

RECEIVED

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

JUL 02 2019

APPLICATION FOR PERMIT TO DRILL OR REENTER

DISTRICT #1 ARTESIA O.C.D.

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM014758
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator PERCUSSION PETROLEUM OPERATING LLC		8. Lease Name and Well No. LAKEWOOD FEDERAL COM 12H. 324926
3a. Address 919 Milam Street, Suite 2475 Houston TX 77002	3b. Phone No. (include area code) (713)589-2337	9. API Well No. 30-015-46171
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface LOT 3 / 755 FNL / 1820 FWL / LAT 32.607637 / LONG -104.475348 At proposed prod. zone NENW / 20 FNL / 1865 FWL / LAT 32.624393 / LONG -104.475063		10. Field and Pool, or Exploratory N. SEVEN RIVERS; GLORIETA -YESO
14. Distance in miles and direction from nearest town or post office* 16 miles		11. Sec., T. R. M. or Blk. and Survey or Area SEC 3 / T20S / R25E / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 755 feet		12. County or Parish EDDY
16. No of acres in lease 1442.36		13. State NM
17. Spacing Unit dedicated to this well 160		
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 1636 feet		20. BLM/BIA Bond No. in file FED: NMB001424
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3503 feet		22. Approximate date work will start* 11/01/2018
		23. Estimated duration 30 days
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Brian Wood / Ph: (505)466-8120	Date 10/11/2018
Title President		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 06/26/2019
Title Assistant Field Manager Lands & Minerals		
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.

APPROVED WITH CONDITIONS
Approval Date: 06/26/2019

RW 7-2-19. *(Instructions on page 2)

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 I: 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.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

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 connects this information to an 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 Connection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

Additional Operator Remarks

Location of Well

1. SHL: LOT 3 / 755 FNL / 1820 FWL / TWSP: 20S / RANGE: 25E / SECTION: 3 / LAT: 32.607637 / LONG: -104.475348 (TVD: 0 feet, MD: 0 feet)
PPP: LOT 3 / 755 FNL / 1820 FWL / TWSP: 20S / RANGE: 25E / SECTION: 3 / LAT: 32.607637 / LONG: -104.475348 (TVD: 0 feet, MD: 0 feet)
PPP: SENW / 0 FSL / 1867 FWL / TWSP: 19S / RANGE: 25E / SECTION: 34 / LAT: 32.609696 / LONG: -104.475215 (TVD: 2577 feet, MD: 3090 feet)
PPP: SENW / 2640 FNL / 1792 FWL / TWSP: 19S / RANGE: 25E / SECTION: 34 / LAT: 32.617001 / LONG: -104.47512 (TVD: 2854 feet, MD: 5751 feet)
BHL: NENW / 20 FNL / 1865 FWL / TWSP: 19S / RANGE: 25E / SECTION: 34 / LAT: 32.624393 / LONG: -104.475063 (TVD: 2592 feet, MD: 8403 feet)

BLM Point of Contact

Name: Tanja Baca

Title: Admin Support Assistant

Phone: 5752345940

Email: tabaca@blm.gov

Review and Appeal Rights

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

Approval Date: 06/26/2019

(Form 3160-3, page 4)

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	PERCUSSION PETROLEUM OPERATING
LEASE NO.:	NMNM014758
WELL NAME & NO.:	LAKWOOD FEDERAL COM 12H
SURFACE HOLE FOOTAGE:	755' FNL & 1820' FWL
BOTTOM HOLE FOOTAGE:	20' FNL & 1865' FWL
LOCATION:	Section 3, T. 20 S., R 25 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input type="radio"/> Low	<input type="radio"/> Medium	<input checked="" type="radio"/> High
Variance	<input checked="" type="radio"/> None	<input type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input checked="" type="radio"/> Conventional	<input type="radio"/> Multibowl	<input type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input type="checkbox"/> Fluid Filled	<input type="checkbox"/> Cement Squeeze	<input type="checkbox"/> Pilot Hole
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit

A. HYDROGEN SULFIDE

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

1. The **9-5/8** inch surface casing shall be set at approximately feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to

- include the lead cement)
- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the 7 inch intermediate casing is:
- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**
- ❖ **In High Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.**
3. The minimum required fill of cement behind the 5-1/2 inch production casing is:
- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

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

JJP05302019

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.

Lakewood Federal Com 12H to 19H Master COAs

Lakewood Federal Com 12H

Surface Hole Location: 755 ft. FNSL and 1820 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 1865 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 13H

Surface Hole Location: 775 ft. FNL and 1820 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 1765 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 14H

Surface Hole Location: 430 ft. FNSL and 1290 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 1545 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 15H

Surface Hole Location: 430 ft. FNL and 1270 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 1205 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 16H

Surface Hole Location: 430 ft. FNSL and 1250 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 985 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 17H

Surface Hole Location: 555 ft. FNSL and 645 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 900 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 18H

Surface Hole Location: 555 ft. FNSL and 825 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 700 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 19H

Surface Hole Location: 555 ft. FNSL and 605 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 360 ft. FWL; Section 34, T. 19 S., R. 25 E.

TABLE OF CONTENTS

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

- General Provisions**
- Permit Expiration**
- Archaeology, Paleontology, and Historical Sites**
- Noxious Weeds**
- Special Requirements**
 - Cave/Karst

- Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- Road Section Diagram**
- Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- Interim Reclamation**
- Final Abandonment & Reclamation**

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

Cave/Karst Surface Mitigation

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

Construction:

General Construction:

- No blasting
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
- All linear surface disturbance activities will avoid sinkholes and other karst features to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

Pad Construction:

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

- Following a rain event, all fluids will be vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

Tank Battery Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche – no blasting.
- All tank battery locations and facilities will be lined and bermed.
- The liner should be at least 20 mil in thickness and 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.

Road Construction:

- Turnout ditches and drainage leadoffs will not be constructed in such a manner as to increase or decrease the natural flow of water into or out of cave or karst features.
- Special restoration stipulations or realignment may be required if subsurface features are discovered during construction.

Buried Pipeline/Cable Construction:

- Rerouting of the buried line(s) may be required if a subsurface void is encountered during construction to minimize the potential subsidence/collapse of a feature(s) as well as the possibility of leaks/spills from entering the karst drainage system.

Powerline Construction:

- Smaller powerlines will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems.
- Larger powerlines will adjust their pole spacing to avoid cave and karst features.
- Special restoration stipulations or realignment may be required if subsurface voids are encountered.

Surface Flowlines Installation:

- Flowlines will be routed around sinkholes and other karst features to minimize the possibility of leaks/spills from entering the karst drainage system.

Leak Detection System:

- A method of detecting leaks is required. The method could incorporate gauges to measure loss, siting valves and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present.

- A leak detection plan will be submitted to BLM that incorporates an automatic shut off system (see below) to minimize the effects of an undesirable event that could negatively sensitive cave/karst resources.
- Well heads, pipelines (surface and buried), storage tanks, and all supporting equipment should be monitored regularly after installation to promptly identify and fix leaks.

Automatic Shut-off Systems:

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

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and groundwater 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:

- The kick off point 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 between surface and the base of the cave occurrence zone will be logged and reported in the drilling report.
- If a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, regardless of the type of drilling machinery used, 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:

- Additional plugging conditions of approval may be required upon well abandonment in high and medium karst potential occurrence zones.
- The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:

- The operator will perform annual pressure monitoring on all casing annuli and reported in a sundry notice.

- If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling

operations until the pit is free of fluids and the operator initiates backfilling. (For examples of enclosure fencing design, refer to BLM's Oil and Gas Gold Book, Enclosure 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

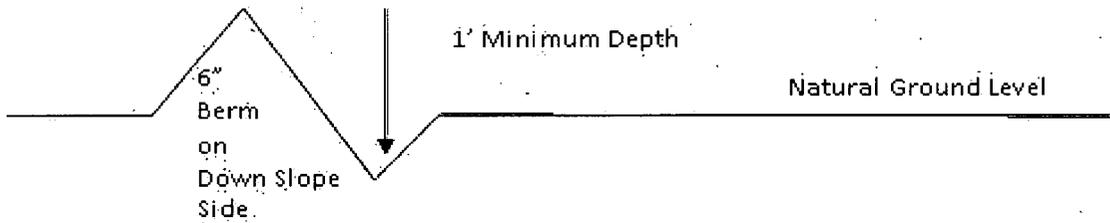
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

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

Fence Requirement

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

Public Access

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

Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

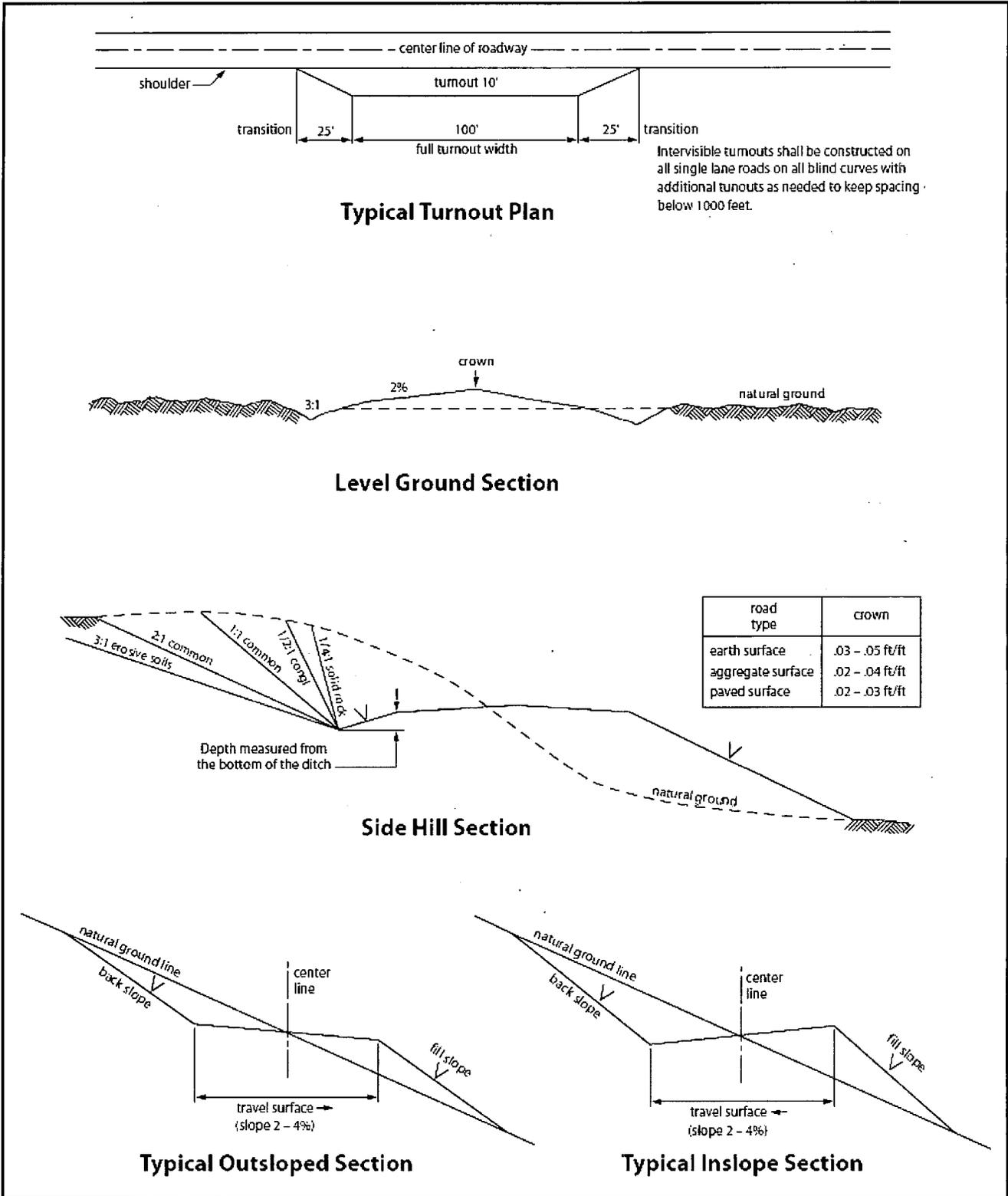


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

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

Exclosure Netting (Open-top Tanks)

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

Chemical and Fuel Secondary Containment and Exclosure Screening

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

Open-Vent Exhaust Stack Exclosures

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

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

Painting Requirement

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

B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

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

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

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 *et seq.* (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, *et seq.* or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, *et seq.*) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.
4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:
 - a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
 - b. Activities of other parties including, but not limited to:
 - (1) Land clearing.

- (2) Earth-disturbing and earth-moving work.
- (3) Blasting.
- (4) Vandalism and sabotage.

c. Acts of God.

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

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

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

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

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

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

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

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

11. In those areas where erosion control structures are required to stabilize soil conditions, the

holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

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

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

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

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

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

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

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, 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. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil 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 or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of 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 holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.
6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.
7. The maximum allowable disturbance for construction in this right-of-way will be 30 feet:
- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
 - Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
 - The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)
8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.
9. 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.
10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.
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. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix:

- | | |
|----------------------------------------------------|--------------------------------------------------|
| <input checked="" type="checkbox"/> seed mixture 1 | <input type="checkbox"/> seed mixture 3 |
| <input type="checkbox"/> seed mixture 2 | <input type="checkbox"/> seed mixture 4 |
| <input type="checkbox"/> seed mixture 2/LPC | <input type="checkbox"/> Aplomado Falcon Mixture |

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. 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. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. 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 before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (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.

17. 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 associated roads, 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.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

- a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.

- b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

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).

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:

<u>Species</u>	<u>lb/acre</u>
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



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

Operator Certification Data Report

06/27/2019

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: 10/10/2018

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:



APD ID: 10400035089

Submission Date: 10/11/2018

Highlighted data
reflects the most
recent changes

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400035089

Tie to previous NOS?

Submission Date: 10/11/2018

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: NMNM014758

Lease Acres: 1442.36

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

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: N. SEVEN RIVERS; Pool Name:
GLORIETA -YESO

Is the proposed well in an area containing other mineral resources? NATURAL GAS OIL

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

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:
LAKEWOOD FEDERAL COM
Number of Legs: 1

Number: 12H

Well Class: HORIZONTAL

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: 1636 FT

Distance to lease line: 755 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: Lake_12H_Plat_GasCap_Plan_20181024121015.pdf

Well work start Date: 11/01/2018

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 3239

	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	755	FNL	1820	FWL	20S	25E	3	Lot 3	32.607637	-104.475348	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 014758	3503	0	0
KOP Leg #1	730	FNL	1821	FWL	20S	25E	3	Lot 3	32.607705	-104.475344	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 014758	1480	2024	2023
PPP Leg #1	755	FNL	1820	FWL	20S	25E	3	Lot 3	32.607637	-104.475348	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 014758	3503	0	0

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

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	1279	0	1279	3503		1279	J-55	36	LTC	1.125	1.125	DRY	1.8	DRY	1.8
2	PRODUCTI ON	8.75	7.0	NEW	API	N	0	2300	0	2287	3503		2300	L-80	32	OTHER - BTC	1.125	1.125	DRY	1.8	DRY	1.8
3	PRODUCTI ON	8.75	5.5	NEW	API	N	0	8403	0	2592	3503		8403	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):

Lake_12H_Casing_Design_Assumptions_20181010123023.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

Casing Attachments

Casing ID: 2 String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Lake_12H_Casing_Design_Assumptions_20181010124040.pdf

Casing ID: 3 String Type: PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Lake_12H_Casing_Design_Assumptions_20181010124012.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1279	636	1.32	14.8	840	100	Class C	2% CaCl + ¼ pound per sack celloflake

PRODUCTION	Lead		0	2300	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	2300	1441	1.32	14.8	1902	50	Class C	2% CaCl + ¼ pound per sack celloflake
PRODUCTION	Lead		0	2400	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

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
											celloflake + 0.2% C41-P
PRODUCTION	Tail		0	8403	1441	1.32	14.8	1902	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. A closed loop system will be used.

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
1279	2024	OTHER : Fresh water/cut brine	8.3	9.2							
2024	8403	OTHER : Cut brine	8.6	9.2							
0	1279	OTHER : Fresh water/gel	8.4	9.2							

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

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:

MUDLOG

Coring operation description for the well:

No core or drill stem test is planned.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 1111

Anticipated Surface Pressure: 483.12

Anticipated Bottom Hole Temperature(F): 109

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

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Lake_12H_H2S_Plan_20181010124132.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Lake_12H_Horizontal_Drill_Plan_20181010124154.pdf

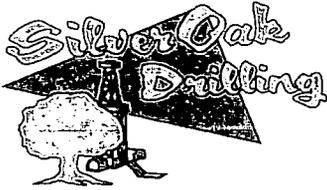
Other proposed operations facets description:

Other proposed operations facets attachment:

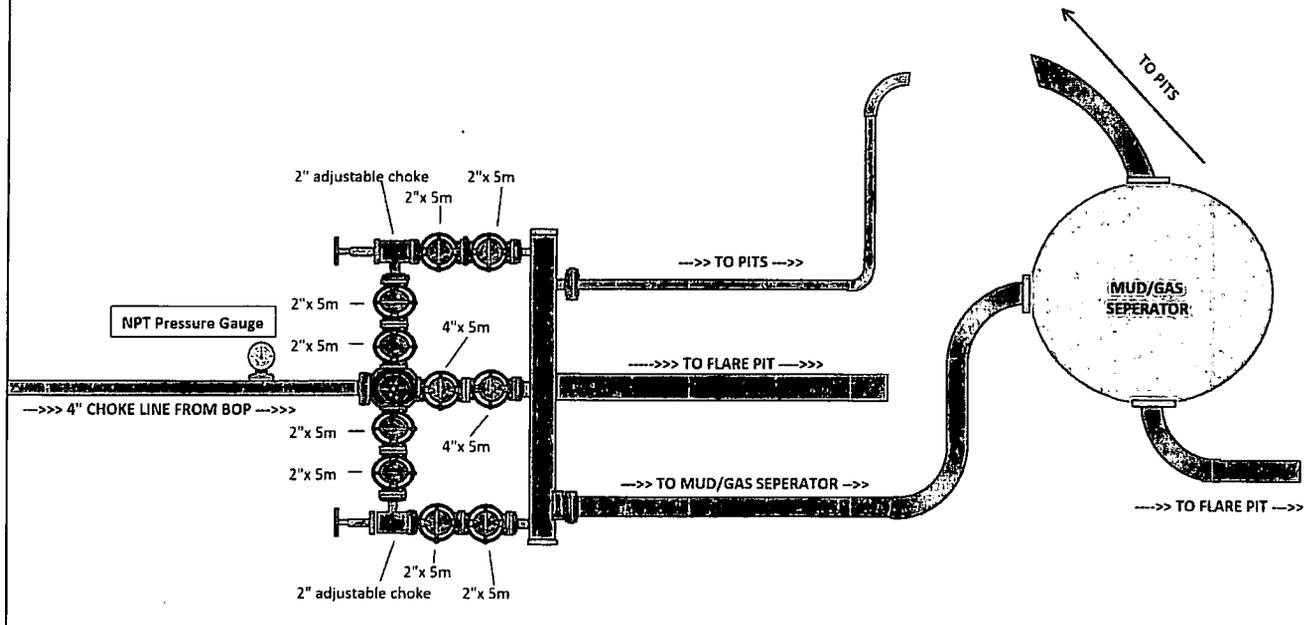
Lake_12H_General_Drill_Plan_20181010124202.pdf

Lake_12H_Contingency_Plan_20181010124210.pdf

Other Variance attachment:



5M CHOKE MANIFOLD ARRANGEMENT



Pressure Testing

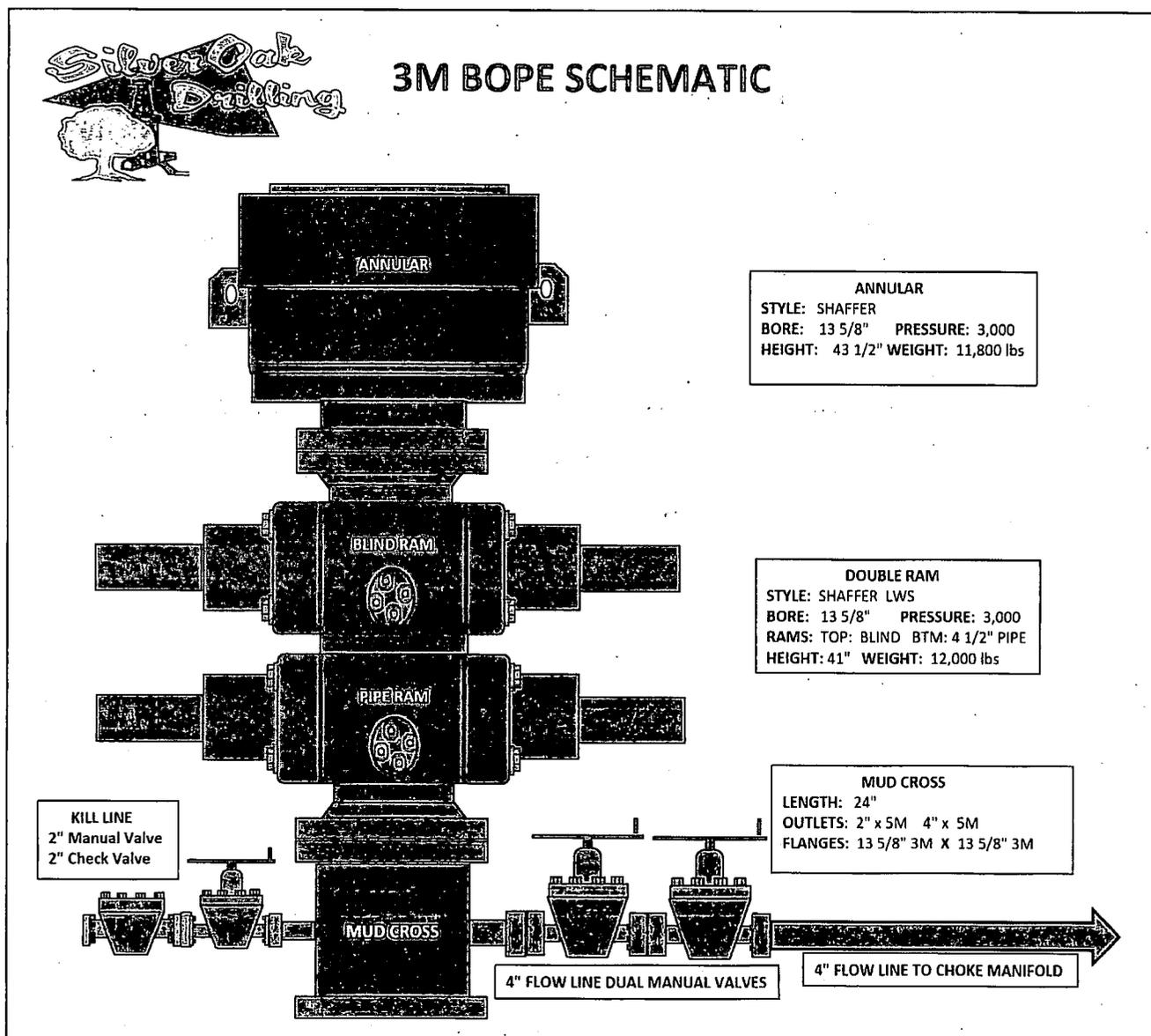
- All testing to be done with 3rd party testing crews
- All tests should be done for each BOP/Valve/Choke Manifold:
 - Recorded for 10 minutes on low pressure (500 psi)
 - Recorded for 10 minutes on high pressure (3000 psi)
 - All BOP testing will be completed with a test plug in place in wellhead
-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

Gas Buster Operation

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

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





Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC.
 919 Milam Street, Suite 2475
 Houston, TX 77002

Lakewood Federal Com horizontal 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: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.5 ppg).

4. 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)
7"	32	L-80	BTC	6.094	5.969	8,600	9,060	745	0.0361
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: 86,522 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)



Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC.
 919 Milam Street, Suite 2475
 Houston, TX 77002

Lakewood Federal Com horizontal 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: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.5 ppg).

4. 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)



**PERCUSSION
PETROLEUM
LLC**

Production Casing Program									
Casing Size (in)	Weight (ppf)	Grade	Connection	ID	ID (drift)	Collapse (psi)	Burst (psi)	Tension (1,000 lbs)	Capacity (bbl/ft)
7"	32	L-80	BTC	6.094	5.969	8,600	9,060	745	0.0361
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: 86,522 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)



Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC.
 919 Milam Street, Suite 2475
 Houston, TX 77002

Lakewood Federal Com horizontal 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: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.5 ppg).

4. 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)



**PERCUSSION
PETROLEUM
LLC**

Production Casing Program									
Casing Size (in)	Weight (ppf)	Grade	Connection	ID	ID (drift)	Collapse (psi)	Burst (psi)	Tension (1,000 lbs)	Capacity (bbl/ft)
7"	32	L-80	BTC	6.094	5.969	8,600	9,060	745	0.0361
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: 86,522 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)



Hydrogen Sulfide Drilling Operations Plan

Percussion Petroleum Operating, LLC.
919 Milam Street, Suite 2475
Houston, TX 77002

1. H₂S Safety Instructions to the following:
 - Characteristics of H₂S.
 - Physical effects and hazards.
 - Principal and operation of H₂S 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. H₂S Detection & Alarm Systems:
 - H₂S 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 H₂S 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 (H₂S present in dangerous concentrations) Only H₂S 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 H₂S 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.

10. Emergency Contacts:

Emergency Contact Information - H ₂ S Contingency Plan				
Percussion 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



**PERCUSSION
PETROLEUM
LLC**

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

WELL SITE PLAN

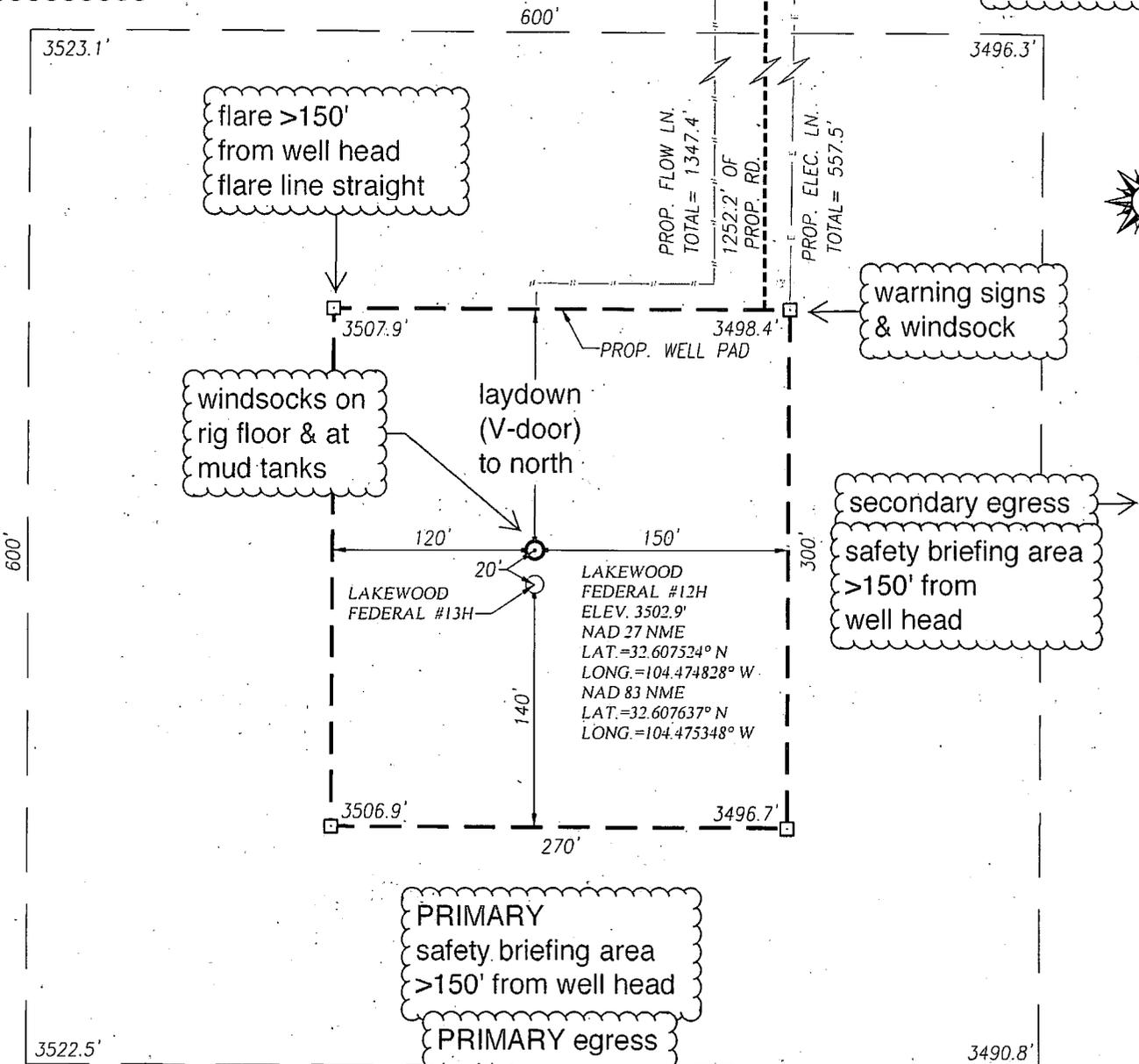
PREV. ROAD SURVEY BY BASIN SURVEYS

FLOW LN. BASIN SURVEY

4-W O.H. ELEC. LN.

prevailing wind
blows from
S or SSE

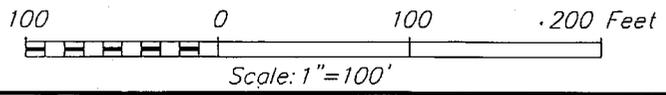
highest ground
to northwest



NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1252.2 FEET TO THE NORTH EDGE OF PAD.



PERCUSSION PETROLEUM OPERATING, LLC

LAKWOOD FEDERAL #12H WELL LOCATED 755 FEET FROM THE NORTH LINE AND 1820 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO HOBBS, N.M. 88240
 (575) 393-3117 www.jwsc.biz
 TBPLS# 10021000

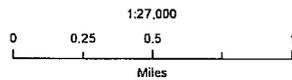
Survey Date: 4/06/18	CAD Date: 5/01/18	Drawn By: ACK
W.O. No.: 18110427	Rev: 09/19/18	Rel. W.O.: 18110115
Sheet 1 of 1		

Percussion Petroleum Operating, LLC

Lakewood Federal 12H/13H
H₂S Contingency Plan:
Radius Map

Section 3, Township 20S, Range 25E
Eddy County, New Mexico

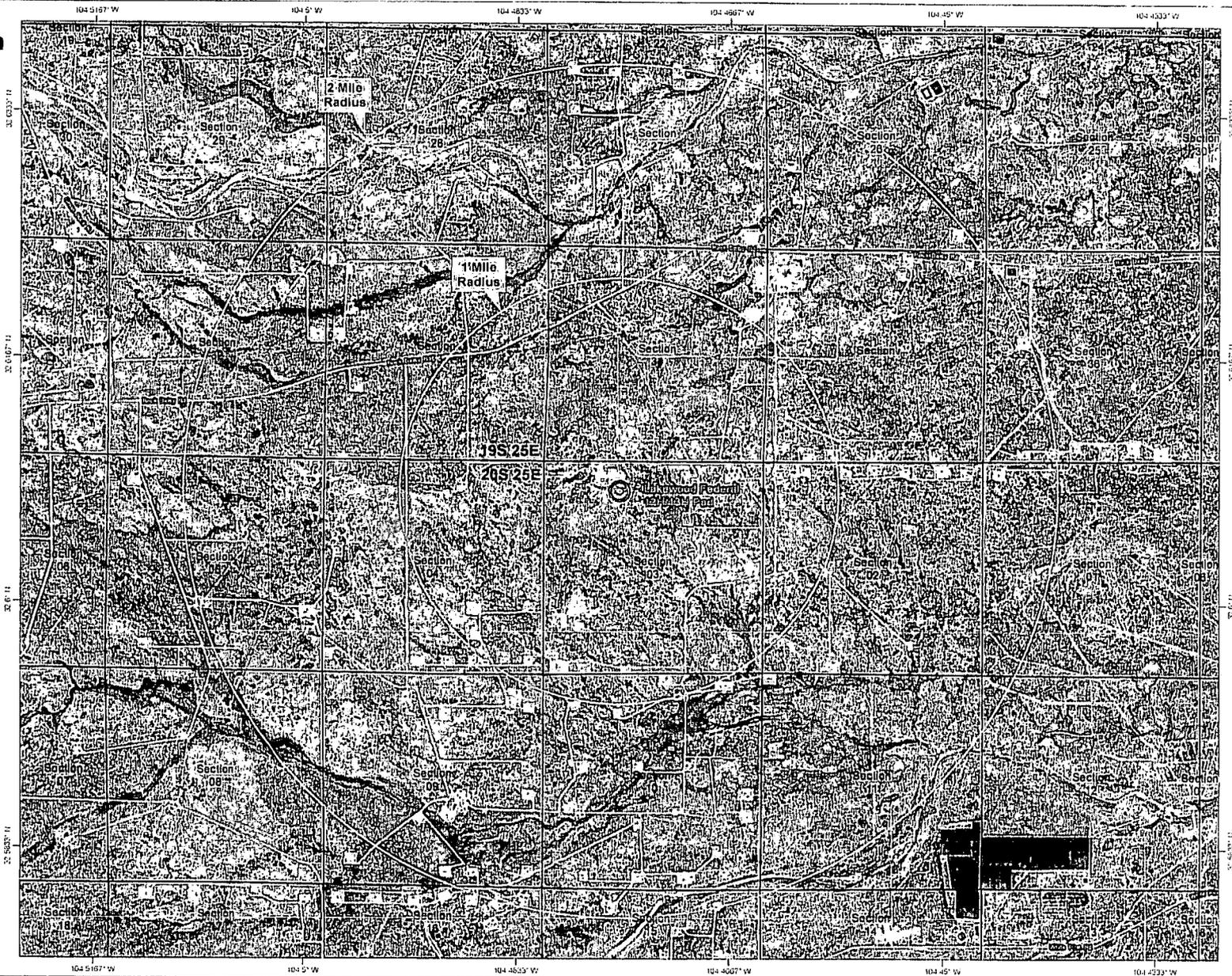
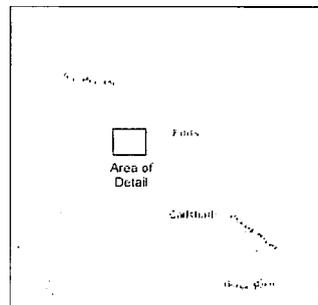
 Surface Hole Location



NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST
INCORPORATED

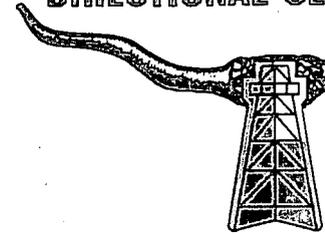
Prepared by Permits West, Inc., September 14, 2018
for Percussion Petroleum Operating, LLC





Company: Percussion Petroleum, LLC
 Project: Eddy County, NM
 Site: Lakewood Federal
 Well: 12H
 Wellbore: OH
 Rig: Silver Oak 1
 Design: Plan #2 / 14:45, May 31 2018

WELLBEN
 DIRECTIONAL SEI



TOTAL CORRECTION
 Magnetic North is 7.37° East of Grid North (Magnetic Convergence)
 To convert a Magnetic Direction to a Grid Direction, Add 7.37°

WELL DETAILS: 12H

RKB=17' @ 3520.00usft (Silver Oak 1)
 3503.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	584818.30	497607.50	32°60'7.637"	-104.475348

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	1200.00	0.00	360.00	1200.00	0.00	0.00	0.00	0.00
3	1400.00	2.00	3.21	1399.96	3.48	0.20	1.00	3.49
4	2023.74	2.00	3.21	2023.32	25.22	1.41	0.00	25.23
5	2902.14	89.84	3.21	2576.27	595.33	33.37	10.00	595.61
6	3161.81	89.84	3.21	2577.00	854.60	47.90	0.00	855.00
7	3297.73	89.84	0.49	2577.38	990.44	52.28	2.00	990.87
8	8403.10	89.84	0.49	2592.00	6095.60	95.90	0.00	6096.22

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
LF 12H: FTP	2577.00	854.60	47.90	585672.90	497655.40	Point
LF 12H: BHL	2592.00	6095.60	95.90	590913.90	497703.40	Point
LF 12H: LTP	2592.00	6015.60	95.20	590833.90	497702.70	Point

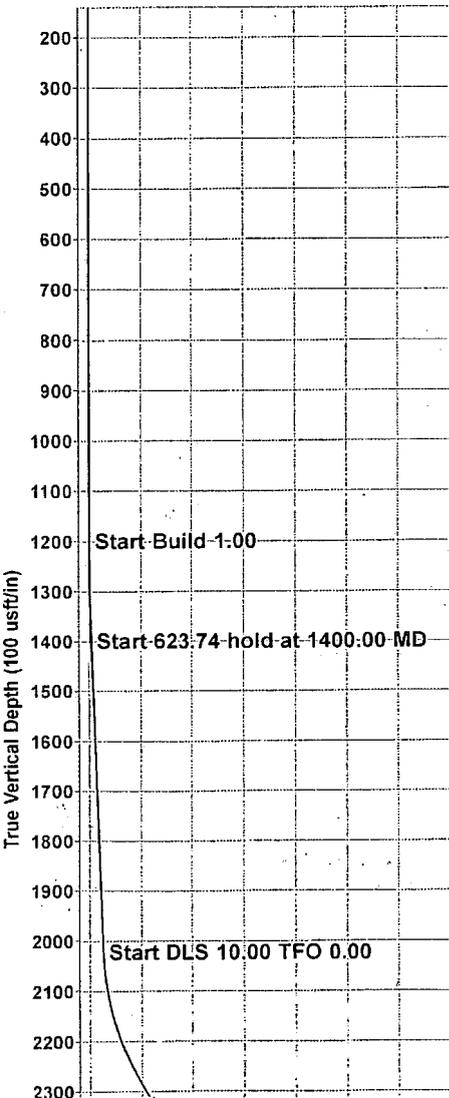
Azimuths to Grid North
 True North: 0.08°
 Magnetic North: 7.37°

Magnetic Field
 Strength: 47969.5snT
 Dip Angle: 60.26°
 Date: 5/29/2018



Disclaimer:

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





Wellbenders

Standard Plan With Toolface



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Lakewood Federal
Well: 12H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

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	Lakewood Federal		
Site Position:		Northing:	590,773.06 usft
From:	Lat/Long	Easting:	499,537.28 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.200 in
		Latitude:	32.624012
		Longitude:	-104.469105
		Grid Convergence:	-0.07 °

Well	12H					
Well Position	+N-S	0.00 usft	Northing:	584,818.30 usft	Latitude:	32.607637
	+E-W	0.00 usft	Easting:	497,607.50 usft	Longitude:	-104.475348
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,503.00 usft	

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2015	5/29/2018	(°)	(°)	(nT)
			7.30	60.26	47,969.49108258

Design	Plan #3			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N-S	+E-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	0.52

Survey Tool Program	Date 5/31/2018			
From	To	Survey (Wellbore)	Tool Name	Description
(usft)	(usft)			
0.00	8,403.10	Plan #3 (OH)	MWD+IGRF	OWSG MWD + IGRF or WMM

Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Lakewood Federal
Well: 12H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V.Sec (usft)	D.Leg (°/100ft)	Build (°/100ft)	Turn (°/100ft)	TFace (°)
0.00	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	0.00
200.00	0.00	0.00	200.00	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	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	360.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	360.00
1,300.00	1.00	3.21	1,299.99	0.87	0.05	0.87	1.00	1.00	0.00	3.21
1,400.00	2.00	3.21	1,399.96	3.48	0.20	3.49	1.00	1.00	0.00	0.00
1,500.00	2.00	3.21	1,499.90	6.97	0.39	6.97	0.00	0.00	0.00	0.00
1,600.00	2.00	3.21	1,599.84	10.45	0.59	10.46	0.00	0.00	0.00	0.00
1,700.00	2.00	3.21	1,699.78	13.94	0.78	13.94	0.00	0.00	0.00	0.00
1,800.00	2.00	3.21	1,799.72	17.42	0.98	17.43	0.00	0.00	0.00	0.00
1,900.00	2.00	3.21	1,899.65	20.91	1.17	20.92	0.00	0.00	0.00	0.00
2,000.00	2.00	3.21	1,999.59	24.39	1.37	24.40	0.00	0.00	0.00	0.00
2,023.74	2.00	3.21	2,023.32	25.22	1.41	25.23	0.00	0.00	0.00	0.00
2,050.00	4.63	3.21	2,049.53	26.73	1.50	26.75	10.00	10.00	0.00	0.00
2,100.00	9.63	3.21	2,099.13	32.93	1.85	32.94	10.00	10.00	0.00	0.00
2,150.00	14.63	3.21	2,148.00	43.41	2.43	43.43	10.00	10.00	0.00	0.00
2,200.00	19.63	3.21	2,195.77	58.11	3.26	58.13	10.00	10.00	0.00	0.00
2,250.00	24.63	3.21	2,242.07	76.90	4.31	76.94	10.00	10.00	0.00	0.00

Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Lakewood Federal
Well: 12H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100ft)	Build (°/100ft)	Turn (°/100ft)	TFace (°)
2,300.00	29.63	3.21	2,286.56	99.66	5.59	99.70	10.00	10.00	0.00	0.00
2,350.00	34.63	3.21	2,328.89	126.20	7.07	126.26	10.00	10.00	0.00	0.00
2,400.00	39.63	3.21	2,368.74	156.32	8.76	156.39	10.00	10.00	0.00	0.00
2,450.00	44.63	3.21	2,405.81	189.79	10.64	189.88	10.00	10.00	0.00	0.00
2,500.00	49.63	3.21	2,439.82	226.37	12.69	226.47	10.00	10.00	0.00	0.00
2,550.00	54.63	3.21	2,470.51	265.76	14.90	265.89	10.00	10.00	0.00	0.00
2,600.00	59.63	3.21	2,497.64	307.68	17.25	307.82	10.00	10.00	0.00	0.00
2,650.00	64.63	3.21	2,521.01	351.79	19.72	351.96	10.00	10.00	0.00	0.00
2,700.00	69.63	3.21	2,540.43	397.77	22.30	397.96	10.00	10.00	0.00	0.00
2,750.00	74.63	3.21	2,555.78	445.27	24.96	445.48	10.00	10.00	0.00	0.00
2,800.00	79.63	3.21	2,566.91	493.92	27.68	494.15	10.00	10.00	0.00	0.00
2,850.00	84.63	3.21	2,573.76	543.36	30.46	543.61	10.00	10.00	0.00	0.00
2,902.14	89.84	3.21	2,576.27	595.33	33.37	595.61	10.00	10.00	0.00	0.00
3,000.00	89.84	3.21	2,576.55	693.04	38.85	693.37	0.00	0.00	0.00	0.00
3,100.00	89.84	3.21	2,576.83	792.89	44.44	793.26	0.00	0.00	0.00	0.00
3,161.81	89.84	3.21	2,577.00	854.60	47.90	855.00	0.00	0.00	0.00	0.00
3,200.00	89.84	2.44	2,577.11	892.74	49.78	893.16	2.00	0.00	-2.00	-90.09
3,297.73	89.84	0.49	2,577.38	990.44	52.28	990.87	2.00	0.00	-2.00	-90.09
3,300.00	89.84	0.49	2,577.39	992.70	52.30	993.14	0.00	0.00	0.00	0.00
3,400.00	89.84	0.49	2,577.68	1,092.70	53.16	1,093.14	0.00	0.00	0.00	0.00
3,500.00	89.84	0.49	2,577.96	1,192.70	54.01	1,193.14	0.00	0.00	0.00	0.00
3,600.00	89.84	0.49	2,578.25	1,292.69	54.87	1,293.14	0.00	0.00	0.00	0.00
3,700.00	89.84	0.49	2,578.54	1,392.69	55.72	1,393.14	0.00	0.00	0.00	0.00
3,800.00	89.84	0.49	2,578.82	1,492.68	56.58	1,493.14	0.00	0.00	0.00	0.00
3,900.00	89.84	0.49	2,579.11	1,592.68	57.43	1,593.14	0.00	0.00	0.00	0.00
4,000.00	89.84	0.49	2,579.39	1,692.68	58.28	1,693.14	0.00	0.00	0.00	0.00
4,100.00	89.84	0.49	2,579.68	1,792.67	59.14	1,793.13	0.00	0.00	0.00	0.00

Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Lakewood Federal
Well: 12H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100ft)	Build (°/100ft)	Turn (°/100ft)	TFace (°)
4,200.00	89.84	0.49	2,579.97	1,892.67	59.99	1,893.13	0.00	0.00	0.00	0.00
4,300.00	89.84	0.49	2,580.25	1,992.66	60.85	1,993.13	0.00	0.00	0.00	0.00
4,400.00	89.84	0.49	2,580.54	2,092.66	61.70	2,093.13	0.00	0.00	0.00	0.00
4,500.00	89.84	0.49	2,580.83	2,192.66	62.56	2,193.13	0.00	0.00	0.00	0.00
4,600.00	89.84	0.49	2,581.11	2,292.65	63.41	2,293.13	0.00	0.00	0.00	0.00
4,700.00	89.84	0.49	2,581.40	2,392.65	64.26	2,393.13	0.00	0.00	0.00	0.00
4,800.00	89.84	0.49	2,581.69	2,492.64	65.12	2,493.13	0.00	0.00	0.00	0.00
4,900.00	89.84	0.49	2,581.97	2,592.64	65.97	2,593.13	0.00	0.00	0.00	0.00
5,000.00	89.84	0.49	2,582.26	2,692.64	66.83	2,693.13	0.00	0.00	0.00	0.00
5,100.00	89.84	0.49	2,582.54	2,792.63	67.68	2,793.13	0.00	0.00	0.00	0.00
5,200.00	89.84	0.49	2,582.83	2,892.63	68.54	2,893.13	0.00	0.00	0.00	0.00
5,300.00	89.84	0.49	2,583.12	2,992.62	69.39	2,993.13	0.00	0.00	0.00	0.00
5,400.00	89.84	0.49	2,583.40	3,092.62	70.24	3,093.13	0.00	0.00	0.00	0.00
5,500.00	89.84	0.49	2,583.69	3,192.62	71.10	3,193.13	0.00	0.00	0.00	0.00
5,600.00	89.84	0.49	2,583.98	3,292.61	71.95	3,293.13	0.00	0.00	0.00	0.00
5,700.00	89.84	0.49	2,584.26	3,392.61	72.81	3,393.13	0.00	0.00	0.00	0.00
5,800.00	89.84	0.49	2,584.55	3,492.60	73.66	3,493.13	0.00	0.00	0.00	0.00
5,900.00	89.84	0.49	2,584.83	3,592.60	74.52	3,593.13	0.00	0.00	0.00	0.00
6,000.00	89.84	0.49	2,585.12	3,692.59	75.37	3,693.13	0.00	0.00	0.00	0.00
6,100.00	89.84	0.49	2,585.41	3,792.59	76.22	3,793.13	0.00	0.00	0.00	0.00
6,200.00	89.84	0.49	2,585.69	3,892.59	77.08	3,893.13	0.00	0.00	0.00	0.00
6,300.00	89.84	0.49	2,585.98	3,992.58	77.93	3,993.13	0.00	0.00	0.00	0.00
6,400.00	89.84	0.49	2,586.27	4,092.58	78.79	4,093.13	0.00	0.00	0.00	0.00
6,500.00	89.84	0.49	2,586.55	4,192.57	79.64	4,193.12	0.00	0.00	0.00	0.00
6,600.00	89.84	0.49	2,586.84	4,292.57	80.50	4,293.12	0.00	0.00	0.00	0.00
6,700.00	89.84	0.49	2,587.12	4,392.57	81.35	4,393.12	0.00	0.00	0.00	0.00
6,800.00	89.84	0.49	2,587.41	4,492.56	82.20	4,493.12	0.00	0.00	0.00	0.00



Wellbenders Standard Plan With Toolface



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Lakewood Federal
Well: 12H
Wellbore: OH
Design: Plan #3

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WBDS_SQL_2

Planned Survey

MD (usft)	Inc (°)	Azi. (azimuth) (°)	TVD (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100ft)	Build (°/100ft)	Turn (°/100ft)	TFace (°)
6,900.00	89.84	0.49	2,587.70	4,592.56	83.06	4,593.12	0.00	0.00	0.00	0.00
7,000.00	89.84	0.49	2,587.98	4,692.55	83.91	4,693.12	0.00	0.00	0.00	0.00
7,100.00	89.84	0.49	2,588.27	4,792.55	84.77	4,793.12	0.00	0.00	0.00	0.00
7,200.00	89.84	0.49	2,588.56	4,892.55	85.62	4,893.12	0.00	0.00	0.00	0.00
7,300.00	89.84	0.49	2,588.84	4,992.54	86.48	4,993.12	0.00	0.00	0.00	0.00
7,400.00	89.84	0.49	2,589.13	5,092.54	87.33	5,093.12	0.00	0.00	0.00	0.00
7,500.00	89.84	0.49	2,589.41	5,192.53	88.18	5,193.12	0.00	0.00	0.00	0.00
7,600.00	89.84	0.49	2,589.70	5,292.53	89.04	5,293.12	0.00	0.00	0.00	0.00
7,700.00	89.84	0.49	2,589.99	5,392.53	89.89	5,393.12	0.00	0.00	0.00	0.00
7,800.00	89.84	0.49	2,590.27	5,492.52	90.75	5,493.12	0.00	0.00	0.00	0.00
7,900.00	89.84	0.49	2,590.56	5,592.52	91.60	5,593.12	0.00	0.00	0.00	0.00
8,000.00	89.84	0.49	2,590.85	5,692.51	92.46	5,693.12	0.00	0.00	0.00	0.00
8,100.00	89.84	0.49	2,591.13	5,792.51	93.31	5,793.12	0.00	0.00	0.00	0.00
8,200.00	89.84	0.49	2,591.42	5,892.51	94.16	5,893.12	0.00	0.00	0.00	0.00
8,300.00	89.84	0.49	2,591.70	5,992.50	95.02	5,993.12	0.00	0.00	0.00	0.00
8,403.10	89.84	0.49	2,592.00	6,095.60	95.90	6,096.22	0.00	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____



PERCUSSION
PETROLEUM
LLC

Percussion Petroleum, LLC

Eddy County, NM
Lakewood Federal
12H

OH
Plan #2

Anticollision Report

31 May, 2018

WELLBENDERS
DIRECTIONAL SERVICES LLC



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Reference Site: Lakewood Federal
Site Error: 0.00 usft
Reference Well: 12H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #2

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WBDS_SQL_2
Offset TVD Reference: Reference Datum

Reference	Plan #2
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD + Stations Interval 100.00usft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 9,999.00 us
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Pedal Curve
Casing Method:	Not applied

Survey Tool Program	Date 5/31/2018	
From (usft)	To (usft)	Survey (Wellbore)
0.00	8,403.10	Plan #2 (OH)
Tool Name	Description	
MWD+IGRF	OWSG MWD + IGRF or WMM	

Site Name	Reference		Distance		Separation Factor	Warning
	Measured Depth (usft)	Offset Measured Depth (usft)	Between Centres (usft)	Between Ellipses (usft)		
Offset Well - Wellbore - Design						
Lakewood Federal						
11H - OH - Plan #3	8,403.10	3,060.77	346.79	264.97	4.239	CC, ES, SF
13H - OH - Plan #2	1,200.00	1,200.00	20.10	11.92	2.456	CC, ES
13H - OH - Plan #2	1,300.00	1,300.01	20.97	12.07	2.356	SF
14H - OH - Plan #2	2,755.81	2,671.54	319.78	298.23	14.838	CC
14H - OH - Plan #2	8,403.10	8,349.85	374.11	173.26	1.863	ES, SF

Offset Design Lakewood Federal - 11H - OH - Plan #3												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IGRF												Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	8,457.15	2,942.00	0.00	112.05	17.98	773.90	251.10	3,052.43				
100.00	100.00	8,457.15	2,942.00	0.15	112.05	17.98	773.90	251.10	2,956.17	2,908.93	47.24	62.578	
200.00	200.00	8,457.15	2,942.00	0.51	112.05	17.98	773.90	251.10	2,860.16	2,812.95	47.21	60.585	
300.00	300.00	8,457.15	2,942.00	0.87	112.05	17.98	773.90	251.10	2,764.44	2,717.26	47.18	58.589	
400.00	400.00	8,457.15	2,942.00	1.22	112.05	17.98	773.90	251.10	2,669.03	2,621.87	47.16	56.591	
500.00	500.00	8,457.15	2,942.00	1.58	112.05	17.98	773.90	251.10	2,573.97	2,526.83	47.15	54.594	
600.00	600.00	8,457.15	2,942.00	1.94	112.05	17.98	773.90	251.10	2,479.30	2,432.16	47.14	52.597	
700.00	700.00	8,457.15	2,942.00	2.30	112.05	17.98	773.90	251.10	2,385.07	2,337.93	47.13	50.605	
800.00	800.00	8,457.15	2,942.00	2.66	112.05	17.98	773.90	251.10	2,291.32	2,244.19	47.13	48.619	
900.00	900.00	8,457.15	2,942.00	3.02	112.05	17.98	773.90	251.10	2,198.12	2,150.99	47.13	46.641	
1,000.00	1,000.00	8,457.15	2,942.00	3.38	112.05	17.98	773.90	251.10	2,105.55	2,058.42	47.13	44.674	
1,100.00	1,100.00	8,457.15	2,942.00	3.73	112.05	17.98	773.90	251.10	2,013.69	1,966.55	47.13	42.723	
1,200.00	1,200.00	8,457.15	2,942.00	4.09	112.05	17.98	773.90	251.10	1,922.64	1,875.50	47.13	40.790	
1,300.00	1,299.99	8,457.15	2,942.00	4.45	112.05	15.32	773.90	251.10	1,832.15	1,785.01	47.14	38.864	
1,400.00	1,399.96	8,457.15	2,942.00	4.81	112.05	15.88	773.90	251.10	1,741.95	1,694.79	47.16	36.937	
1,500.00	1,499.90	8,457.15	2,942.00	5.17	112.05	15.88	773.90	251.10	1,652.48	1,605.31	47.17	35.031	
1,600.00	1,599.84	8,457.15	2,942.00	5.53	112.05	15.88	773.90	251.10	1,564.29	1,517.12	47.17	33.164	
1,700.00	1,699.78	8,457.15	2,942.00	5.88	112.05	15.88	773.90	251.10	1,477.61	1,430.46	47.15	31.338	
1,800.00	1,799.72	8,457.15	2,942.00	6.24	112.05	15.88	773.90	251.10	1,392.71	1,345.59	47.11	29.561	
1,900.00	1,899.65	8,457.15	2,942.00	6.61	112.05	15.88	773.90	251.10	1,309.94	1,262.89	47.05	27.843	
2,000.00	1,999.59	8,457.15	2,942.00	6.97	112.05	15.88	773.90	251.10	1,229.74	1,182.79	46.95	26.195	
2,023.74	2,023.32	8,457.15	2,942.00	7.05	112.05	15.88	773.90	251.10	1,211.13	1,164.22	46.91	25.816	

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



Wellbenders Anticollision Report



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Reference Site: Lakewood Federal
Site Error: 0.00 usft
Reference Well: 12H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #2

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WBDS_SQL_2
Offset TVD Reference: Reference Datum

Offset Design Lakewood Federal - 11H - OH - Plan #3													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IGRF													Offset Well Error:	0.00 usft
Reference		Offset		Semi-Major Axis			Distance				Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
2,050.00	2,049.53	8,457.15	2,942.00	7.15	112.05	16.83	773.90	251.10	1,190.40	1,143.50	46.90	25.384		
2,100.00	2,099.13	8,457.15	2,942.00	7.33	112.05	19.00	773.90	251.10	1,149.61	1,102.70	46.91	24.506		
2,150.00	2,148.00	8,457.15	2,942.00	7.52	112.05	21.79	773.90	251.10	1,107.20	1,060.20	47.00	23.557		
2,200.00	2,195.77	8,457.15	2,942.00	7.72	112.05	25.46	773.90	251.10	1,063.32	1,016.15	47.17	22.543		
2,250.00	2,242.07	8,457.15	2,942.00	7.94	112.05	30.40	773.90	251.10	1,018.14	970.71	47.43	21.464		
2,300.00	2,286.56	8,457.15	2,942.00	8.17	112.05	37.21	773.90	251.10	971.85	924.03	47.82	20.323		
2,350.00	2,328.89	8,457.15	2,942.00	8.44	112.05	46.77	773.90	251.10	924.65	876.30	48.35	19.125		
2,400.00	2,368.74	8,457.15	2,942.00	8.74	112.05	60.00	773.90	251.10	876.79	827.74	49.05	17.877		
2,450.00	2,405.81	8,457.15	2,942.00	9.09	112.05	76.98	773.90	251.10	828.55	778.60	49.95	16.586		
2,500.00	2,439.82	8,457.15	2,942.00	9.48	112.05	95.46	773.90	251.10	780.27	729.18	51.09	15.273		
2,550.00	2,470.51	8,457.15	2,942.00	9.92	112.05	111.83	773.90	251.10	732.33	679.83	52.50	13.949		
2,600.00	2,497.64	8,457.15	2,942.00	10.41	112.05	124.28	773.90	251.10	685.21	630.99	54.22	12.638		
2,650.00	2,521.01	8,457.15	2,942.00	10.96	112.05	133.12	773.90	251.10	639.49	583.21	56.28	11.363		
2,700.00	2,540.43	8,457.15	2,942.00	11.55	112.05	139.31	773.90	251.10	595.88	537.18	58.70	10.151		
2,750.00	2,555.78	8,457.15	2,942.00	12.18	112.05	143.67	773.90	251.10	555.25	493.79	61.47	9.033		
2,800.00	2,566.91	8,457.15	2,942.00	12.85	112.05	146.75	773.90	251.10	518.65	454.12	64.52	8.038		
2,850.00	2,573.76	8,457.15	2,942.00	13.55	112.05	148.91	773.90	251.10	487.27	419.55	67.73	7.195		
2,900.00	2,576.26	8,457.15	2,942.00	14.28	112.05	150.36	773.90	251.10	462.46	391.63	70.83	6.529		
2,902.14	2,576.27	8,457.15	2,942.00	14.31	112.05	150.41	773.90	251.10	461.57	390.62	70.96	6.505		
3,000.00	2,576.55	8,457.15	2,942.00	15.80	112.05	150.41	773.90	251.10	430.28	354.27	76.02	5.660		
3,100.00	2,576.83	8,436.14	2,941.82	17.40	111.65	150.52	794.91	251.21	419.50	341.35	78.15	5.368		
3,161.81	2,577.00	8,374.41	2,941.29	18.42	110.47	150.84	856.64	251.54	417.35	339.75	77.60	5.378		
3,200.00	2,577.11	8,336.26	2,940.96	19.05	109.75	151.00	894.78	251.75	416.15	338.84	77.31	5.383		
3,297.73	2,577.38	8,238.56	2,940.12	20.72	107.89	151.13	992.48	252.27	414.22	337.25	76.97	5.382		
3,300.00	2,577.39	8,236.29	2,940.10	20.75	107.84	151.13	994.75	252.28	414.19	337.23	76.97	5.381		
3,400.00	2,577.68	8,136.30	2,939.25	22.49	105.94	151.09	1,094.73	252.82	413.04	336.12	76.92	5.370		
3,500.00	2,577.96	8,036.30	2,938.39	24.25	104.04	151.06	1,194.72	253.36	411.88	335.00	76.88	5.357		
3,600.00	2,578.25	7,936.31	2,937.53	26.04	102.14	151.02	1,294.71	253.89	410.73	333.87	76.86	5.344		
3,700.00	2,578.54	7,836.32	2,936.67	27.84	100.24	150.98	1,394.70	254.43	409.57	332.72	76.85	5.329		
3,800.00	2,578.82	7,736.33	2,935.81	29.65	98.33	150.94	1,494.69	254.96	408.42	331.56	76.85	5.314		
3,900.00	2,579.11	7,636.33	2,934.95	31.48	96.43	150.90	1,594.67	255.50	407.26	330.40	76.86	5.299		
4,000.00	2,579.39	7,536.34	2,934.09	33.31	94.53	150.86	1,694.66	256.04	406.11	329.23	76.87	5.283		
4,100.00	2,579.68	7,436.35	2,933.24	35.16	92.64	150.82	1,794.65	256.57	404.95	328.06	76.89	5.266		
4,200.00	2,579.97	7,336.35	2,932.38	37.01	90.74	150.78	1,894.64	257.11	403.80	326.88	76.92	5.250		
4,300.00	2,580.25	7,236.36	2,931.52	38.87	88.84	150.74	1,994.62	257.65	402.64	325.70	76.95	5.233		
4,400.00	2,580.54	7,136.37	2,930.66	40.73	86.94	150.70	2,094.61	258.18	401.49	324.51	76.98	5.216		
4,500.00	2,580.83	7,036.38	2,929.80	42.60	85.05	150.66	2,194.60	258.72	400.33	323.32	77.01	5.198		
4,600.00	2,581.11	6,936.38	2,928.94	44.47	83.15	150.62	2,294.59	259.25	399.18	322.13	77.05	5.181		
4,700.00	2,581.40	6,836.39	2,928.08	46.34	81.26	150.58	2,394.58	259.79	398.03	320.93	77.09	5.163		
4,800.00	2,581.69	6,736.40	2,927.23	48.22	79.36	150.54	2,494.56	260.33	396.87	319.73	77.14	5.145		
4,900.00	2,581.97	6,636.40	2,926.37	50.10	77.47	150.50	2,594.55	260.86	395.72	318.53	77.19	5.127		
5,000.00	2,582.26	6,536.41	2,925.51	51.98	75.58	150.46	2,694.54	261.40	394.57	317.33	77.24	5.109		
5,100.00	2,582.54	6,436.42	2,924.65	53.86	73.69	150.41	2,794.53	261.93	393.41	316.13	77.29	5.090		
5,200.00	2,582.83	6,336.42	2,923.79	55.75	71.80	150.37	2,894.52	262.47	392.26	314.92	77.34	5.072		
5,300.00	2,583.12	6,236.43	2,922.93	57.64	69.91	150.33	2,994.50	263.01	391.11	313.71	77.40	5.053		
5,400.00	2,583.40	6,136.44	2,922.07	59.53	68.02	150.29	3,094.49	263.54	389.96	312.50	77.45	5.035		
5,500.00	2,583.69	6,036.45	2,921.22	61.42	66.14	150.24	3,194.48	264.08	388.80	311.29	77.51	5.016		
5,600.00	2,583.98	5,936.45	2,920.36	63.31	64.25	150.20	3,294.47	264.61	387.65	310.08	77.57	4.997		
5,700.00	2,584.26	5,836.46	2,919.50	65.21	62.37	150.16	3,394.45	265.15	386.50	308.86	77.64	4.978		
5,800.00	2,584.55	5,736.47	2,918.64	67.10	60.49	150.11	3,494.44	265.69	385.35	307.65	77.70	4.959		
5,900.00	2,584.83	5,636.47	2,917.78	69.00	58.62	150.07	3,594.43	266.22	384.20	306.43	77.77	4.940		
6,000.00	2,585.12	5,536.48	2,916.92	70.89	56.74	150.02	3,694.42	266.76	383.05	305.21	77.84	4.921		

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

Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Reference Site: Lakewood Federal
Site Error: 0.00 usft
Reference Well: 12H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #2

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WBDS_SQL_2
Offset TVD Reference: Reference Datum

Offset Design Lakewood Federal - 11H - OH - Plan #3													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+GRF													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Minimum Separation	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	(usft)			
6,100.00	2,585.41	5,436.49	2,916.06	72.79	54.87	149.98	3,794.41	267.30	381.90	303.98	77.91	4.901		
6,200.00	2,585.69	5,336.50	2,915.21	74.69	53.00	149.94	3,894.39	267.83	380.75	302.76	77.99	4.882		
6,300.00	2,585.98	5,236.50	2,914.35	76.59	51.13	149.89	3,994.38	268.37	379.60	301.53	78.07	4.862		
6,400.00	2,586.27	5,136.51	2,913.49	78.49	49.27	149.85	4,094.37	268.90	378.45	300.30	78.15	4.843		
6,500.00	2,586.55	5,036.52	2,912.63	80.39	47.41	149.80	4,194.36	269.44	377.30	299.07	78.23	4.823		
6,600.00	2,586.84	4,936.52	2,911.77	82.29	45.56	149.75	4,294.34	269.98	376.15	297.83	78.32	4.803		
6,700.00	2,587.12	4,836.53	2,910.91	84.19	43.71	149.71	4,394.33	270.51	375.00	296.59	78.41	4.783		
6,800.00	2,587.41	4,736.54	2,910.05	86.09	41.87	149.66	4,494.32	271.05	373.85	295.35	78.50	4.762		
6,900.00	2,587.70	4,636.54	2,909.20	88.00	40.03	149.61	4,594.31	271.58	372.70	294.10	78.60	4.742		
7,000.00	2,587.98	4,536.55	2,908.34	89.90	38.21	149.57	4,694.30	272.12	371.55	292.85	78.70	4.721		
7,100.00	2,588.27	4,436.56	2,907.48	91.80	36.39	149.52	4,794.28	272.66	370.40	291.60	78.81	4.700		
7,200.00	2,588.56	4,336.57	2,906.62	93.71	34.58	149.47	4,894.27	273.19	369.26	290.33	78.92	4.679		
7,300.00	2,588.84	4,236.57	2,905.76	95.61	32.78	149.43	4,994.26	273.73	368.11	289.06	79.04	4.657		
7,400.00	2,589.13	4,136.58	2,904.90	97.51	31.00	149.38	5,094.25	274.27	366.96	287.79	79.17	4.635		
7,500.00	2,589.41	4,036.59	2,904.04	99.42	29.23	149.33	5,194.24	274.80	365.81	286.50	79.31	4.612		
7,600.00	2,589.70	3,936.59	2,903.19	101.32	27.48	149.28	5,294.22	275.34	364.67	285.20	79.46	4.589		
7,700.00	2,589.99	3,836.60	2,902.33	103.23	25.76	149.23	5,394.21	275.87	363.52	283.89	79.63	4.565		
7,800.00	2,590.27	3,736.61	2,901.47	105.14	24.07	149.18	5,494.20	276.41	362.37	282.57	79.81	4.541		
7,900.00	2,590.56	3,636.62	2,900.61	107.04	22.41	149.13	5,594.19	276.95	361.23	281.22	80.01	4.515		
8,000.00	2,590.85	3,536.62	2,899.75	108.95	20.79	149.08	5,694.17	277.48	360.08	279.85	80.23	4.488		
8,100.00	2,591.13	3,436.63	2,898.89	110.85	19.23	149.03	5,794.16	278.02	358.94	278.45	80.49	4.459		
8,200.00	2,591.42	3,336.64	2,898.03	112.76	17.75	148.98	5,894.15	278.55	357.79	277.01	80.78	4.429		
8,300.00	2,591.70	3,236.64	2,897.18	114.67	16.34	148.93	5,994.14	279.09	356.65	275.52	81.13	4.396		
8,400.00	2,591.99	3,066.32	2,876.43	116.57	14.20	146.77	6,162.57	282.70	347.45	265.73	81.72	4.252		
8,403.10	2,592.00	3,060.77	2,874.94	116.63	14.14	146.60	6,167.91	282.93	346.79	264.97	81.82	4.239	CC, ES, SF	



Wellbenders Anticollision Report



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Reference Site: Lakewood Federal
Site Error: 0.00 usft
Reference Well: 12H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #2

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WBDS_SQL_2
Offset TVD Reference: Reference Datum

Offset Design: Lakewood Federal - 13H - OH - Plan #2													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IGRF													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance			Minimum Separation		Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre: +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-179.71	-20.10	-0.10	20.10	19.80	0.30	67.557		
100.00	100.00	100.00	100.00	0.15	0.15	-179.71	-20.10	-0.10	20.10	19.09	1.01	19.813		
200.00	200.00	200.00	200.00	0.51	0.51	-179.71	-20.10	-0.10	20.10	18.37	1.73	11.609		
300.00	300.00	300.00	300.00	0.87	0.87	-179.71	-20.10	-0.10	20.10	17.65	2.45	8.210		
400.00	400.00	400.00	400.00	1.22	1.22	-179.71	-20.10	-0.10	20.10	16.93	3.17	6.350		
500.00	500.00	500.00	500.00	1.58	1.58	-179.71	-20.10	-0.10	20.10	16.22	3.88	5.177		
600.00	600.00	600.00	600.00	1.94	1.94	-179.71	-20.10	-0.10	20.10	15.50	4.60	4.370		
700.00	700.00	700.00	700.00	2.30	2.30	-179.71	-20.10	-0.10	20.10	14.78	5.32	3.781		
800.00	800.00	800.00	800.00	2.66	2.66	-179.71	-20.10	-0.10	20.10	14.07	6.03	3.332		
900.00	900.00	900.00	900.00	3.02	3.02	-179.71	-20.10	-0.10	20.10	13.35	6.75	2.978		
1,000.00	1,000.00	1,000.00	1,000.00	3.38	3.38	-179.71	-20.10	-0.10	20.10	12.63	7.47	2.692		
1,100.00	1,100.00	1,100.00	1,100.00	3.73	3.73	-179.71	-20.10	-0.10	20.10	11.92	8.18	2.456 CC, ES		
1,200.00	1,200.00	1,200.00	1,200.00	4.09	4.09	-179.71	-20.10	-0.10	20.10	11.20	8.90	2.356 SF		
1,300.00	1,299.99	1,300.01	1,299.99	4.45	4.45	177.20	-20.10	-0.10	20.97	12.07	9.62	2.452		
1,400.00	1,399.96	1,400.04	1,399.96	4.81	4.81	177.51	-20.10	-0.10	23.59	13.97	10.34	2.620		
1,500.00	1,499.90	1,500.10	1,499.90	5.17	5.17	177.83	-20.10	-0.10	27.07	16.74	11.05	2.765		
1,600.00	1,599.84	1,600.16	1,599.84	5.53	5.53	178.08	-20.10	-0.10	30.56	19.51	11.77	2.893		
1,700.00	1,699.78	1,700.22	1,699.78	5.88	5.88	178.27	-20.10	-0.10	34.05	22.28	12.49	3.006		
1,800.00	1,799.72	1,800.28	1,799.72	6.24	6.24	178.43	-20.10	-0.10	37.54	25.05	13.20	3.107		
1,900.00	1,899.65	1,900.35	1,899.65	6.61	6.60	178.57	-20.10	-0.10	41.03	27.82	13.92	3.198		
2,000.00	1,999.59	2,000.41	1,999.59	6.97	6.96	178.68	-20.10	-0.10	44.52	30.59	14.09	3.219		
2,023.74	2,023.32	2,023.32	2,023.32	7.05	7.04	178.70	-20.10	-0.10	45.34	31.26	14.28	3.282		
2,050.00	2,049.53	2,049.53	2,049.53	7.15	7.14	178.74	-20.10	-0.10	46.86	32.58	14.65	3.623		
2,100.00	2,099.13	2,100.87	2,099.13	7.33	7.32	178.88	-20.10	-0.10	53.06	38.42	15.00	4.237		
2,150.00	2,148.00	2,148.00	2,148.00	7.52	7.49	179.05	-20.10	-0.10	63.56	48.56	15.39	5.087		
2,200.00	2,195.77	2,204.23	2,195.77	7.72	7.69	179.20	-20.10	-0.10	78.28	62.89	15.71	6.182		
2,250.00	2,242.07	2,242.07	2,242.07	7.94	7.83	179.34	-20.10	-0.10	97.10	81.40	16.04	7.473		
2,300.00	2,286.56	2,286.56	2,286.56	8.17	7.99	179.44	-20.10	-0.10	119.89	103.85	16.37	8.949		
2,350.00	2,328.89	2,328.89	2,328.89	8.44	8.14	179.51	-20.10	-0.10	146.47	130.11	16.67	10.594		
2,400.00	2,368.74	2,368.74	2,368.74	8.74	8.28	179.57	-20.10	-0.10	176.64	159.97	16.96	12.393		
2,450.00	2,405.81	2,405.81	2,405.81	9.09	8.41	179.61	-20.10	-0.10	210.17	193.21	17.22	14.330		
2,500.00	2,439.82	2,439.82	2,439.82	9.48	8.54	179.63	-20.10	-0.10	246.80	229.58	17.49	16.367		
2,550.00	2,470.51	2,475.65	2,475.65	9.92	8.66	179.66	-20.01	-0.11	286.21	268.72	17.79	18.332		
2,600.00	2,497.64	2,539.97	2,539.76	10.41	8.90	179.87	-15.25	-0.39	326.14	308.35	17.90	20.393		
2,650.00	2,521.01	2,618.85	2,617.02	10.96	9.18	-179.68	0.32	-1.31	364.96	347.06	17.61	22.805		
2,700.00	2,540.43	2,720.86	2,712.47	11.55	9.56	-178.92	35.86	-3.43	401.54	383.93	16.49	26.301		
2,750.00	2,555.78	2,859.98	2,829.49	12.18	10.20	-177.73	110.32	-7.85	433.81	417.31	13.97	32.786		
2,800.00	2,566.91	3,053.53	2,955.50	12.85	11.55	-175.86	255.77	-16.49	457.89	443.93	10.90	42.958		
2,850.00	2,573.76	3,300.57	3,034.59	13.55	14.29	-172.94	487.38	-30.26	468.17	457.27	11.12	42.023		
2,890.67	2,576.13	3,409.36	3,038.40	14.14	15.78	-171.65	577.16	-35.59	467.34	456.22	11.14	41.943		
2,900.00	2,576.26	3,400.09	3,038.45	14.28	15.64	-171.52	586.41	-36.14	467.42	456.27	11.17	41.834		
2,902.14	2,576.27	3,402.03	3,038.46	14.31	15.67	-171.49	588.53	-36.27	467.45	456.28	12.69	37.006		
3,000.00	2,576.55	3,500.76	3,039.02	15.80	17.12	-170.15	685.57	-42.04	469.55	456.87	14.40	32.778		
3,100.00	2,576.83	3,601.42	3,039.60	17.40	18.68	-168.78	784.73	-47.93	471.97	457.57	15.50	30.545		
3,161.81	2,577.00	3,659.98	3,039.95	18.42	19.62	-167.95	846.02	-51.57	473.59	458.09	16.21	29.278		
3,200.00	2,577.11	3,699.03	3,040.17	19.05	20.25	-167.45	885.01	-53.73	474.56	458.35	17.91	26.588		
3,297.73	2,577.38	3,800.39	3,040.76	20.72	21.93	-166.75	986.31	-56.89	476.08	458.17	17.94	26.534		
3,300.00	2,577.39	3,802.74	3,040.77	20.75	21.97	-166.74	988.67	-56.92	476.09	458.15	19.53	24.394		
3,400.00	2,577.68	3,905.28	3,041.36	22.49	23.70	-166.68	1,091.20	-56.61	476.50	456.96	21.13	22.564		
3,500.00	2,577.96	4,005.28	3,041.93	24.25	25.42	-166.71	1,191.19	-55.56	476.73	455.60	22.74	20.971		
3,600.00	2,578.25	4,105.28	3,042.50	26.04	27.16	-166.75	1,291.18	-54.50	476.96	454.22	24.38	19.576		
3,700.00	2,578.54	4,205.28	3,043.07	27.84	28.93	-166.78	1,391.18	-53.45	477.20	452.82				

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



Wellbenders Anticollision Report



Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Reference Site: Lakewood Federal
Site Error: 0.00 usft
Reference Well: 12H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #2

Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WBDS_SQL_2
Offset TVD Reference: Reference Datum

Offset Design Lakewood Federal - 13H - OH - Plan #2													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IGRF													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
3,800.00	2,578.82	4,305.28	3,043.65	29.65	30.71	-166.81	1,491.17	-52.40	477.43	451.41	26.02	18.346		
3,900.00	2,579.11	4,405.28	3,044.22	31.48	32.51	-166.84	1,591.16	-51.35	477.66	449.98	27.68	17.256		
4,000.00	2,579.39	4,505.28	3,044.79	33.31	34.32	-166.87	1,691.15	-50.30	477.90	448.55	29.35	16.284		
4,100.00	2,579.68	4,605.28	3,045.36	35.16	36.14	-166.90	1,791.15	-49.25	478.13	447.11	31.02	15.413		
4,200.00	2,579.97	4,705.28	3,045.94	37.01	37.97	-166.93	1,891.14	-48.20	478.37	445.66	32.70	14.629		
4,300.00	2,580.25	4,805.28	3,046.51	38.87	39.81	-166.96	1,991.13	-47.15	478.60	444.21	34.38	13.919		
4,400.00	2,580.54	4,905.28	3,047.08	40.73	41.65	-166.99	2,091.12	-46.10	478.83	442.76	36.07	13.274		
4,500.00	2,580.83	5,005.28	3,047.65	42.60	43.50	-167.02	2,191.12	-45.05	479.07	441.31	37.76	12.686		
4,600.00	2,581.11	5,105.28	3,048.22	44.47	45.36	-167.05	2,291.11	-43.99	479.30	439.85	39.46	12.148		
4,700.00	2,581.40	5,205.27	3,048.80	46.34	47.22	-167.08	2,391.10	-42.94	479.54	438.39	41.15	11.653		
4,800.00	2,581.69	5,305.27	3,049.37	48.22	49.08	-167.11	2,491.09	-41.89	479.77	436.92	42.85	11.197		
4,900.00	2,581.97	5,405.27	3,049.94	50.10	50.95	-167.14	2,591.08	-40.84	480.01	435.46	44.55	10.776		
5,000.00	2,582.26	5,505.27	3,050.51	51.98	52.82	-167.18	2,691.08	-39.79	480.24	434.00	46.24	10.385		
5,100.00	2,582.54	5,605.27	3,051.09	53.86	54.69	-167.21	2,791.07	-38.74	480.48	432.53	47.94	10.022		
5,200.00	2,582.83	5,705.27	3,051.66	55.75	56.57	-167.24	2,891.06	-37.69	480.71	431.07	49.64	9.683		
5,300.00	2,583.12	5,805.27	3,052.23	57.64	58.45	-167.27	2,991.05	-36.64	480.95	429.60	51.34	9.367		
5,400.00	2,583.40	5,905.27	3,052.80	59.53	60.33	-167.30	3,091.05	-35.59	481.18	428.14	53.04	9.071		
5,500.00	2,583.69	6,005.27	3,053.37	61.42	62.21	-167.33	3,191.04	-34.54	481.42	426.68	54.74	8.794		
5,600.00	2,583.98	6,105.27	3,053.95	63.31	64.10	-167.36	3,291.03	-33.48	481.66	425.21	56.44	8.533		
5,700.00	2,584.26	6,205.27	3,054.52	65.21	65.98	-167.39	3,391.02	-32.43	481.89	423.75	58.14	8.288		
5,800.00	2,584.55	6,305.27	3,055.09	67.10	67.87	-167.42	3,491.01	-31.38	482.13	422.29	59.84	8.057		
5,900.00	2,584.83	6,405.27	3,055.66	69.00	69.76	-167.45	3,591.01	-30.33	482.36	420.82	61.54	7.838		
6,000.00	2,585.12	6,505.27	3,056.24	70.89	71.65	-167.48	3,691.00	-29.28	482.60	419.36	63.24	7.631		
6,100.00	2,585.41	6,605.27	3,056.81	72.79	73.54	-167.51	3,790.99	-28.23	482.84	417.90	64.94	7.436		
6,200.00	2,585.69	6,705.27	3,057.38	74.69	75.43	-167.54	3,890.98	-27.18	483.07	416.44	66.63	7.250		
6,300.00	2,585.98	6,805.27	3,057.95	76.59	77.33	-167.57	3,990.98	-26.13	483.31	414.98	68.33	7.073		
6,400.00	2,586.27	6,905.26	3,058.52	78.49	79.22	-167.60	4,090.97	-25.08	483.55	413.52	70.02	6.905		
6,500.00	2,586.55	7,005.26	3,059.10	80.39	81.12	-167.63	4,190.96	-24.03	483.79	412.07	71.72	6.746		
6,600.00	2,586.84	7,105.26	3,059.67	82.29	83.01	-167.66	4,290.95	-22.97	484.02	410.61	73.41	6.593		
6,700.00	2,587.12	7,205.26	3,060.24	84.19	84.91	-167.69	4,390.94	-21.92	484.26	409.15	75.11	6.448		
6,800.00	2,587.41	7,305.26	3,060.81	86.09	86.81	-167.72	4,490.94	-20.87	484.50	407.70	76.80	6.309		
6,900.00	2,587.70	7,405.26	3,061.39	88.00	88.70	-167.75	4,590.93	-19.82	484.73	406.25	78.49	6.176		
7,000.00	2,587.98	7,505.26	3,061.96	89.90	90.60	-167.78	4,690.92	-18.77	484.97	404.80	80.18	6.049		
7,100.00	2,588.27	7,605.26	3,062.53	91.80	92.50	-167.81	4,790.91	-17.72	485.21	403.34	81.87	5.927		
7,200.00	2,588.56	7,705.26	3,063.10	93.71	94.40	-167.84	4,890.91	-16.67	485.45	401.89	83.55	5.810		
7,300.00	2,588.84	7,805.26	3,063.67	95.61	96.30	-167.87	4,990.90	-15.62	485.69	400.45	85.24	5.698		
7,400.00	2,589.13	7,905.26	3,064.25	97.51	98.20	-167.90	5,090.89	-14.57	485.93	399.00	86.93	5.590		
7,500.00	2,589.41	8,005.26	3,064.82	99.42	100.10	-167.93	5,190.88	-13.52	486.16	397.55	88.61	5.487		
7,600.00	2,589.70	8,105.26	3,065.39	101.32	102.00	-167.96	5,290.87	-12.46	486.40	396.11	90.29	5.387		
7,700.00	2,589.99	8,205.26	3,065.96	103.23	103.91	-167.99	5,390.87	-11.41	486.64	394.66	91.98	5.291		
7,800.00	2,590.27	8,305.26	3,066.54	105.14	105.81	-168.02	5,490.86	-10.36	486.88	393.22	93.66	5.199		
7,900.00	2,590.56	8,405.26	3,067.11	107.04	107.71	-168.05	5,590.85	-9.31	487.12	391.78	95.34	5.109		
8,000.00	2,590.85	8,505.25	3,067.68	108.95	109.61	-168.08	5,690.84	-8.26	487.36	390.34	97.02	5.023		
8,100.00	2,591.13	8,605.25	3,068.25	110.85	111.52	-168.11	5,790.84	-7.21	487.60	388.90	98.69	4.940		
8,200.00	2,591.42	8,705.25	3,068.82	112.76	113.42	-168.13	5,890.83	-6.16	487.84	387.46	100.37	4.860		
8,300.00	2,591.70	8,805.25	3,069.40	114.67	115.33	-168.16	5,990.82	-5.11	488.08	386.03	102.05	4.783		
8,400.00	2,591.99	8,905.25	3,069.97	116.57	117.23	-168.19	6,090.81	-4.06	488.32	384.59	103.72	4.708		
8,403.10	2,592.00	8,908.36	3,069.99	116.63	117.29	-168.19	6,093.91	-4.02	488.32	384.55	103.77	4.706		

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



Wellbenders Anticollision Report



Company: Percussion Petroleum, LLC
 Project: Eddy County, NM
 Reference Site: Lakewood Federal
 Site Error: 0.00 usft
 Reference Well: 12H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan #2

Local Co-ordinate Reference: Well 12H
 TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
 MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: WBDS_SQL_2
 Offset TVD Reference: Reference Datum

Offset Design Lakewood Federal - 14H - OH - Plan #2														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+GRF														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance					Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
0.00	0.00	100.00	74.00	0.00	0.00	-58.31	326.60	-529.10	626.17						
100.00	100.00	126.00	100.00	0.15	0.05	-58.31	326.60	-529.10	621.78	621.59	0.20	3,180.230			
200.00	200.00	226.00	200.00	0.51	0.27	-58.31	326.60	-529.10	621.78	621.00	0.78	797.489			
300.00	300.00	326.00	300.00	0.87	0.63	-58.31	326.60	-529.10	621.78	620.29	1.50	415.459			
400.00	400.00	426.00	400.00	1.22	0.99	-58.31	326.60	-529.10	621.78	619.57	2.21	280.897			
500.00	500.00	608.02	565.52	1.58	1.65	-58.02	324.70	-519.95	616.50	613.28	3.22	191.528			
600.00	600.00	708.66	664.24	1.94	2.02	-57.64	322.42	-508.94	605.89	601.96	3.93	154.240			
700.00	700.00	809.30	762.96	2.30	2.42	-57.26	320.14	-497.92	595.30	590.65	4.64	128.174			
800.00	800.00	909.95	861.68	2.66	2.82	-56.86	317.86	-486.91	584.74	579.37	5.37	108.982			
900.00	900.00	989.41	960.40	3.02	3.14	-56.45	315.57	-475.89	574.20	568.19	6.01	95.510			
1,000.00	1,000.00	1,088.77	1,059.11	3.38	3.54	-56.02	313.29	-464.88	563.70	556.97	6.73	83.726			
1,100.00	1,100.00	1,188.13	1,157.83	3.73	3.95	-55.58	311.01	-453.87	553.23	545.77	7.46	74.194			
1,200.00	1,200.00	1,287.48	1,256.55	4.09	4.35	-55.12	308.73	-442.85	542.79	534.61	8.18	66.343			
1,300.00	1,299.99	1,386.82	1,355.25	4.45	4.76	-54.66	306.44	-431.84	531.93	523.03	8.91	59.715			
1,400.00	1,399.96	1,486.10	1,453.89	4.81	5.17	-54.21	304.16	-420.93	520.17	510.54	9.63	53.992			
1,500.00	1,499.90	1,585.34	1,552.49	5.17	5.58	-53.76	301.88	-409.83	507.96	497.60	10.36	49.029			
1,600.00	1,599.84	1,684.57	1,651.09	5.53	5.99	-53.30	299.60	-398.83	495.75	484.66	11.09	44.715			
1,700.00	1,699.78	1,783.81	1,749.69	5.88	6.40	-52.84	297.32	-387.83	483.55	471.73	11.81	40.928			
1,800.00	1,799.72	1,883.05	1,848.29	6.24	6.81	-52.38	295.04	-376.83	471.35	458.80	12.54	37.578			
1,900.00	1,899.65	1,982.29	1,946.89	6.61	7.22	-51.92	292.76	-365.83	459.16	445.88	13.27	34.594			
2,000.00	1,999.59	2,081.53	2,045.49	6.97	7.63	-51.46	290.48	-354.82	446.97	432.97	14.00	31.920			
2,023.74	2,023.32	2,105.08	2,068.89	7.05	7.73	-51.00	289.94	-352.21	444.08	429.90	14.18	31.326			
2,050.00	2,049.53	2,131.11	2,094.75	7.15	7.84	-50.54	289.34	-349.33	440.55	426.19	14.37	30.660			
2,100.00	2,099.13	2,180.28	2,143.61	7.33	8.04	-50.08	288.21	-343.88	432.06	417.33	14.73	29.325			
2,150.00	2,148.00	2,220.12	2,183.20	7.52	8.20	-49.62	287.66	-339.46	421.65	406.57	15.08	27.966			
2,200.00	2,195.77	2,254.26	2,217.08	7.72	8.34	-49.16	289.10	-335.66	410.70	395.30	15.40	26.666			
2,250.00	2,242.07	2,288.73	2,251.15	7.94	8.48	-48.70	292.61	-331.82	399.50	383.77	15.73	25.402			
2,300.00	2,286.56	2,323.58	2,285.32	8.17	8.61	-48.24	298.25	-327.96	388.19	372.13	16.06	24.167			
2,350.00	2,328.89	2,358.86	2,319.50	8.44	8.75	-47.78	306.08	-324.07	376.97	360.54	16.42	22.956			
2,400.00	2,368.74	2,394.65	2,353.61	8.74	8.88	-47.32	316.16	-320.18	366.03	349.22	16.82	21.766			
2,450.00	2,405.81	2,431.01	2,387.55	9.09	9.01	-46.86	328.59	-316.28	355.63	338.36	17.27	20.590			
2,500.00	2,439.82	2,468.02	2,421.23	9.48	9.15	-46.40	343.43	-312.40	346.02	328.24	17.78	19.456			
2,550.00	2,470.51	2,505.77	2,454.52	9.92	9.29	-45.94	360.80	-308.53	337.48	319.10	18.38	18.360			
2,600.00	2,497.64	2,544.37	2,487.30	10.41	9.44	-45.48	380.79	-304.70	330.31	311.25	19.06	17.331			
2,650.00	2,521.01	2,583.94	2,519.44	10.96	9.61	-45.02	403.55	-300.92	324.80	304.99	19.81	16.394			
2,700.00	2,540.43	2,624.62	2,550.78	11.55	9.79	-44.56	429.21	-297.21	321.22	300.60	20.62	15.579			
2,750.00	2,555.78	2,666.58	2,581.11	12.18	10.01	-44.10	457.96	-293.58	319.80	298.35	21.45	14.908			
2,755.81	2,557.29	2,671.54	2,584.56	12.26	10.04	-43.64	461.50	-293.17	319.78	298.23	21.55	14.838	CC		
2,800.00	2,566.91	2,710.00	2,610.21	12.85	10.26	-43.18	489.98	-290.07	320.71	298.43	22.28	14.393			
2,850.00	2,573.76	2,755.12	2,637.80	13.55	10.56	-42.72	525.50	-286.69	324.04	300.97	23.08	14.043			
2,900.00	2,576.26	2,802.20	2,663.54	14.28	10.93	-42.26	564.77	-283.49	329.77	305.95	23.83	13.839			
2,902.14	2,576.27	2,804.26	2,664.59	14.31	10.94	-41.80	566.54	-283.36	330.07	306.21	23.86	13.833			
3,000.00	2,576.55	2,907.66	2,709.02	15.80	11.92	-41.34	659.58	-277.63	344.71	319.30	25.41	13.567			
3,100.00	2,576.83	3,029.22	2,739.02	17.40	13.33	-40.88	777.07	-273.31	357.10	329.47	27.64	12.921			
3,161.81	2,577.00	3,108.85	2,745.01	18.42	14.37	-40.42	856.40	-271.99	361.33	331.82	29.52	12.242			
3,200.00	2,577.11	3,146.82	2,745.30	19.05	14.89	-40.42	894.37	-271.65	362.78	332.17	30.61	11.853			
3,297.73	2,577.38	3,244.54	2,746.05	20.72	16.31	-40.42	992.07	-270.76	364.43	330.99	33.44	10.898			
3,300.00	2,577.39	3,246.80	2,746.07	20.75	16.34	-40.42	994.34	-270.74	364.43	330.93	33.51	10.876			
3,400.00	2,577.68	3,346.80	2,746.83	22.49	17.88	-40.42	1,094.33	-269.83	364.61	328.12	36.48	9.994			
3,500.00	2,577.96	3,446.80	2,747.60	24.25	19.48	-40.42	1,194.32	-268.93	364.79	325.25	39.54	9.226			
3,600.00	2,578.25	3,546.80	2,748.37	26.04	21.13	-40.42	1,294.32	-268.02	364.96	322.31	42.65	8.556			
3,700.00	2,578.54	3,646.80	2,749.14	27.84	22.82	-40.42	1,394.31	-267.11	365.14	319.33	45.81	7.970			

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

Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Reference Site: Lakewood Federal
Site Error: 0.00 usft
Reference Well: 12H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan #2

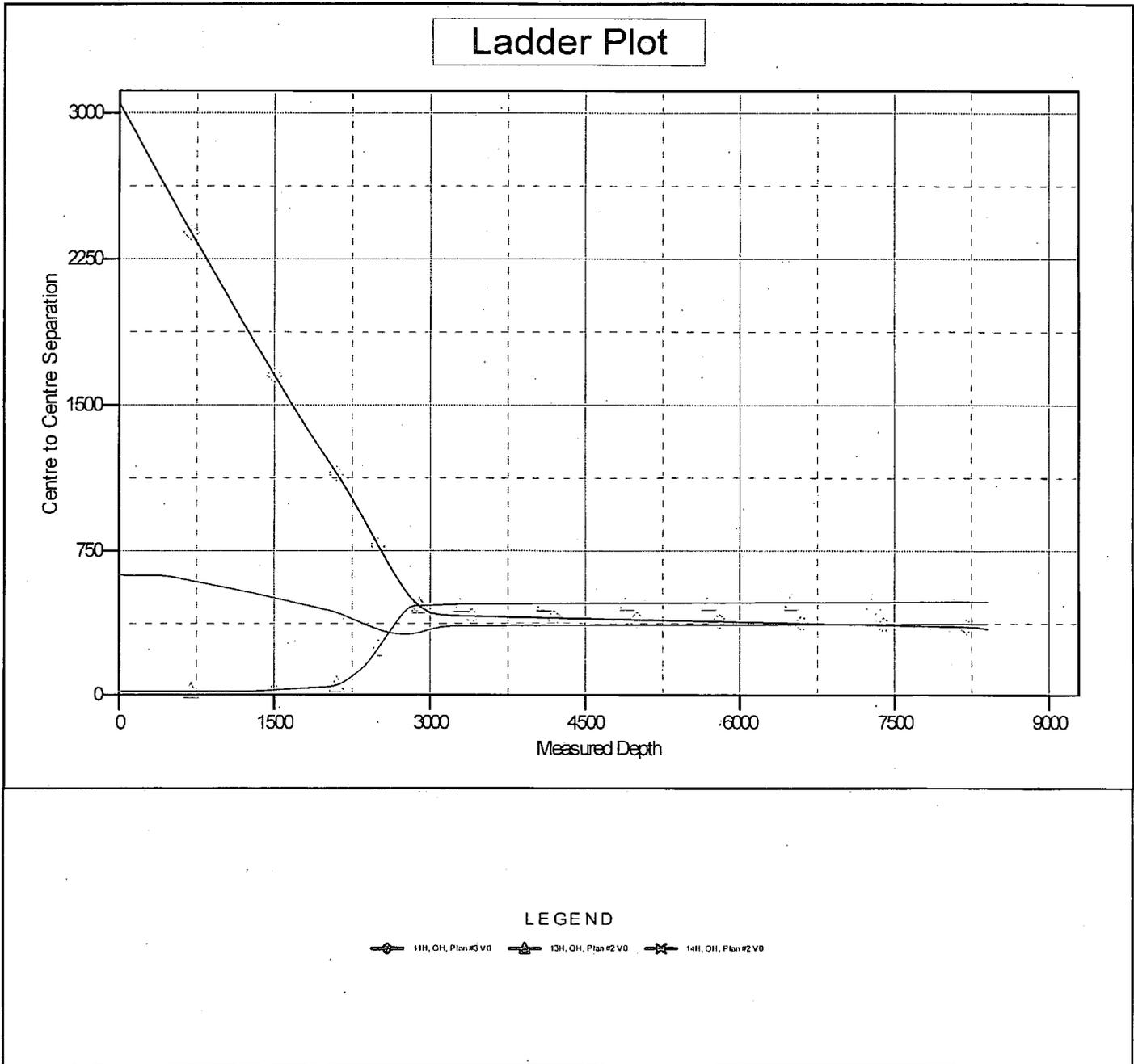
Local Co-ordinate Reference: Well 12H
TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: WBDS_SQL_2
Offset TVD Reference: Reference Datum

Offset Design Lakewood Federal - 14H - OH - Plan #2													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+IGRF													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Minimum Separation	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	(usft)			
3,800.00	2,578.82	3,746.80	2,749.91	29.65	24.55	-117.93	1,494.30	-266.20	365.32	316.31	49.01	7.454		
3,900.00	2,579.11	3,846.80	2,750.67	31.48	26.30	-118.00	1,594.29	-265.30	365.50	313.27	52.23	6.998		
4,000.00	2,579.39	3,946.80	2,751.44	33.31	28.07	-118.07	1,694.28	-264.39	365.68	310.20	55.48	6.591		
4,100.00	2,579.68	4,046.80	2,752.21	35.16	29.86	-118.14	1,794.28	-263.48	365.86	307.11	58.74	6.228		
4,200.00	2,579.97	4,146.79	2,752.98	37.01	31.67	-118.21	1,894.27	-262.57	366.04	304.02	62.02	5.902		
4,300.00	2,580.25	4,246.79	2,753.74	38.87	33.48	-118.28	1,994.26	-261.67	366.22	300.91	65.31	5.607		
4,400.00	2,580.54	4,346.79	2,754.51	40.73	35.31	-118.35	2,094.25	-260.76	366.40	297.79	68.61	5.340		
4,500.00	2,580.83	4,446.79	2,755.28	42.60	37.14	-118.42	2,194.24	-259.85	366.58	294.66	71.92	5.097		
4,600.00	2,581.11	4,546.79	2,756.05	44.47	38.98	-118.49	2,294.23	-258.94	366.76	291.53	75.23	4.875		
4,700.00	2,581.40	4,646.79	2,756.82	46.34	40.83	-118.56	2,394.23	-258.04	366.95	288.40	78.55	4.671		
4,800.00	2,581.69	4,746.79	2,757.58	48.22	42.69	-118.63	2,494.22	-257.13	367.13	285.26	81.87	4.484		
4,900.00	2,581.97	4,846.79	2,758.35	50.10	44.55	-118.70	2,594.21	-256.22	367.32	282.12	85.20	4.311		
5,000.00	2,582.26	4,946.78	2,759.12	51.98	46.41	-118.77	2,694.20	-255.31	367.50	278.98	88.52	4.151		
5,100.00	2,582.54	5,046.78	2,759.89	53.86	48.28	-118.84	2,794.19	-254.41	367.69	275.84	91.85	4.003		
5,200.00	2,582.83	5,146.78	2,760.66	55.75	50.15	-118.91	2,894.18	-253.50	367.87	272.69	95.18	3.865		
5,300.00	2,583.12	5,246.78	2,761.42	57.64	52.02	-118.98	2,994.18	-252.59	368.06	269.55	98.51	3.736		
5,400.00	2,583.40	5,346.78	2,762.19	59.53	53.90	-119.05	3,094.17	-251.68	368.25	266.41	101.84	3.616		
5,500.00	2,583.69	5,446.78	2,762.96	61.42	55.78	-119.12	3,194.16	-250.78	368.43	263.27	105.17	3.503		
5,600.00	2,583.98	5,546.78	2,763.73	63.31	57.66	-119.19	3,294.15	-249.87	368.62	260.13	108.49	3.398		
5,700.00	2,584.26	5,646.78	2,764.50	65.21	59.54	-119.26	3,394.14	-248.96	368.81	256.99	111.82	3.298		
5,800.00	2,584.55	5,746.78	2,765.26	67.10	61.43	-119.32	3,494.13	-248.05	369.00	253.85	115.15	3.205		
5,900.00	2,584.83	5,846.77	2,766.03	69.00	63.31	-119.39	3,594.13	-247.15	369.19	250.72	118.47	3.116		
6,000.00	2,585.12	5,946.77	2,766.80	70.89	65.20	-119.46	3,694.12	-246.24	369.38	247.59	121.79	3.033		
6,100.00	2,585.41	6,046.77	2,767.57	72.79	67.09	-119.53	3,794.11	-245.33	369.57	244.46	125.11	2.954		
6,200.00	2,585.69	6,146.77	2,768.34	74.69	68.98	-119.60	3,894.10	-244.42	369.76	241.33	128.43	2.879		
6,300.00	2,585.98	6,246.77	2,769.10	76.59	70.87	-119.67	3,994.09	-243.52	369.95	238.20	131.75	2.808		
6,400.00	2,586.27	6,346.77	2,769.87	78.49	72.77	-119.74	4,094.09	-242.61	370.15	235.08	135.06	2.741		
6,500.00	2,586.55	6,446.77	2,770.64	80.39	74.66	-119.81	4,194.08	-241.70	370.34	231.96	138.37	2.676		
6,600.00	2,586.84	6,546.77	2,771.41	82.29	76.56	-119.88	4,294.07	-240.79	370.53	228.85	141.68	2.615		
6,700.00	2,587.12	6,646.76	2,772.18	84.19	78.45	-119.94	4,394.06	-239.89	370.73	225.74	144.99	2.557		
6,800.00	2,587.41	6,746.76	2,772.94	86.09	80.35	-120.01	4,494.05	-238.98	370.92	222.63	148.29	2.501		
6,900.00	2,587.70	6,846.76	2,773.71	88.00	82.25	-120.08	4,594.04	-238.07	371.12	219.52	151.60	2.448		
7,000.00	2,587.98	6,946.76	2,774.48	89.90	84.14	-120.15	4,694.04	-237.16	371.31	216.42	154.89	2.397		
7,100.00	2,588.27	7,046.76	2,775.25	91.80	86.04	-120.22	4,794.03	-236.25	371.51	213.32	158.19	2.348		
7,200.00	2,588.56	7,146.76	2,776.01	93.71	87.94	-120.29	4,894.02	-235.35	371.70	210.22	161.48	2.302		
7,300.00	2,588.84	7,246.76	2,776.78	95.61	89.84	-120.36	4,994.01	-234.44	371.90	207.13	164.77	2.257		
7,400.00	2,589.13	7,346.76	2,777.55	97.51	91.74	-120.42	5,094.00	-233.53	372.10	204.04	168.06	2.214		
7,500.00	2,589.41	7,446.76	2,778.32	99.42	93.64	-120.49	5,193.99	-232.62	372.30	200.96	171.34	2.173		
7,600.00	2,589.70	7,546.75	2,779.09	101.32	95.54	-120.56	5,293.98	-231.72	372.50	197.87	174.62	2.133		
7,700.00	2,589.99	7,646.75	2,779.85	103.23	97.45	-120.63	5,393.98	-230.81	372.70	194.80	177.90	2.095		
7,800.00	2,590.27	7,746.75	2,780.62	105.14	99.35	-120.70	5,493.97	-229.90	372.90	191.72	181.17	2.058		
7,900.00	2,590.56	7,846.75	2,781.39	107.04	101.25	-120.76	5,593.96	-228.99	373.10	188.65	184.44	2.023		
8,000.00	2,590.85	7,946.75	2,782.16	108.95	103.15	-120.83	5,693.95	-228.09	373.30	185.59	187.71	1.989		
8,100.00	2,591.13	8,046.75	2,782.93	110.85	105.06	-120.90	5,793.95	-227.18	373.50	182.52	190.98	1.956		
8,200.00	2,591.42	8,146.75	2,783.69	112.76	106.96	-120.97	5,893.94	-226.27	373.70	179.46	194.24	1.924		
8,300.00	2,591.70	8,246.75	2,784.46	114.67	108.86	-121.03	5,993.93	-225.36	373.90	176.41	197.49	1.893		
8,400.00	2,591.99	8,346.74	2,785.23	116.57	110.77	-121.10	6,093.92	-224.46	374.11	173.36	200.75	1.864		
8,403.10	2,592.00	8,349.85	2,785.25	116.63	110.83	-121.10	6,097.02	-224.43	374.11	173.26	200.85	1.863 ES, SF		

Company: Percussion Petroleum, LLC
 Project: Eddy County, NM
 Reference Site: Lakewood Federal
 Site Error: 0.00 usft
 Reference Well: 12H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan #2

Local Co-ordinate Reference: Well 12H
 TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
 MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: WBDS_SQL_2
 Offset TVD Reference: Reference Datum

Reference Depths are relative to RKB=17' @ 3520.00usft (Silver Oak 1) Coordinates are relative to: 12H
 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: -0.08°

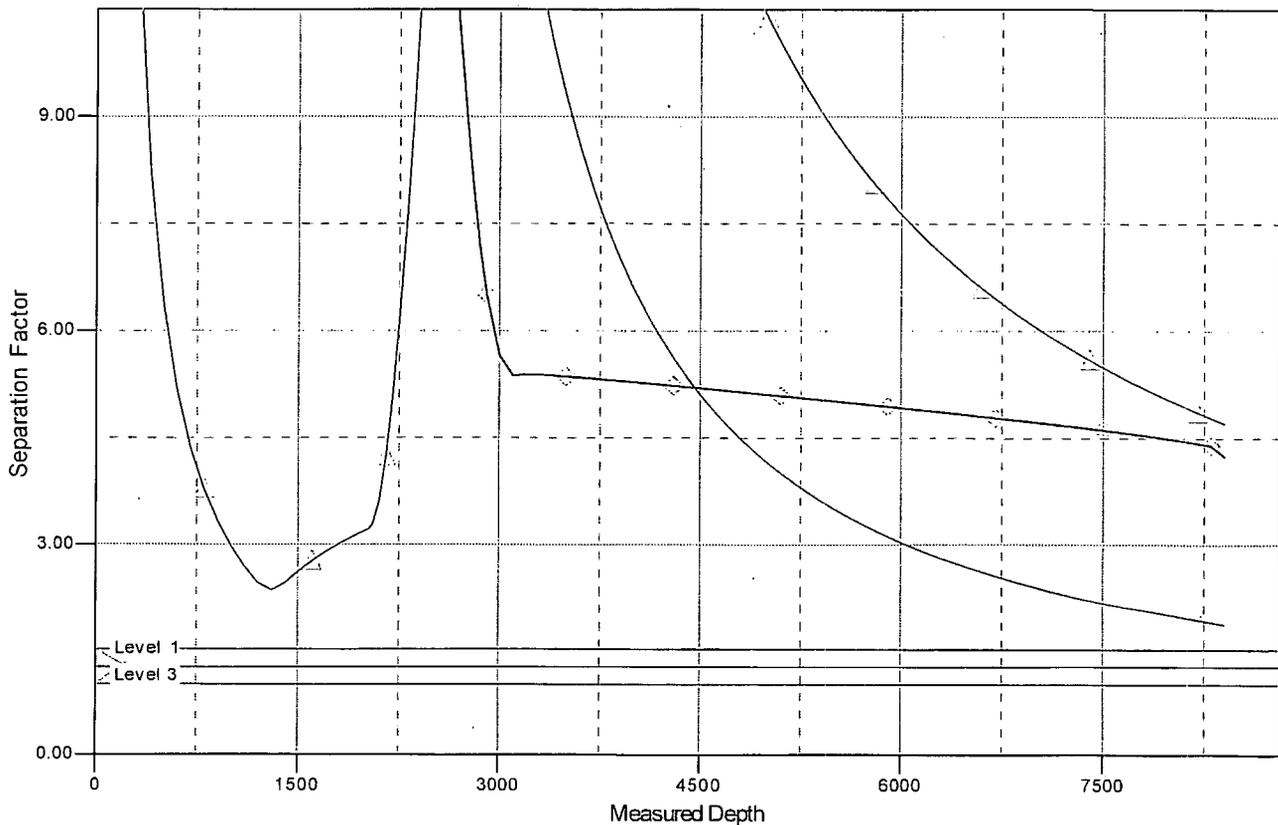


Company: Percussion Petroleum, LLC
 Project: Eddy County, NM
 Reference Site: Lakewood Federal
 Site Error: 0.00 usft
 Reference Well: 12H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan #2

Local Co-ordinate Reference: Well 12H
 TVD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
 MD Reference: RKB=17' @ 3520.00usft (Silver Oak 1)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: WBDS_SQL_2
 Offset TVD Reference: Reference Datum

Reference Depths are relative to RKB=17' @ 3520.00usft (Silver Oak 1) Coordinates are relative to: 12H
 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: -0.08°

Separation Factor Plot



LEGEND

11H, OH, Plan #3 VD
 13H, OH, Plan #2 VD
 14H, OH, Plan #2 VD

Percussion Petroleum Operating, LLC
Lakewood Federal Com 12H
SHL 755' FNL & 1820' FWL 3-20S-25E
BHL 20' FNL & 1865' FWL 34-19S-25E
Eddy County, NM

DRILL PLAN PAGE 1

Drilling Program

1. ESTIMATED TOPS

Formation/Lithology	TVD	MD	Contents
Quaternary caliche	000'	000'	water
Grayburg dolomite	633'	633'	hydrocarbons
San Andres dolomite	818'	818'	hydrocarbons
(KOP	2023'	2024'	hydrocarbons)
Glorieta silty dolomite	2378'	2390'	hydrocarbons
Yeso dolomite & goal	2533'	2565'	hydrocarbons
TD	2592'	8403'	hydrocarbons

2. NOTABLE ZONES

Yeso is the goal. Closest water well (RA 02958) is 3096' northeast. Depth to water was not reported 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.

Percussion Petroleum Operating, LLC
 Lakewood Federal Com 12H
 SHL 755' FNL & 1820' FWL 3-20S-25E
 BHL 20' FNL & 1865' FWL 34-19S-25E
 Eddy County, NM

DRILL PLAN PAGE 2

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' - 1279'	0' - 1279'	Surface 9.625"	36	J-55	LTC	1.125	1.125	1.8
8.75"	0' - 2300'	0' - 2287'	Prod. 1 7"	32	L-80	BTC	1.125	1.125	1.8
8.75"	0' - 8403'	0' - 2592'	Prod. 2 5.5"	17	L-80	BTC	1.125	1.125	1.8

Casing Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Lead	636	1.32	840	14.8	Class C + 2% CaCl + ¼ pound per sack celloflake
TOC = GL		100% Excess			Stop collar 10' above shoe with centralizer. One on 1st collar and every 4 th collar to GL.	
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	1441	1.32	1902	14.8	Class C + 2% CaCl + ¼ pound per sack celloflake
TOC = GL		50% Excess			Stop collar 10' above shoe with centralizer. One on 1st collar and every 10 collars to 1200' with 1 centralizer in 9.625" 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.

Percussion Petroleum Operating, LLC
Lakewood Federal Com 12H
SHL 755' FNL & 1820' FWL 3-20S-25E
BHL 20' FNL & 1865' FWL 34-19S-25E
Eddy County, NM

DRILL PLAN PAGE 3

Type	Interval (MD)	lb/gal	Viscosity	Fluid Loss	Plastic Viscosity	Yield Point
fresh water/gel	0' - 1279'	8.4 - 9.2	36-42	NC	3-5	5-7
fresh water/cut brine	1279' - 2024'	8.3 - 9.2	28-30	NC	1	1
cut brine	2024' - 8403'	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 ≈ 1111 psi. Expected bottom hole temperature is $\approx 109^\circ$ 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 all three leases that will be penetrated. St. Devote LLC is a subsidiary of Percussion.

Contingency Planning – Lakewood Federal 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.

SCENARIO:

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 200% excess cement
 1. 400 sks 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: 10400035089

Submission Date: 10/11/2018

Highlighted data
reflects the most
recent changes

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Lake_12H_Road_Map_20181010124243.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:

Lake_12H_New_Road_Map_20181010124316.pdf

New road type: RESOURCE

Length: 1252.2 Feet

Width (ft.): 30

Max slope (%): 0

Max grade (%): 4

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; Borrow ditches will turn out every 100 yards.

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

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; Borrow ditches will turn out every 100 yards.

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:

Lake_12H_Well_Map_20181010124445.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: A 556.9' long overhead raptor safe 3-phase power line will be built north, parallel to the access road, to Percussion's existing power line. A 3452.2' long 4" O D. HDPE flow line will be laid on the surface north and west along Lakewood, Huber, & Irami roads and pads to a proposed central tank battery (CTB) on the proposed Lakewood Federal Com 17H/18H/19H pad. (CTB will be described in, and authorized by approval of, the 17H/18H/19H APDs.) Flowline maximum operating pressure will be 100 psi.

Production Facilities map:

Lake_12H_Production_Facilities_20181010124457.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: DUST CONTROL, STIMULATION, SURFACE CASING **Water source type:** GW WELL

Describe type:

Source latitude:

Source longitude:

Source datum:

Water source permit type: PRIVATE CONTRACT

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:

Lake_12H_Water_Source_Map_20181010124721.pdf

Water source comments: Two temporary 10" Kevlar lay flat surface pipelines will be laid 4350' along roads from Percussion's existing Huber 3 pond to the pad. Pipeline route will not be bladed or excavated.

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:

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

Additional information attachment:

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.

Construction Materials source location attachment:

Lake_12H_Construction_Methods_20181010124820.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

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

Amount of waste: 1000 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

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

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:

Lake_12H_Well_Site_Layout_20181010124944.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: LAKEWOOD FEDERAL COM

Multiple Well Pad Number: 12H

Recontouring attachment:

Lake_12H_Interim_Reclamation_Diagram_20181010125000.pdf

Lake_12H_Recontour_Plat_20181010125007.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

Well pad proposed disturbance (acres): 1.86

Well pad interim reclamation (acres): 0.37

Well pad long term disturbance (acres): 1.49

Road proposed disturbance (acres): 0.86

Road interim reclamation (acres): 0

Road long term disturbance (acres): 0.86

Powerline proposed disturbance (acres): 0.38

Powerline interim reclamation (acres): 0.38

Powerline long term disturbance (acres): 0

Pipeline proposed disturbance (acres): 4.38

Pipeline interim reclamation (acres): 4.38

Pipeline long term disturbance (acres): 0

Other proposed disturbance (acres): 0

Other interim reclamation (acres): 0

Other long term disturbance (acres): 0

Total proposed disturbance: 7.48

Total interim reclamation: 5.13

Total long term disturbance: 2.35

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

Disturbance Comments:

Reconstruction method: Interim reclamation will be completed within 6 months of completing the well. Interim reclamation will consist of shrinking the well pad 0.37 acre by removing caliche and reclaiming 20' on the west side and 40' on the south side of the pad. This will leave 1.49 acres for the anchors, pump jacks, and tractor-trailer turn around. Disturbed areas will be contoured to match pre-construction grades. Once the wells are plugged and all production equipment removed, then reclamation will be completed within 6 months of plugging the last well. Reclamation will consist of removing caliche and deeply ripping on the contour. 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. Noxious weeds will be controlled.

Topsoil redistribution: 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.

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

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

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	
Seed Type	Pounds/Acre

Total 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

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM

Well Number: 12H

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Disturbance type: PIPELINE

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: LAKEWOOD FEDERAL COM

Well Number: 12H

Disturbance type: OTHER

Describe: Power Line

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Section 12 - Other Information

Right of Way needed? NO

Use APD as ROW?

ROW Type(s):

ROW Applications

SUPO Additional Information:

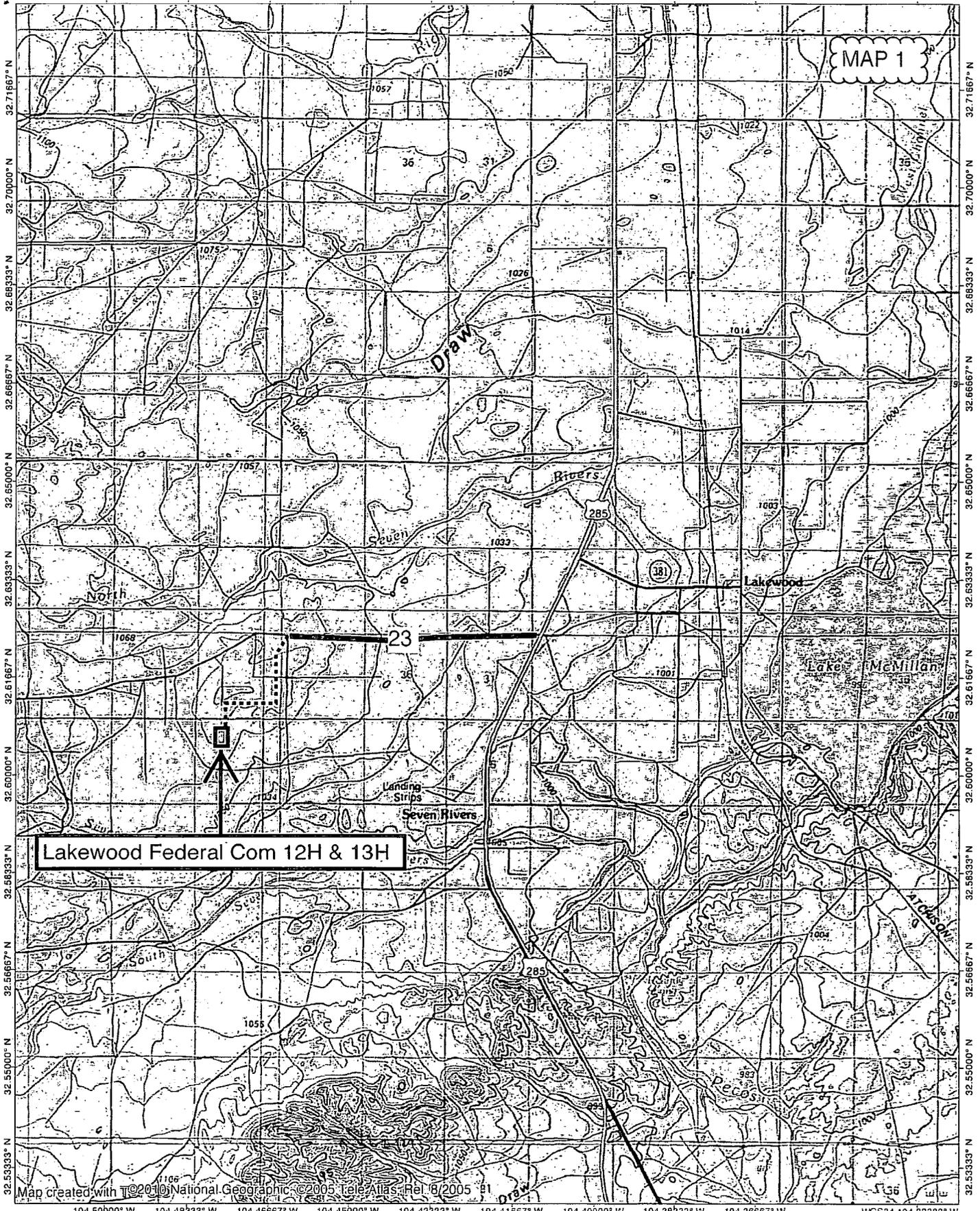
Use a previously conducted onsite? YES

Previous Onsite information: On-site inspection was held with Jessie Bassett (BLM) on April 3, 2018.

Other SUPO Attachment

Lake_12H_SUPO_20181010125504.pdf

104.50000° W 104.48333° W 104.46667° W 104.45000° W 104.43333° W 104.41667° W 104.40000° W 104.38333° W 104.36667° W WGS84 104.33333° W

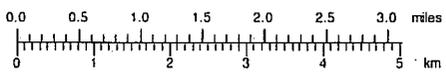


MAP 1

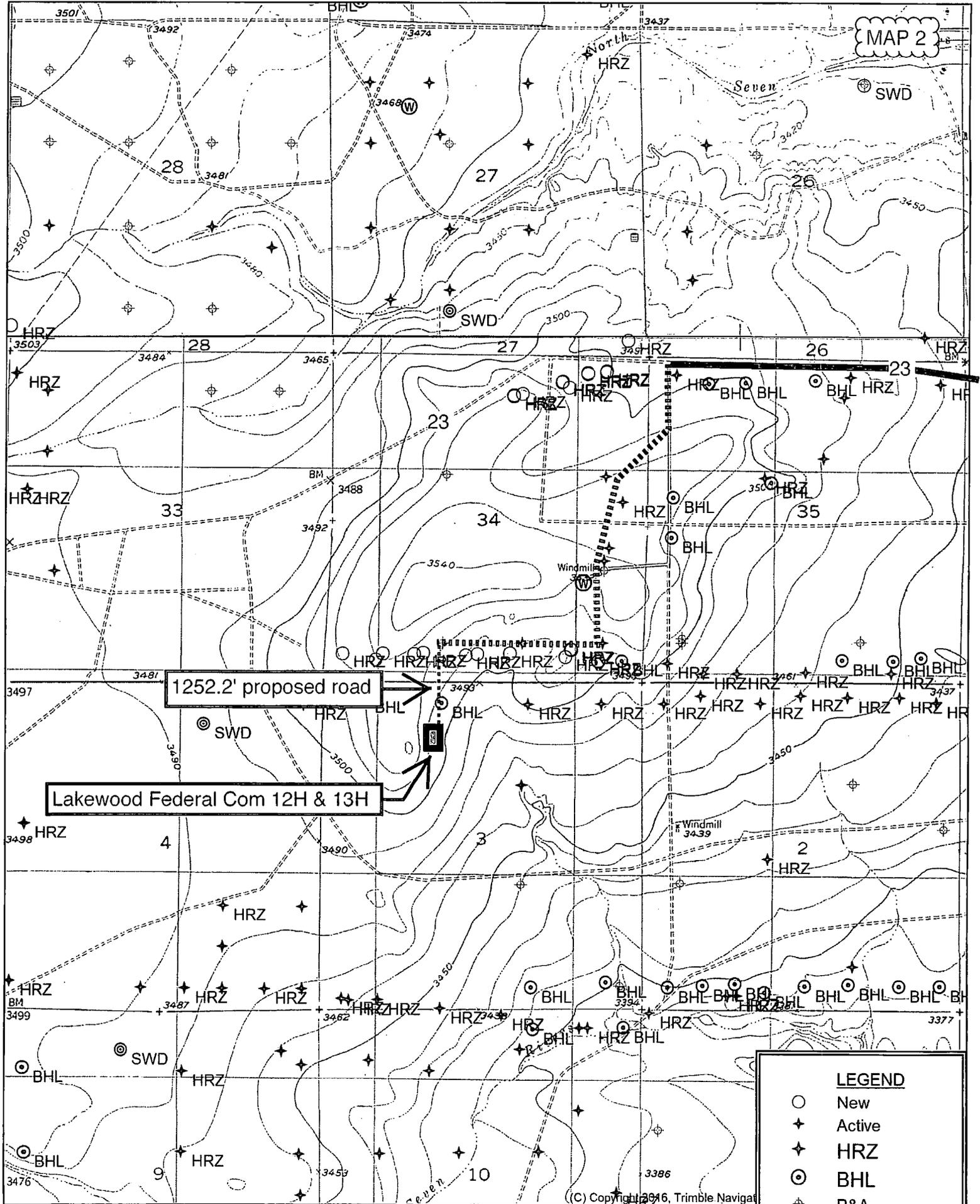
Lakewood Federal Com 12H & 13H

Map created with T@2010 National Geographic ©2005 Tele Atlas, Rel. 8/2005 81 WGS84 104.33333° W

NATIONAL GEOGRAPHIC



TN 7° MN



1252.2' proposed road

Lakewood Federal Com 12H & 13H

LEGEND	
○	New
+	Active
✦	HRZ
⊙	BHL
⊕	P&A
⊗	INJ
⊙	SWD
⊙	Water



Quad: SEVEN RIVERS
 Scale: 1 inch = 2,000 ft.

Lakewood
Federal 1

Huber
Federal
15H & 16H

Huber
Federal
10H & 12H

Huber
Federal
11H

road approved via
Percussion's
Huber Federal
10H-12H &
15H-18H APDs

Lakewood
Federal 1

1252.2' proposed road

Lakewood
Fed'l Com
12H 13H

MAP 3

400 ft

3260137, -10447493

3260304, -10447575

3260304, -10447493

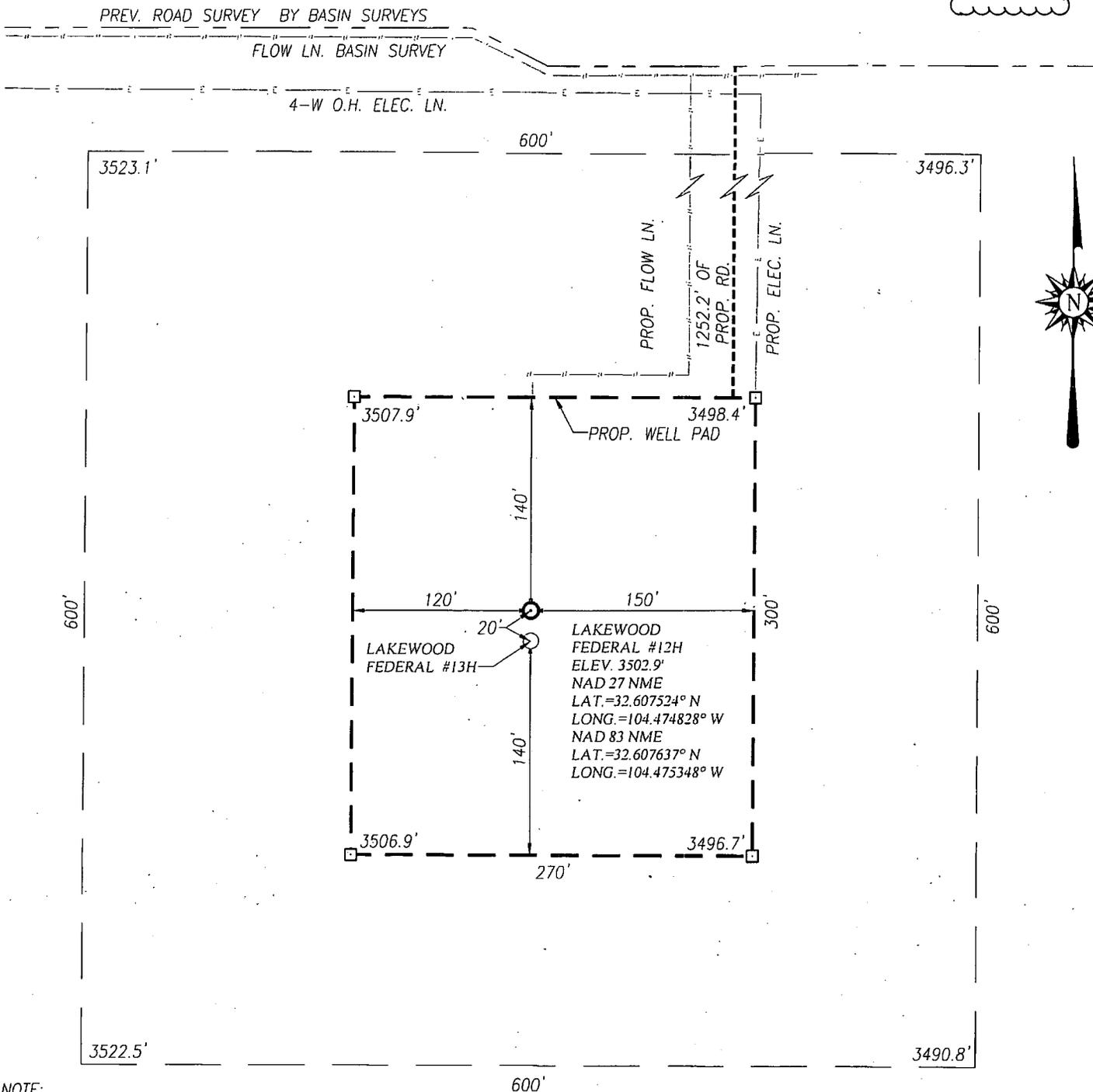
3260304, -10447437

3260722, -10447575

326072, -10447437

WELL SITE PLAN

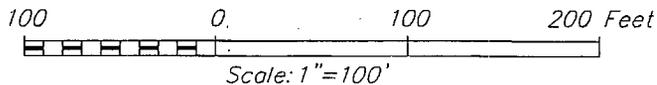
MAP 4



NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1252.2 FEET TO THE NORTH EDGE OF PAD.



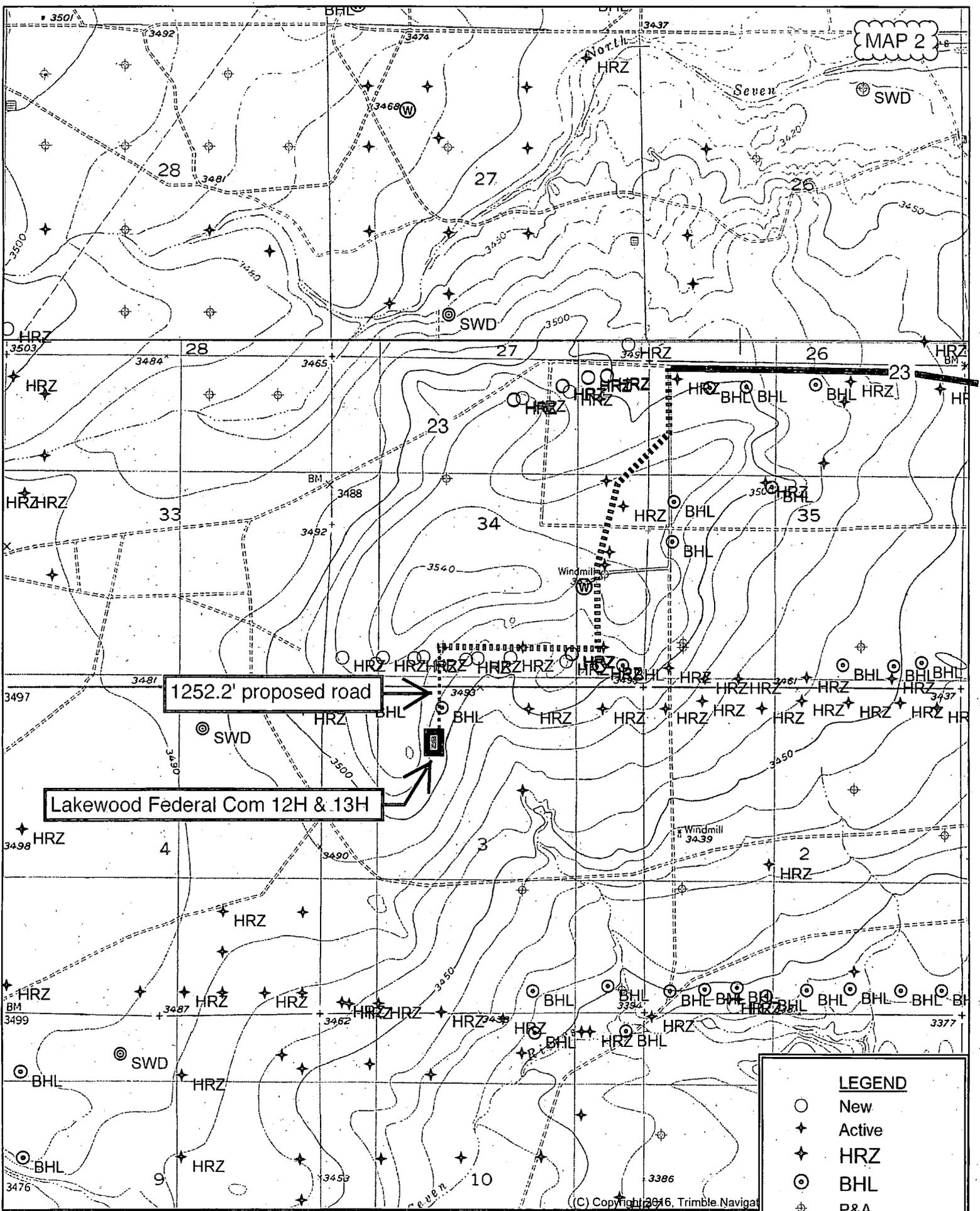
PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #12H WELL LOCATED 755 FEET FROM THE NORTH LINE AND 1820 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 4/06/18	CAD Date: 5/01/18	Drawn By: ACK
W.O. No.: 18110427	Rev: 09/19/18	Rel. W.O.:18110115
		Sheet 1 of 1



1252.2' proposed road

Lakewood Federal Com 12H & 13H

LEGEND

- New
- ✦ Active
- ✦ HRZ
- ⊙ BHL
- ⊕ P&A
- ⊙ INJ
- ⊙ SWD
- ⊙ W Water



Quad: SEVEN RIVERS
 Scale: 1 inch = 2,000 ft.

Huber
Federal
15H & 16H

3260117 - 10447493

Huber
Federal
10H & 12H

Huber
Federal
11H

Lakewood
Federal 1

road approved via
Percussion's
Huber Federal
10H-12H &
15H-18H APDs

1252.2' proposed road



Lakewood
Federal 1

3260804 - 10447575

Lakewood
Fed'l Com
12H 13H

3260304 - 10447493

3260304 - 10447493

3260772 - 10447575

3260772 - 10447493

MAP 3

400 ft

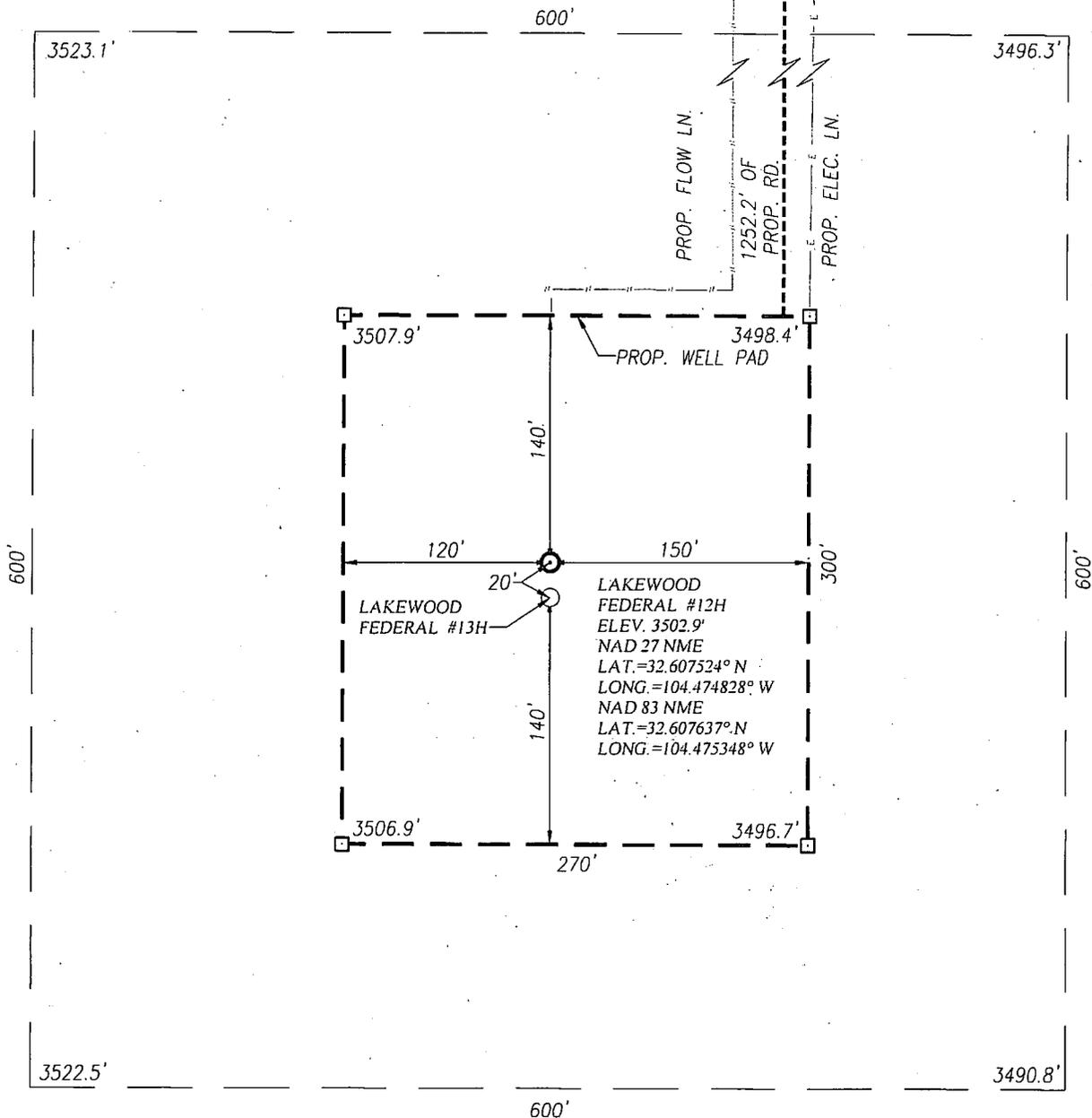
WELL SITE PLAN

MAP 4

PREV. ROAD SURVEY BY BASIN SURVEYS

FLOW LN. BASIN SURVEY

4-W O.H. ELEC. LN.

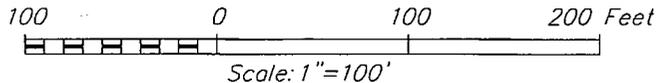


NOTE:

1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1252.2 FEET TO THE NORTH EDGE OF PAD.



PERCUSSION PETROLEUM OPERATING, LLC

LAKWOOD FEDERAL #12H WELL LOCATED 755 FEET FROM THE NORTH LINE AND 1820 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 4/06/18

CAD Date: 5/01/18

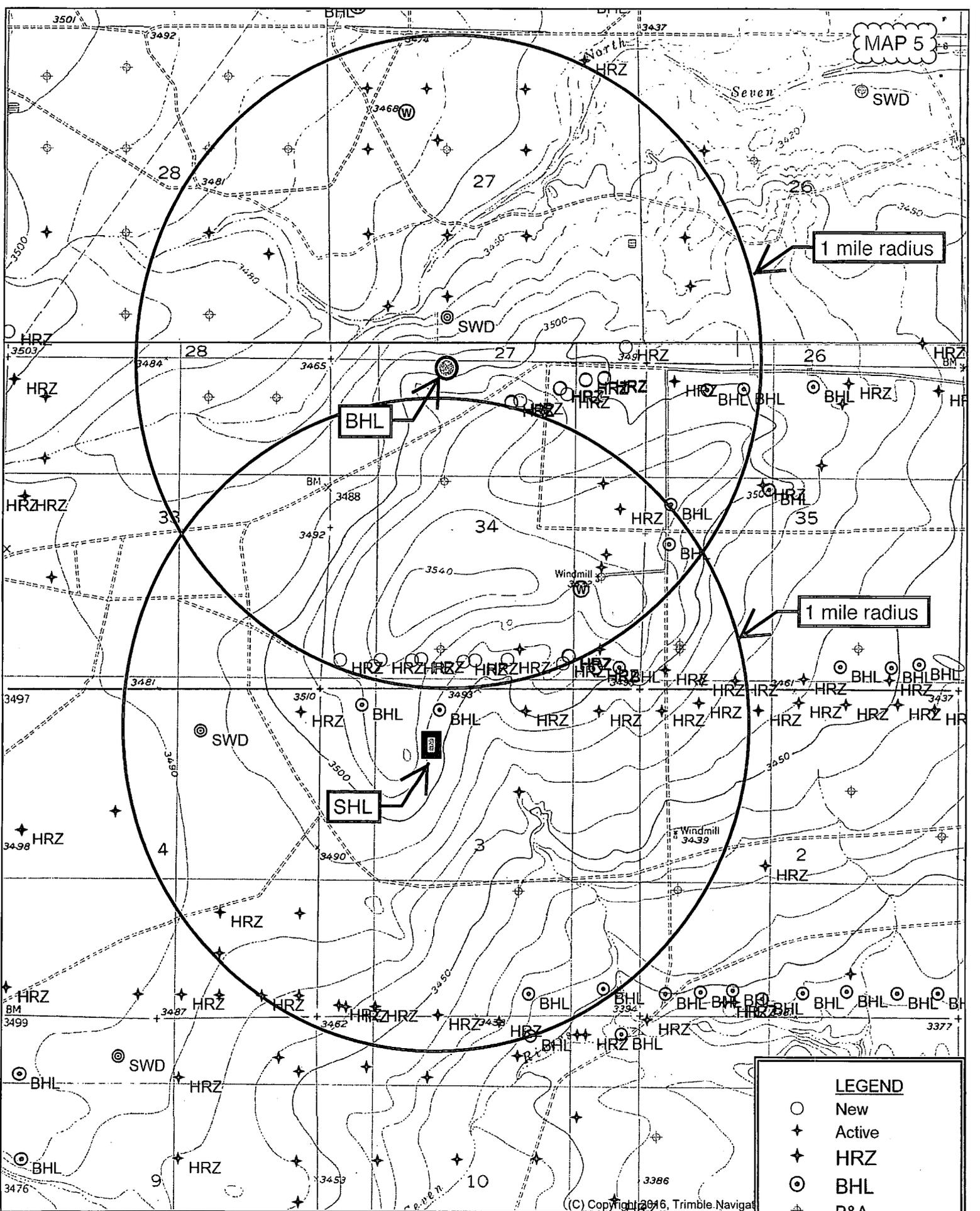
Drawn By: ACK

W.O. No.: 18110427

Rev: 09/19/18

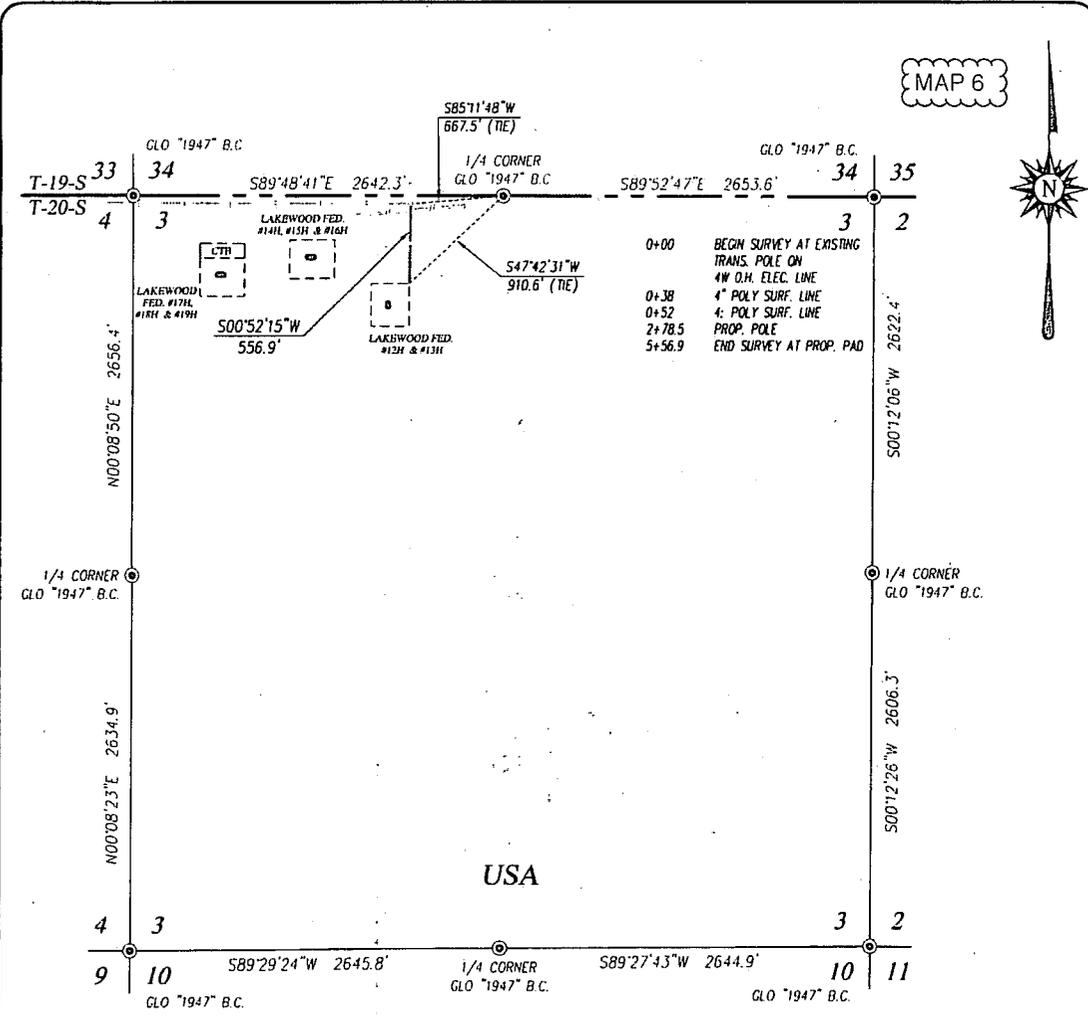
Rel. W.O.: 18110115

Sheet 1 of 1



Quad: SEVEN RIVERS
 Scale: 1 inch = 2,000 ft.

LEGEND	
○	New
✦	Active
✦	HRZ
⊙	BHL
⊕	P&A
⊖	INJ
⊗	SWD
⊙	Water



DESCRIPTION

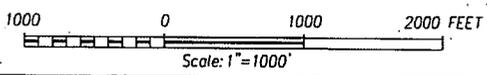
SURVEY FOR A STRIP OF LAND 30.0 FEET WIDE AND 556.9 FEET OR 0.105 MILES IN LENGTH CROSSING USA LAND IN SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

NOTE

- 1) BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.
- 2) LATITUDE AND LONGITUDE VALUES SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN DATUM 1983 (NAD83).

LEGEND

- ⊙ - DENOTES FOUND CORNER AS NOTED
- - DENOTES CENTERLINE SURVEY



I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED, WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

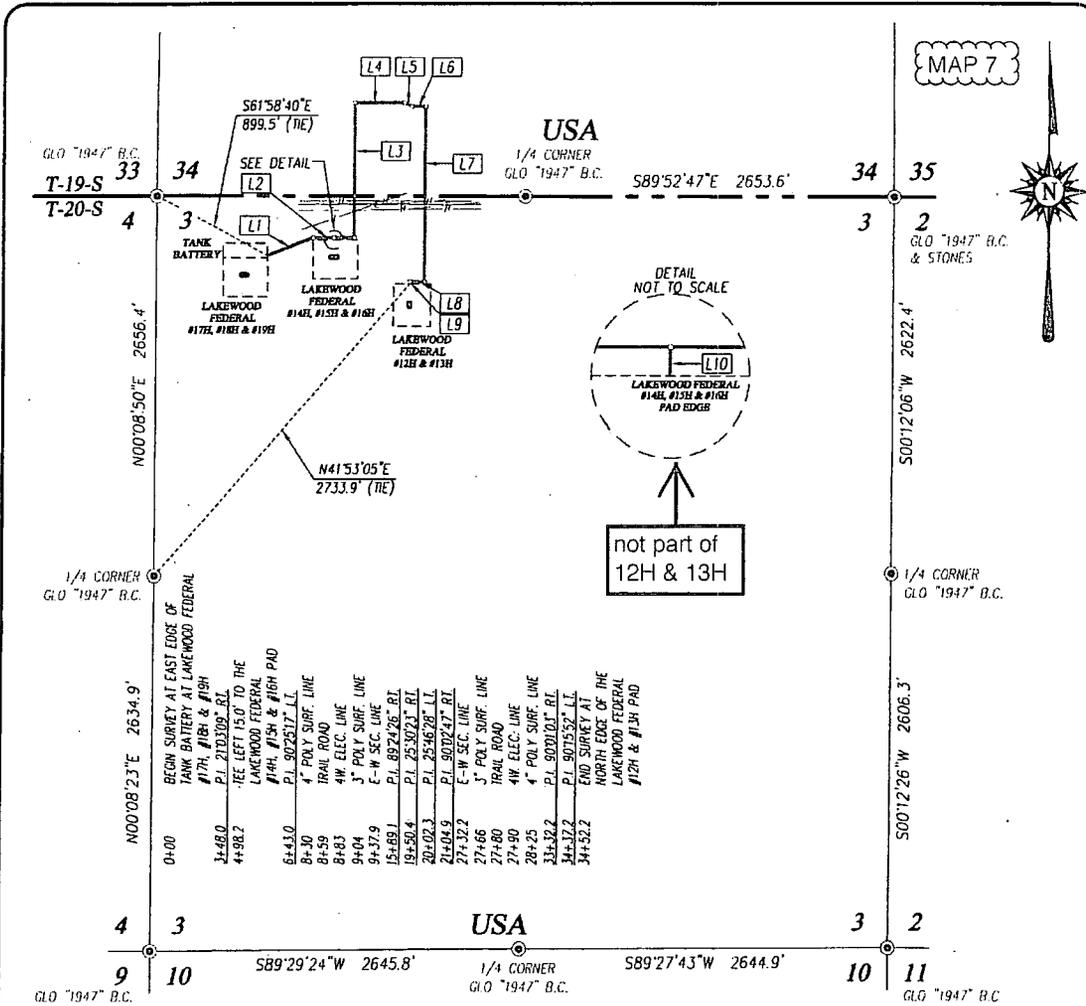
RONALD J. EIDSON *Ronald J. Eidson*
 DATE: 6/18/2016

PERCUSSION PETROLEUM OPERATING, LLC

SURVEY FOR AN ELECTRIC LINE TO THE
 LAKEWOOD FEDERAL #12H & #13H
 CROSSING SECTION 3,
 TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M.
 EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO HOBBS, N.M. 88240
 (575) 393-3117 www.jwsc.biz
 TBPLS# 10021000

Survey Date: 06/11/18	CAD Date: 06/15/18	Drawn By: LSL
W.O. No.: 18110696	Rev.:	Rel. W.O.:
		Sheet 1 of 1



DESCRIPTION

SURVEY FOR A STRIP OF LAND 30.0 FEET WIDE AND 3467.3 FEET OR 0.657 MILES IN LENGTH CROSSING USA LAND IN SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST & 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.

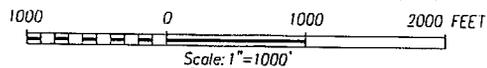
3467.3'
- 15.1'
3452.2'

LINE	BEARING	DISTANCE
L1	N69°07'56"E	348.0'
L2	S89°48'55"E	295.0'
L3	N00°45'48"E	946.1'
L4	S89°49'46"E	361.3'
L5	S64°19'23"E	56.9'
L6	N89°54'09"E	97.6'
L7	S00°08'38"W	1227.2'
L8	N89°50'19"W	105.1'
L9	S00°06'11"E	15.0'
L10	S00°38'00"W	15.1'

not part of
12H & 13H

LEGEND

⊙ DENOTES FOUND CORNER AS NOTED



NOTE

BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY, PLAT AND THE ACTUAL SURVEY ON THE GROUND WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON *Ronald J. Eidson*
DATE: 10/04/2018



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

PERCUSSION PETROLEUM OPERATING, LLC

SURVEY FOR A FLOW LINE FROM THE BATTERY AT THE LAKEWOOD FEDERAL #17H, #18H & #19H TO THE LAKEWOOD FEDERAL #12H, #13H, #14H, #15H & #16H CROSSING SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST AND SECTION 34 TOWNSHIP 19 SOUTH, RANGE 25 EAST N.M.P.M. EDDY COUNTY, NEW MEXICO

Survey Date: 03/05/18	CAD Date: 10/03/18	Drawn By: LSL
W.O. No.: 18131107	Rev.:	Rel. W.O.: 18110120

3260147, -1044749 3260144, -1044750

3260956, -1044748

3260804, -1044757 3260804, -1044747
3260808, -1044756 3260804, -1044748

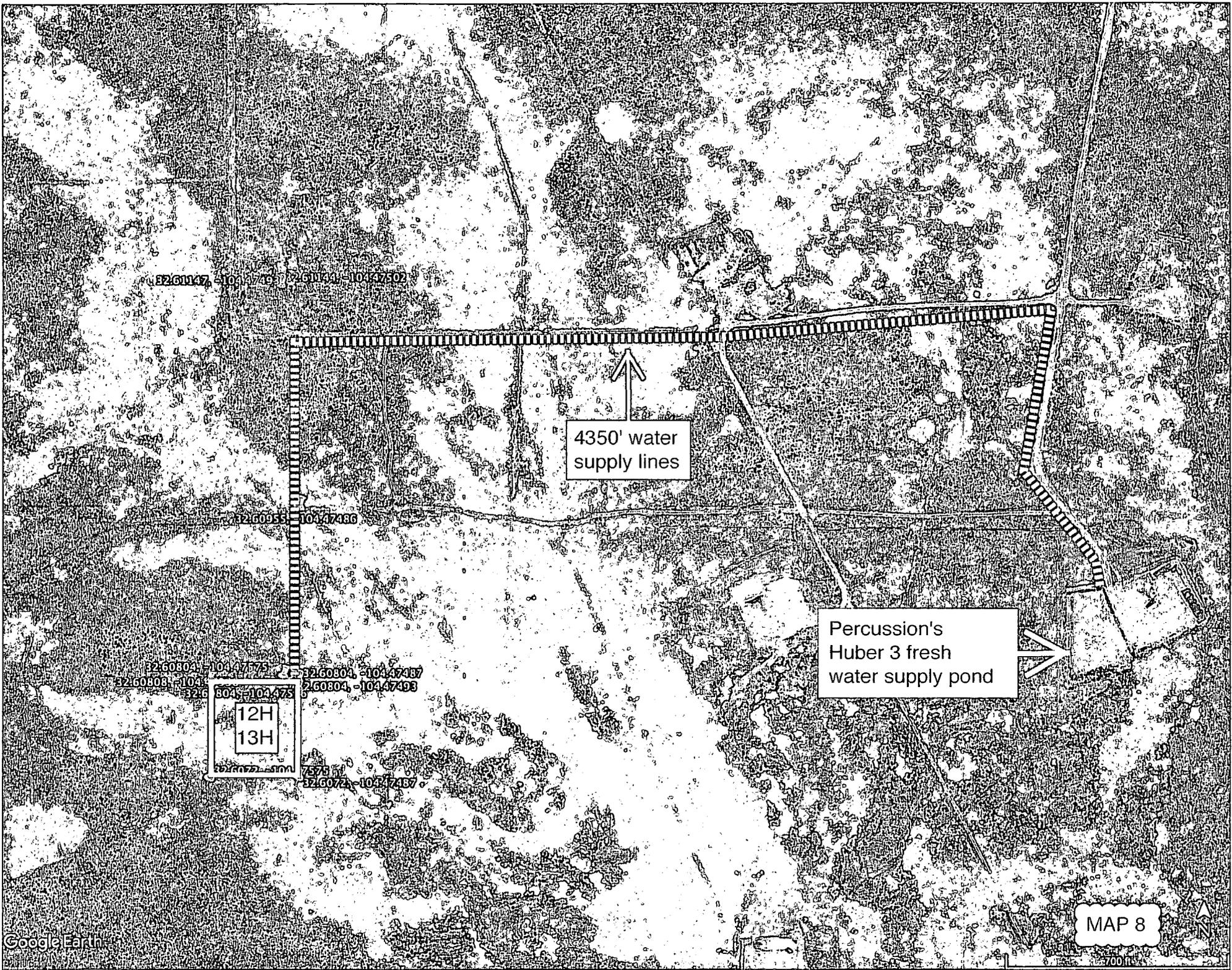
3260804, -104475
12H
13H

3260721, -1044747

4350' water supply lines

Percussion's Huber 3 fresh water supply pond

MAP 8

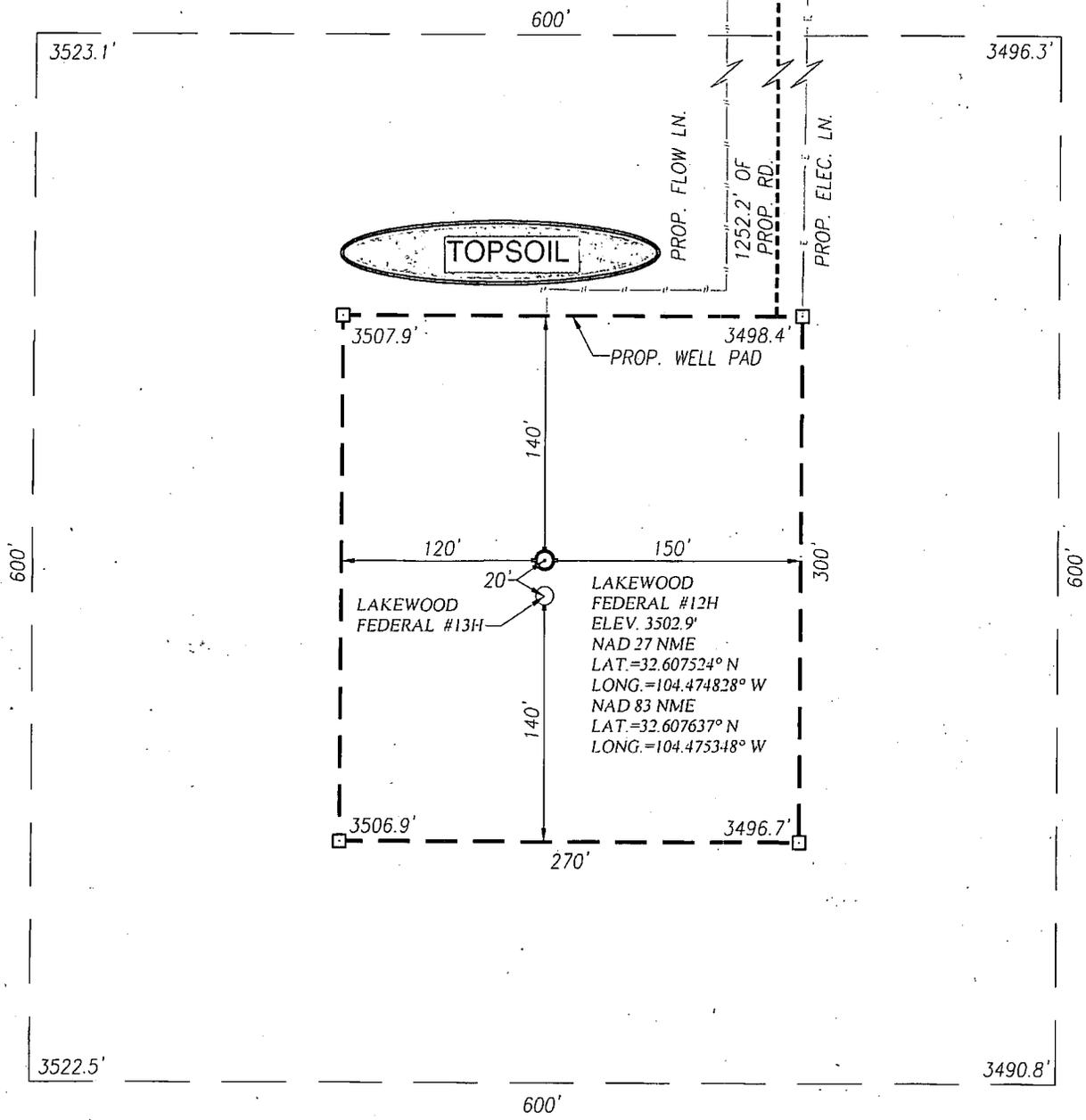


WELL SITE PLAN

MAP 9

PREV. ROAD SURVEY BY BASIN SURVEYS
FLOW LN. BASIN SURVEY

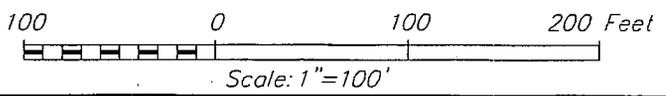
4-W O.H. ELEC. LN.



NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1252.2 FEET TO THE NORTH EDGE OF PAD.



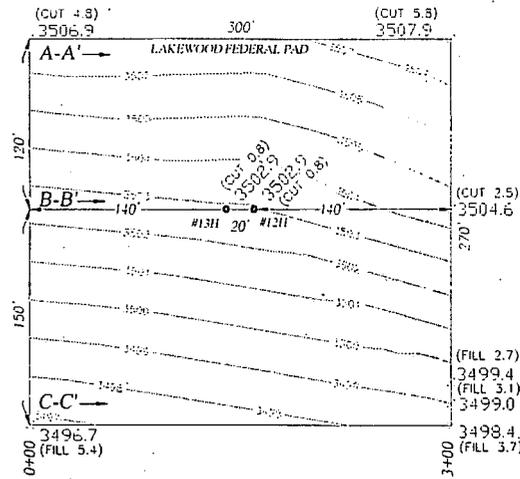
PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #12H WELL LOCATED 755 FEET FROM THE NORTH LINE AND 1820 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

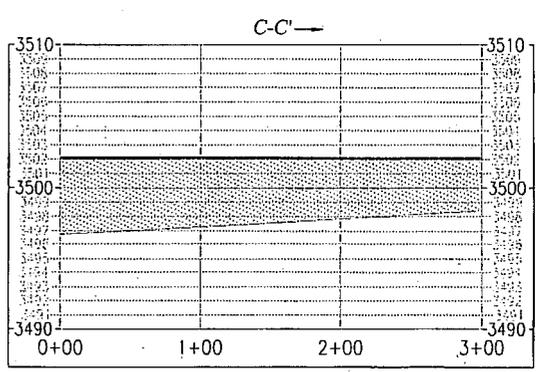
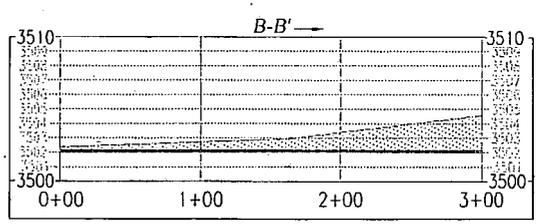
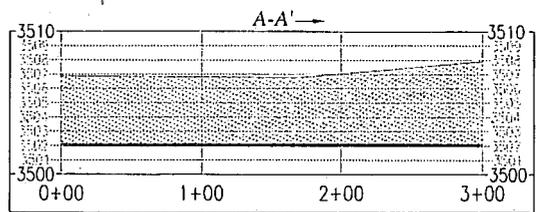


PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 4/06/18	CAD Date: 5/01/18	Drawn By: ACK
W.O. No.: 18110427	Rev: 09/19/18	Rel. W.O.: 18110115
		Sheet 1 of 1

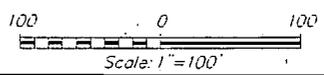


MAP 10



PERCUSSION PETROLEUM OPERATING, LLC

LAKWOOD FEDERAL #12H & #13H WELL PAD IN
SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST,
N.M.P.M., EDDY COUNTY, NEW MEXICO

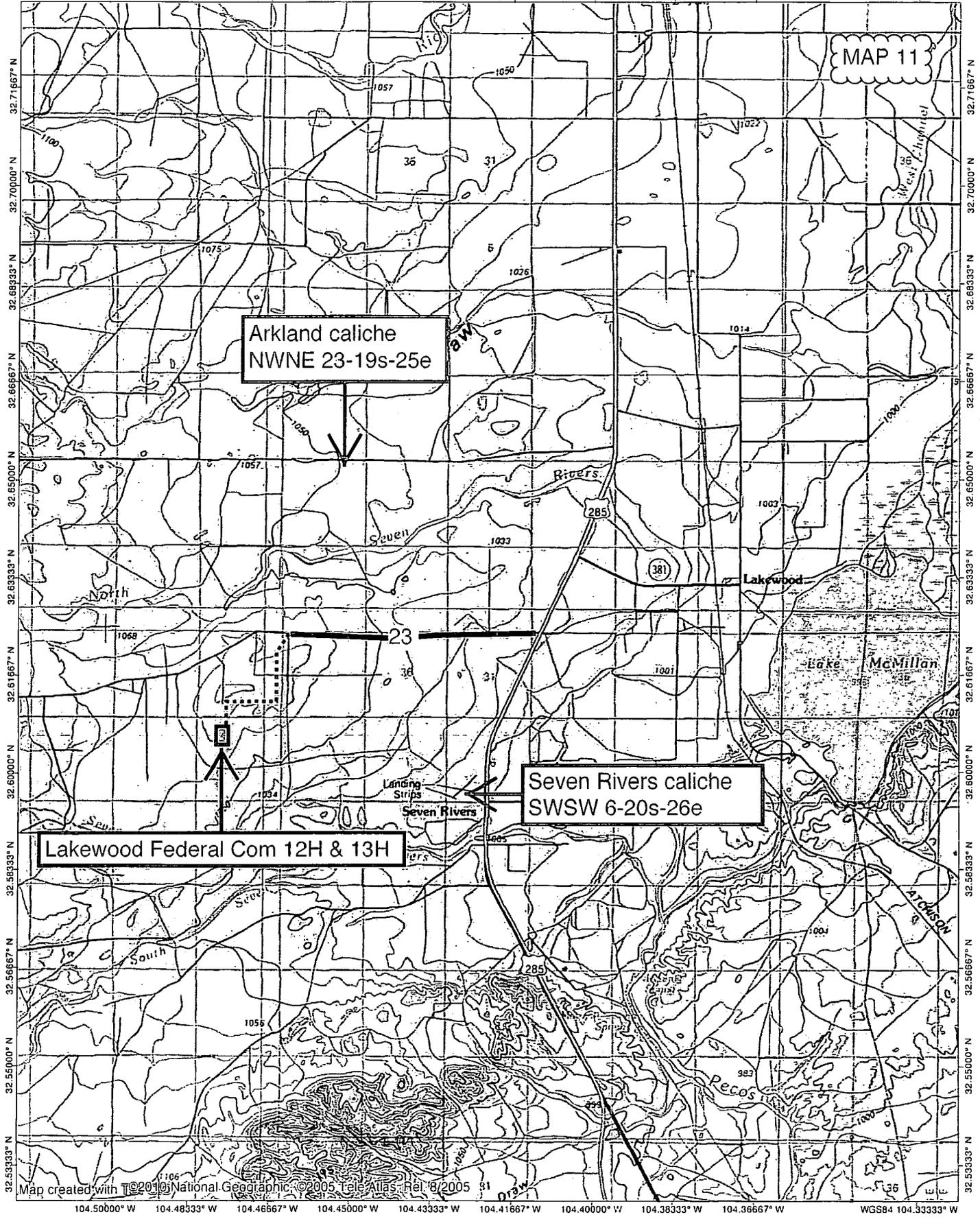


PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 2/21/18	CAD Date: 6/29/18	Drawn By: ACK
W.O. No.: 18130756	Rev:	Rel. W.O.: 18110115
		Sheet 1 of 1

104.50000° W 104.48333° W 104.46667° W 104.45000° W 104.43333° W 104.41667° W 104.40000° W 104.38333° W 104.36667° W WGS84 104.33333° W

MAP 11



NATIONAL GEOGRAPHIC



TN MN

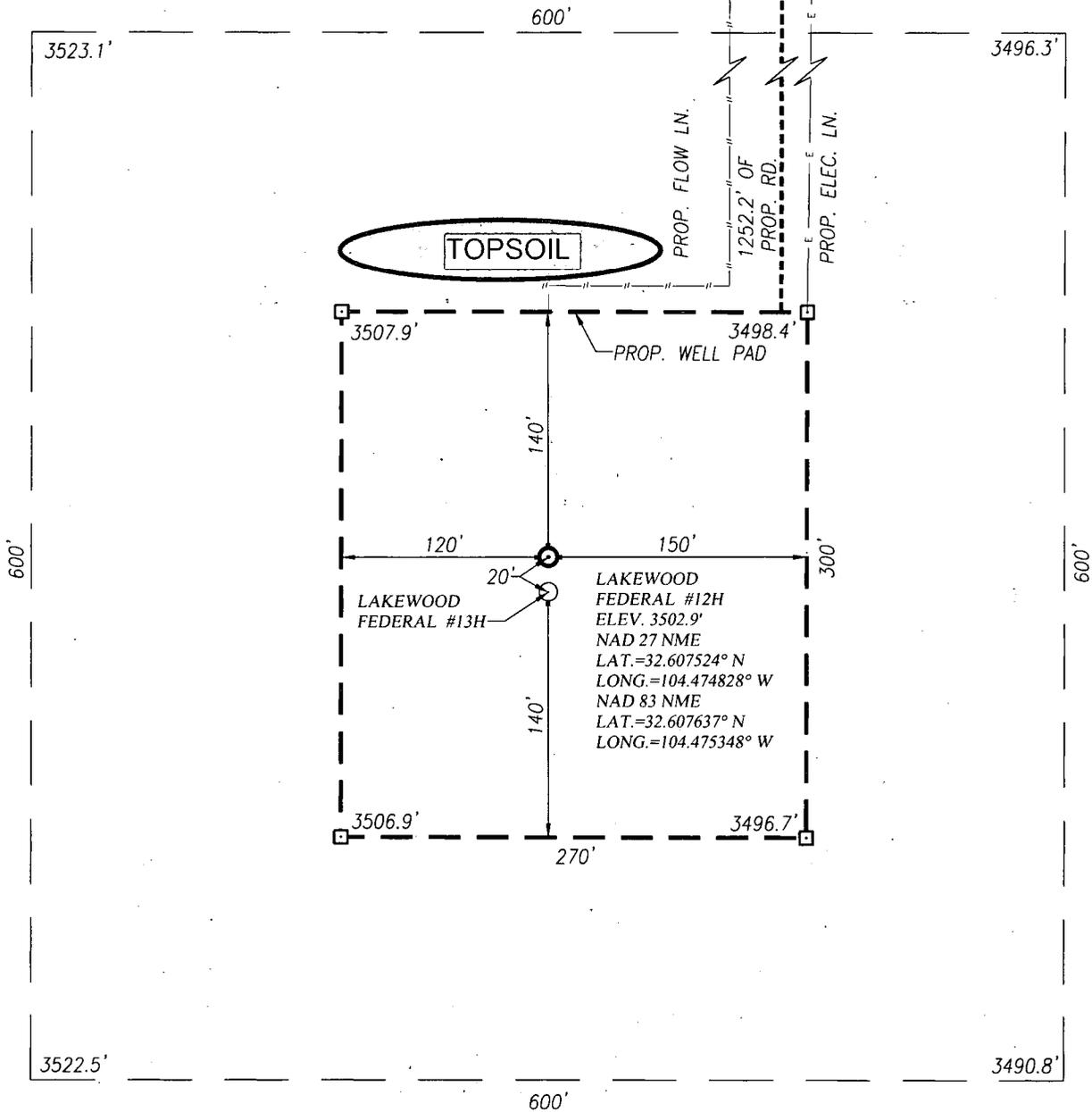
7°

WELL SITE PLAN

MAP 12

PREV. ROAD SURVEY BY BASIN SURVEYS
FLOW LN. BASIN SURVEY

4-W O.H. ELEC. LN.

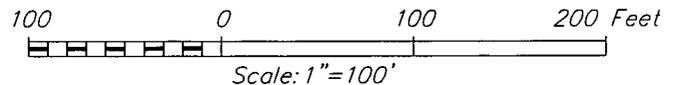


NOTE:

1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1252.2 FEET TO THE NORTH EDGE OF PAD.



PERCUSSION PETROLEUM OPERATING, LLC

LAKWOOD FEDERAL #12H WELL LOCATED 755 FEET FROM THE NORTH LINE AND 1820 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 4/06/18	CAD Date: 5/01/18	Drawn By: ACK
W.O. No.: 18110427	Rev: 09/19/18	Rel. W.O.: 18110115
		Sheet 1 of 1

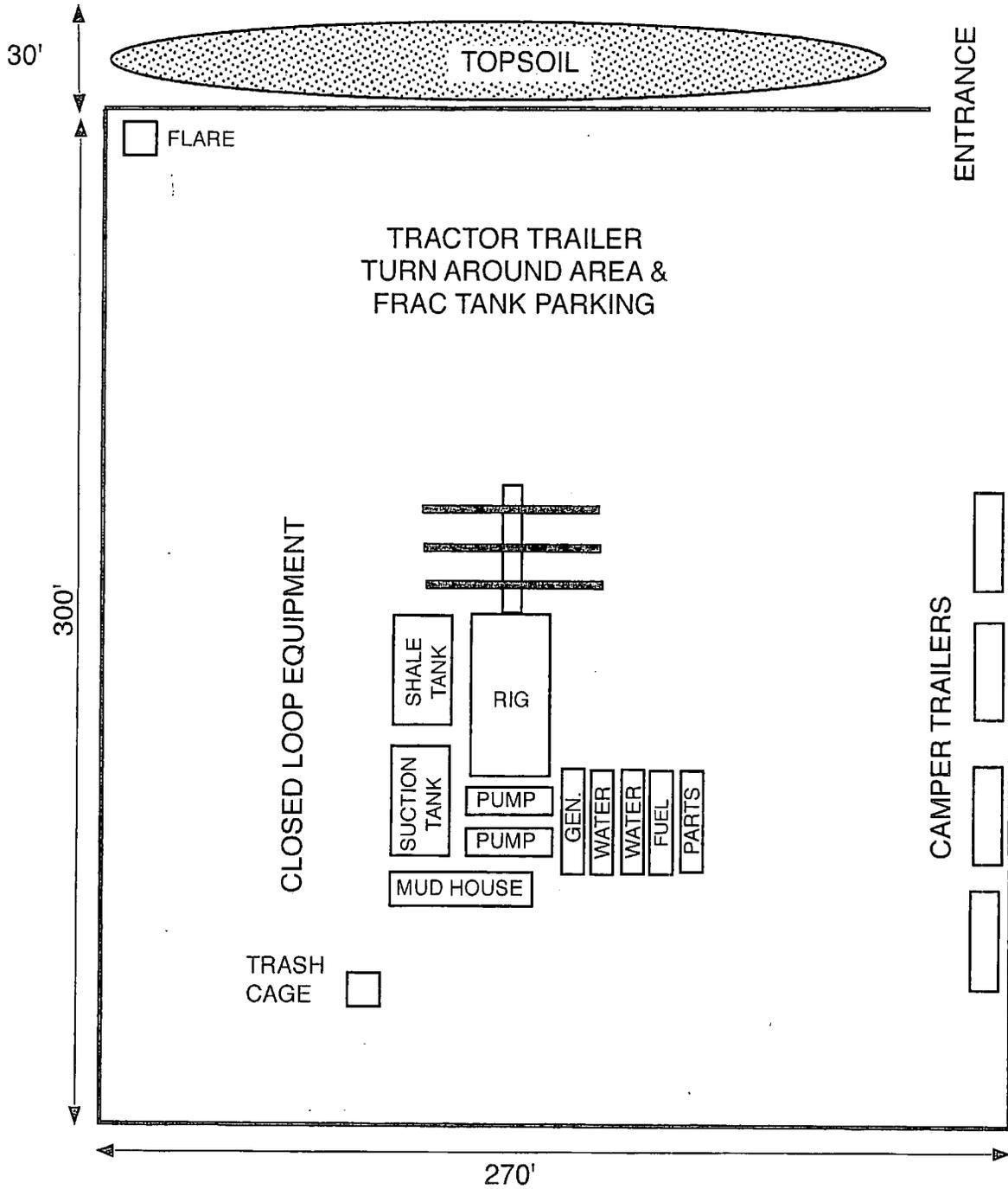
Percussion's
Lakewood Federal Com 12H
rig diagram

NORTH



Prevailing Wind
out of South
or SSE

1" = 50'



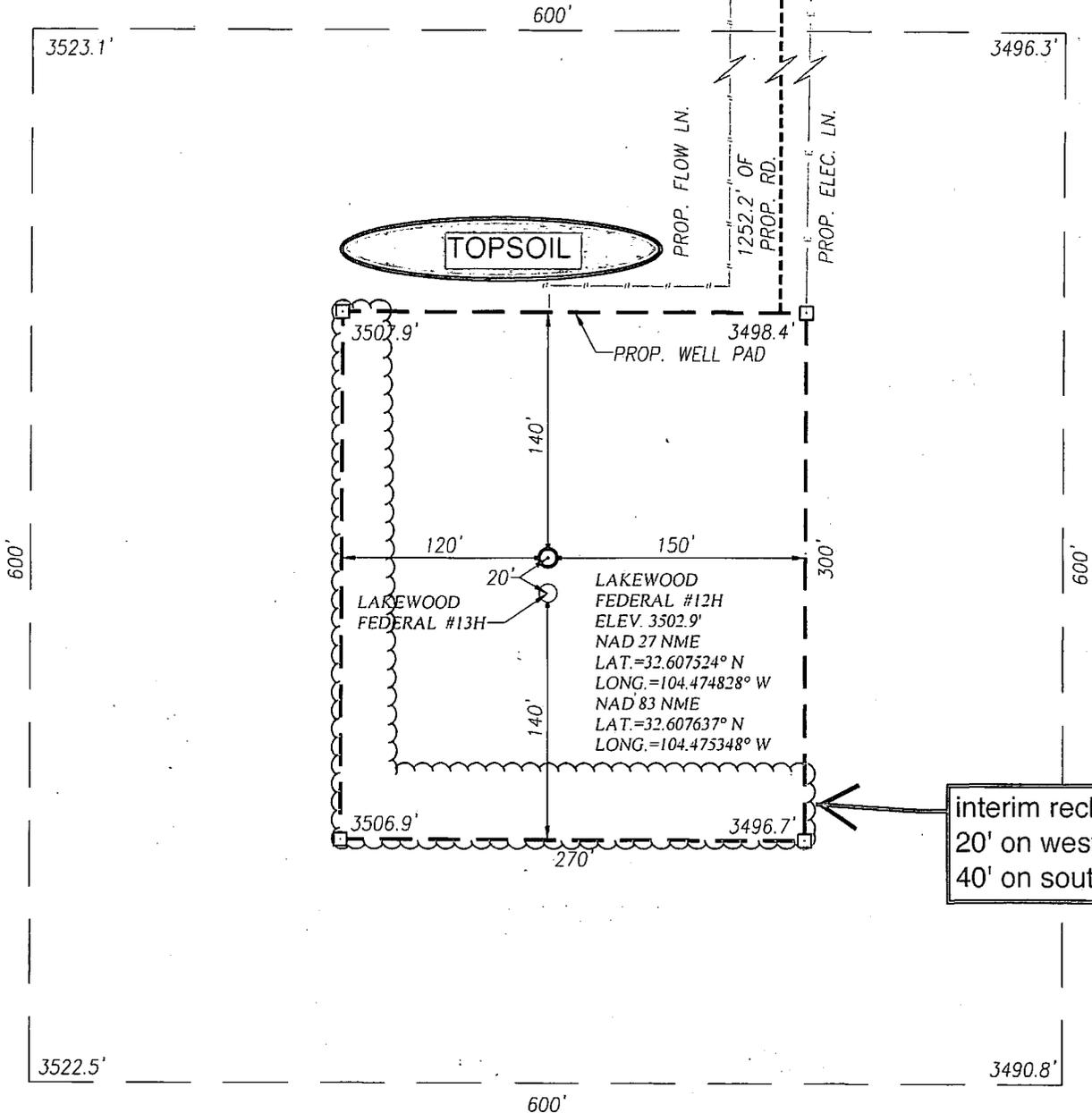
WELL SITE PLAN

MAP 13

PREV. ROAD SURVEY BY BASIN SURVEYS

FLOW LN. BASIN SURVEY

4-W O.H. ELEC. LN.

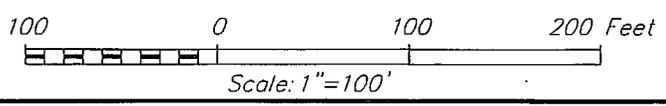


interim reclamation
20' on west
40' on south

NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1252.2 FEET TO THE NORTH EDGE OF PAD.



PERCUSSION PETROLEUM OPERATING, LLC

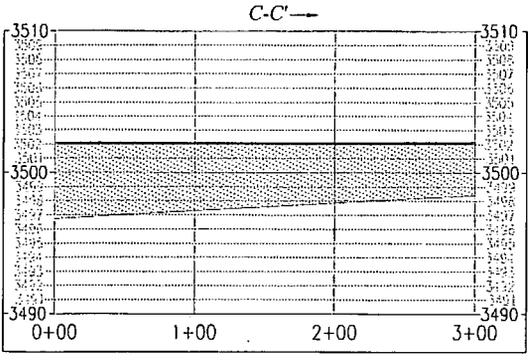
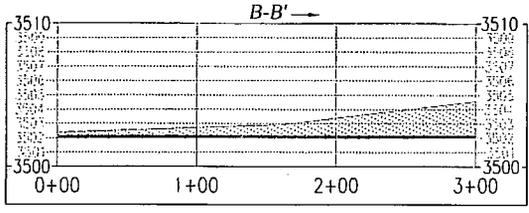
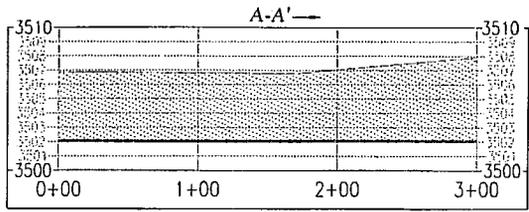
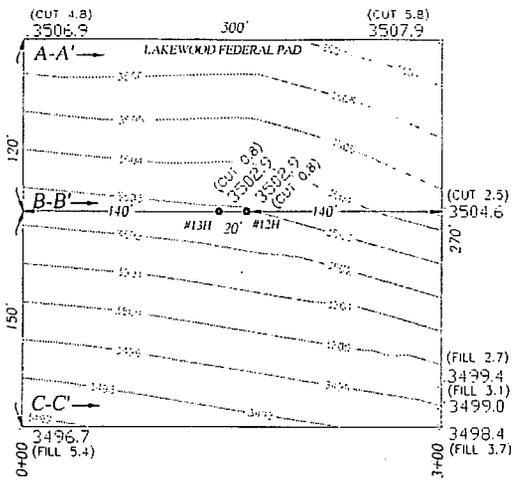
LAKWOOD FEDERAL #12H WELL LOCATED 755 FEET FROM THE NORTH LINE AND 1820 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO



PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

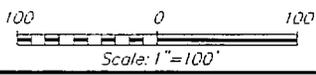
Survey Date: 4/06/18	CAD Date: 5/01/18	Drawn By: ACK
W.O. No.: 18110427	Rev: 09/19/18	Rel. W.O.: 18110115
		Sheet 1 of 1

MAP 14



PERCUSSION PETROLEUM OPERATING, LLC

LAKWOOD FEDERAL #12H & #13H WELL PAD IN SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO



PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
 412 N. DAL PASO HOBBS, N.M. 88240
 (575) 393-3117 www.jwsc.biz
 TBPLS# 10021000

Survey Date: 2/21/18	CAD Date: 6/29/18	Drawn By: ACK
W.O. No.: 18130756	Rev: .	Rel. W.O.: 18110115
		Sheet 1 of 1

© Applied 2018 Percussion Petroleum Operating, LLC Well #12H & #13H Lakewood Federal #14 in Sec. 27, T15S, R25E, Eddy County, NM

Percussion Petroleum Operating, LLC
Lakewood Federal Com 12H
SHL 755' FNL & 1820' FWL 3-20S-25E
Eddy County, NM

SURFACE PLAN PAGE 1

Surface Use Plan

1. ROAD DIRECTIONS & DESCRIPTIONS (See MAPS 1 - 4)

From the junction of US 82 & US 285 in Artesia....

Go South 15.2 miles on US 285 to the equivalent of Mile Post 54.1

Then turn right and go West 3.05 miles on paved County Road 23 (Rock Daisy)

Then turn left and go S 0.2 mile on a caliche road

Then bear right and go SW 0.75 mile on a caliche road

Then turn right and go West 0.45 mile on a jeep trail*

Then turn left and go South 1252.2' cross-country to the proposed pad

*Described and authorized in Huber Federal 17H, 18H, et al. Likely to be built before Lakewood spud.

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

2. ROAD TO BE BUILT OR UPGRADED (See MAPS 2 - 4)

The 1252.2' of new resource road will be crowned and ditched, have a 14' wide driving surface, and be surfaced with caliche. Borrow ditches will turn out every \approx 100 yards. Maximum disturbed width = 30'. Maximum grade = 4%. Maximum cut or fill = 3'.

3. EXISTING WELLS (See MAP 5)

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

Percussion Petroleum Operating, LLC
Lakewood Federal Com 12H
SHL 755' FNL & 1820' FWL 3-20S-25E
Eddy County, NM

SURFACE PLAN PAGE 2

4. PROPOSED PRODUCTION FACILITIES (See MAPS 6 & 7)

A 556.9' long overhead raptor safe 3-phase power line will be built north, parallel to the access road, to Percussion's existing power line. A 3452.2' long ≈ 4 " O D. HDPE flow line will be laid on the surface north and west along Lakewood, Huber, & Irami roads and pads to a proposed central tank battery (CTB) on the proposed Lakewood Federal Com 17H/18H/19H pad. (CTB will be described in, and authorized by approval of, the 17H/18H/19H APDs.) Flowline maximum operating pressure will be <100 psi.

5. WATER SUPPLY (See MAP 8)

Two temporary 10" Kevlar lay flat surface pipelines will be laid ≈ 4350 ' along roads from Percussion's existing Huber 3 pond to the pad. Pipeline route will not be bladed or excavated.

6. CONSTRUCTION MATERIALS & METHODS (See MAPS 9 - 11)

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.

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.

Percussion Petroleum Operating, LLC
Lakewood Federal Com 12H
SHL 755' FNL & 1820' FWL 3-20S-25E
Eddy County, NM

SURFACE PLAN PAGE 3

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 MAP 12).

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 13 & 14)

Interim reclamation will be completed within 6 months of completing the well. Interim reclamation will consist of shrinking the well pad 0.37 acre by removing caliche and reclaiming 20' on the west side and 40' on the south side of the pad. This will leave 1.49 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.

Once the wells are plugged and all production equipment removed, then reclamation will be completed within 6 months of plugging the last well. Reclamation will consist of removing caliche and deeply ripping on the contour. 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. Noxious weeds will be controlled.

Percussion Petroleum Operating, LLC
Lakewood Federal Com 12H
SHL 755' FNL & 1820' FWL 3-20S-25E
Eddy County, NM

SURFACE PLAN PAGE 4

Land use:

1844.5' x 30' road = 0.86 acres
3452.2' x 30' flow line = 2.38 acres
556.9' x 30' power line = 0.38 acres
20' x 4350' water line from pond = 2.00 acres
+ 270' x 300' pad = 1.86 acres
7.48 acres short term
- 2.38 acres flow line
- 0.38 acres power line
- 0.37 acres interim reclamation
- 2.00 acres water line from pond
2.35 acres long term (1.27 ac. road + 1.49 ac. pad)

11. SURFACE OWNER

All 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.

12. OTHER INFORMATION

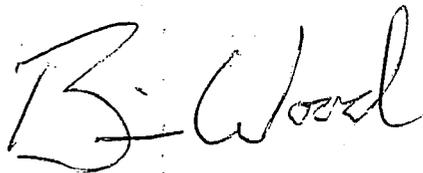
On-site inspection was held with Jessie Bassett (BLM) on April 3, 2018.

Percussion Petroleum Operating, LLC
Lakewood Federal Com 12H
SHL 755' FNL & 1820' FWL 3-20S-25E
Eddy County, NM

SURFACE PLAN PAGE 5

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 9th 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



Section 1 - General

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

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well type:

Injection well number:

Assigned injection well API number?

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Injection well name:

Injection well API number:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:



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

Bond Info Data Report

06/27/2019

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:

