA LAND IN

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST.

N.M.P.M., EDDY COUNTY, NEW MEXICO.

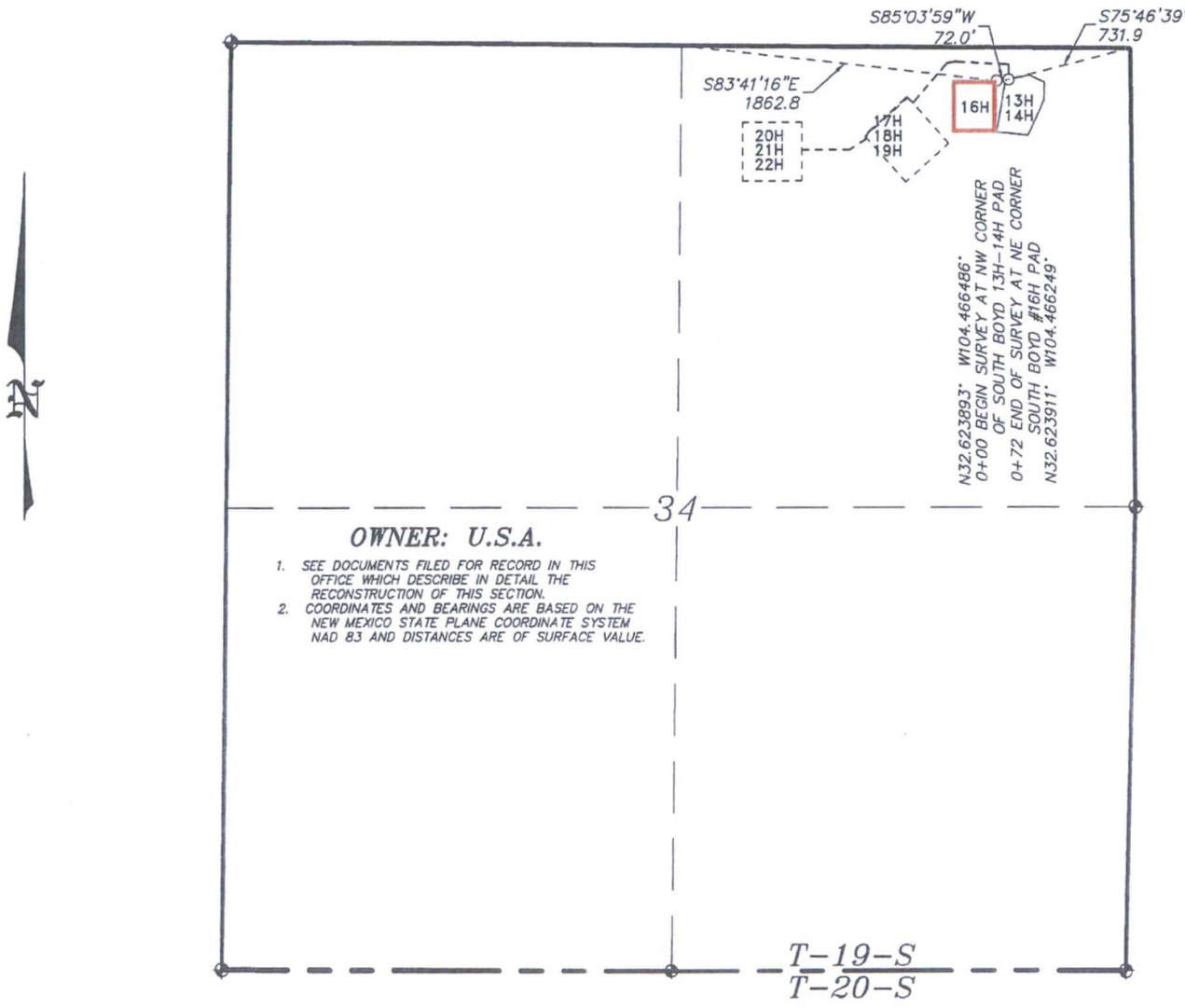
basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 33222	Drawn By: K. GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 2 Sheets

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST. N.M.P.M.,

EDDY COUNTY, **NEW MEXICO**

MAP 7



OWNER: U.S.A.

1. SEE DOCUMENTS FILED FOR RECORD IN THIS OFFICE WHICH DESCRIBE IN DETAIL THE RECONSTRUCTION OF THIS SECTION.
2. COORDINATES AND BEARINGS ARE BASED ON THE NEW MEXICO STATE PLANE COORDINATE SYSTEM NAD 83 AND DISTANCES ARE OF SURFACE VALUE.

LEGAL DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE, LOCATED IN SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

1000 0 1000 2000 FEET

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

GARY L. JONES — NEW MEXICO — 7977 — REGISTERED PROFESSIONAL LAND SURVEYOR

GARY L. JONES P.S. No. 7977
No. 5074

basin surveys
focused on excellence in the oilfield

P.O. Box 1786 (575) 393-7316 – Office
1120 N. West County Rd. (575) 392-2206 – Fax
Hobbs, New Mexico 88241 basinsurveys.com

PERCUSSION PETROLEUM, LLC

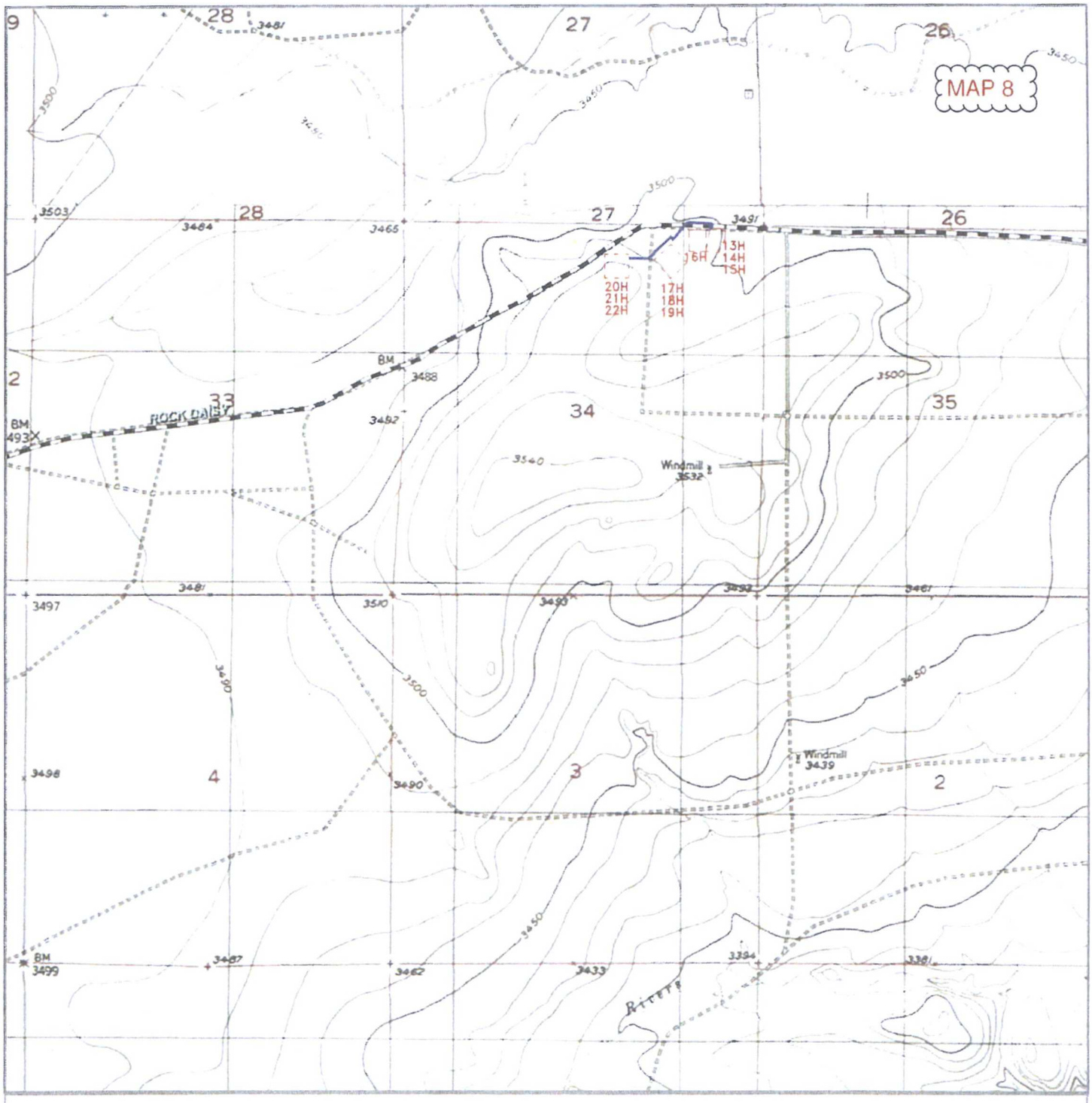
REF: PROPOSED SOUTH BOYD 13H TO THE 16H FLOWLINE

A FLOWLINE CROSSING USA LAND IN

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST.

N.M.P.M., EDDY COUNTY, NEW MEXICO.

W.O. Number: 33222	Drawn By: K. GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 1 Sheets



PROPOSED SOUTH BOYD FLOWLINES

Section 34, Township 19 South, Range 25 East,
N.M.P.M., Eddy County, New Mexico.

basin surveys
focused on excellence in the oilfield

P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

0' 1000' 2000' 3000' 4000'
SCALE: 1" = 2000'

W.O. Number: KJG 33222

Survey Date: 07-28-2017

YELLOW TINT - USA LAND
BLUE TINT - STATE LAND
NATURAL COLOR - FEE LAND

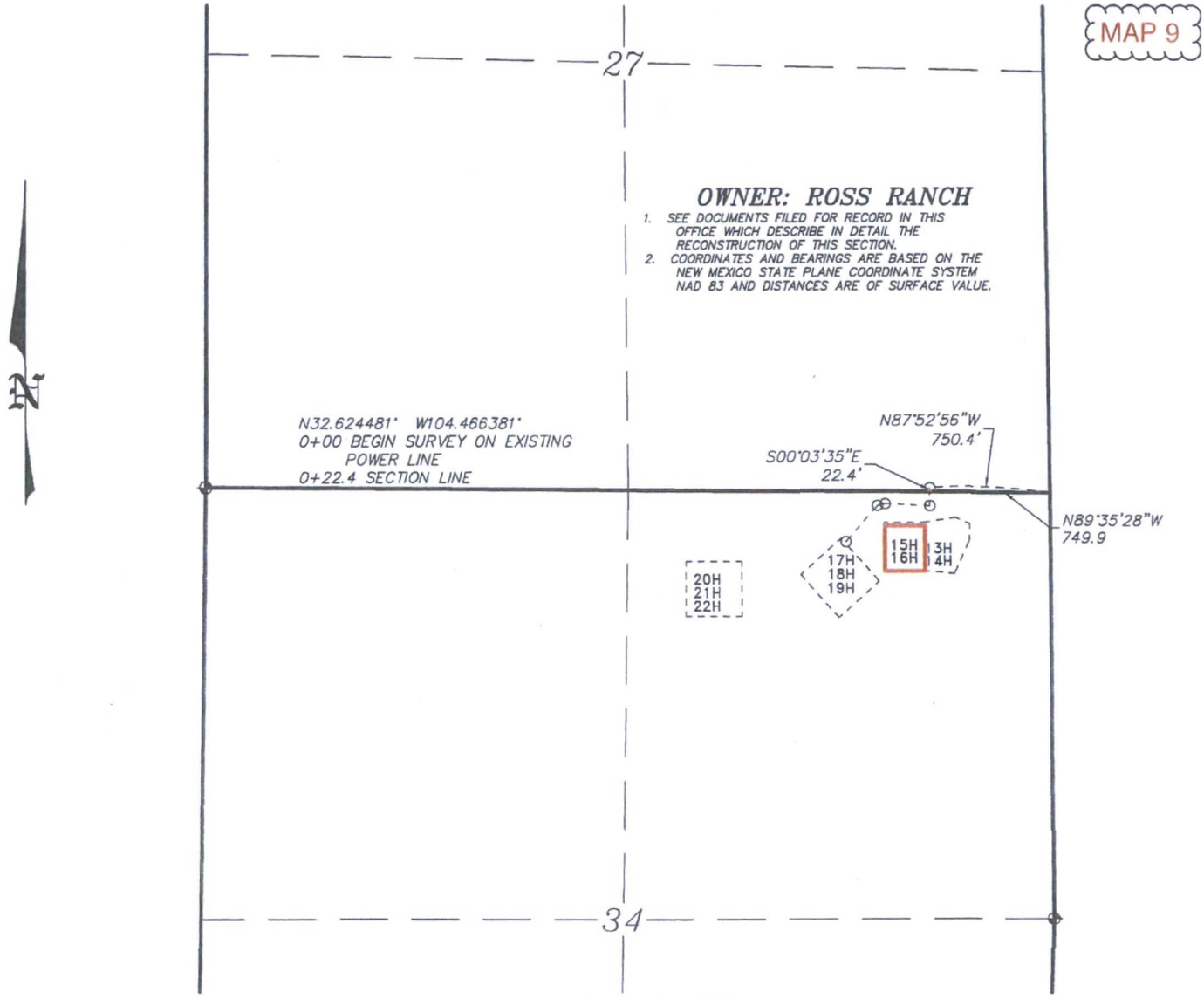
N

PERCUSSION PETROLEUM, LLC

SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST. N.M.P.M.,

EDDY COUNTY, **NEW MEXICO.**

MAP 9



LEGAL DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE, LOCATED IN SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

GARY L. JONES, N.M. P.S. No. 7977
TX. No. 5074

GARY L. JONES NEW MEXICO 7977 REGISTERED PROFESSIONAL LAND SURVEYOR

1000 0 1000 2000 FEET

PERCUSSION PETROLEUM, LLC

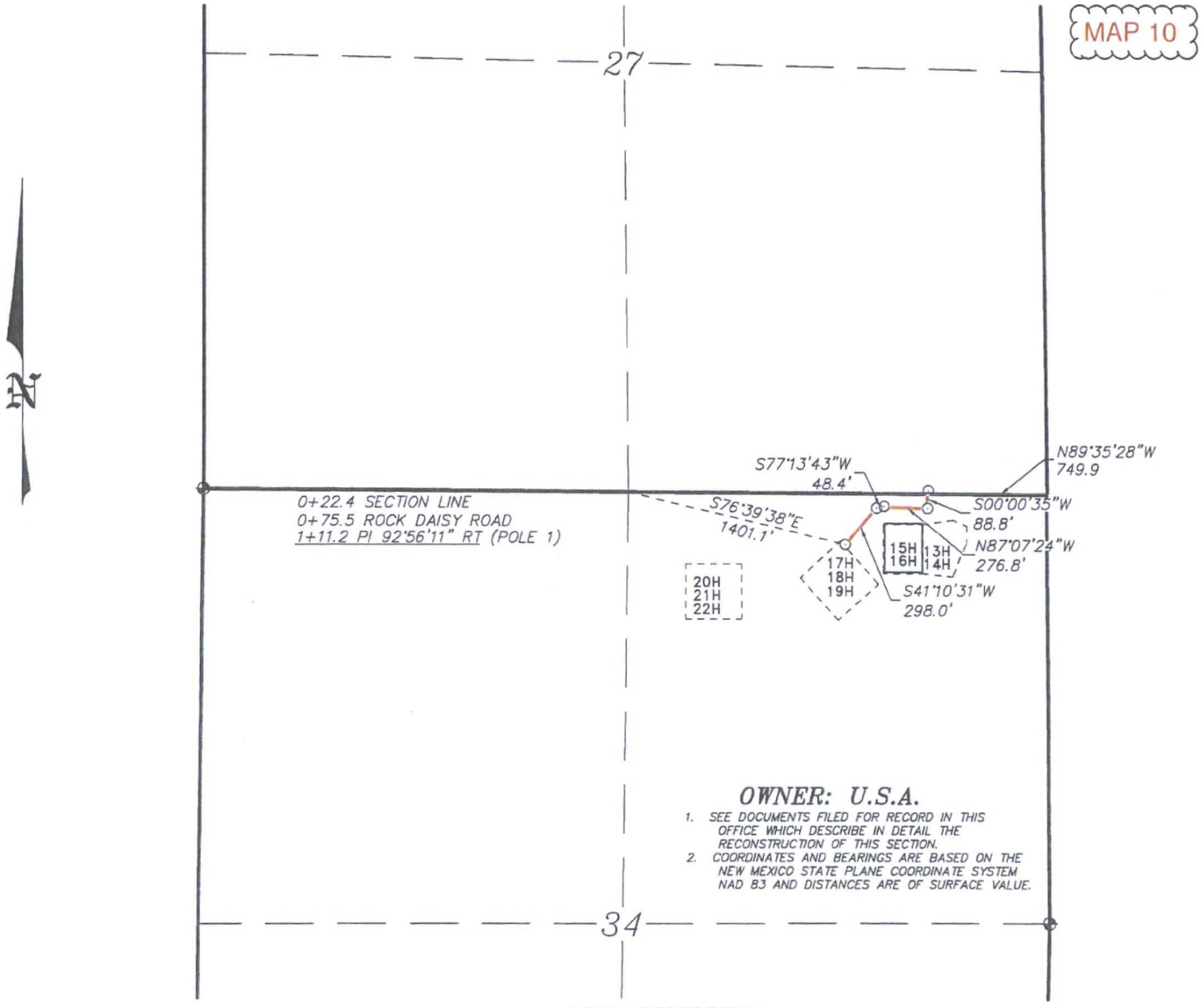
AN ELECTRIC LINE CROSSING LAND IN
SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST.
N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 33217	Drawn By: K. GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 2 Sheets

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST. N.M.P.M.,

EDDY COUNTY, NEW MEXICO.



LEGAL DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE, LOCATED IN SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

GARY L. JONES — NEW MEXICO — 7977 — REGISTERED PROFESSIONAL LAND SURVEYOR

GARY L. JONES, N.M. P.S. No. 7977
TEXAS No. 5074

1000 0 1000 2000 FEET

PERCUSSION PETROLEUM, LLC

AN ELECTRIC LINE CROSSING USA LAND IN
SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST.
N.M.P.M., EDDY COUNTY, NEW MEXICO.

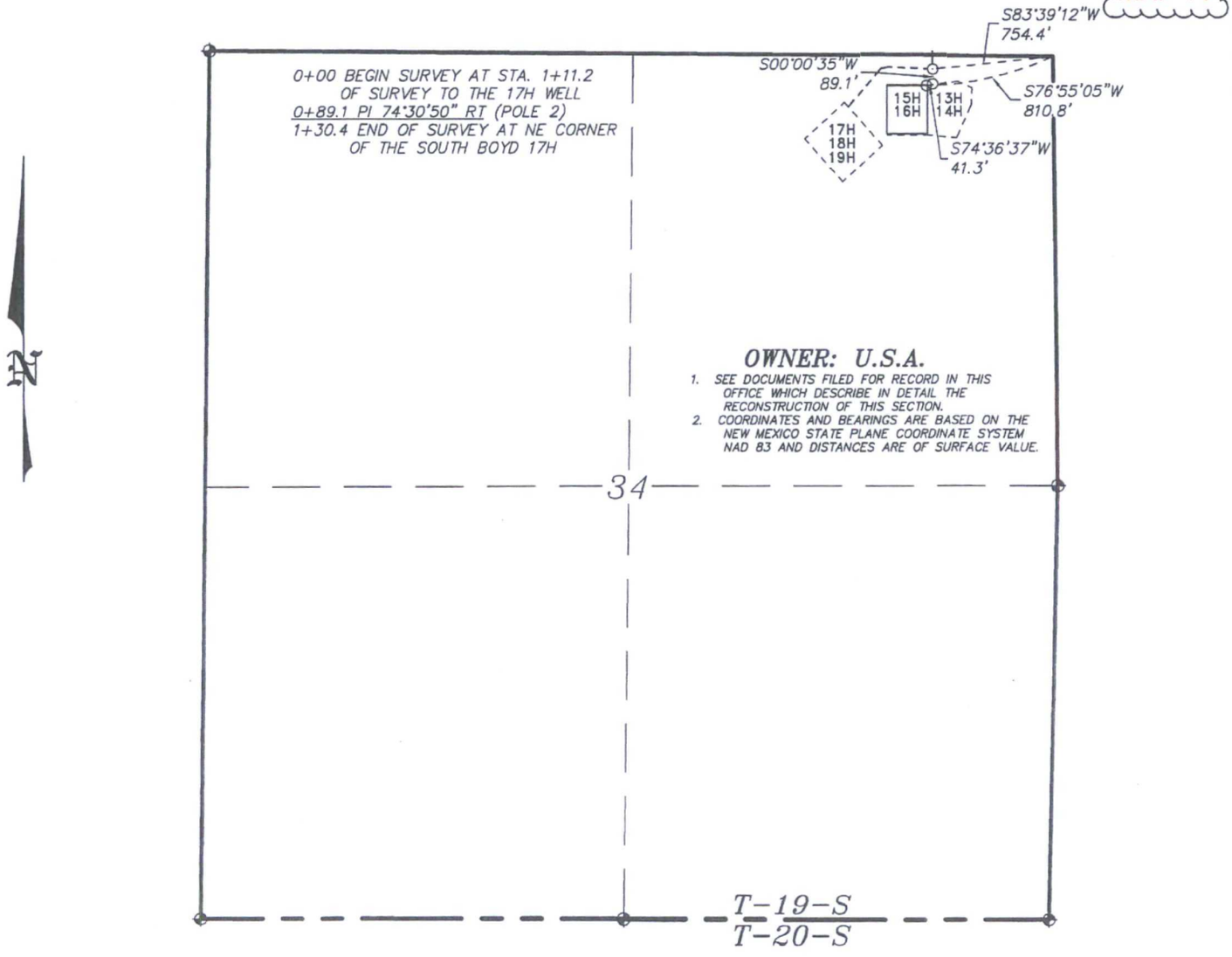
basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 33217	Drawn By: K. GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 2 of 2 Sheets

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST. N.M.P.M.,

EDDY COUNTY, **NEW MEXICO.**

MAP 11



LEGAL DESCRIPTION

A STRIP OF LAND 30.0 FEET WIDE, LOCATED IN SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

GARY L. JONES — NEW MEXICO — 7977 — REGISTERED PROFESSIONAL LAND SURVEYOR

GARY L. JONES, N.M. P.S. No. 7977
TEXAS No. 5074

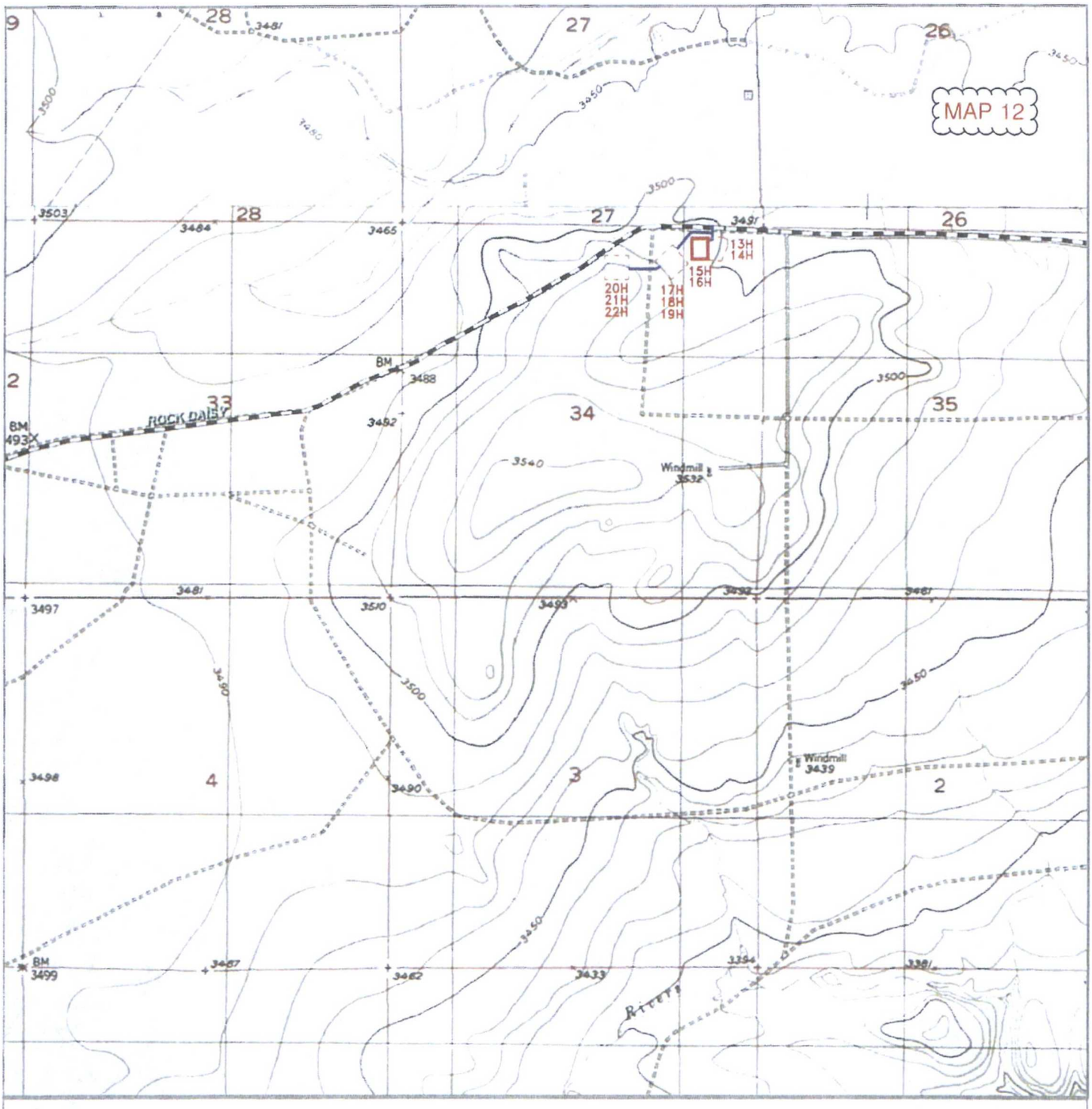
1000 0 1000 2000 FEET

PERCUSSION PETROLEUM, LLC

AN ELECTRIC LINE CROSSING USA LAND IN
SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST.
N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 33217	Drawn By: K. GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 1 Sheets



PROPOSED SOUTH BOYD ELECTRIC LINES

Section 34, Township 19 South, Range 25 East,
N.M.P.M., Eddy County, New Mexico.

basin surveys
focused on excellence in the oilfield

P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

0' 1000' 2000' 3000' 4000'

SCALE: 1" = 2000'

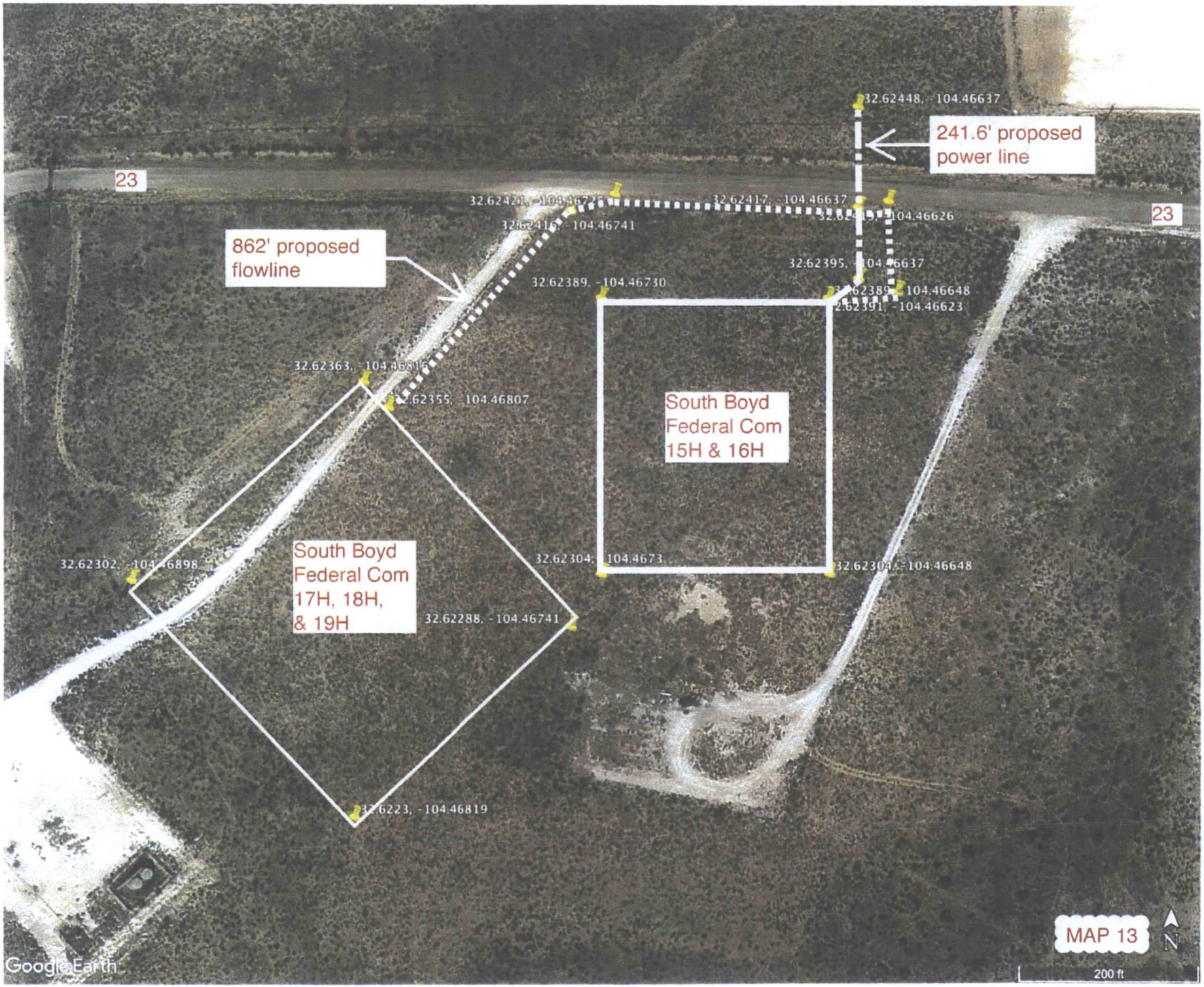
W.O. Number: KJG 33217

Survey Date: 07-28-2017

YELLOW TINT - USA LAND
BLUE TINT - STATE LAND
NATURAL COLOR - FEE LAND

N

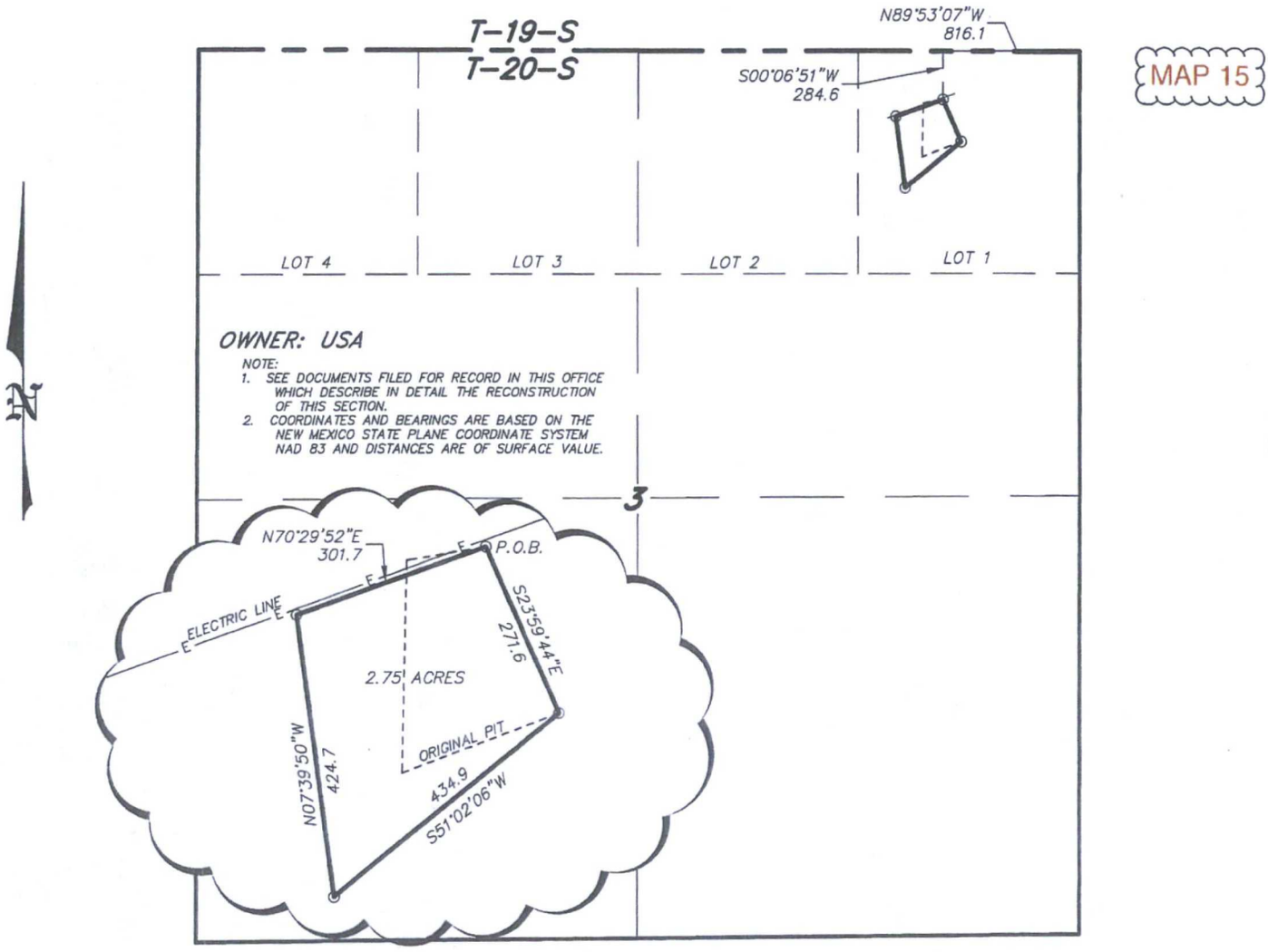
PERCUSSION PETROLEUM, LLC


32.62448, -104.46637
241.6' proposed power line
23
32.62421, -104.46725
32.62417, -104.46637
32.62417, -104.46741
32.62395, -104.46637
862' proposed flowline
32.62389, -104.46730
32.62389, -104.46648
32.62391, -104.46623
32.62363, -104.46816
32.62355, -104.46807
South Boyd Federal Com 15H & 16H
32.62302, -104.46898
South Boyd Federal Com 17H, 18H, & 19H
32.62304, -104.4673
32.62304, -104.46648
32.62288, -104.46741
32.6223, -104.46819
MAP 13
N
200 ft
Google Earth

MAP 14


storage pond
for fresh H2O
temporary surface
lay flat water line
Seven Rivers
well RA 10949
NWNE 6-20s-26e
Seven Rivers
well RA 10918
NESE 11-20s-25e
Seven Rivers
Google Earth
4000 ft
N

SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.



LEGAL DESCRIPTION

A TRACT OF LAND LOCATED IN SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT WHICH LIES N89°53'07"W., 816.1 FEET AND S00°06'51"W., 284.6 FEET FROM THE NORTHEAST CORNER OF SAID SECTION 3; THENCE S23°59'44"E., 271.6 FEET; THENCE S51°02'06"W., 434.9 FEET; THENCE N07°39'50"W., 424.7 FEET; THENCE N70°29'52"E., 301.7 FEET TO THE POINT OF BEGINNING. SAID TRACT OF LAND BEING 2.75 ACRES, MORE OR LESS.

I HEREBY CERTIFY THAT THIS PLAT WAS PREPARED FROM FIELD NOTES OF AN ACTUAL SURVEY AND MEETS OR EXCEEDS ALL REQUIREMENTS FOR LAND SURVEYS AS SPECIFIED BY THIS STATE.

GARY L. JONES — NEW MEXICO — 7977 — PROFESSIONAL LAND SURVEYOR

GARY L. JONES, N.M. P.S. No. 7977
TEXAS P.S. No. 5074

1000 0 1000 2000 FEET

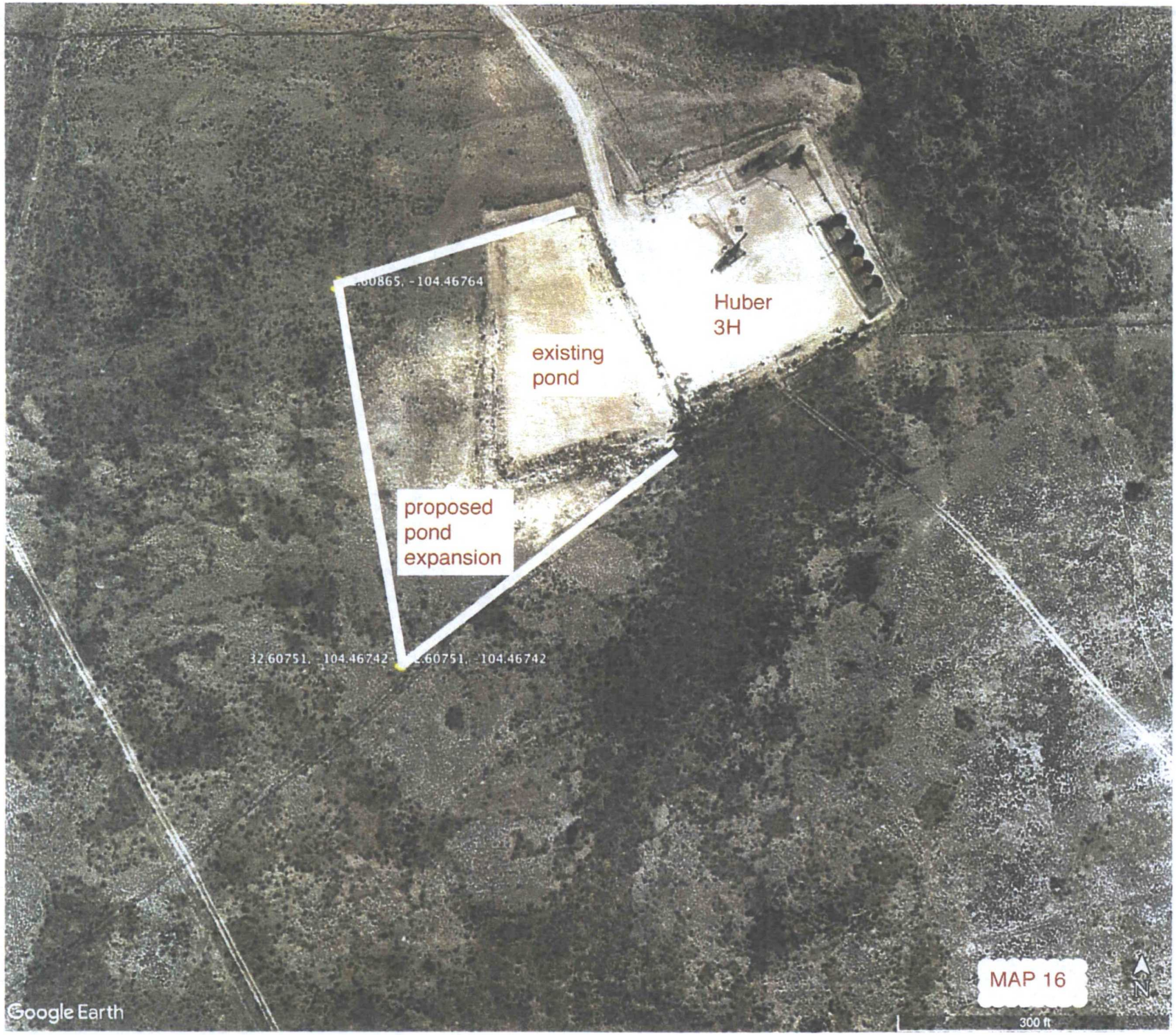
PERCUSSION PETROLEUM, LLC

REF: HUBER WATER PIT EXPANSION

A TRACT OF LAND LOCATED ON USA LAND IN SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 33050	Drawn By: J. GOAD	Date: 6-15-2017	Survey Date: 6-9-2017	Sheet 1 of 1 Sheets

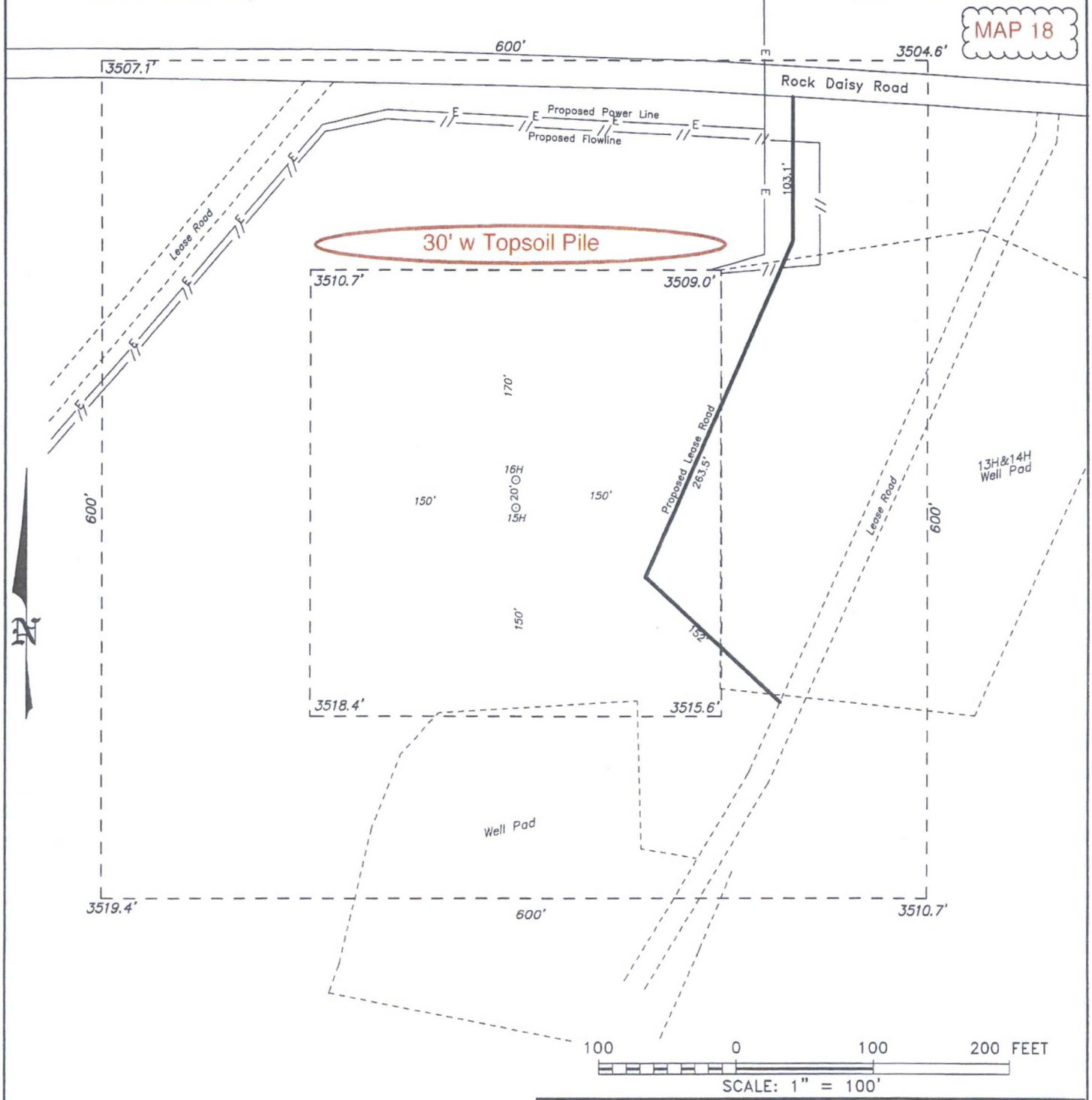

Huber
3H
existing
pond
proposed
pond
expansion
32.60751, -104.46742
MAP 16
Google Earth
300 ft


32.62389, -104.46730
32.62389, -104.46648
15H
16H
32.62304, -104.46673
32.62304, -104.46648
≈7025' proposed
temporary surface
fresh water line
pond
Google Earth
MAP 17
N
1000 ft

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO.

MAP 18



PERCUSSION PETROLEUM OPERATING, LLC

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,

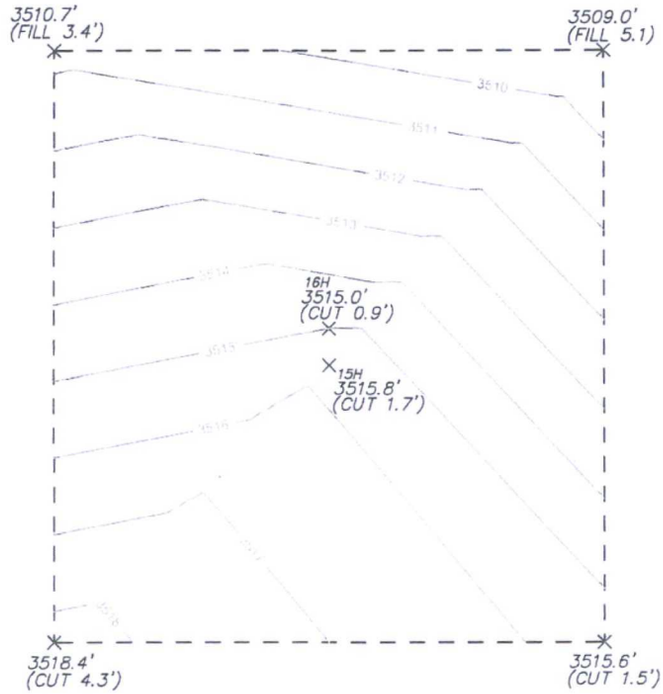
N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 33173	Drawn By: K GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 1 Sheets

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

MAP 19



100 0 100 200 FEET

SCALE: 1" = 100'

PERCUSSION PETROLEUM OPERATING, LLC

REF: SOUTH BOYD FEDERAL COM #15H&16H / WELL PAD CUT & FILL

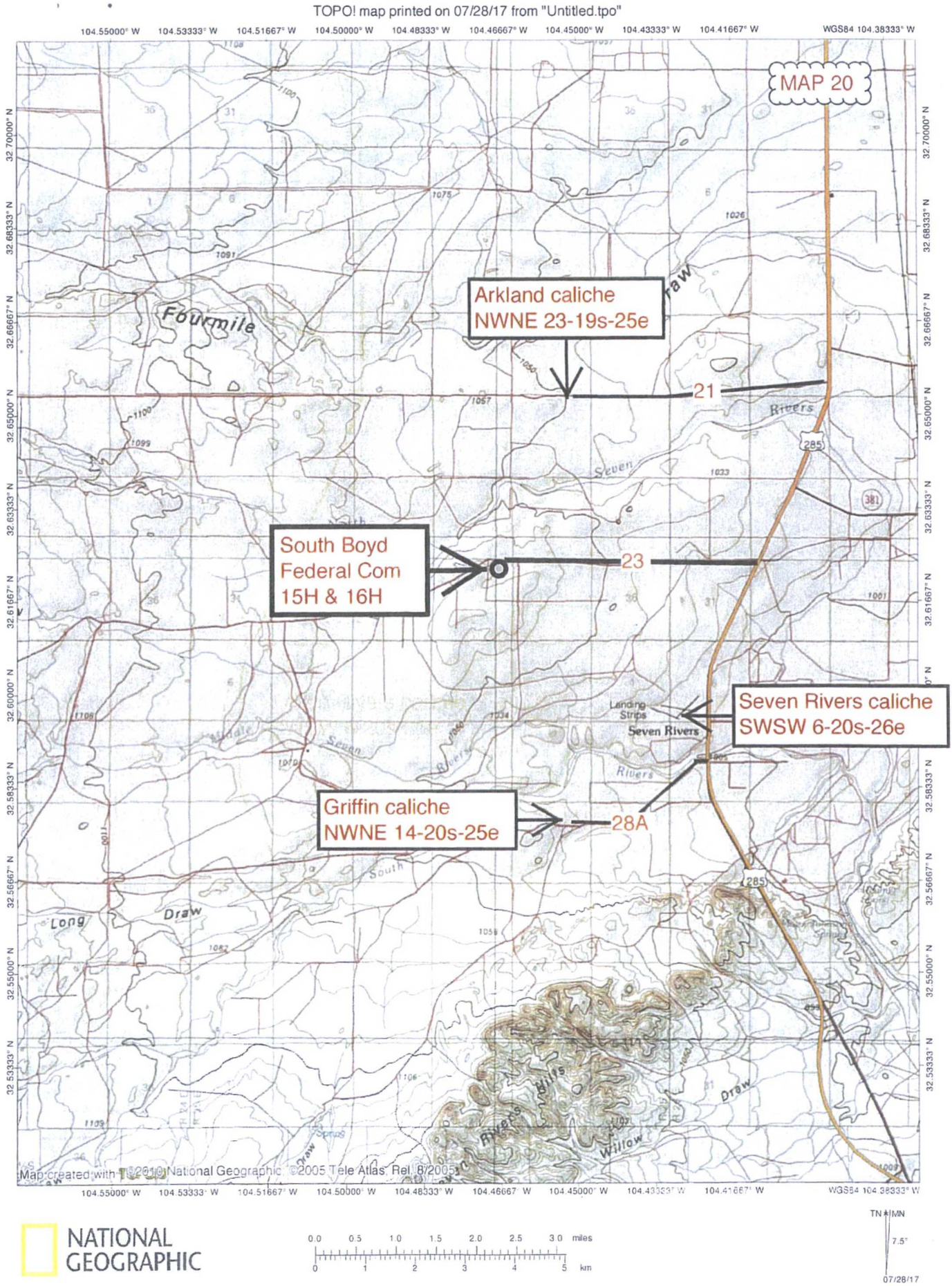
A WELL PAD LOCATED IN

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,

N.M.P.M., EDDY COUNTY, NEW MEXICO.

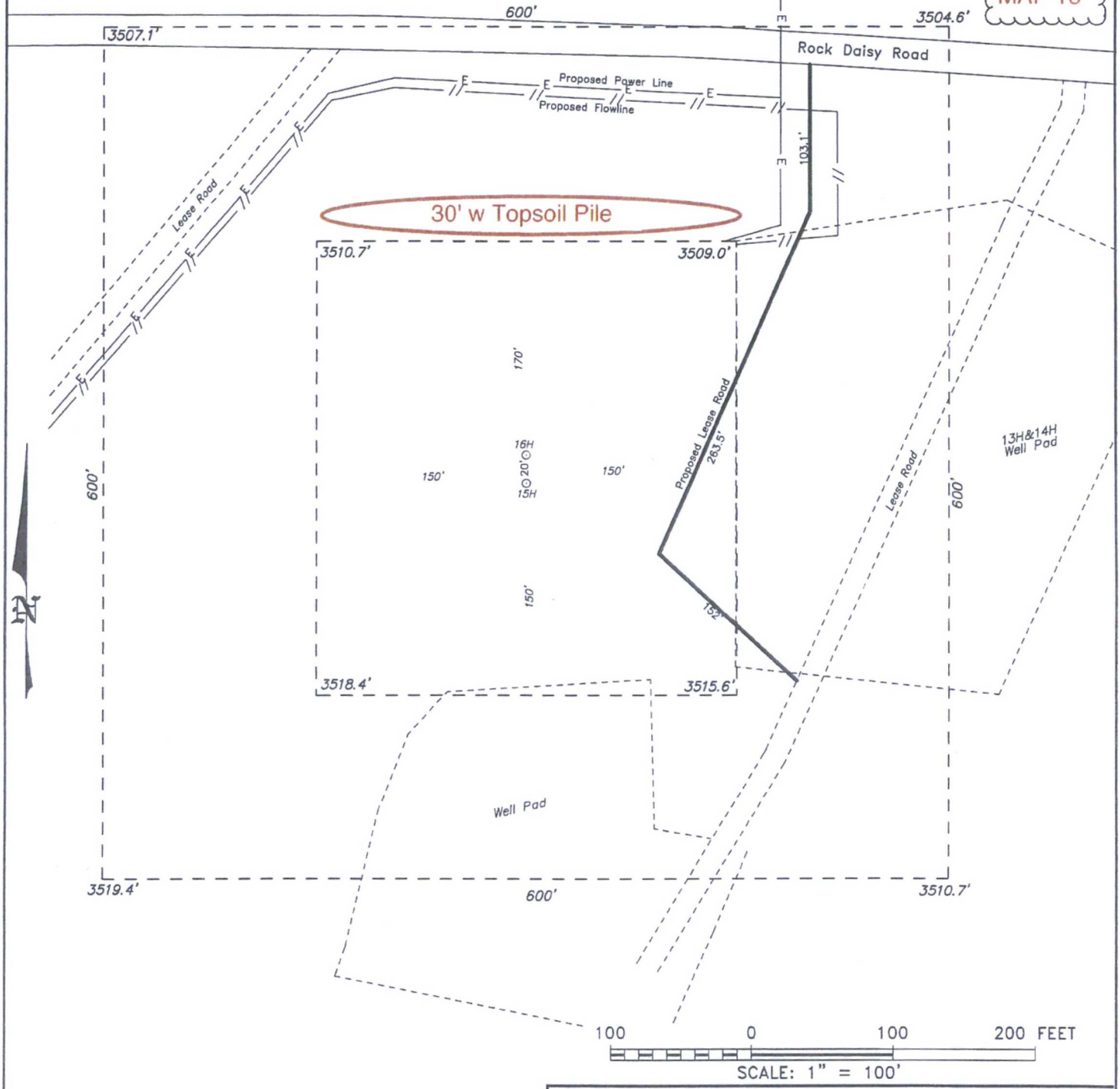
basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 32948	Drawn By: K GOAD	Date: 06-01-2017	Survey Date: 05-06-2017	Sheet 1 of 1 Sheets


TOPO! map printed on 07/28/17 from "Untitled.tpo"
104.55000° W 104.53333° W 104.51667° W 104.50000° W 104.48333° W 104.46667° W 104.45000° W 104.43333° W 104.41667° W WGS84 104.38333° W
32.70000° N 32.68333° N 32.66667° N 32.65000° N 32.63333° N 32.61667° N 32.60000° N 32.58333° N 32.56667° N 32.55000° N 32.53333° N
MAP 20
Arkland caliche
NWNE 23-19s-25e
21
South Boyd
Federal Com
15H & 16H
23
Seven Rivers caliche
SWSW 6-20s-26e
Griffin caliche
NWNE 14-20s-25e
28A
Fourmile
Draw
Seven
Rivers
Landing
Strips
Seven Rivers
Long
Draw
Willow
Draw
285
381
Map created with TOPO! ©2010 National Geographic. ©2005 Tele Atlas, Rel. 8/2005
NATIONAL GEOGRAPHIC
0.0 0.5 1.0 1.5 2.0 2.5 3.0 miles
0 1 2 3 4 5 km
TN
MN
7.5°
07/28/17

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

MAP 18



PERCUSSION PETROLEUM OPERATING, LLC

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,
N.M.P.M., EDDY COUNTY, NEW MEXICO.

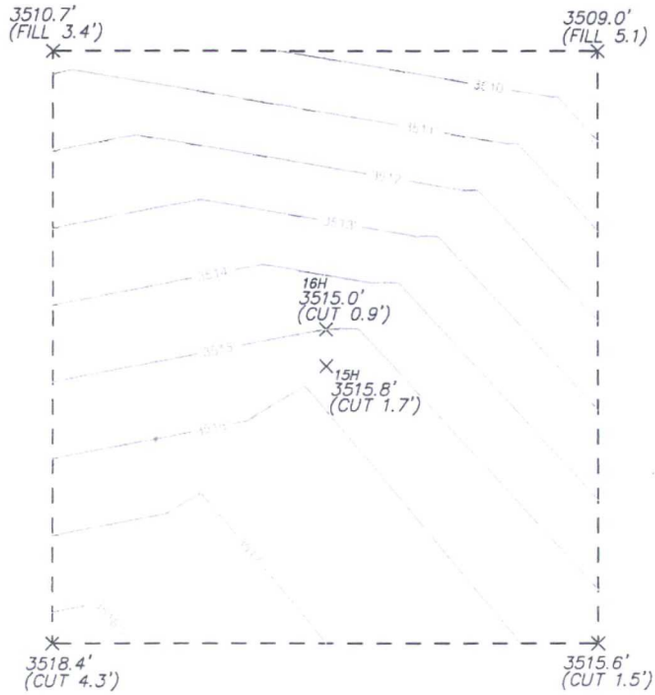
basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 – Office
(575) 392-2206 – Fax
basinsurveys.com

W.O. Number: 33173	Drawn By: K GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 1 Sheets

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,

EDDY COUNTY, NEW MEXICO.

MAP 19



100 0 100 200 FEET

SCALE: 1" = 100'

PERCUSSION PETROLEUM OPERATING, LLC

REF: SOUTH BOYD FEDERAL COM #15H&16H / WELL PAD CUT & FILL

A WELL PAD LOCATED IN

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,

N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

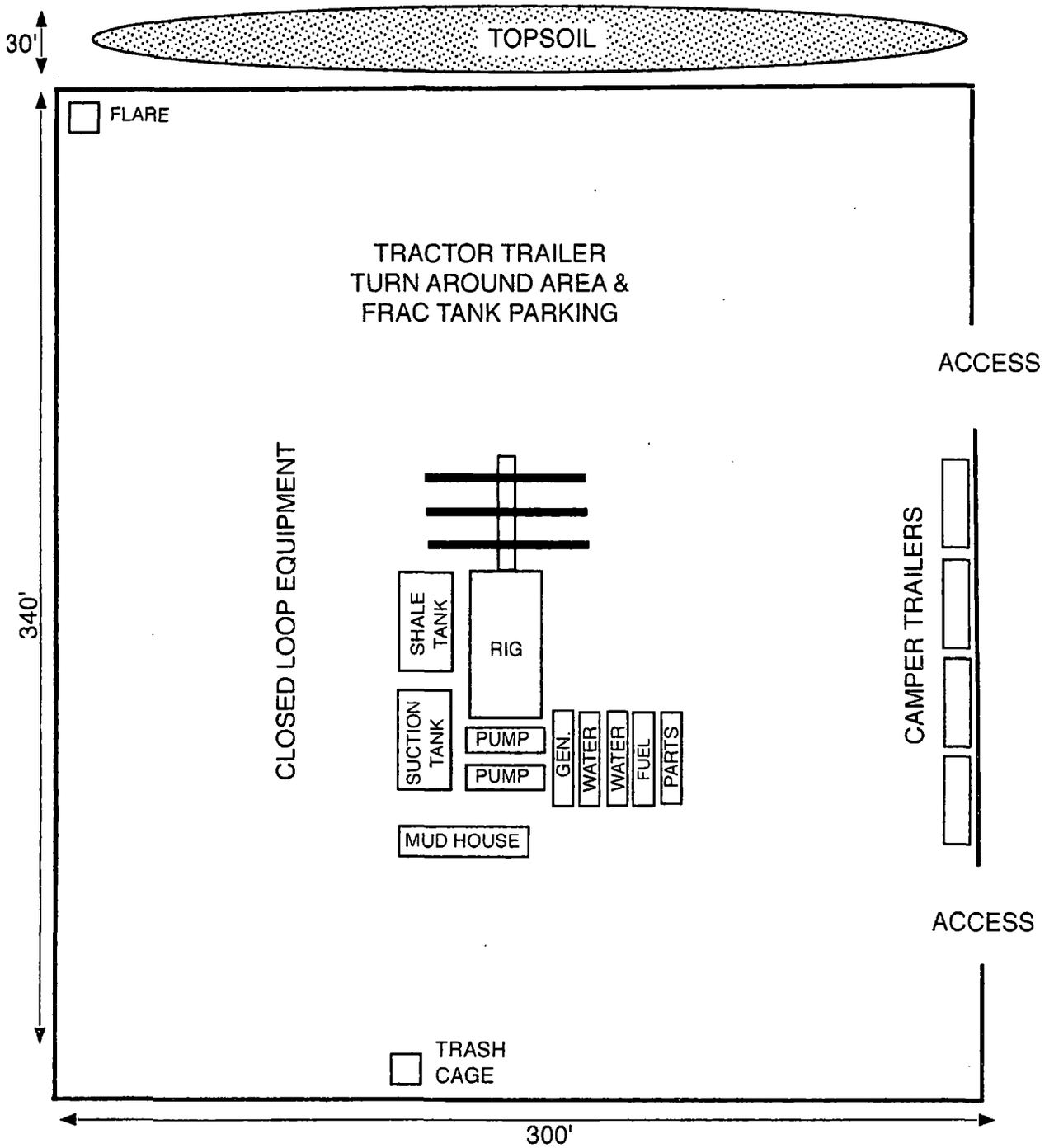
W.O. Number: 32948	Drawn By: K GOAD	Date: 06-01-2017	Survey Date: 05-06-2017	Sheet 1 of 1 Sheets

Percussion's
South Boyd Federal Com 16H
rig diagram

NORTH

1" = 50'

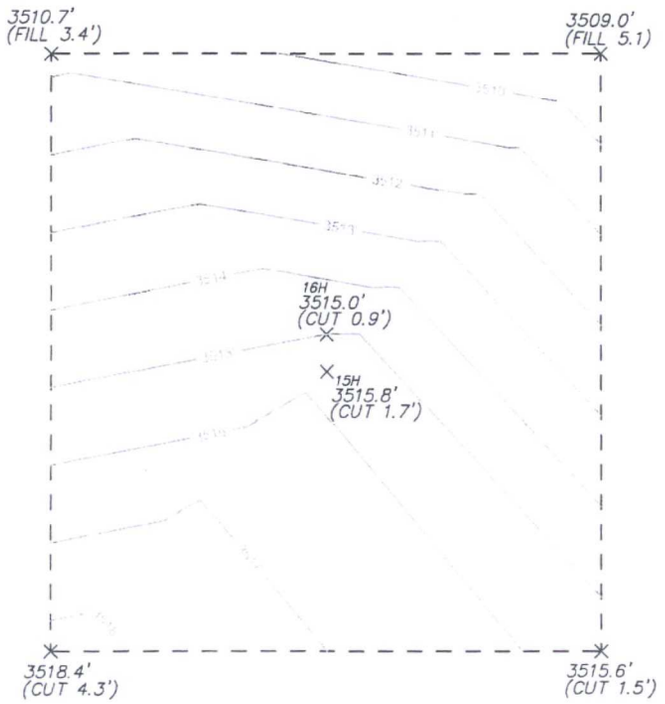
Prevailing Wind out of South or SSE



PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, *NEW MEXICO.*

MAP 19



N

100 0 100 200 FEET

SCALE: 1" = 100'

PERCUSSION PETROLEUM OPERATING, LLC

REF: SOUTH BOYD FEDERAL COM #15H&16H / WELL PAD CUT & FILL

A WELL PAD LOCATED IN

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,

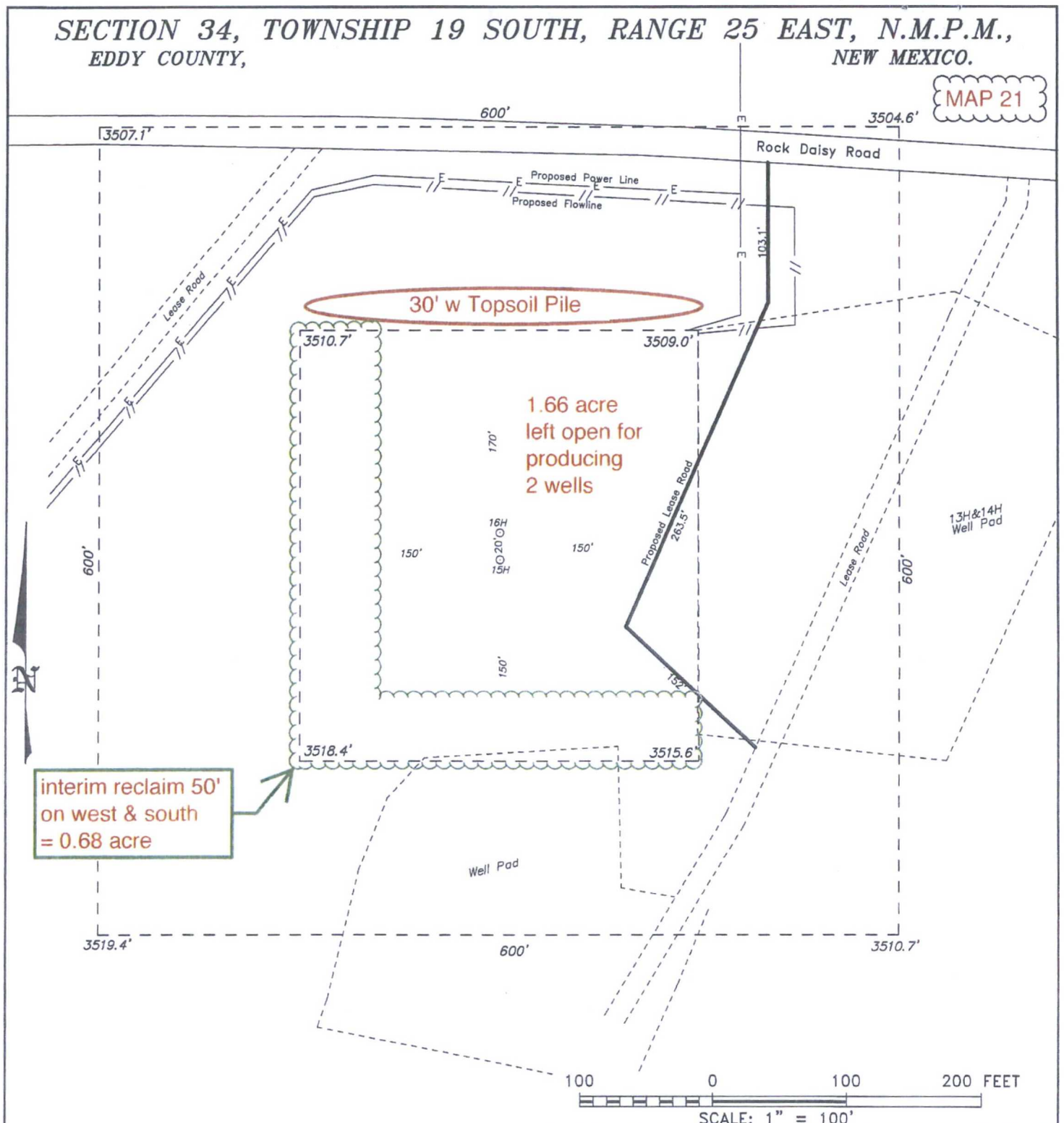
N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 - Office
(575) 392-2206 - Fax
basinsurveys.com

W.O. Number: 32948	Drawn By: K GOAD	Date: 06-01-2017	Survey Date: 05-06-2017	Sheet 1 of 1 Sheets

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M.,
EDDY COUNTY, NEW MEXICO.

MAP 21



PERCUSSION PETROLEUM OPERATING, LLC

SECTION 34, TOWNSHIP 19 SOUTH, RANGE 25 EAST,
N.M.P.M., EDDY COUNTY, NEW MEXICO.

basin surveys
focused on excellence in the oilfield
P.O. Box 1786
1120 N. West County Rd.
Hobbs, New Mexico 88241
(575) 393-7316 – Office
(575) 392-2206 – Fax
basinsurveys.com

W.O. Number: 33173	Drawn By: K GOAD	Date: 08-08-2017	Survey Date: 07-28-2017	Sheet 1 of 1 Sheets

Surface Use Plan

1. ROAD DIRECTIONS & DESCRIPTIONS (See MAPS 1 - 5)

From the junction of US 82 & US 285 in Artesia...
Go South 15.6 miles on US 285 to the equivalent of Mile Post 53.6
Then turn right and go West 3.25 miles on paved County Road 23 (Rock Daisy)
Then turn left and go S 103.1' on a proposed road onto the 13H/14H pad
West side of 13H/14H pad is east side of 15H/16H pad

Non-county roads will be maintained as needed to Gold Book standards. This includes pulling ditches and preserving the crown. This will be done at least once a year, and more often as needed.

2. ROAD TO BE BUILT OR UPGRADED (See MAP 5)

The 103.1' new resource road will be crowned and ditched, have a 14' wide driving surface, and be surfaced with caliche. Maximum disturbed width = 30'. Maximum grade = 3%. Maximum cut or fill = 1'. No culvert, cattle guard, or vehicle turn out is needed. No upgrade is needed.

3. EXISTING WELLS (See MAP 3)

Existing oil, gas, water, disposal, and P & A wells are within a mile. No injection well is within a mile radius.

4. PROPOSED PRODUCTION FACILITIES (See MAPS 6-13)

An 862' long ≈4" O D. HDPE flow line will be laid on the surface east, north, west, and southwest to a proposed central tank battery on the proposed

17H/18H/19H pad. A 241.6' long overhead raptor safe 3-phase power line will be built south and southwest from an existing power line.

5. WATER SUPPLY (See MAPS 14-17)

Water will be piped via one temporary surface 12" Kevlar lay flat pipeline from one of two water wells to a fresh water pond at Percussion's Huber Federal 3H well. Pipeline routes will not be bladed or excavated. Existing unlined pond will be expanded to 2.75 acres and lined with geotextile fabric and 12-30 mil liner.

Primary source will be Seven Rivers' well RA 10949 in NWNE 6-20s-29e. That route is ≈14,750' long (≈2950' private + ≈5350' State + ≈6450' BLM).

Secondary source will be Seven Rivers' well RA 10918 in NESE 11-20s-25e. That route is ≈14,000' long (≈6850' of private land + ≈7150' of BLM).

Two temporary surface 10" Kevlar lay flat pipelines will then be laid ≈7025' north and west along roads from the pond to the 15H/16H pad. Pipeline route will not be bladed or excavated.

6. CONSTRUCTION MATERIALS & METHODS (See MAPS 18-20)

NM One Call (811) will be notified before construction starts. Top ≈6" of soil and brush will be stockpiled north of the pad. V-door will face north. Closed loop drilling system will be used. Caliche will be hauled from existing caliche pits on private land. Arkland caliche pit is in NWNE 23-19s-25e. Seven Rivers caliche pit is in SWSW 6-20s-26e. Griffin caliche pit is in NWNE 14-20s-25e.

7. WASTE DISPOSAL

All trash will be placed in a portable trash cage. It will be hauled to the Eddy County landfill. There will be no trash burning. Contents (drill cuttings, mud, salts, and other chemicals) of the mud tanks will be hauled to R360's state approved (NM-01-0006) disposal site at Halfway. Human waste will be disposed of in chemical toilets and hauled to the Artesia wastewater treatment plant.

8. ANCILLARY FACILITIES

There will be no airstrip or camp. Camper trailers will be on location for the company man, tool pusher, and mud logger.

9. WELL SITE LAYOUT (See MAPS 18 & 19)

Also see Rig Layout diagram for depictions of the well pad, trash cage, access onto the location, parking, living facilities, and rig orientation.

10. RECLAMATION (See MAPS 19 & 21)

Interim reclamation will be completed within 6 months of completing the well. Interim reclamation will consist of shrinking the pad ≈29% (0.66 acre) by removing caliche and reclaiming 50' on the west and south sides. This will leave 1.68 acres for the anchors, pump jacks, and tractor-trailer turn around. Disturbed areas will be contoured to match pre-construction grades. Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM's requirements.

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 rest of the pad and

new road will be similarly reclaimed within 6 months of plugging. Noxious weeds will be controlled. Land use will be:

103.1' x 30' road = 0.07 acre
862' x 30' flow line = 0.59 acre
241.6' x 30' power line = 0.17 acre
20' x 14,750' water line to pond = 6.77 acres
20' x 7025' water line from pond = 3.23 acres
fresh water pond = 2.75 acres
+ 300' x 340' pad = 2.34 acres
15.92 acres short term
- 0.59 acre flow line
- 0.17 acre power line
- 0.66 acre interim reclamation on pad
- 20' x 14,750' water line to pond = 6.77 acres
- 20' x 6875' water line from pond = 3.23 acres
4.50 acres long term (2.75 ac. pond + 0.07 ac. road + 1.68 ac. pad)

11. SURFACE OWNER

Most construction will be on BLM land managed by the Carlsbad Field Office, 620 E. Greene St., Carlsbad NM 88220. Phone number is 575 234-5972. Remaining construction (22.4' power line) will be on private land (SESE 27-19s-25e) owned by Ross Ranch Inc. (P. O. Box 216, Lakewood NM 88254; (575) 365-4797). Percussion has an agreement with Ross.

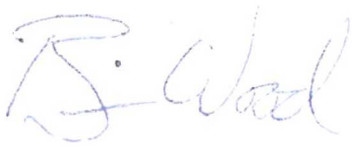
12. OTHER INFORMATION

On site inspection was held with Jim Goodbar and Jessie Bassett (both BLM) on July 18, 2017.

Lone Mountain has inspected the project area and will submit an archaeology report.

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. Executed this 28th day of October, 2017.



Brian Wood, Consultant
Permits West, Inc.
37 Verano Loop, Santa Fe, NM 87508
(505) 466-8120 FAX: (505) 466-9682 Cellular: (505) 699-2276

Field representative will be:

Lelan Anders, Operations Manager
Percussion Petroleum Operating, LLC
919 Milam, Suite 2475
Houston TX 77002
Office: (713) 429-1291
Mobile: (281) 908-1752

October 28, 2017

To Who it May Concern:

Percussion Petroleum Operating, LLC has a private surface owner agreement with Ross Ranch Inc. (PO Box 216, Lakewood NM 88254) for a 22.4' long powerline in SESE Section 27, T. 19 S., R. 25 E., Eddy County, NM. Their phone number is (575) 365-4797.

Brian Wood

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:

Decribe 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:

Decribe 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:

AFMSS

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

Bond Info Data Report

03/30/2018

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001424

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: