RECEIVED

Form 3160-3
(June 2015)

JAN 30 2019

DISTRICT II-ARTESIA O.C.D.

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM0504364B

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

7. If Unit or CA Agreement, Name and No.

8. Lease Name and Well No.
LAKEWOOD FEDERAL COM
21H
324926

2. Name of Operator
PERCUSSION PETROLEUM OPERATING LLC
371755

9. API Well No.
30-015-45679

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory
919 Milam Street, Suite 2475 Houston TX 77002	(713)589-2337	N. SEVEN RIVERS; GLORIETA -YESO

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface SESE / 592 FSL / 708 FEL / LAT 32.626041 / LONG -104.466382

At proposed prod. zone SESE / 20 FSL / 966 FEL / LAT 32.609758 / LONG -104.467198

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 27 / T19S / R25E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
15 miles	EDDY	NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
708 feet	480	160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
20 feet	2827 feet / 8391 feet	FED: NMB001424

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3497 feet	10/01/2018	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.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Brian Wood / Ph: (505)466-8120	08/20/2018

Title
President

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Ty Allen / Ph: (575)234-5978	12/20/2018

Title	Office
Wildlife Biologist	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

(Continued on page 2)

Approval Date: 12/20/2018

*(Instructions on page 2)

RP 2-1-19

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 wen, 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 directionany 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 wen 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 win 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 conects this information to anow 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 Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

(Continued on page 3)

Additional Operator Remarks

Location of Well

1. SHL: SESE / 592 FSL / 708 FEL / TWSP: 19S / RANGE: 25E / SECTION: 27 / LAT: 32.626041 / LONG: -104.466382 (TVD: 0 feet, MD: 0 feet)

   PPP: NESE / 2640 FSL / 1019 FEL / TWSP: 19S / RANGE: 25E / SECTION: 34 / LAT: 32.616875 / LONG: -104.467088 (TVD: 2822 feet, MD: 5802 feet)

   PPP: SESE / 592 FSL / 708 FEL / TWSP: 19S / RANGE: 25E / SECTION: 27 / LAT: 32.626041 / LONG: -104.466382 (TVD: 0 feet, MD: 0 feet)

   BHL: SESE / 20 FSL / 966 FEL / TWSP: 19S / RANGE: 25E / SECTION: 34 / LAT: 32.609758 / LONG: -104.467198 (TVD: 2827 feet, MD: 8391 feet)

BLM Point of Contact

Name: Katrina Ponder

Title: Geologist

Phone: 5752345969

Email: kponder@blm.gov

Approval Date: 12/20/2018

Review and Appeal Rights

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

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Percussion Petroleum Operating LLC
LEASE NO.:	NMNM0504364B
WELL NAME & NO.:	Lakewood Federal Com 21H
SURFACE HOLE FOOTAGE:	592'/S & 708'/E
BOTTOM HOLE FOOTAGE	20'/S & 966'/E
LOCATION:	Section 27, T.19 S., R.25 E., NMPM
COUNTY:	Eddy County, New Mexico

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

A. HYDROGEN SULFIDE

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

B. CASING

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

IF LOST CIRCULATION OCCURS WHILE DRILLING THE 8-3/4" HOLE, THE CEMENT PROGRAM FOR THE 7 X 5-1/2" CASING WILL NEED TO BE MODIFIED AND THE BLM IS TO BE CONTACTED PRIOR TO RUNNING THE CASING. A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH THEREFORE, ONE INCH OPERATIONS WILL NOT BE PERMITTED. A DV TOOL WILL BE REQUIRED.

Contingency Surface Casing Plan:

1. The **13 3/8** inch contingency surface casing shall be set at approximately **400** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Casing Plan without Contingency:

2. The **9 5/8** inch surface casing shall be set at approximately **1279** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

3. The minimum required fill of cement behind the **7 X 5 1/2** inch production casing is:

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

C. PRESSURE CONTROL

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

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

D. SPECIAL REQUIREMENT(S)

Communitization Agreement

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

MHH 12152018

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.

AFMSS

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

Operator Certification Data Report

12/27/2018

Operator Certification

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

NAME: Brian Wood **Signed on:** 08/20/2018

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:

AFMSS

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

Application Data Report

12/27/2018

APD ID: 10400033137 **Submission Date:** 08/20/2018

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400033137 **Tie to previous NOS?** **Submission Date:** 08/20/2018

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: NMNM0504364B **Lease Acres:** 480

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? NO

Permitting Agent? YES **APD Operator:** PERCUSSION PETROLEUM OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: PERCUSSION PETROLEUM OPERATING LLC

Operator Address: 919 Milam Street, Suite 2475

Zip: 77002

Operator PO Box:

Operator City: Houston **State:** TX

Operator Phone: (713)589-2337

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO **Mater Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H **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? USEABLE WATER,NATURAL GAS,OIL

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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:** 20H

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 15 Miles **Distance to nearest well:** 20 FT **Distance to lease line:** 708 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: Lake_21H_Plat_GasCap_Plan_20180816094057.pdf

Well work start Date: 10/01/2018 **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	592	FSL	708	FEL	19S	25E	27	Aliquot SESE	32.626041	-104.466382	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 050436 4B	3497	0	0
KOP Leg #1	472	FSL	884	FEL	19S	25E	27	Aliquot SESE	32.6257124	-104.4669535	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 050436 4B	1212	2297	2285
PPP Leg #1	592	FSL	708	FEL	19S	25E	27	Aliquot SESE	32.626041	-104.466382	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 050436 4B	3497	0	0

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
PPP Leg #1	2640	FSL	1019	FEL	19S	25E	34	Aliquot NESE	32.616875	-104.467088	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 031200	675	5802	2822
EXIT Leg #1	20	FSL	966	FEL	19S	25E	34	Aliquot SESE	32.609758	-104.467198	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 031200	670	8391	2827
BHL Leg #1	20	FSL	966	FEL	19S	25E	34	Aliquot SESE	32.609758	-104.467198	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 031200	670	8391	2827

APD ID: 10400033137 **Submission Date:** 08/20/2018

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	QUATERNARY	3497	0	0	OTHER : Caliche	USEABLE WATER	No
2	GRAYBURG	2870	627	628	DOLOMITE	NATURAL GAS,OIL	No
3	SAN ANDRES	2685	812	814	DOLOMITE	NATURAL GAS,OIL	No
4	GLORIETA	1125	2372	2393	DOLOMITE	NATURAL GAS,OIL	No
5	YESO	970	2527	2554	DOLOMITE	NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

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

Equipment: A 3000-psi 5000' rated BOP stack consisting of annular preventer and double (blind and pipe) ram will be used below surface casing to TD. See attached BOP and choke manifold diagrams.
Requesting Variance? NO

Variance request:

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

Choke Diagram Attachment:

Lake_21H_Choke_20180816100120.pdf

BOP Diagram Attachment:

Lake_21H_BOP_20180816100126.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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	1273	3497		1279	J-55	36	LTC	1.125	1.125	DRY	1.8	DRY	1.8
2	PRODUCTION	8.75	7.0	NEW	API	Y	0	2550	0	2524	3497		2550	L-80	32	OTHER - BTC	1.125	1.125	DRY	1.8	DRY	1.8
3	PRODUCTION	8.75	5.5	NEW	API	Y	2550	8391	2524	2827			5841	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_21H_Casing_Design_Assumptions_20180816100232.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Lake_21H_Casing_Design_Assumptions_20181012141604.pdf

Casing Design Assumptions and Worksheet(s):

Lake_21H_Casing_Design_Assumptions_20180816100629.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Lake_21H_Casing_Design_Assumptions_20181012141650.pdf

Casing Design Assumptions and Worksheet(s):

Lake_21H_Casing_Design_Assumptions_20180816100703.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	2550	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	2675	1408	1.32	14.8	1858	50	Class C	2% CaCl + ¼ pound per sack celloflake
PRODUCTION	Lead		0	8391	495	1.97	12.6	975	50	65/65/6 Class C	6% gel + 5% salt + ¼ pound per sack

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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	8391	1408	1.32	14.8	1858	50	Class C	2% CaCl + ¼ pound per sack celloflake

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

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

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

Describe what will be on location to control well or mitigate other conditions: All necessary mud products (LCM) will be on site to handle any abnormal hole condition that may be encountered while drilling this well.

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

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
2427	8391	OTHER : Cut brine	8.6	9.2							
1279	2297	OTHER : Fresh water/cut brine	8.3	9.2							
0	1279	OTHER : Fresh water/gel	8.4	9.2							

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.

No electric logs are planned at this time.

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: 1213 **Anticipated Surface Pressure:** 591.05

Anticipated Bottom Hole Temperature(F): 112

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Lake_21H_H2S_Plan_20180816102139.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Lake_21H_Horizontal_Drill_Plan_20180816102159.pdf

Other proposed operations facets description:

Deficiency letter dated 10/11/18 requests a casing spec change for 5.5. in casing - this was already addressed on 10/3.

Other proposed operations facets attachment:

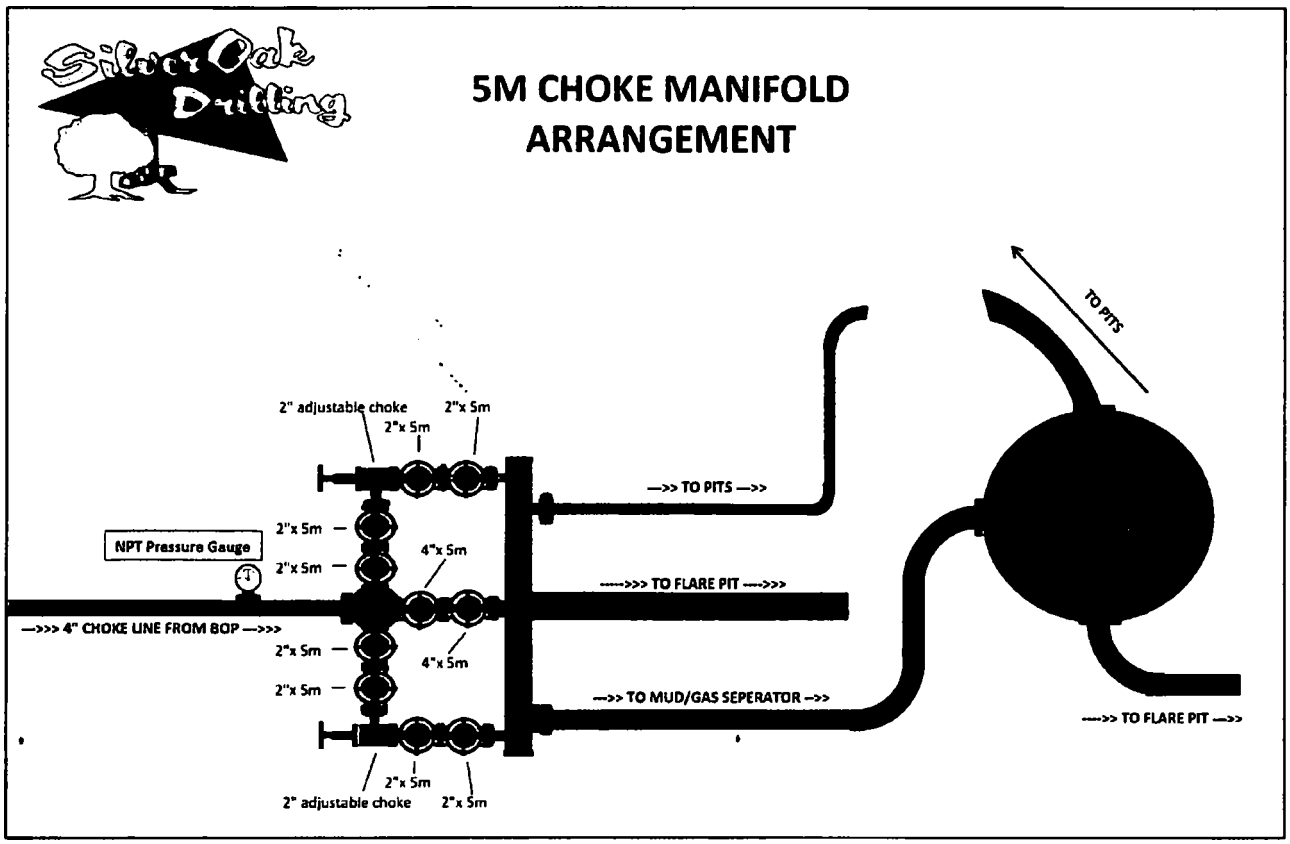
Lake_21H_Drill_Plan_20181012141709.pdf

Lake_21H_Contingency_Plan_20181012141733.pdf

Other Variance attachment:

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002



Pressure Testing

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

Gas Buster Operation

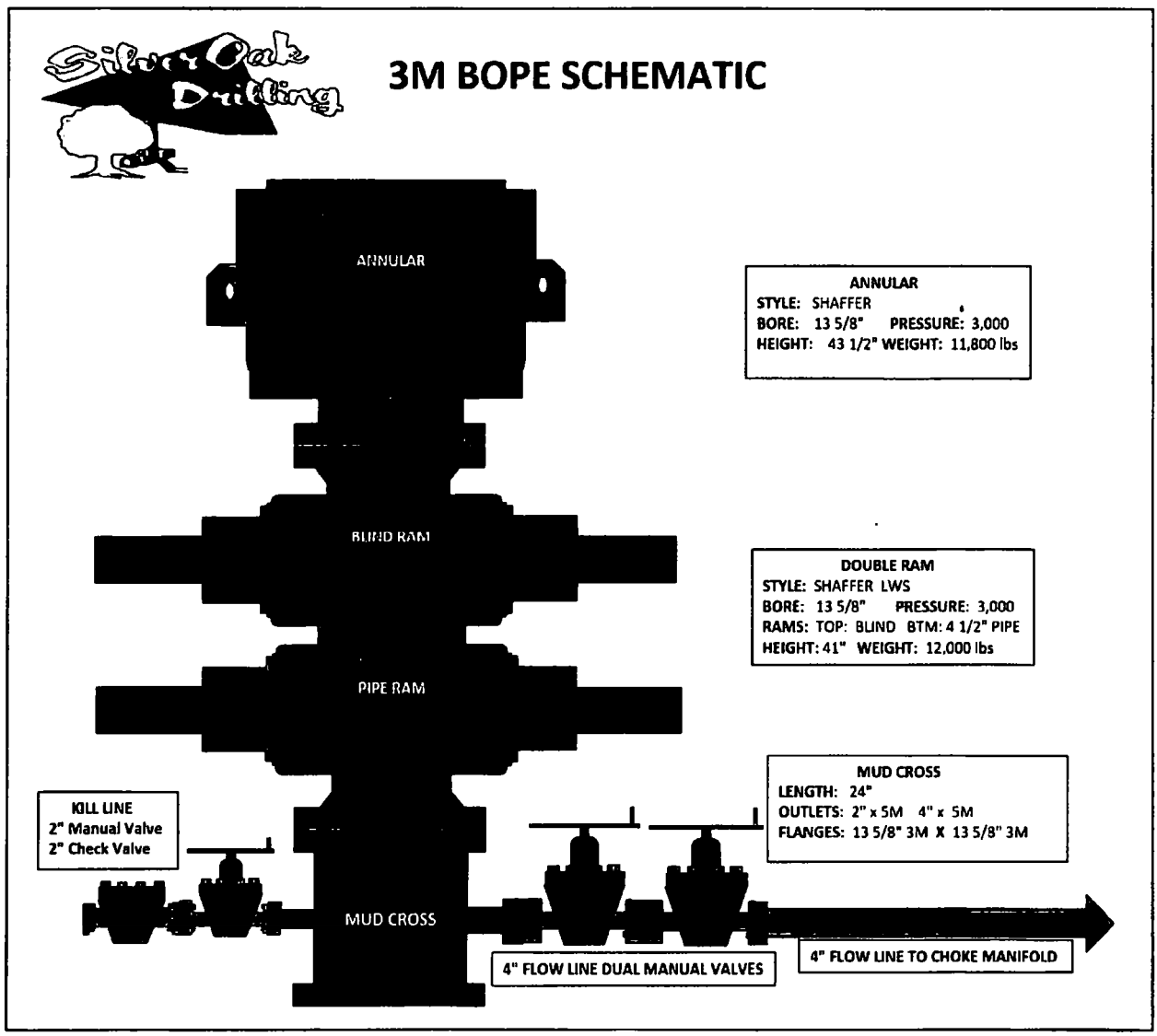
a. Flow should be directed to pits unless choke is needed to control gas
b. Adjustable choke to adjusted only by Percussion Rep on location
c. Flare should remain burning (pilot lit) anytime fluid is going through gas buster
d. Choke needs to be monitored to not overrun gas buster

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

Nipple-Up

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



PERCUSSION PETROLEUM LLC

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)***

PERCUSSION PETROLEUM LLC

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)***

PERCUSSION PETROLEUM LLC

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)***

PERCUSSION PETROLEUM LLC

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)***

PERCUSSION PETROLEUM LLC

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)***

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

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:

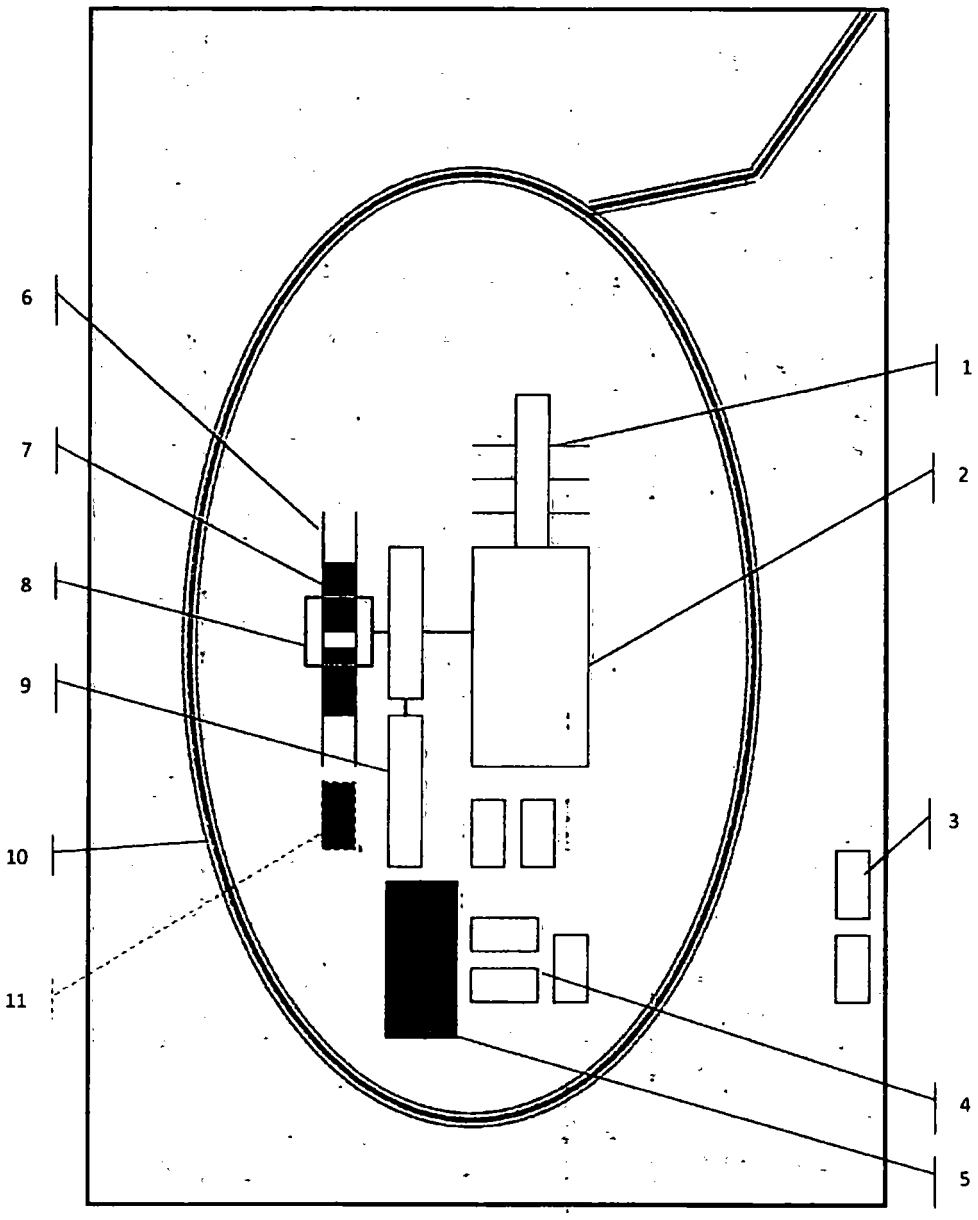
1. Pump an LCM sweep and attempt to regain circulation – if unsuccessful go to step 2

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 100% excess cement
            1. 65/35/6 Class C Cement, 12.8 ppg, 1.87 yield, 10.15 gal/sk to be used on initial cement job.
        ii. Top off cement from surface using 1" if necessary
            1. Top off will be 200 sks of 65/35/6 Class C Cement, 12.8 ppg, 1.87 yield, 10.15 gal/sk
            2. Second top off will be performed with same cement if needed.
        iii. Insure that cement has cured for a minimum of 12 hours prior to drilling out

    4. Install 13-3/8" 3M wellhead and drill to surface casing depth with 12-1/4" OD bit

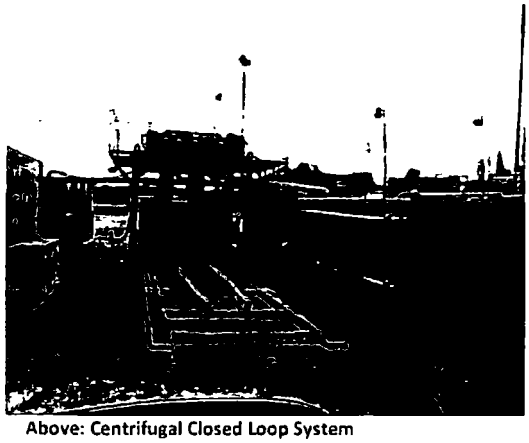
    5. Run and cement surface casing as planned



Schematic Closed Loop Drilling Rig*

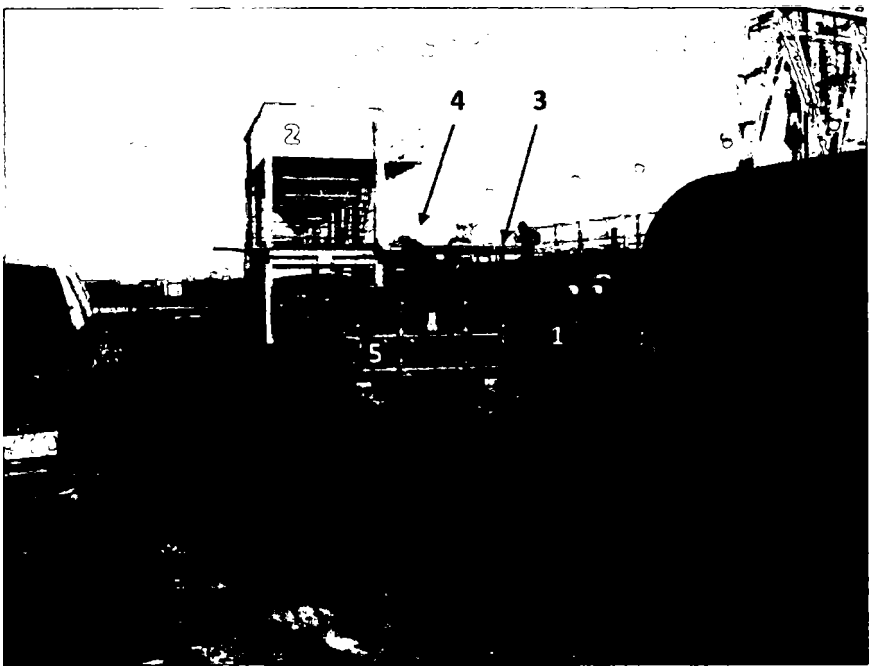
1. **Pipe Rack**
2. **Drill Rig**
3. **House Trailers/ Offices**
4. **Generator/Fuel/Storage**
5. **Overflow-Frac Tank**
6. **Skids**
7. **Roll Offs**
8. **Hopper or Centrifuge**
9. **Mud Tanks**
10. **Loop Drive**
11. Generator (only for use with centrifuge)

*Not drawn to scale: Closed loop system requires at least 30 feet beyond mud tanks. Ideally 60 feet would be available



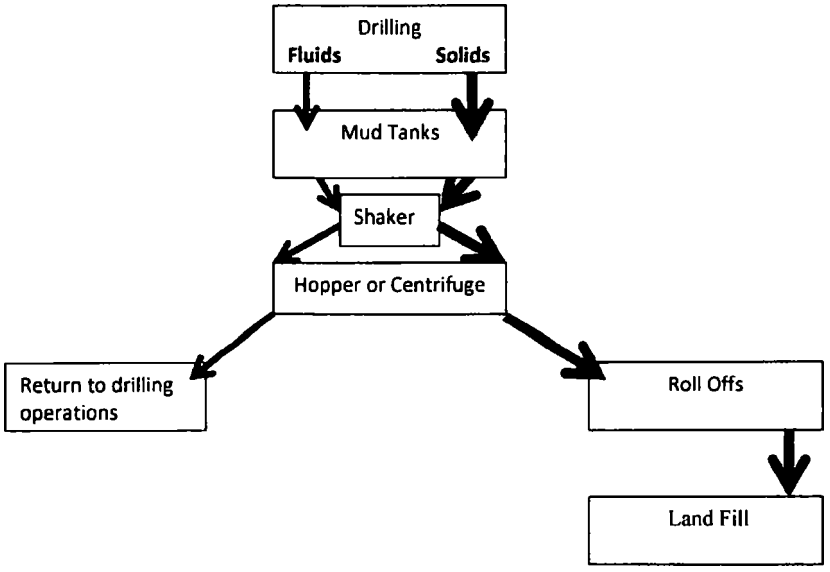
Above: Centrifugal Closed Loop System

PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120



Closed Loop Drilling System: Mud tanks to right (1)
Hopper in air to settle out solids (2)
Water return pipe (3)
Shaker between hopper and mud tanks (4)
Roll offs on skids (5)

Flow Chart for Drilling Fluids and Solids



Photos Courtesy of Gandy Corporation Oil Field Service

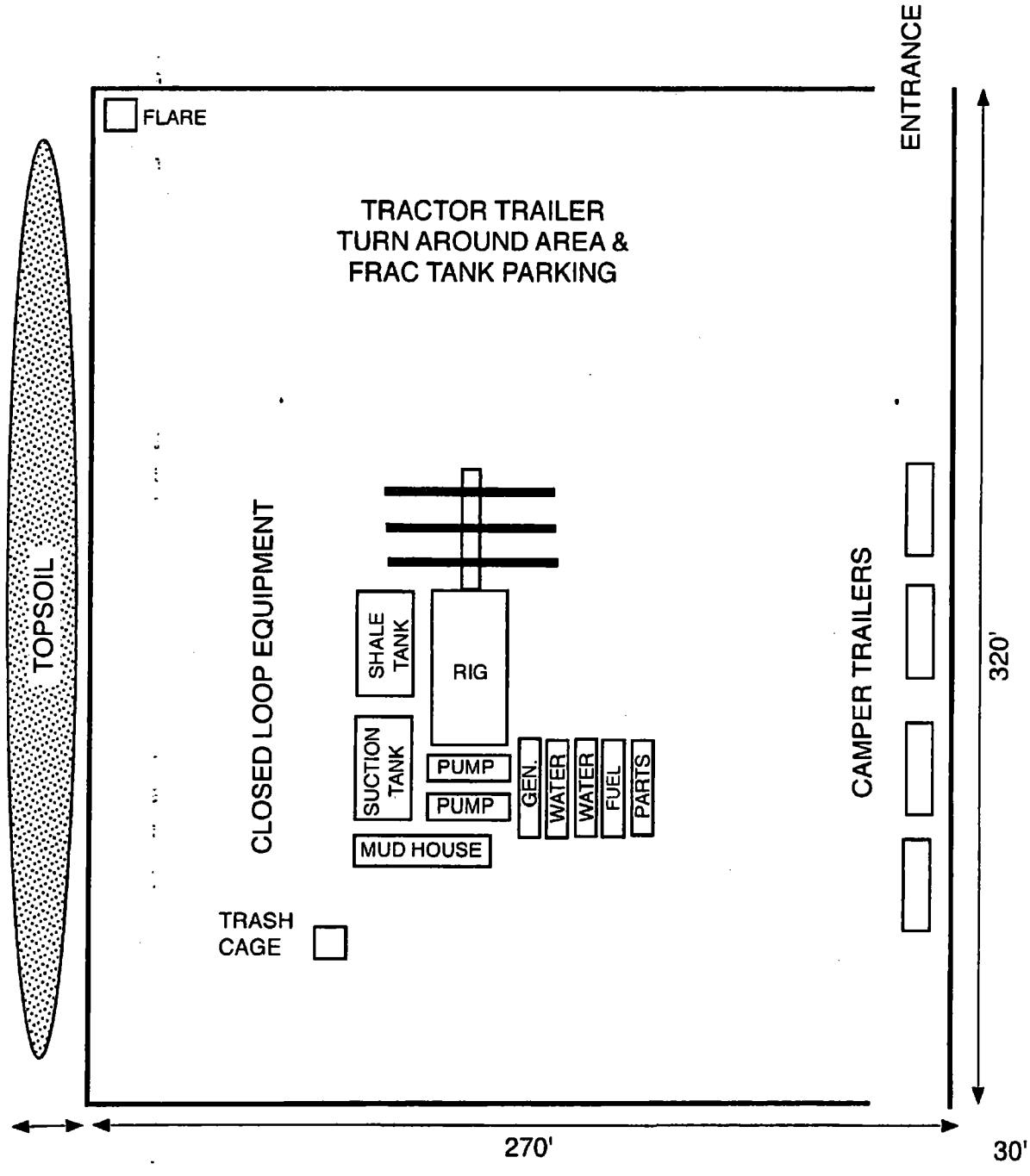
PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS
12Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120

Percussion's
Lakewood Federal Com 21H
rig diagram

NORTH

1" = 50'

Prevailing Wind out of South or SSE



PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS

PERCUSSION PETROLEUM LLC

Hydrogen Sulfide Drilling Operations Plan

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

1. H_2S Safety Instructions to the following:
    - Characteristics of H_2S.
    - Physical effects and hazards.
    - Principal and operation of H_2S detectors, warning system and briefing areas.
    - Evacuation procedures, routes and First Aid.
    - Proper use of safety equipment and life support systems.
    - Essential personnel meeting medical evaluation criteria will receive additional training on the proper use of 30 min pressure demand air packs.

2. H_2S Detection & Alarm Systems:
    - H_2S sensor/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud returns pits by the shale shaker. Additional H_2S monitors may be placed as deemed necessary.
    - An audio alarm system will be installed on the derrick, the floor, and in the doghouse.

3. Windsocks and Wind Streamers:
    - Windsocks at mud pit area should be high enough to be visible.
    - Windsock on the rig floor/top of doghouse should be high enough to be visible.

4. Condition Flags & Signs:
    - Warning sign on access road to location
    - Flags to be displayed on sign at entrance to location
        i. Green Flag – Normal Safe Operation Condition
        ii. Yellow Flag – Potential Pressure and Danger
        iii. Red Flag – Danger (H_2S present in dangerous concentrations) Only H_2S trained personnel admitted on location

5. Well Control Equipment:
    - See attached APD

6. Communications:
    - While working under masks, chalkboards will be used for communications
    - Hand signals will be used where chalk board is inappropriate
    - Two-way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at drilling foreman's trailer or living quarters.

7. Drilling Stem Testing:
    - No Drill Stem Tests or hole coring is planned at this time.

8. Drilling contractor supervisor will be required to be familiar with the effects H_2S has on tubular goods and other mechanical equipment.

9. If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavenger chemicals if necessary.

10. Emergency Contacts:

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

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

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

PERCUSSION PETROLEUM LLC

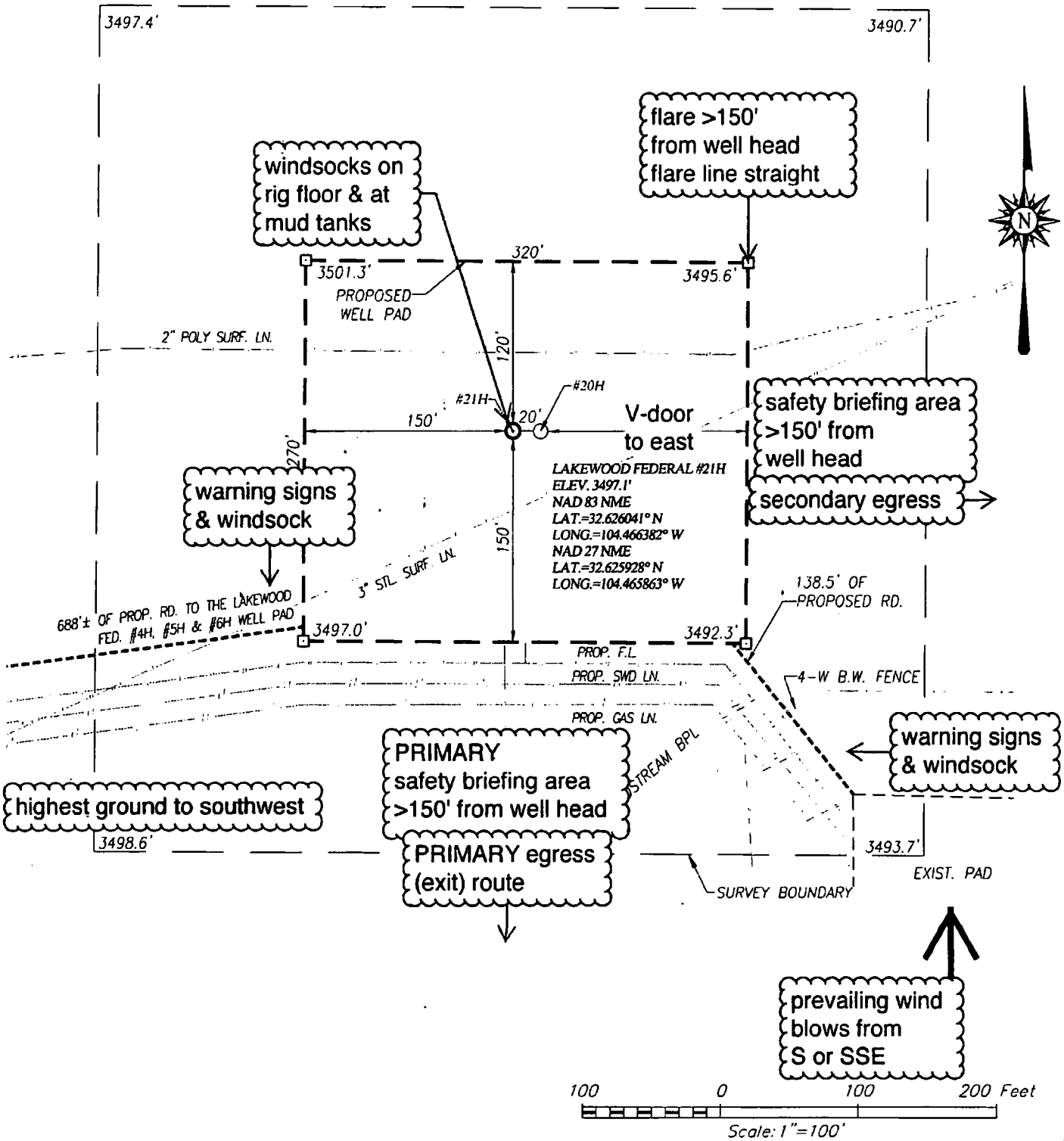
Santa Fe, New Mexico:	
New Mexico Emergency Response Commission	505-476-9600
New Mexico Emergency Response Commission (24 hr)	505-827-9126
New Mexico State Emergency Operations Center	505-476-9635

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



PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #21H WELL LOCATED 592 FEET FROM THE SOUTH LINE AND 708 FEET FROM THE EAST LINE OF SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

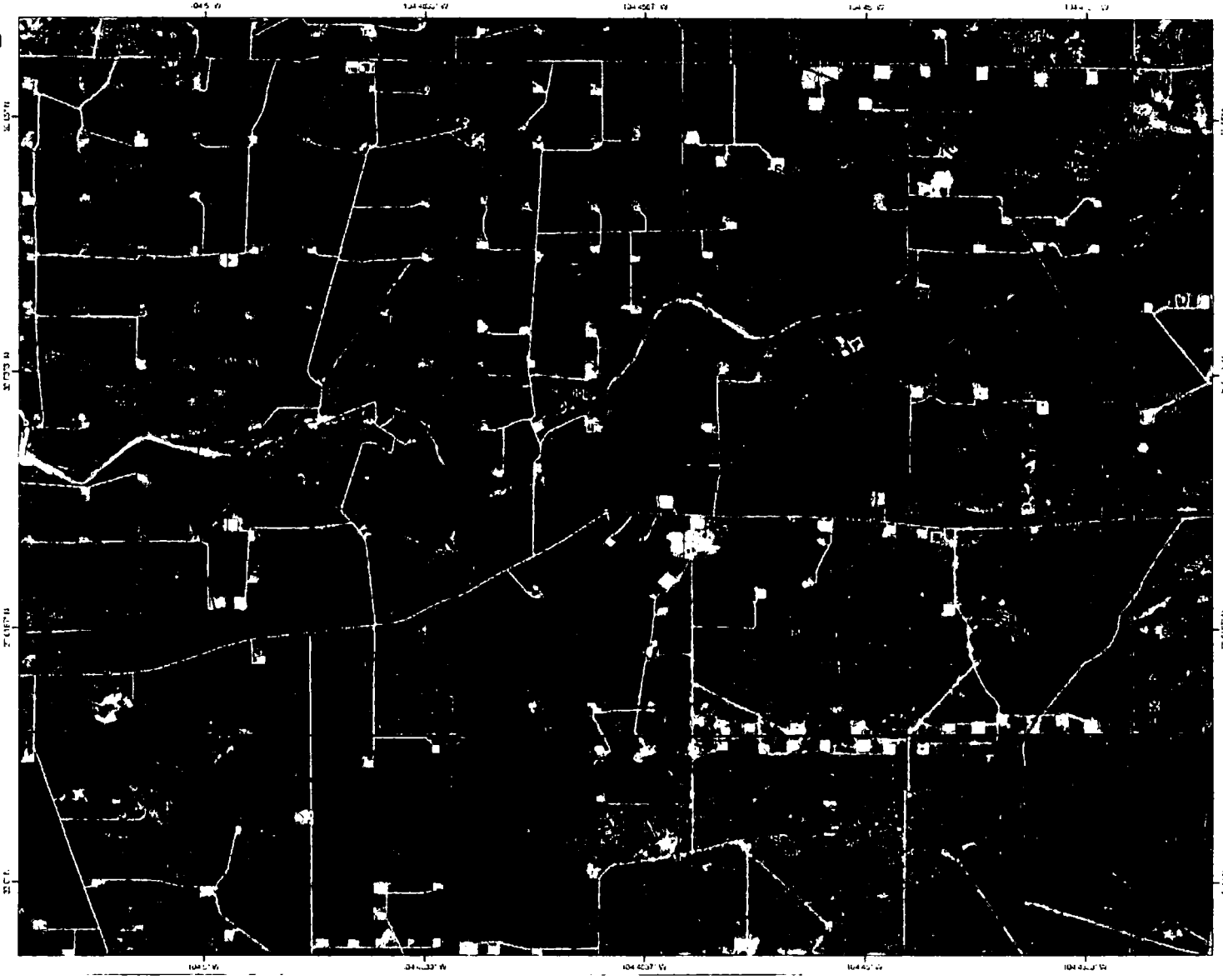
PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 02/23/18	CAD Date: 3/08/18	Drawn By: ACK
W.O. No.: 18110124	Rev: .06/19/18	Rel. W.O.:	Sheet 1 of 1

Percussion Petroleum Operating, LLC

Lakewood Federal Com 20H/21H
H_2S Contingency Plan:
Radius Map

Section 27, Township 19S, Range 25E
Eddy County, New Mexico



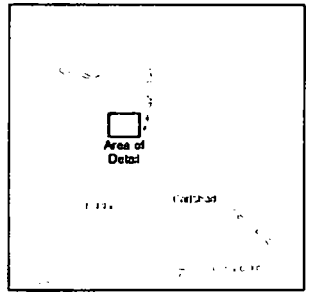
Surface Hole Location

1:26,000
0 0.225 0.45 0.9
Miles

N

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

Prepared by Permits West, Inc., June 26, 2018
for Percussion Petroleum Operating, LLC



PERCUSSION PETROLEUM LLC

Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Lakewood Federal
Well: 21H
Wellbore: OH
Rig: Silver Oak 1
Design: Plan #2 / 10:33, May 02 2018

WELLBENDERS DIRECTIONAL SERVICES LLC

PROJECT DETAILS: Eddy County, NM
Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

TOTAL CORRECTION
Magnetic North is 7.38° East of Grid North (Magnetic Convergence)

WELL DETAILS: 21H

RKB=17' @ 3514.00usft (Silver Oak 1)
3497.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	691610.20	500376.60	32.626041	-104.466382

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	450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00
3	517.45	6.75	235.65	517.30	-2.24	-3.27	10.00	2.26
4	2297.29	6.75	235.65	2284.82	-120.20	-175.87	0.00	121.15
5	3157.90	89.89	180.31	2817.00	-690.50	-230.60	10.00	691.74
6	8310.89	89.89	180.31	2826.85	-5843.40	-258.17	0.00	5844.71
7	8390.89	89.89	180.31	2827.00	-5923.40	-258.60	0.00	5924.71

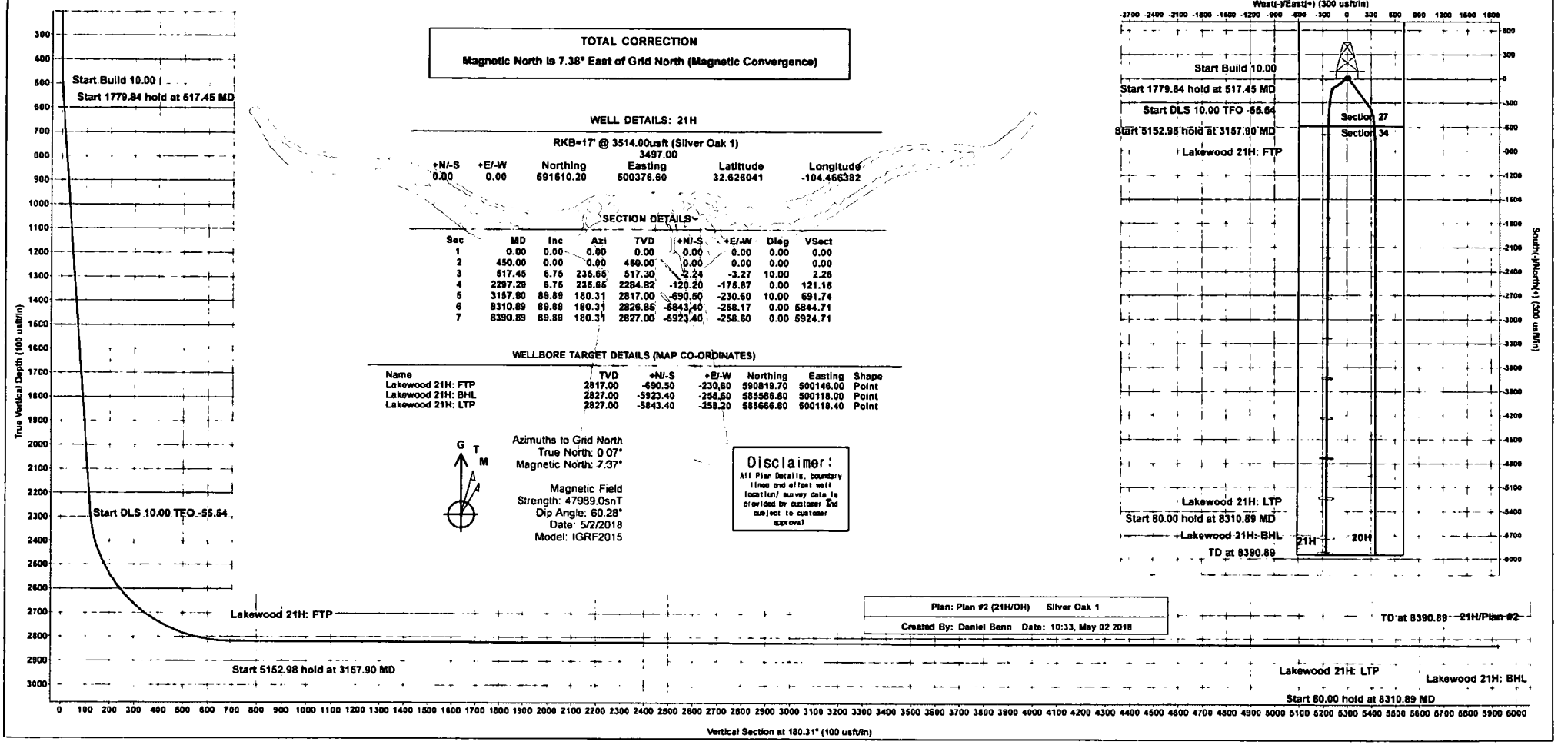
WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Lakewood 21H: FTP	2817.00	-690.50	-230.60	590819.70	500146.00	Point
Lakewood 21H: BHL	2827.00	-5923.40	-258.60	585586.80	500118.00	Point
Lakewood 21H: LTP	2827.00	-5843.40	-258.20	585666.80	500118.40	Point

Azimuths to Grid North
True North: 0.07°
Magnetic North: 7.37°

Magnetic Field
Strength: 47969.0snT
Dip Angle: 60.28°
Date: 5/2/2018
Model: IGRF2015

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



Plan: Plan #2 (21H/OH) Silver Oak 1
Created By: Daniel Benn Date: 10:33, May 02 2018

TD at 8390.89 - 21H/Plan #2

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 21H
Company:	Percussion Petroleum, LLC	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Project:	Eddy County, NM	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site:	Lakewood Federal	**North Reference:**	Grid
Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #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:**	590,773.07 usft	**Latitude:**	32.624012
From:	Lat/Long	**Easting:**	499,537.28 usft	**Longitude:**	-104.469106
Position Uncertainty:	0.00 usft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-0.07 °

Well	21H					
Well Position	**+N/-S**	737.14 usft	**Northing:**	591,510.20 usft	**Latitude:**	32.626041
	+E/-W	839.32 usft	**Easting:**	500,376.60 usft	**Longitude:**	-104.466383
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	3,497.00 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	5/2/2018	7.30	60.28	47,988.99807199

Design	Plan #2				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	180.31	

Plan Survey Tool Program **Date** 5/2/2018

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	8,390.89	Plan #2 (OH)	MWD+IGRF	
				OWSG MWD + IGRF or WI	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00	
517.45	6.75	235.65	517.30	-2.24	-3.27	10.00	10.00	0.00	235.65	
2,297.29	6.75	235.65	2,284.82	-120.20	-175.87	0.00	0.00	0.00	0.00	
3,157.90	89.89	180.31	2,817.00	-690.50	-230.60	10.00	9.66	-6.43	-55.54	Lakewood 21H: FTI
8,310.89	89.89	180.31	2,826.85	-5,843.40	-258.17	0.00	0.00	0.00	0.00	Lakewood 21H: LTI
8,390.89	89.89	180.31	2,827.00	-5,923.40	-258.60	0.00	0.00	0.00	0.00	Lakewood 21H: BH

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 21H
Company:	Percussion Petroleum, LLC	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Project:	Eddy County, NM	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site:	Lakewood Federal	**North Reference:**	Grid
Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
450.00	0.00	0.00	450.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	5.00	235.65	499.94	-1.23	-1.80	1.24	10.00	10.00	0.00
517.45	6.75	235.65	517.30	-2.24	-3.27	2.26	10.00	10.00	0.00
600.00	6.75	235.65	599.27	-7.71	-11.28	7.77	0.00	0.00	0.00
700.00	6.75	235.65	698.58	-14.34	-20.98	14.45	0.00	0.00	0.00
800.00	6.75	235.65	797.89	-20.96	-30.67	21.13	0.00	0.00	0.00
900.00	6.75	235.65	897.20	-27.59	-40.37	27.81	0.00	0.00	0.00
1,000.00	6.75	235.65	996.50	-34.22	-50.07	34.49	0.00	0.00	0.00
1,100.00	6.75	235.65	1,095.81	-40.85	-59.77	41.17	0.00	0.00	0.00
1,200.00	6.75	235.65	1,195.12	-47.47	-69.46	47.85	0.00	0.00	0.00
1,300.00	6.75	235.65	1,294.43	-54.10	-79.16	54.53	0.00	0.00	0.00
1,400.00	6.75	235.65	1,393.74	-60.73	-88.86	61.21	0.00	0.00	0.00
1,500.00	6.75	235.65	1,493.04	-67.36	-98.55	67.89	0.00	0.00	0.00
1,600.00	6.75	235.65	1,592.35	-73.98	-108.25	74.57	0.00	0.00	0.00
1,700.00	6.75	235.65	1,691.66	-80.61	-117.95	81.25	0.00	0.00	0.00
1,800.00	6.75	235.65	1,790.97	-87.24	-127.65	87.93	0.00	0.00	0.00
1,900.00	6.75	235.65	1,890.27	-93.87	-137.34	94.61	0.00	0.00	0.00
2,000.00	6.75	235.65	1,989.58	-100.49	-147.04	101.29	0.00	0.00	0.00
2,100.00	6.75	235.65	2,088.89	-107.12	-156.74	107.97	0.00	0.00	0.00
2,200.00	6.75	235.65	2,188.20	-113.75	-166.44	114.65	0.00	0.00	0.00
2,297.29	6.75	235.65	2,284.82	-120.20	-175.87	121.15	0.00	0.00	0.00
2,300.00	6.90	233.79	2,287.51	-120.38	-176.13	121.33	10.00	5.79	-68.62
2,350.00	10.65	211.46	2,336.92	-126.10	-180.97	127.08	10.00	7.50	-44.67
2,400.00	15.13	201.38	2,385.66	-136.13	-185.77	137.13	10.00	8.97	-20.15
2,450.00	19.86	195.92	2,433.33	-150.38	-190.48	151.41	10.00	9.46	-10.92
2,500.00	24.69	192.51	2,479.59	-168.76	-195.07	169.81	10.00	9.66	-6.82
2,550.00	29.58	190.17	2,524.07	-191.12	-199.52	192.19	10.00	9.77	-4.69
2,600.00	34.50	188.44	2,566.45	-217.29	-203.78	218.39	10.00	9.83	-3.46
2,650.00	39.43	187.09	2,606.39	-247.07	-207.82	248.19	10.00	9.87	-2.69
2,700.00	44.38	186.00	2,643.59	-280.23	-211.61	281.38	10.00	9.89	-2.18
2,750.00	49.33	185.09	2,677.77	-316.53	-215.12	317.69	10.00	9.91	-1.82
2,800.00	54.29	184.31	2,708.67	-355.69	-218.33	356.87	10.00	9.92	-1.57
2,850.00	59.26	183.61	2,736.06	-397.40	-221.21	398.60	10.00	9.93	-1.39
2,900.00	64.23	182.99	2,759.72	-441.36	-223.74	442.56	10.00	9.94	-1.25
2,950.00	69.20	182.41	2,779.48	-487.22	-225.90	488.44	10.00	9.94	-1.15
3,000.00	74.18	181.88	2,795.18	-534.64	-227.67	535.87	10.00	9.95	-1.08
3,050.00	79.15	181.36	2,806.71	-583.26	-229.05	584.49	10.00	9.95	-1.02
3,100.00	84.13	180.87	2,813.98	-632.70	-230.01	633.94	10.00	9.95	-0.99
3,150.00	89.10	180.38	2,816.93	-682.60	-230.55	683.83	10.00	9.95	-0.97
3,157.90	89.89	180.31	2,817.00	-690.50	-230.60	691.74	10.00	9.95	-0.97
3,200.00	89.89	180.31	2,817.08	-732.60	-230.83	733.83	0.00	0.00	0.00
3,300.00	89.89	180.31	2,817.27	-832.59	-231.36	833.83	0.00	0.00	0.00
3,400.00	89.89	180.31	2,817.46	-932.59	-231.90	933.83	0.00	0.00	0.00
3,500.00	89.89	180.31	2,817.65	-1,032.59	-232.43	1,033.83	0.00	0.00	0.00
3,600.00	89.89	180.31	2,817.84	-1,132.59	-232.97	1,133.83	0.00	0.00	0.00
3,700.00	89.89	180.31	2,818.04	-1,232.59	-233.50	1,233.83	0.00	0.00	0.00
3,800.00	89.89	180.31	2,818.23	-1,332.59	-234.04	1,333.83	0.00	0.00	0.00
3,900.00	89.89	180.31	2,818.42	-1,432.58	-234.57	1,433.83	0.00	0.00	0.00
4,000.00	89.89	180.31	2,818.61	-1,532.58	-235.11	1,533.83	0.00	0.00	0.00

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 21H
Company:	Percussion Petroleum, LLC	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Project:	Eddy County, NM	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site:	Lakewood Federal	**North Reference:**	Grid
Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,100.00	89.89	180.31	2,818.80	-1,632.58	-235.64	1,633.83	0.00	0.00	0.00
4,200.00	89.89	180.31	2,818.99	-1,732.58	-236.18	1,733.83	0.00	0.00	0.00
4,300.00	89.89	180.31	2,819.18	-1,832.58	-236.71	1,833.83	0.00	0.00	0.00
4,400.00	89.89	180.31	2,819.37	-1,932.58	-237.25	1,933.83	0.00	0.00	0.00
4,500.00	89.89	180.31	2,819.56	-2,032.58	-237.78	2,033.83	0.00	0.00	0.00
4,600.00	89.89	180.31	2,819.76	-2,132.57	-238.32	2,133.83	0.00	0.00	0.00
4,700.00	89.89	180.31	2,819.95	-2,232.57	-238.85	2,233.83	0.00	0.00	0.00
4,800.00	89.89	180.31	2,820.14	-2,332.57	-239.39	2,333.83	0.00	0.00	0.00
4,900.00	89.89	180.31	2,820.33	-2,432.57	-239.92	2,433.83	0.00	0.00	0.00
5,000.00	89.89	180.31	2,820.52	-2,532.57	-240.46	2,533.83	0.00	0.00	0.00
5,100.00	89.89	180.31	2,820.71	-2,632.57	-240.99	2,633.83	0.00	0.00	0.00
5,200.00	89.89	180.31	2,820.90	-2,732.56	-241.53	2,733.83	0.00	0.00	0.00
5,300.00	89.89	180.31	2,821.09	-2,832.56	-242.06	2,833.83	0.00	0.00	0.00
5,400.00	89.89	180.31	2,821.28	-2,932.56	-242.60	2,933.83	0.00	0.00	0.00
5,500.00	89.89	180.31	2,821.48	-3,032.56	-243.13	3,033.83	0.00	0.00	0.00
5,600.00	89.89	180.31	2,821.67	-3,132.56	-243.67	3,133.83	0.00	0.00	0.00
5,700.00	89.89	180.31	2,821.86	-3,232.56	-244.20	3,233.83	0.00	0.00	0.00
5,800.00	89.89	180.31	2,822.05	-3,332.55	-244.74	3,333.83	0.00	0.00	0.00
5,900.00	89.89	180.31	2,822.24	-3,432.55	-245.27	3,433.83	0.00	0.00	0.00
6,000.00	89.89	180.31	2,822.43	-3,532.55	-245.81	3,533.83	0.00	0.00	0.00
6,100.00	89.89	180.31	2,822.62	-3,632.55	-246.34	3,633.83	0.00	0.00	0.00
6,200.00	89.89	180.31	2,822.81	-3,732.55	-246.88	3,733.83	0.00	0.00	0.00
6,300.00	89.89	180.31	2,823.00	-3,832.55	-247.41	3,833.83	0.00	0.00	0.00
6,400.00	89.89	180.31	2,823.20	-3,932.54	-247.95	3,933.83	0.00	0.00	0.00
6,500.00	89.89	180.31	2,823.39	-4,032.54	-248.48	4,033.83	0.00	0.00	0.00
6,600.00	89.89	180.31	2,823.58	-4,132.54	-249.02	4,133.83	0.00	0.00	0.00
6,700.00	89.89	180.31	2,823.77	-4,232.54	-249.55	4,233.83	0.00	0.00	0.00
6,800.00	89.89	180.31	2,823.96	-4,332.54	-250.09	4,333.83	0.00	0.00	0.00
6,900.00	89.89	180.31	2,824.15	-4,432.54	-250.62	4,433.83	0.00	0.00	0.00
7,000.00	89.89	180.31	2,824.34	-4,532.53	-251.16	4,533.83	0.00	0.00	0.00
7,100.00	89.89	180.31	2,824.53	-4,632.53	-251.69	4,633.83	0.00	0.00	0.00
7,200.00	89.89	180.31	2,824.72	-4,732.53	-252.23	4,733.83	0.00	0.00	0.00
7,300.00	89.89	180.31	2,824.92	-4,832.53	-252.76	4,833.83	0.00	0.00	0.00
7,400.00	89.89	180.31	2,825.11	-4,932.53	-253.30	4,933.83	0.00	0.00	0.00
7,500.00	89.89	180.31	2,825.30	-5,032.53	-253.83	5,033.83	0.00	0.00	0.00
7,600.00	89.89	180.31	2,825.49	-5,132.53	-254.37	5,133.83	0.00	0.00	0.00
7,700.00	89.89	180.31	2,825.68	-5,232.52	-254.90	5,233.83	0.00	0.00	0.00
7,800.00	89.89	180.31	2,825.87	-5,332.52	-255.44	5,333.83	0.00	0.00	0.00
7,900.00	89.89	180.31	2,826.06	-5,432.52	-255.97	5,433.83	0.00	0.00	0.00
8,000.00	89.89	180.31	2,826.25	-5,532.52	-256.51	5,533.83	0.00	0.00	0.00
8,100.00	89.89	180.31	2,826.44	-5,632.52	-257.04	5,633.83	0.00	0.00	0.00
8,200.00	89.89	180.31	2,826.64	-5,732.52	-257.58	5,733.83	0.00	0.00	0.00
8,300.00	89.89	180.31	2,826.83	-5,832.51	-258.11	5,833.83	0.00	0.00	0.00
8,310.89	89.89	180.31	2,826.85	-5,843.40	-258.17	5,844.71	0.00	0.00	0.00
8,390.89	89.89	180.31	2,827.00	-5,923.40	-258.60	5,924.71	0.00	0.00	0.00

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 21H
Company:	Percussion Petroleum, LLC	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Project:	Eddy County, NM	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site:	Lakewood Federal	**North Reference:**	Grid
Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lakewood 21H: FTP - plan hits target center - Point	0.00	360.00	2,817.00	-690.50	-230.60	590,819.70	500,146.00	32.624142	-104.467129
Lakewood 21H: LTP - plan misses target center by 0.16usft at 8310.89usft MD (2826.85 TVD, -5843.40 N, -258.17 E) - Point	0.00	360.00	2,827.00	-5,843.40	-258.20	585,666.80	500,118.40	32.609978	-104.467197
Lakewood 21H: BHL - plan hits target center - Point	0.00	0.01	2,827.00	-5,923.40	-258.60	585,586.80	500,118.00	32.609758	-104.467198

PERCUSSION PETROLEUM LLC

Percussion Petroleum, LLC

Eddy County, NM
Lakewood Federal
21H

OH
Plan #2

Anticollision Report

02 May, 2018

WELLBENDERS DIRECTIONAL SERVICES LLC

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 21H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #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	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.00 us	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	**Casing Method:**	Not applied

Survey Tool Program Date 5/2/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	8,390.89	Plan #2 (OH)	MWD+IGRF	OWSG MWD + IGRF or WMM

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Lakewood Federal						
20H - OH - Plan #2	300.00	299.00	20.00	18.27	11.575	CC, ES
20H - OH - Plan #2	8,390.89	8,271.61	614.05	388.95	2.728	SF

Offset Design Lakewood Federal - 20H - OH - Plan #2 — Offset Site Error: 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	1.00	0.00	0.00	0.00	90.29	-0.10	20.00	20.00				
100.00	100.00	101.00	100.00	0.15	0.15	90.29	-0.10	20.00	20.00	19.70	0.30	66.420	
200.00	200.00	201.00	200.00	0.51	0.51	90.29	-0.10	20.00	20.00	18.98	1.02	19.645	
300.00	300.00	299.00	300.00	0.87	0.86	90.29	-0.10	20.00	20.00	18.27	1.73	11.575	CC, ES
400.00	400.00	396.12	396.68	1.22	1.24	104.63	-6.44	24.67	25.71	23.26	2.45	10.482	
450.00	450.00	444.00	443.60	1.40	1.45	114.97	-14.12	30.33	34.06	31.25	2.81	12.107	
500.00	499.94	507.22	491.26	1.58	1.67	-115.63	-22.48	36.49	44.64	41.42	3.23	13.832	
517.45	517.30	509.73	507.82	1.66	1.68	-115.36	-25.39	38.63	48.80	45.49	3.31	14.734	
600.00	599.27	589.75	586.00	1.94	2.07	-116.68	-39.11	48.74	69.03	65.13	3.90	17.715	
700.00	698.58	686.69	680.72	2.31	2.56	-117.52	-55.74	60.98	93.55	88.92	4.63	20.216	
800.00	797.89	783.63	775.43	2.70	3.06	-118.01	-72.36	73.23	118.08	112.69	5.39	21.924	
900.00	897.20	880.57	870.15	3.10	3.56	-118.33	-88.99	85.48	142.61	136.46	6.16	23.160	
1,000.00	996.50	977.51	964.87	3.50	4.07	-118.55	-105.61	97.72	167.15	160.21	6.94	24.087	
1,100.00	1,095.81	1,074.45	1,059.58	3.91	4.59	-118.72	-122.24	109.97	191.69	183.96	7.73	24.800	
1,200.00	1,195.12	1,171.39	1,154.30	4.32	5.10	-118.85	-138.86	122.21	216.24	207.71	8.52	25.367	
1,300.00	1,294.43	1,268.33	1,249.01	4.73	5.62	-118.95	-155.49	134.46	240.78	231.46	9.32	25.827	
1,400.00	1,393.74	1,365.27	1,343.73	5.15	6.14	-119.04	-172.11	146.71	265.32	255.20	10.12	26.208	
1,500.00	1,493.04	1,462.21	1,438.45	5.56	6.66	-119.11	-188.73	158.95	289.87	278.94	10.93	26.527	
1,600.00	1,592.35	1,559.15	1,533.16	5.98	7.18	-119.17	-205.36	171.20	314.41	302.68	11.73	26.799	
1,700.00	1,691.66	1,656.09	1,627.88	6.40	7.70	-119.22	-221.98	183.44	338.96	326.42	12.54	27.033	
1,800.00	1,790.97	1,753.03	1,722.59	6.81	8.22	-119.26	-238.61	195.69	363.50	350.16	13.35	27.236	
1,900.00	1,890.27	1,849.97	1,817.31	7.23	8.74	-119.30	-255.23	207.94	388.05	373.89	14.16	27.414	
2,000.00	1,989.58	1,946.91	1,912.03	7.65	9.26	-119.33	-271.86	220.18	412.59	397.63	14.96	27.572	
2,100.00	2,088.89	2,043.85	2,006.74	8.07	9.78	-119.36	-288.48	232.43	437.14	421.37	15.77	27.712	
2,200.00	2,188.20	2,140.80	2,101.46	8.49	10.30	-119.39	-305.11	244.68	461.69	445.10	16.59	27.837	

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

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 21H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Lakewood Federal - 20H - OH - Plan #2 — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,297.29	2,284.82	2,235.11	2,193.61	8.90	10.81	-119.41	-321.28	256.59	485.57	468.19	17.37	27.947	
2,300.00	2,287.51	2,237.74	2,196.17	8.91	10.83	-117.51	-321.73	256.92	486.23	468.83	17.40	27.950	
2,350.00	2,336.92	2,286.39	2,243.71	9.13	11.09	-94.65	-330.07	263.07	497.46	479.63	17.82	27.911	
2,400.00	2,385.66	2,335.12	2,291.32	9.37	11.35	-84.68	-338.43	269.22	506.79	488.51	18.29	27.711	
2,450.00	2,433.33	2,383.55	2,338.64	9.63	11.61	-79.88	-346.74	275.34	514.30	495.51	18.80	27.362	
2,500.00	2,479.59	2,431.32	2,385.31	9.92	11.87	-77.64	-354.93	281.38	520.14	500.80	19.35	26.885	
2,550.00	2,524.07	2,478.05	2,430.98	10.23	12.12	-76.93	-362.94	287.28	524.56	504.62	19.94	26.304	
2,600.00	2,566.45	2,512.84	2,464.71	10.57	12.32	-76.57	-370.19	291.64	528.36	507.86	20.50	25.777	
2,650.00	2,606.39	2,549.12	2,499.37	10.94	12.55	-76.74	-379.92	296.12	532.03	510.90	21.13	25.184	
2,700.00	2,643.59	2,586.09	2,533.99	11.35	12.82	-77.25	-392.08	300.59	535.60	513.76	21.84	24.521	
2,750.00	2,677.77	2,623.85	2,568.46	11.80	13.11	-78.04	-406.80	305.04	539.14	516.49	22.64	23.809	
2,800.00	2,708.67	2,662.52	2,602.70	12.29	13.43	-79.05	-424.22	309.46	542.67	519.13	23.54	23.055	
2,850.00	2,736.06	2,702.24	2,636.56	12.83	13.78	-80.25	-444.49	313.84	546.25	521.73	24.52	22.274	
2,900.00	2,759.72	2,743.16	2,669.91	13.41	14.18	-81.60	-467.80	318.14	549.91	524.29	25.61	21.469	
2,950.00	2,779.48	2,785.46	2,702.56	14.02	14.61	-83.11	-494.35	322.35	553.66	526.87	26.79	20.664	
3,000.00	2,795.18	2,829.35	2,734.29	14.68	15.10	-84.75	-524.38	326.44	557.54	529.48	28.06	19.873	
3,050.00	2,806.71	2,875.06	2,764.80	15.36	15.63	-86.52	-558.17	330.37	561.54	532.15	29.39	19.106	
3,100.00	2,813.98	2,922.87	2,793.76	16.07	16.23	-88.43	-596.02	334.09	565.65	534.86	30.79	18.372	
3,150.00	2,816.93	2,973.09	2,820.69	16.81	16.89	-90.46	-638.24	337.55	569.85	537.61	32.23	17.678	
3,157.90	2,817.00	2,981.27	2,824.73	16.92	17.00	-90.79	-645.34	338.07	570.51	538.05	32.47	17.572	
3,200.00	2,817.08	3,026.90	2,845.37	17.55	17.63	-92.84	-685.94	340.72	574.14	540.41	33.74	17.019	
3,300.00	2,817.27	3,149.08	2,884.24	19.11	19.43	-96.63	-801.41	345.69	581.76	544.74	37.01	15.718	
3,400.00	2,817.46	3,280.82	2,898.04	20.72	21.49	-97.92	-932.13	347.40	584.87	544.27	40.61	14.404	
3,500.00	2,817.65	3,380.82	2,898.54	22.38	23.11	-97.94	-1,032.13	347.41	585.46	541.52	43.93	13.326	
3,600.00	2,817.84	3,480.81	2,899.04	24.08	24.76	-97.96	-1,132.13	347.42	586.04	538.71	47.33	12.382	
3,700.00	2,818.04	3,580.81	2,899.54	25.81	26.45	-97.99	-1,232.12	347.43	586.62	535.84	50.78	11.552	
3,800.00	2,818.23	3,680.81	2,900.04	27.56	28.17	-98.01	-1,332.12	347.44	587.20	532.92	54.28	10.818	
3,900.00	2,818.42	3,780.81	2,900.54	29.34	29.91	-98.03	-1,432.12	347.45	587.79	529.97	57.82	10.166	
4,000.00	2,818.61	3,880.81	2,901.04	31.13	31.67	-98.05	-1,532.11	347.46	588.37	526.99	61.38	9.585	
4,100.00	2,818.80	3,980.80	2,901.54	32.93	33.45	-98.08	-1,632.11	347.47	588.95	523.98	64.97	9.064	
4,200.00	2,818.99	4,080.80	2,902.04	34.75	35.25	-98.10	-1,732.11	347.48	589.54	520.95	68.59	8.595	
4,300.00	2,819.18	4,180.80	2,902.54	36.57	37.05	-98.12	-1,832.10	347.49	590.12	517.90	72.22	8.171	
4,400.00	2,819.37	4,280.80	2,903.04	38.41	38.87	-98.14	-1,932.10	347.50	590.70	514.84	75.87	7.786	
4,500.00	2,819.56	4,380.80	2,903.54	40.25	40.69	-98.17	-2,032.10	347.51	591.29	511.76	79.53	7.435	
4,600.00	2,819.76	4,480.79	2,904.04	42.10	42.53	-98.19	-2,132.09	347.52	591.87	508.67	83.20	7.114	
4,700.00	2,819.95	4,580.79	2,904.54	43.95	44.37	-98.21	-2,232.09	347.53	592.45	505.57	86.88	6.819	
4,800.00	2,820.14	4,680.79	2,905.04	45.81	46.21	-98.23	-2,332.09	347.54	593.04	502.47	90.57	6.548	
4,900.00	2,820.33	4,780.79	2,905.54	47.67	48.06	-98.25	-2,432.08	347.55	593.62	499.35	94.27	6.297	
5,000.00	2,820.52	4,880.79	2,906.04	49.54	49.92	-98.28	-2,532.08	347.56	594.20	496.23	97.97	6.065	
5,100.00	2,820.71	4,980.79	2,906.54	51.41	51.78	-98.30	-2,632.08	347.57	594.79	493.10	101.68	5.849	
5,200.00	2,820.90	5,080.78	2,907.04	53.28	53.64	-98.32	-2,732.07	347.58	595.37	489.97	105.40	5.649	
5,300.00	2,821.09	5,180.78	2,907.54	55.16	55.51	-98.34	-2,832.07	347.59	595.96	486.83	109.12	5.461	
5,400.00	2,821.28	5,280.78	2,908.04	57.04	57.38	-98.36	-2,932.07	347.60	596.54	483.69	112.85	5.286	
5,500.00	2,821.48	5,380.78	2,908.54	58.92	59.25	-98.38	-3,032.06	347.61	597.12	480.55	116.58	5.122	
5,600.00	2,821.67	5,480.78	2,909.04	60.80	61.13	-98.41	-3,132.06	347.62	597.71	477.40	120.31	4.968	
5,700.00	2,821.86	5,580.77	2,909.54	62.69	63.01	-98.43	-3,232.06	347.63	598.29	474.25	124.05	4.823	
5,800.00	2,822.05	5,680.77	2,910.04	64.57	64.89	-98.45	-3,332.06	347.64	598.88	471.09	127.78	4.687	
5,900.00	2,822.24	5,780.77	2,910.54	66.46	66.77	-98.47	-3,432.05	347.65	599.46	467.94	131.53	4.558	
6,000.00	2,822.43	5,880.77	2,911.04	68.35	68.66	-98.49	-3,532.05	347.66	600.05	464.78	135.27	4.436	
6,100.00	2,822.62	5,980.77	2,911.54	70.24	70.54	-98.51	-3,632.05	347.67	600.63	461.62	139.01	4.321	
6,200.00	2,822.81	6,080.76	2,912.04	72.13	72.43	-98.54	-3,732.04	347.68	601.22	458.46	142.76	4.211	
6,300.00	2,823.00	6,180.76	2,912.54	74.03	74.32	-98.56	-3,832.04	347.69	601.80	455.29	146.51	4.108	

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

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 21H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

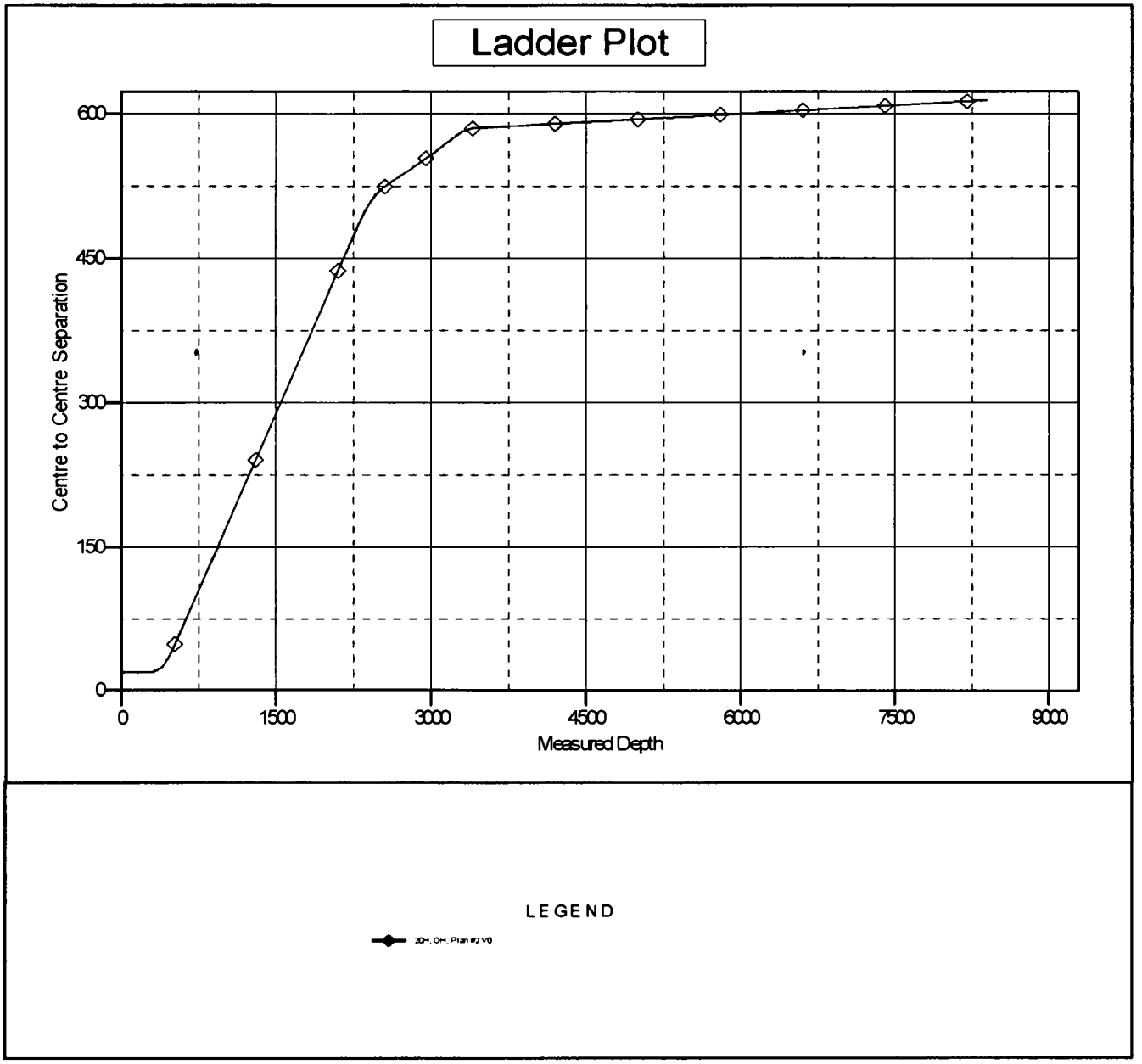
Offset Design Lakewood Federal - 20H - OH - Plan #2 — **Offset Site Error:** 0.00 usft

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

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,400.00	2,823.20	6,280.76	2,913.04	75.92	76.21	-98.58	-3,932.04	347.70	602.39	452.13	150.26	4.009	
6,500.00	2,823.39	6,380.76	2,913.54	77.82	78.10	-98.60	-4,032.03	347.71	602.97	448.96	154.01	3.915	
6,600.00	2,823.58	6,480.76	2,914.04	79.71	79.99	-98.62	-4,132.03	347.72	603.56	445.79	157.77	3.826	
6,700.00	2,823.77	6,580.75	2,914.54	81.61	81.89	-98.64	-4,232.03	347.73	604.14	442.62	161.52	3.740	
6,800.00	2,823.96	6,680.75	2,915.04	83.51	83.78	-98.66	-4,332.02	347.74	604.73	439.45	165.27	3.659	
6,900.00	2,824.15	6,780.75	2,915.54	85.41	85.68	-98.68	-4,432.02	347.75	605.31	436.28	169.03	3.581	
7,000.00	2,824.34	6,880.75	2,916.04	87.30	87.57	-98.71	-4,532.02	347.76	605.90	433.11	172.79	3.507	
7,100.00	2,824.53	6,980.75	2,916.54	89.20	89.47	-98.73	-4,632.01	347.77	606.48	429.94	176.55	3.435	
7,200.00	2,824.72	7,080.74	2,917.04	91.10	91.37	-98.75	-4,732.01	347.78	607.07	426.76	180.30	3.367	
7,300.00	2,824.92	7,180.74	2,917.54	93.01	93.27	-98.77	-4,832.01	347.79	607.65	423.59	184.06	3.301	
7,400.00	2,825.11	7,280.74	2,918.04	94.91	95.17	-98.79	-4,932.00	347.80	608.24	420.42	187.82	3.238	
7,500.00	2,825.30	7,380.74	2,918.54	96.81	97.07	-98.81	-5,032.00	347.81	608.83	417.24	191.58	3.178	
7,600.00	2,825.49	7,480.74	2,919.04	98.71	98.97	-98.83	-5,132.00	347.82	609.41	414.07	195.35	3.120	
7,700.00	2,825.68	7,580.73	2,919.54	100.61	100.87	-98.85	-5,231.99	347.83	610.00	410.89	199.11	3.064	
7,800.00	2,825.87	7,680.73	2,920.04	102.52	102.77	-98.87	-5,331.99	347.84	610.58	407.72	202.87	3.010	
7,900.00	2,826.06	7,780.73	2,920.54	104.42	104.67	-98.89	-5,431.99	347.85	611.17	404.54	206.63	2.958	
8,000.00	2,826.25	7,880.73	2,921.04	106.32	106.57	-98.91	-5,531.98	347.86	611.76	401.36	210.39	2.908	
8,100.00	2,826.44	7,980.73	2,921.54	108.23	108.48	-98.93	-5,631.98	347.87	612.34	398.19	214.16	2.859	
8,200.00	2,826.64	8,080.72	2,922.04	110.13	110.38	-98.96	-5,731.98	347.88	612.93	395.01	217.92	2.813	
8,300.00	2,826.83	8,180.72	2,922.54	112.04	112.28	-98.98	-5,831.97	347.89	613.52	391.83	221.68	2.768	
8,310.89	2,826.85	8,191.61	2,922.59	112.25	112.49	-98.98	-5,842.86	347.89	613.58	391.49	222.09	2.763	
8,390.89	2,827.00	8,271.61	2,922.99	113.77	114.01	-98.99	-5,922.86	347.90	614.05	388.95	225.10	2.728 SF	

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 21H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

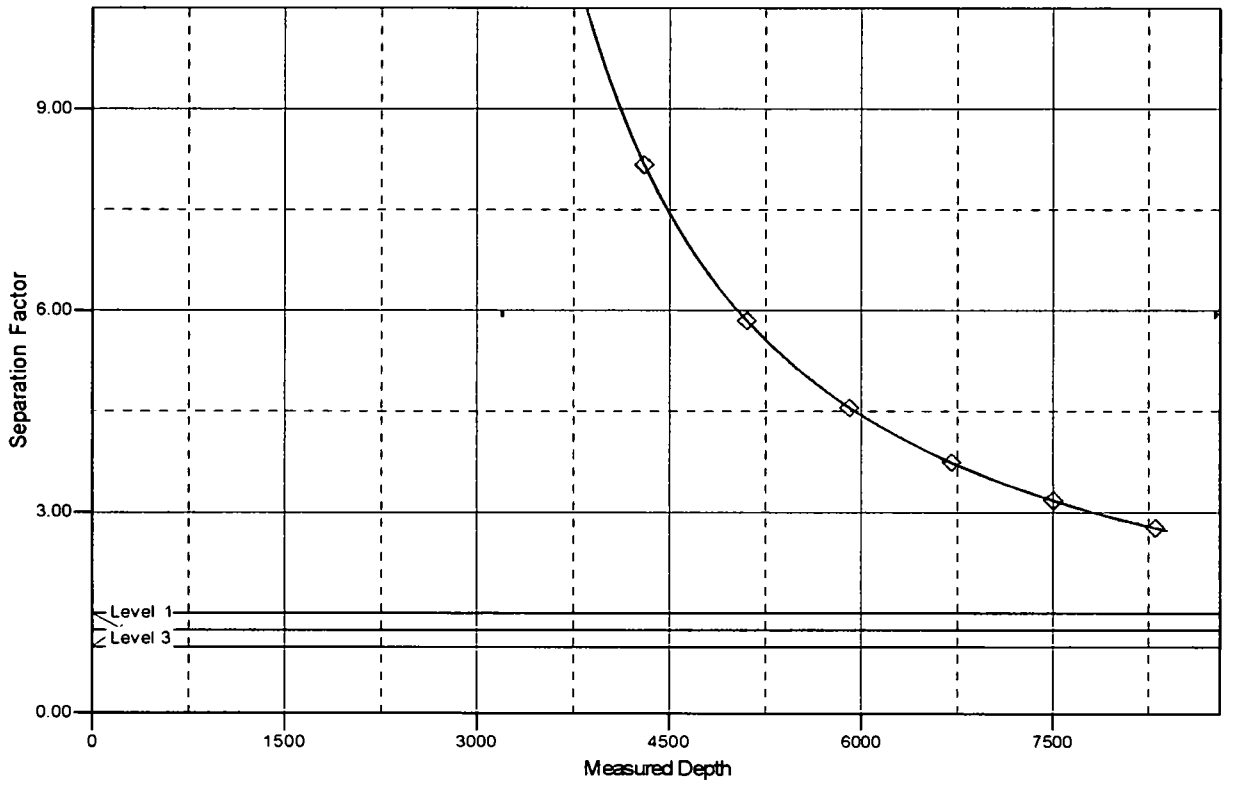
Reference Depths are relative to RKB=17' @ 3514.00usft (Silver Oak 1Coordinates are relative to: 21H
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334 Grid Convergence at Surface is: -0.07°



Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 21H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3514.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	21H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=17' @ 3514.00usft (Silver Oak 1Coordinates are relative to: 21H
Offset Depths are relative to Offset Datum
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334
Grid Convergence at Surface is: -0.07°

Separation Factor Plot



LEGEND

2DH, OH, Plan #2 V0

Percussion Petroleum Operating, LLC
Lakewood Federal Com 21H
SHL 592' FSL & 708' FEL 27-19S-25E
BHL 20' FSL & 966' FEL 34-19S-25E
Eddy County, NM

Drilling Program

1. ESTIMATED TOPS

Formation/Lithology	TVD	MD	Contents
Quaternary caliche	000'	000'	water
Grayburg dolomite	627'	628'	hydrocarbons
San Andres dolomite	812'	814'	hydrocarbons
(KOP	2285'	2297'	hydrocarbons)
Glorieta silty dolomite	2372'	2393'	hydrocarbons
Yeso dolomite & goal	2527'	2554'	hydrocarbons
TD	2827'	8391'	hydrocarbons

2. NOTABLE ZONES

Yeso is the goal. Closest water well (RA 02958) is 4178' south-southwest. Depth to water was not recorded in this 450' deep well.

3. PRESSURE CONTROL

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

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

4. CASING & CEMENT

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

Hole O. D.	Set MD	Set TVD	Casing O. D.	Weight (lb/ft)	Grade	Joint	Collapse	Burst	Tension
12.25"	0' - 1279'	0' - 1273'	Surface 9.625"	36	J-55	LTC	1.125	1.125	1.8
8.75"	0' - 2550'	0' - 2524'	Prod. 1 7"	32	L-80	BTC	1.125	1.125	1.8
8.75"	2550' - 8391'	2524' - 2827'	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 4th 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	1408	1.32	1858	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.

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' - 2297'	8.3 - 9.2	28-30	NC	1	1
cut brine	2297' - 8391'	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 ≈1213 psi. Expected bottom hole temperature is ≈112° F.

A Hydrogen Sulfide Drilling Operation Plan is attached.

8. OTHER INFORMATION

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

St. Devote LLC has operating rights in NMNM-0504364B and NMNM-031200. St. Devote LLC is a subsidiary of Percussion.

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

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: 10400033137 **Submission Date:** 08/20/2018

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Lake_21H_Road_Map_20180816104406.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_21H_New_Road_Map_20180816104421.pdf

New road type: RESOURCE

Length: 138.5 Feet **Width (ft.):** 30

Max slope (%): 0 **Max grade (%):** 1

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: Crowned and ditched

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Grader

Access other construction information: No culvert, new cattle guard, or vehicle turn out is needed. A gap will be left in the fence northwest of the 5H pad. No upgrade is needed.
Access miscellaneous information:

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

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Crowned and ditched

Road Drainage Control Structures (DCS) description: None

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Lake_21H_Well_Map_20180816104439.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 307.6' long 4" O D. HDPE flow line will be laid on the surface south 15' and southeast 292.6' to a central tank battery on the existing Pan Canadian 5H pad. Maximum operating pressure will be 100 psi. A 424.5' long overhead raptor safe 3-phase power line will be built south to an existing power line. Three 2837.9' long 4" O. D. HDPE saltwater disposal (SWD) lines will be laid on the surface west to Percussion's existing SWD line south of its Aikman SWD State 1 well. Maximum operating pressure will be 100 psi. A third-party will come to the CTB and take the gas. They will be responsible for their route and their application. A CTB will be built on the existing abandoned (never drilled) Pan Canadian 5H pad. Separators, heater-treaters, etc. will be on the west side. Tank battery will be south of the separators. Battery will be lined and surrounded by a berm >150% of the volume of the largest tank. Water tanks will be to the north. Oil tanks will be to the south. Flare and/or CBU will be in the northeast corner.
Production Facilities map:

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

Lake_21H_Production_Facilities_20180816104500.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

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

Water source type: GW WELL

Describe type:

Source longitude:

Source latitude:

Source datum:

Water source permit type: OTHER

Source land ownership: PRIVATE

Water source transport method: PIPELINE

Source transportation land ownership: PRIVATE

Water source volume (barrels): 9000

Source volume (acre-feet): 1.1600379

Source volume (gal): 378000

Water source and transportation map:

Lake_21H_Water_Source_Map_20180816104521.pdf

Water source comments: Water will be piped via temporary 10,500' long surface 10" Kevlar lay flat pipelines (2) from Percussion's existing lined fresh water pond on its own land in NE4 26-19s-25e. Pipeline route will not be bladed or excavated. Route is all private.

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:**

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: NM One Call (811) will be notified before construction starts. Percussion will move its two surface lines north of the pad. Top 6" of soil and brush will be stockpiled northwest of the pad. V-door will face east. 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_21H_Construction_Methods_20180816104536.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 on pad

Cuttings area length (ft.) **Cuttings area width (ft.)**

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

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

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Lake_21H_Well_Site_Layout_20180816104552.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: 20H

Recontouring attachment:

Lake_21H_Interim_Reclamation_Diagram_20180816104802.pdf
Lake_21H_Recontour_Plat_20180816104812.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

Well pad proposed disturbance (acres): 1.98
Road proposed disturbance (acres): 0.1
Powerline proposed disturbance (acres): 0.29
Pipeline proposed disturbance (acres): 6.98
Other proposed disturbance (acres): 0
Total proposed disturbance: 9.35

Well pad interim reclamation (acres): 0.15
Road interim reclamation (acres): 0
Powerline interim reclamation (acres): 0.29
Pipeline interim reclamation (acres): 6.98
Other interim reclamation (acres): 0
Total interim reclamation: 7.42

Well pad long term disturbance (acres): 1.83
Road long term disturbance (acres): 0.1
Powerline long term disturbance (acres): 0
Pipeline long term disturbance (acres): 0
Other long term disturbance (acres): 0
Total long term disturbance: 1.93

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 0.15 acre by removing caliche and reclaiming 20' on the north side of the pad. This will leave 1.83 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 surface owner's requirements.
Topsoil redistribution: Enough stockpiled topsoil will be retained to cover the remainder of the pad when the well is plugged. Once the last well is plugged, then the rest of the pad and new road will be similarly reclaimed within 6 months of plugging. Noxious weeds will be controlled.
Soil treatment: None

Existing Vegetation at the well pad:

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type:

Seed source:

Seed name:

Source name:

Source address:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Proposed seeding season:

Seed Summary

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:

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

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

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

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: Agreement

Surface Access Agreement Need description: To be provided

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Disturbance type: OTHER

Describe: SWD line

Surface Owner: STATE GOVERNMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office: SANTA FE

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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

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

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: Agreement

Surface Access Agreement Need description: To be provided

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Disturbance type: NEW ACCESS ROAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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

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

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: Agreement

Surface Access Agreement Need description: To be provided

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Disturbance type: OTHER

Describe: Power Line

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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

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

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: Agreement

Surface Access Agreement Need description: To be provided

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Disturbance type: OTHER

Describe: Water Line

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 21H

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

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

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: Agreement

Surface Access Agreement Need description: To be provided

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Section 12 - Other Information

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

ROW Type(s):

ROW Applications

SUPO Additional Information:

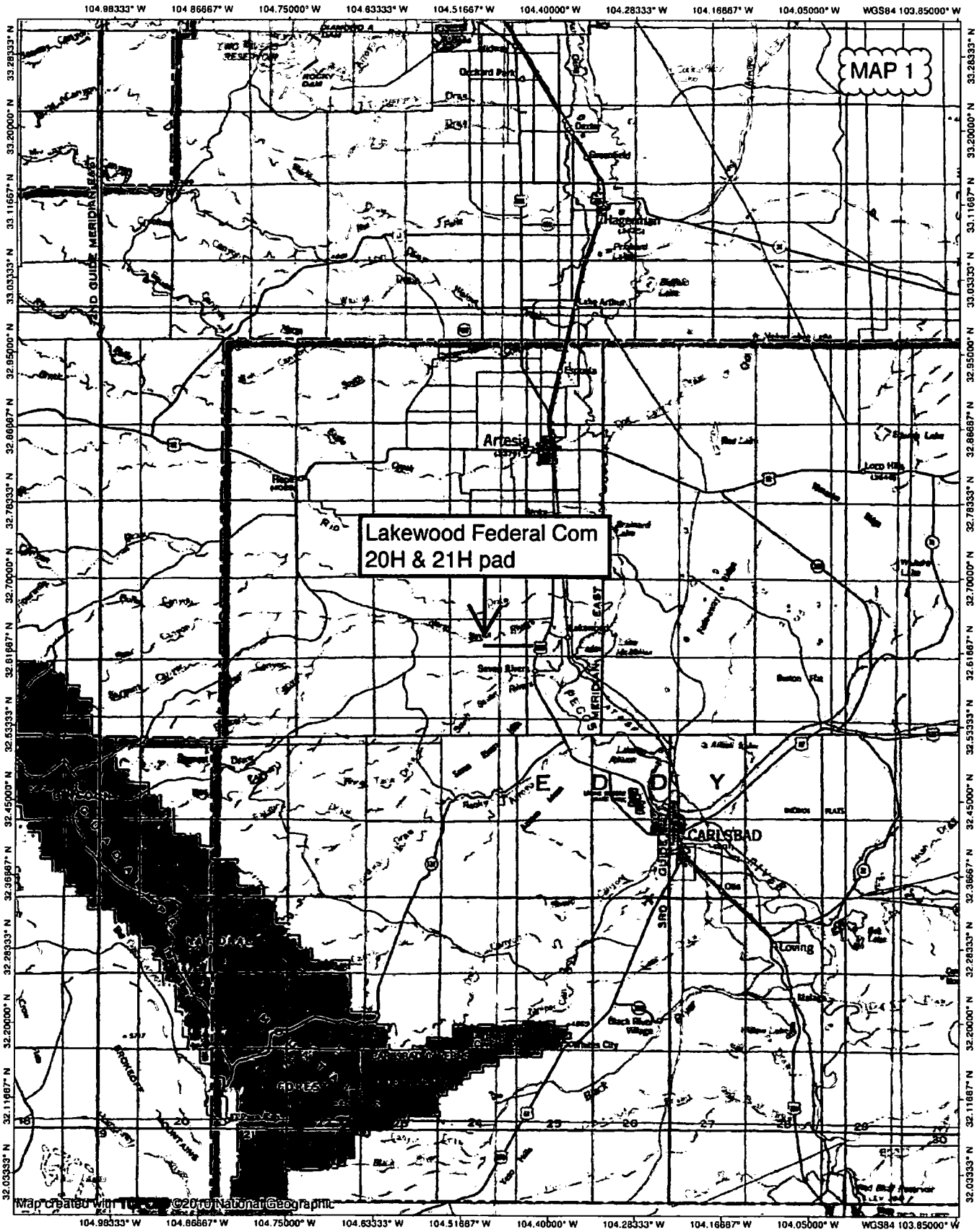
Use a previously conducted onsite? YES

Previous Onsite Information: On-site inspection was held with Jessie Bassett (BLM) on April 3, 2018. Lone Mountain inspected the project area and submitted archaeology report NMCRIS-140197 on April 11, 2018.

Other SUPO Attachment

Lake_21H_SUPO_20180816104846.pdf

TOPO! map printed on 06/26/18 from "Untitled.tpo"

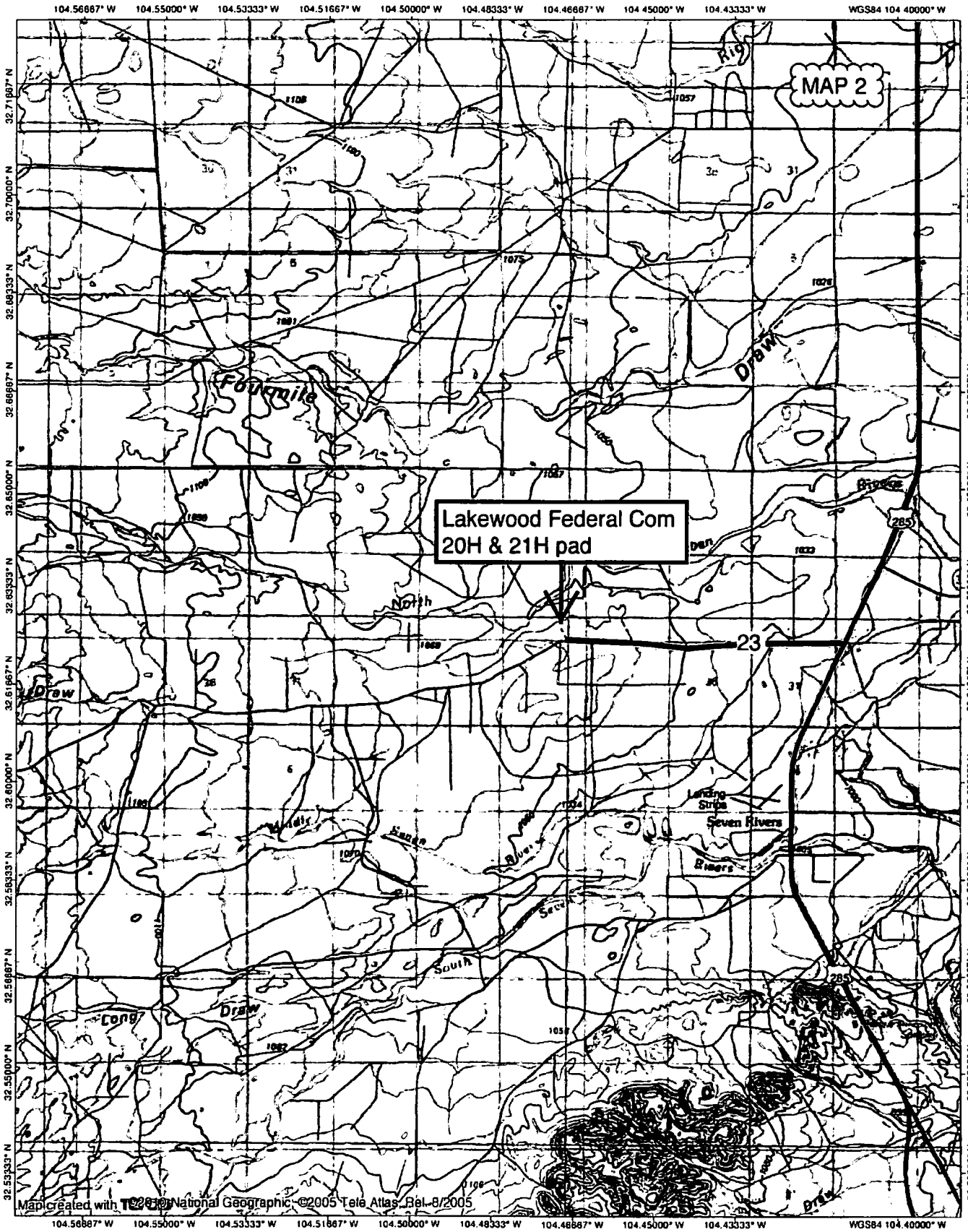


NATIONAL GEOGRAPHIC

0 5 10 15 20 miles
0 5 10 15 20 25 30 km

TN MN
7°
06/26/18

TOPO! map printed on 06/26/18 from "Untitled.tpo"



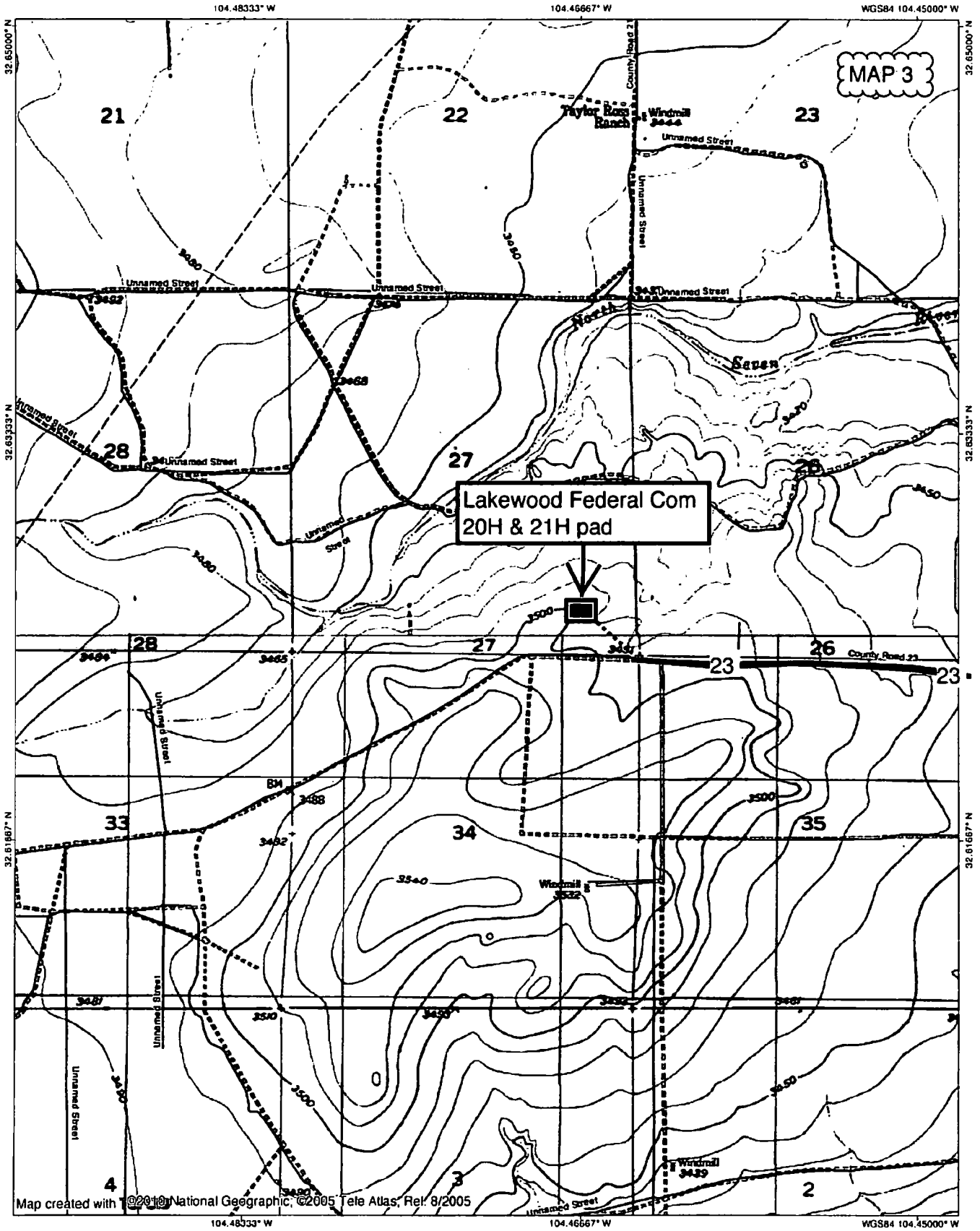
Map created with TOPO! ©National Geographic ©2005 Tele Atlas Rel. 8/2005

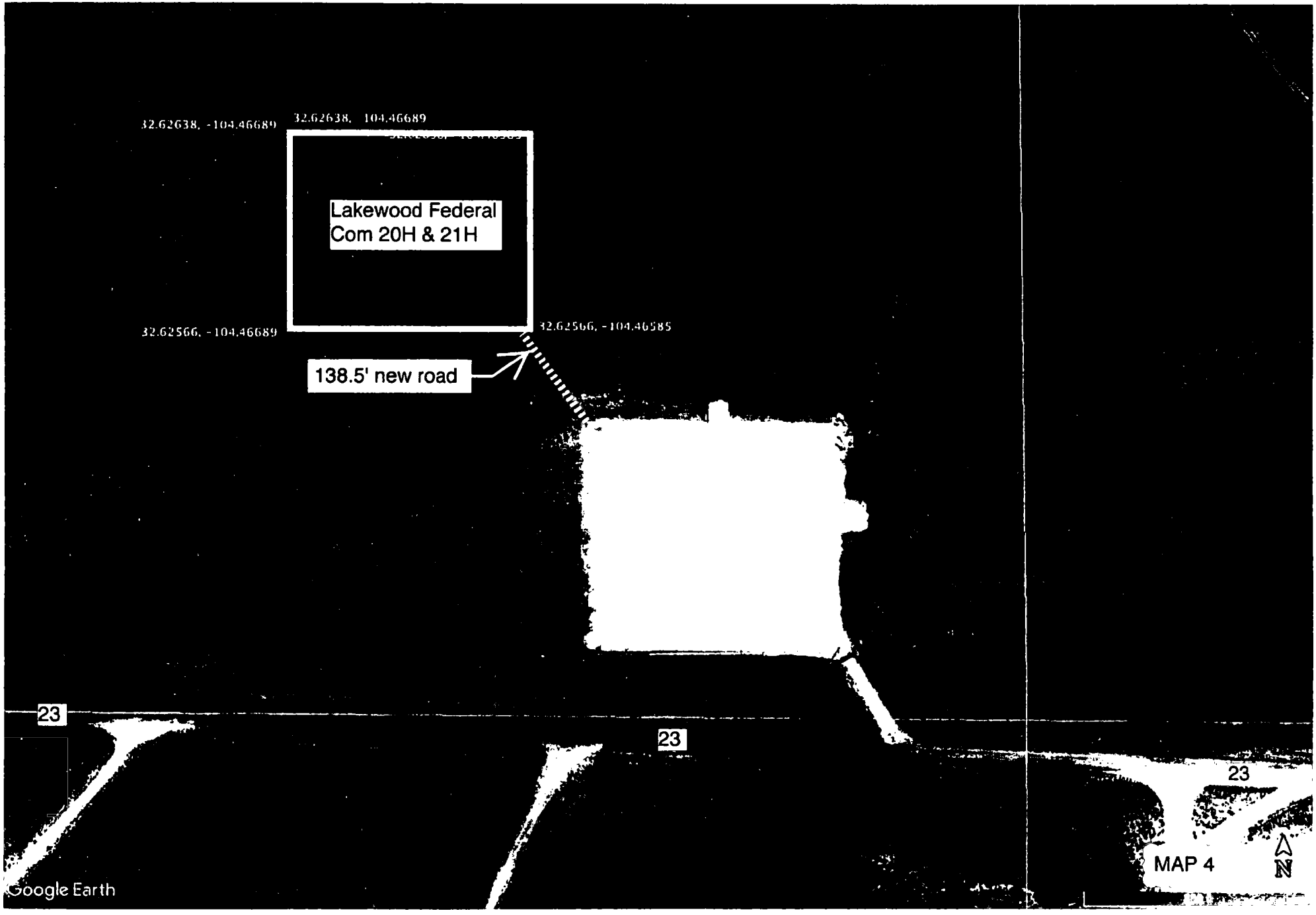
NATIONAL GEOGRAPHIC

0.0 0.5 1.0 1.5 2.0 2.5 3.0 miles
0 1 2 3 4 5 km

TN A MN
7°
06/26/18

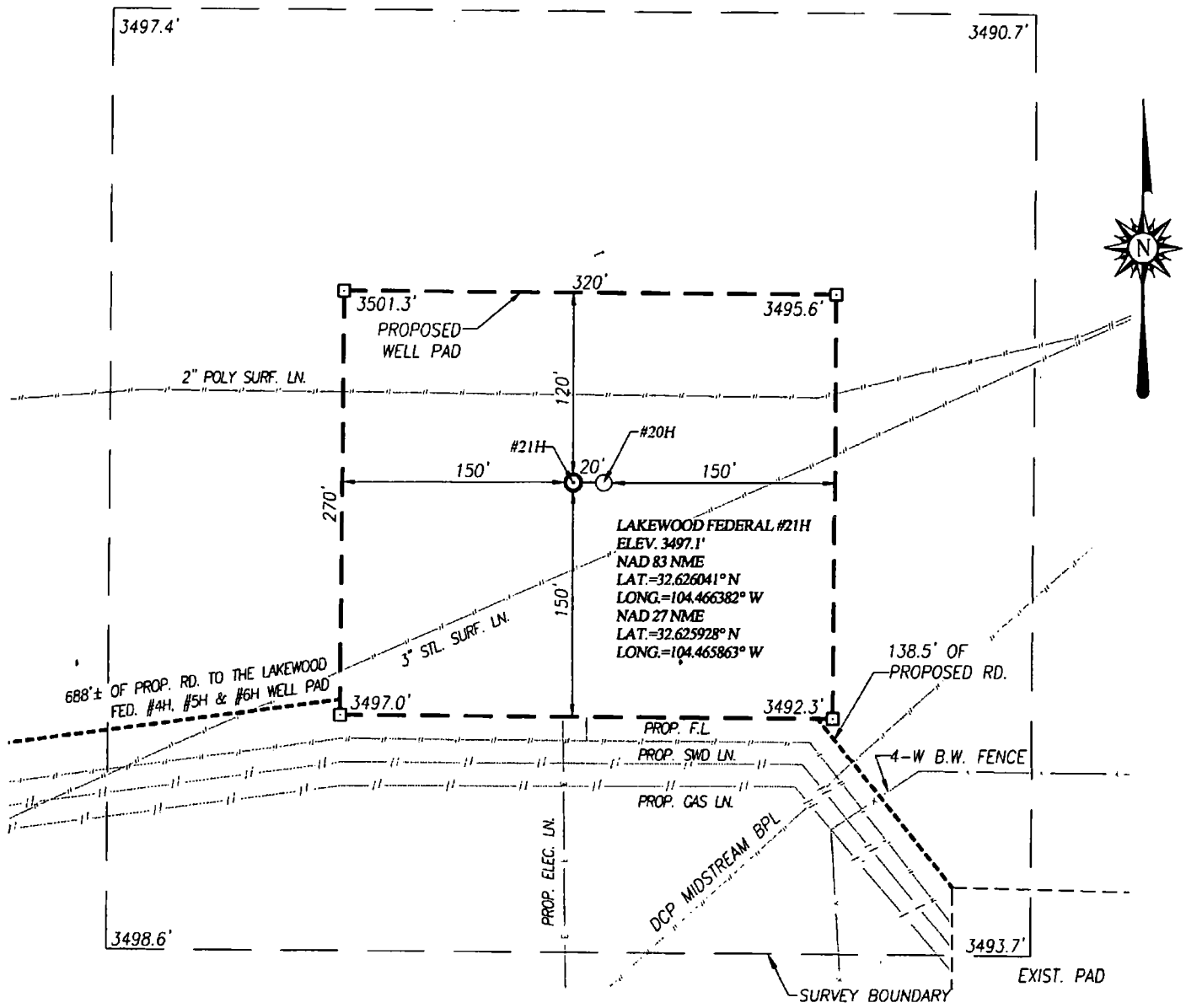
TOPO! map printed on 06/26/18 from "Untitled.tpo"




32.62638, -104.46689
32.62638, -104.46689
Lakewood Federal
Com 20H & 21H
32.62566, -104.46689
32.62566, -104.46585
138.5' new road
23
23
23
Google Earth
MAP 4
N

WELL SITE PLAN

MAP 5



NOTE:
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 DAISY RD.), GO WEST ON CO. RD. 23 APPROX. 3.1 MILES TO CO. RD. 21A DIRT ROAD. FOLLOW DIRT ROAD NORTHWEST APPROX. 164 FEET TO EXIST. PAD. FOLLOW STAKED FROM NORTHWEST CORNER OF EXIST. PAD APPROX. 138.5 FEET TO THE SOUTH EDGE OF THIS LOCATION.

100 0 100 200 Feet

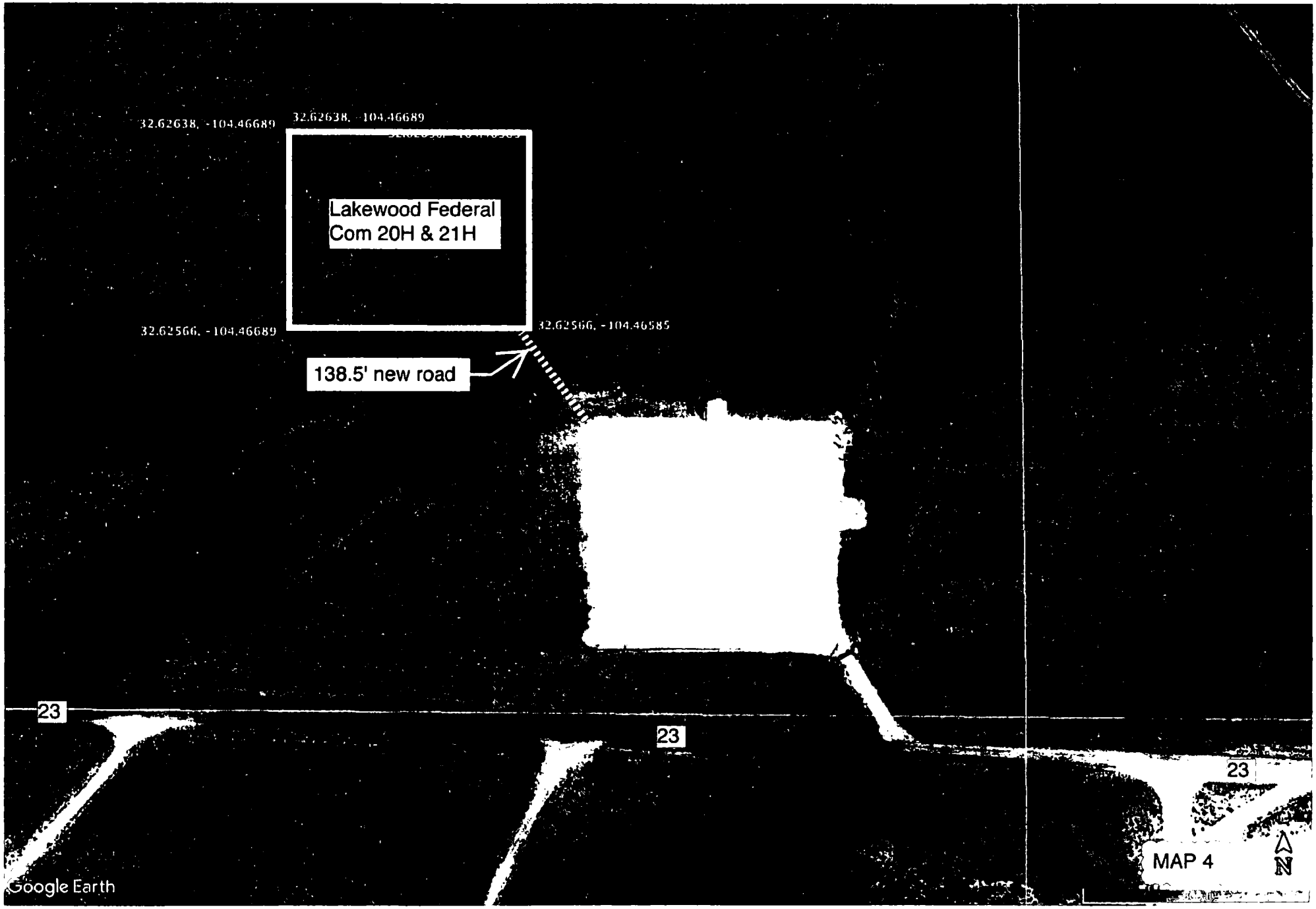
Scale: 1"=100'

PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #21H WELL LOCATED 592 FEET FROM THE SOUTH LINE AND 708 FEET FROM THE EAST LINE OF SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

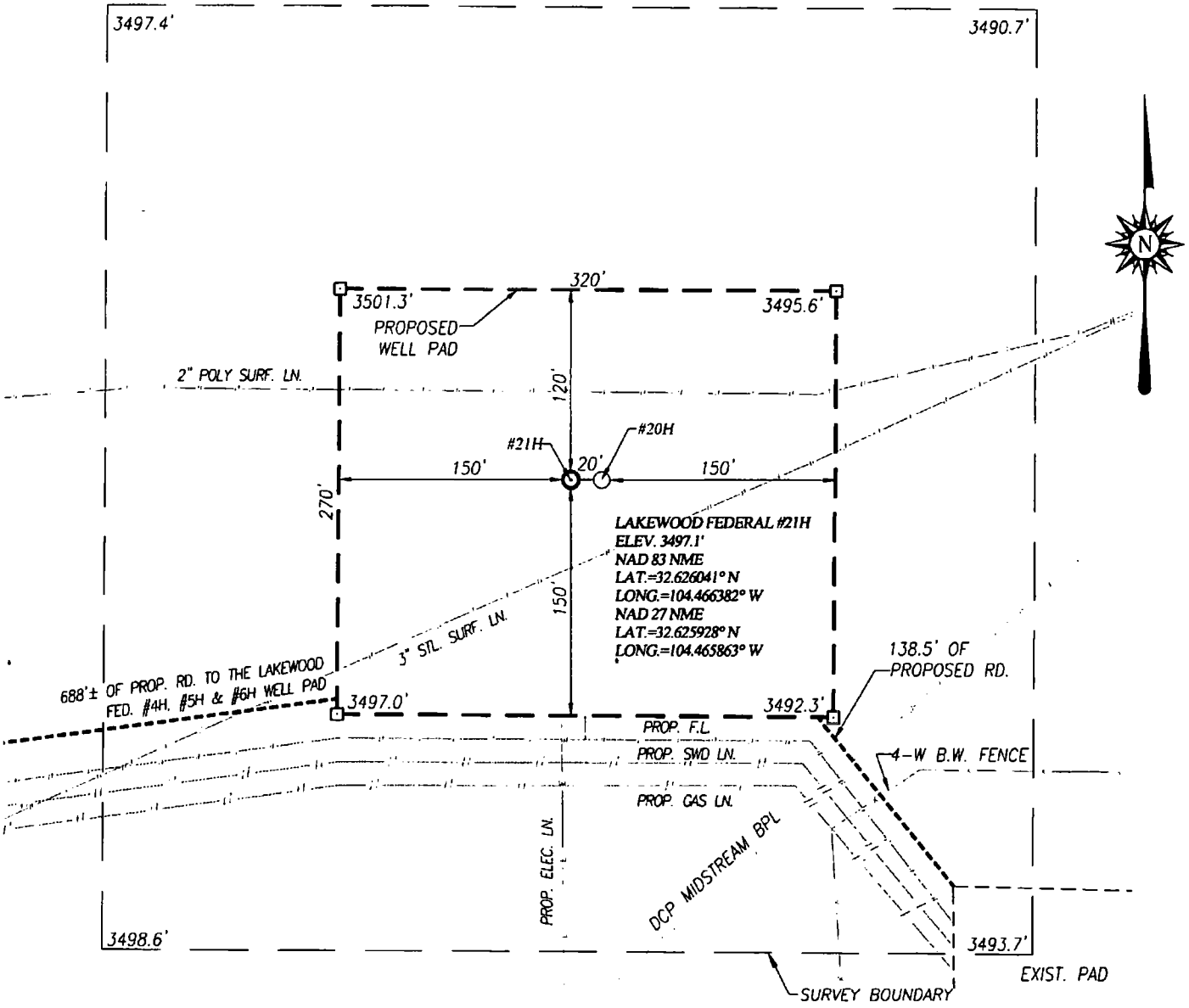
PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 02/23/18	CAD Date: 3/08/18	Drawn By: ACK
W.O. No.: 18110124	Rev: .06/19/18	Rel. W.O.:	Sheet 1 of 1


32.62638, -104.46689
32.62638, -104.46689
Lakewood Federal
Com 20H & 21H
32.62566, -104.46689
32.62566, -104.46585
138.5' new road
23
23
23
MAP 4
N
Google Earth

WELL SITE PLAN

MAP 5



NOTE:
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 DAISY RD.), GO WEST ON CO. RD. 23 APPROX. 3.1 MILES TO CO. RD. 21A DIRT ROAD. FOLLOW DIRT ROAD NORTHWEST APPROX. 164 FEET TO EXIST. PAD. FOLLOW STAKED FROM NORTHWEST CORNER OF EXIST. PAD APPROX. 138.5 FEET TO THE SOUTH EDGE OF THIS LOCATION.

100 0 100 200 Feet

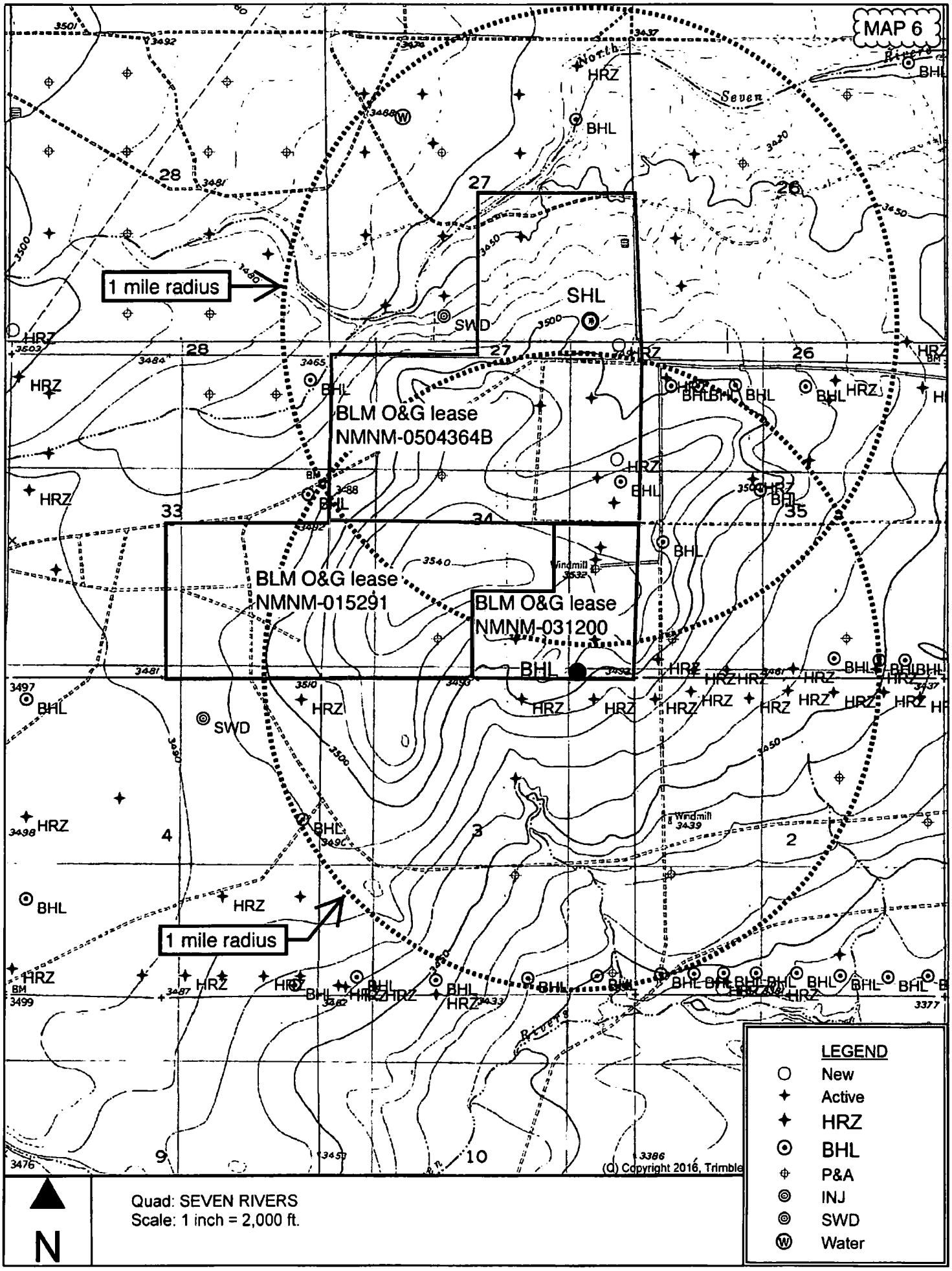
Scale: 1"=100'

PERCUSSION PETROLEUM OPERATING, LLC

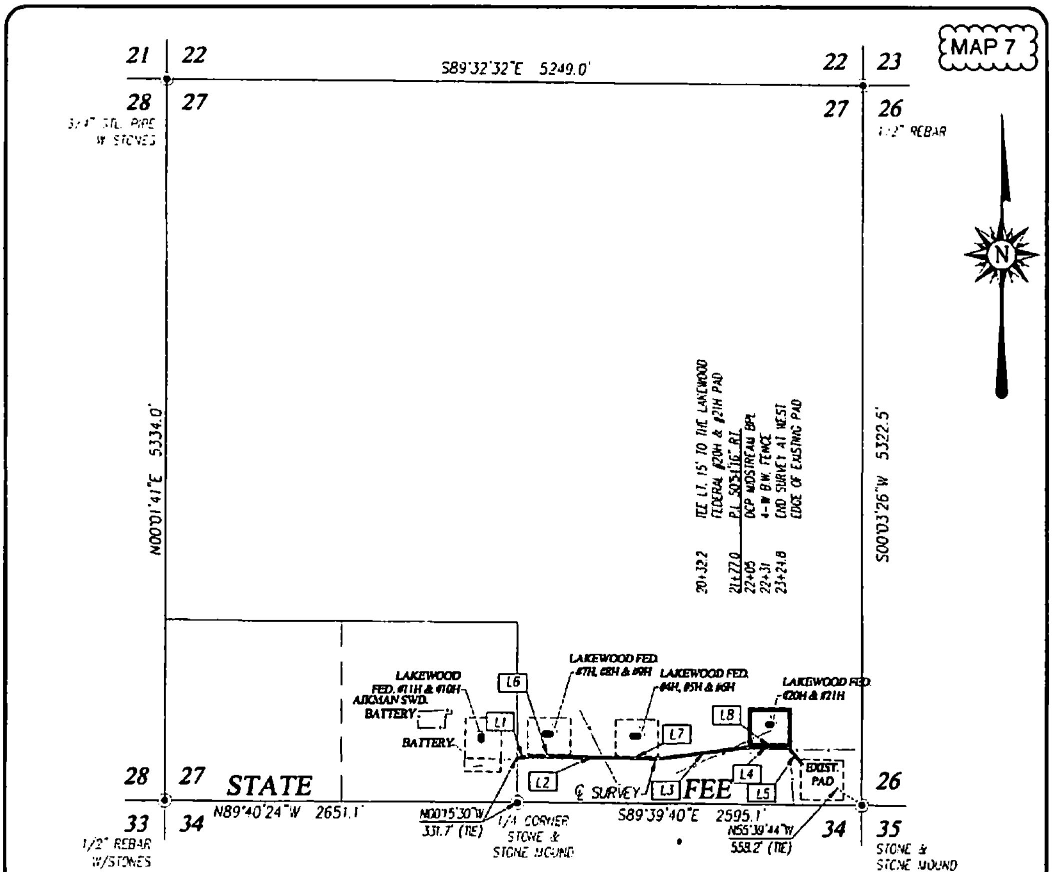
LAKEWOOD FEDERAL #21H WELL LOCATED 592 FEET FROM THE SOUTH LINE AND 708 FEET FROM THE EAST LINE OF SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

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: 02/23/18	CAD Date: 3/08/18	Drawn By: ACK
W.O. No.: 18110124	Rev: .06/19/18	Rel. W.O.:	Sheet 1 of 1


MAP 6
1 mile radius
SHL
SWD
BLM O&G lease
NMNM-0504364B
BLM O&G lease
NMNM-015291
BLM O&G lease
NMNM-031200
BHL
HRZ
1 mile radius
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Water
N
Quad: SEVEN RIVERS
Scale: 1 inch = 2,000 ft.
(C) Copyright 2016, Trimble

MAP 7



DESCRIPTION

SURVEY FOR A FLOW LINE CROSSING SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT ON THE WEST LINE OF THE SW/4 SE/4 OF SECTION 27, WHICH LIES N00°15'30"W 331.7 FEET FROM THE SOUTH QUARTER CORNER OF SAID SECTION; THEN N80°29'41"E 77.2 FEET; THEN S89°05'02"E 150.0 FEET TO A SURVEY LINE WHICH BEARS N00°32'10"E 15.0 FEET THEN CONTINUING S89°05'02"E 661.2 FEET TO A SURVEY LINE WHICH BEARS N00°19'25"W 15.0 FEET THEN CONTINUING S89°05'02"E 169.0 FEET, 980.2 FEET IN ALL; THEN N82°39'19"E 687.6 FEET; THEN S89°38'36"E 160.2 FEET TO A SURVEY LINE WHICH BEARS N00°07'51"W 15.0 FEET THEN CONTINUING S89°38'36"E 144.8 FEET, 305.0 FEET IN ALL; THEN S38°44'20"E 147.8 FEET TO A POINT IN THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 27, WHICH LIES N55°39'44"W 558.2 FEET FROM THE SOUTHEAST CORNER OF SAID SECTION.

TOTAL LENGTH EQUALS 2242.8 FEET OR 135.93 RODS.

LINE	BEARING	DISTANCE
L1	N80°29'41"E	77.2'
L2	S89°05'02"E	980.2'
L3	N82°39'19"E	687.6'
L4	S89°38'36"E	305.0'
L5	S38°44'20"E	147.8'
L6	N00°32'10"E	15.0'
L7	N00°19'25"W	15.0'
L8	N00°07'51"W	15.0'

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.

LEGEND

⦿ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

Scale: 1"=1000'

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: 03/26/2018

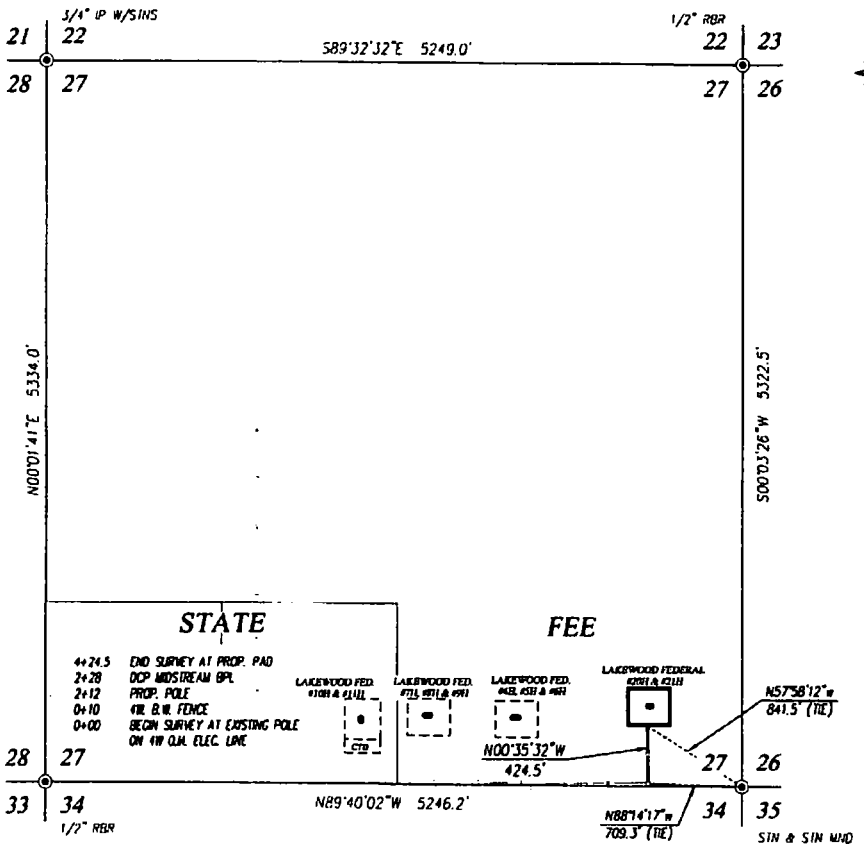
PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

PERCUSSION PETROLEUM OPERATING, LLC

SURVEY FOR A FLOW LINE FROM THE LAKEWOOD FEDERAL #10H & #11H BATTERY TO AN EXISTING PAD CROSSING SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

Survey Date: 2/26/18	CAD Date: 3/22/18	Drawn By: ACK
W.O. No.: 18110365	Rev.:	Rel. W.O.:
Sheet 1 of 1		

MAP 8



DESCRIPTION

SURVEY FOR AN ELECTRIC LINE CROSSING SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT A POINT IN THE SOUTHEAST QUARTER, WHICH LIES N88°14'17"W 709.3 FEET FROM THE SOUTHEAST CORNER; THEN N00°35'32"W 424.5 FEET TO A POINT, WHICH LIES N57°58'12"W 841.5 FEET FROM THE SOUTHEAST CORNER.

TOTAL LENGTH EQUALS 424.5 FEET OR 25.73 RODS.

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).

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

DATE: 6/18/2018

RONALD J. EIDSON NEW MEXICO 3239 PROFESSIONAL SURVEYOR

LEGEND

- DENOTES FOUND CORNER AS NOTED
- DENOTES CENTERLINE SURVEY

1000 0 1000 2000 FEET

Scale: 1" = 1000'

PROVIDING SURVEYING SERVICES SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

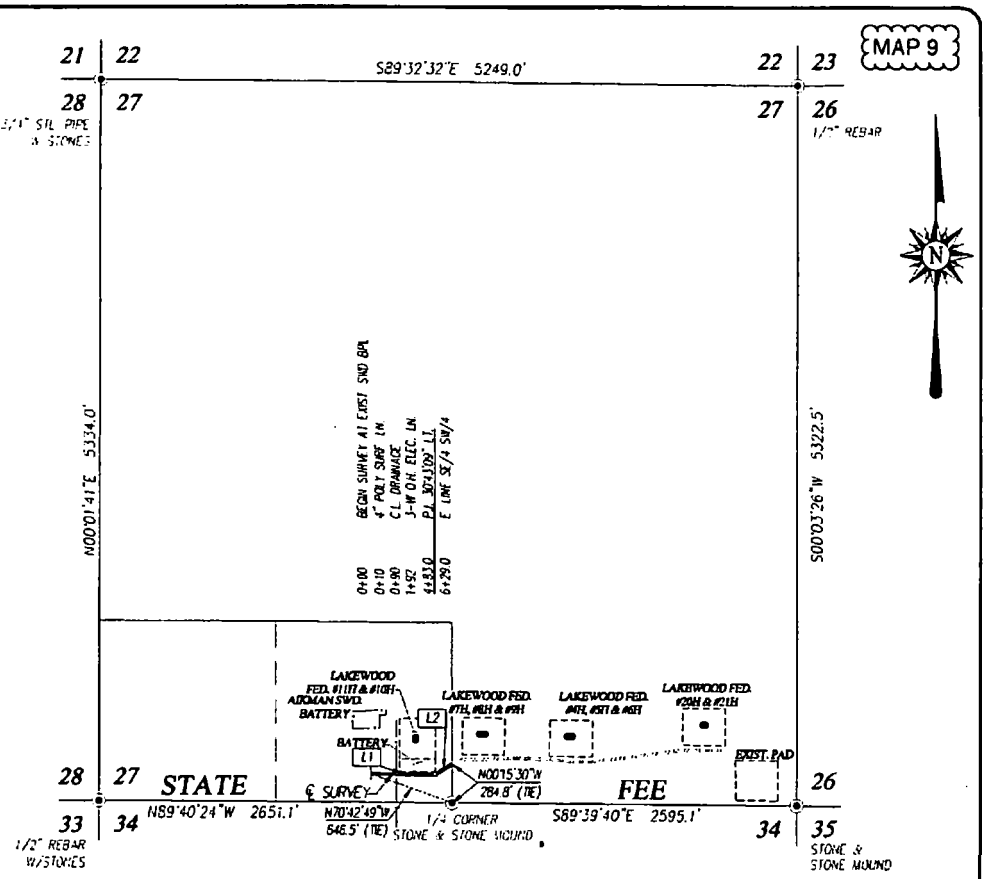
(575) 393-3117 www.jwsc.biz

TBPLS# 10021000

PERCUSSION PETROLEUM OPERATING, LLC

SURVEY FOR AN ELECTRIC LINE TO THE LAKEWOOD FEDERAL #20H & #21H CROSSING SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

Survey Date: 06/08/18	CAD Date: 06/15/18	Drawn By: LSL
W.O. No.: 18110699	Rev.: .	Rel. W.O.:	Sheet 1 of 1



LINE	BEARING	DISTANCE
L1	S89°41'23"E	483.0'
L2	N59°35'28"E	146.0'

DESCRIPTION

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

BEGINNING AT A POINT IN THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SAID SECTION 27, WHICH LIES N70°42'49"W 646.5 FEET FROM THE SOUTH QUARTER CORNER OF SAID SECTION; THEN S89°41'23"E 483.0 FEET; THEN N59°35'28"E 146.0 FEET TO A POINT ON THE EAST LINE OF THE SE/4 SW/4, WHICH LIES N00°15'30"W 284.8 FEET FROM THE SOUTH QUARTER CORNER OF SAID SECTION.

SAID STRIP OF LAND BEING 629.0 FEET OR 38.12 RODS IN LENGTH, CONTAINING 0.433 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SE/4 SW/4 38.12 RODS OR 0.433 ACRES

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 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: 03/22/2018

NEW MEXICO 3239 PROFESSIONAL SURVEYOR

LEGEND

◉ DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

Scale: 1"=1000'

PROVIDING SURVEYING SERVICES SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

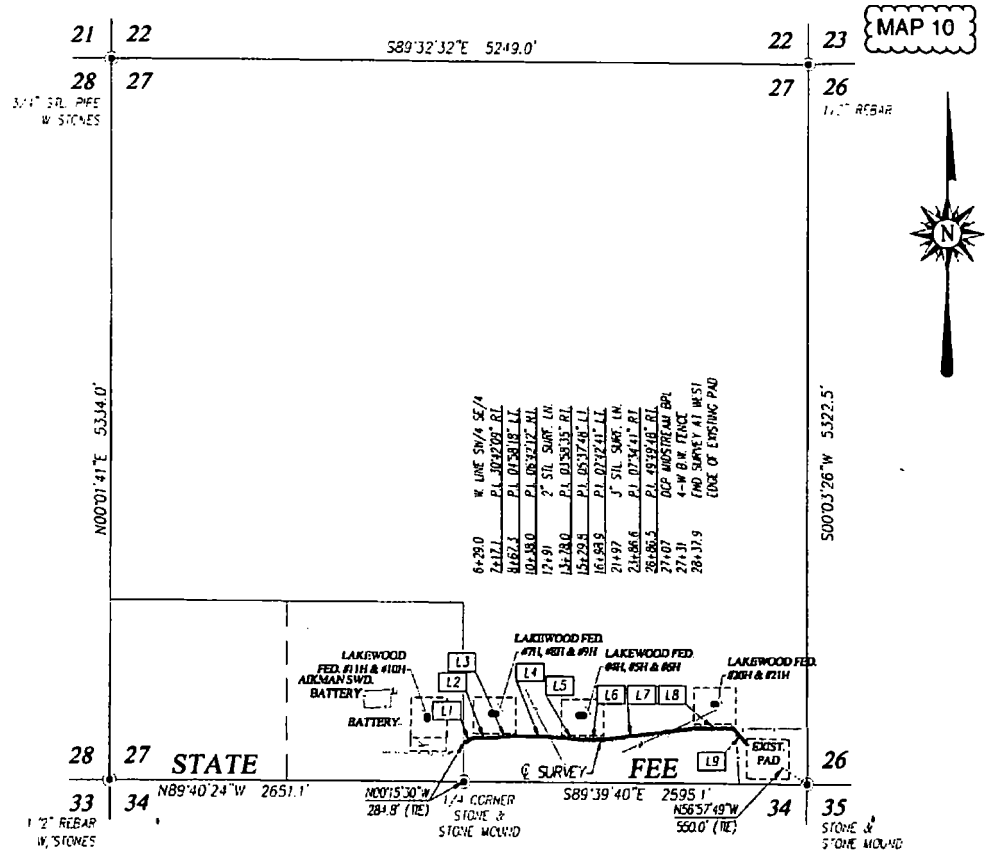
(575) 393-3117 www.jwsc.biz

TBPLS# 10021000

PERCUSSION PETROLEUM OPERATING, LLC

SURVEY FOR AN SWD PIPELINE FROM AN EXISTING SWD PIPELINE TO AN EXISTING PAD CROSSING SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

Survey Date: 2/26/18	CAD Date: 3/08/18	Drawn By: ACK
W.O. No.: 18110179	Rev:	Rel. W.O.:	Sheet 1 of 1



DESCRIPTION

SURVEY FOR AN SWD PIPELINE CROSSING SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS.

BEGINNING AT A POINT ON THE WEST LINE OF THE SW/4 SE/4 OF SECTION 27, WHICH LIES N00°15'30"W 284.8 FEET FROM THE SOUTH QUARTER CORNER OF SAID SECTION; THEN N59°35'28"E 88.1 FEET; THEN S89°42'22"E 150.2 FEET; THEN N85°18'38"E 170.7 FEET; THEN S87°59'10"E 340.0 FEET; THEN S84°00'35"E 151.8 FEET; THEN S89°38'22"E 169.0 FEET; THEN N82°38'56"E 687.8 FEET; THEN S89°46'23"E 299.9 FEET; THEN S39°56'35"E 151.4 FEET TO A POINT IN THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 27, WHICH LIES N58°57'49"W 550.0 FEET FROM THE SOUTHEAST CORNER OF SAID SECTION.

TOTAL LENGTH EQUALS 2208.9 FEET OR 133.87 RODS.

LINE	BEARING	DISTANCE
L1	N59°35'28"E	88.1'
L2	S89°42'22"E	150.2'
L3	N85°18'38"E	170.7'
L4	S87°59'10"E	340.0'
L5	S84°00'35"E	151.8'
L6	S89°38'22"E	169.0'
L7	N82°38'56"E	687.8'
L8	S89°46'23"E	299.9'
L9	S39°56'35"E	151.4'

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 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: 03/22/2018

RONALD J. EIDSON NEW MEXICO 3239 PROFESSIONAL SURVEYOR

LEGEND

● DENOTES FOUND CORNER AS NOTED

1000 0 1000 2000 FEET

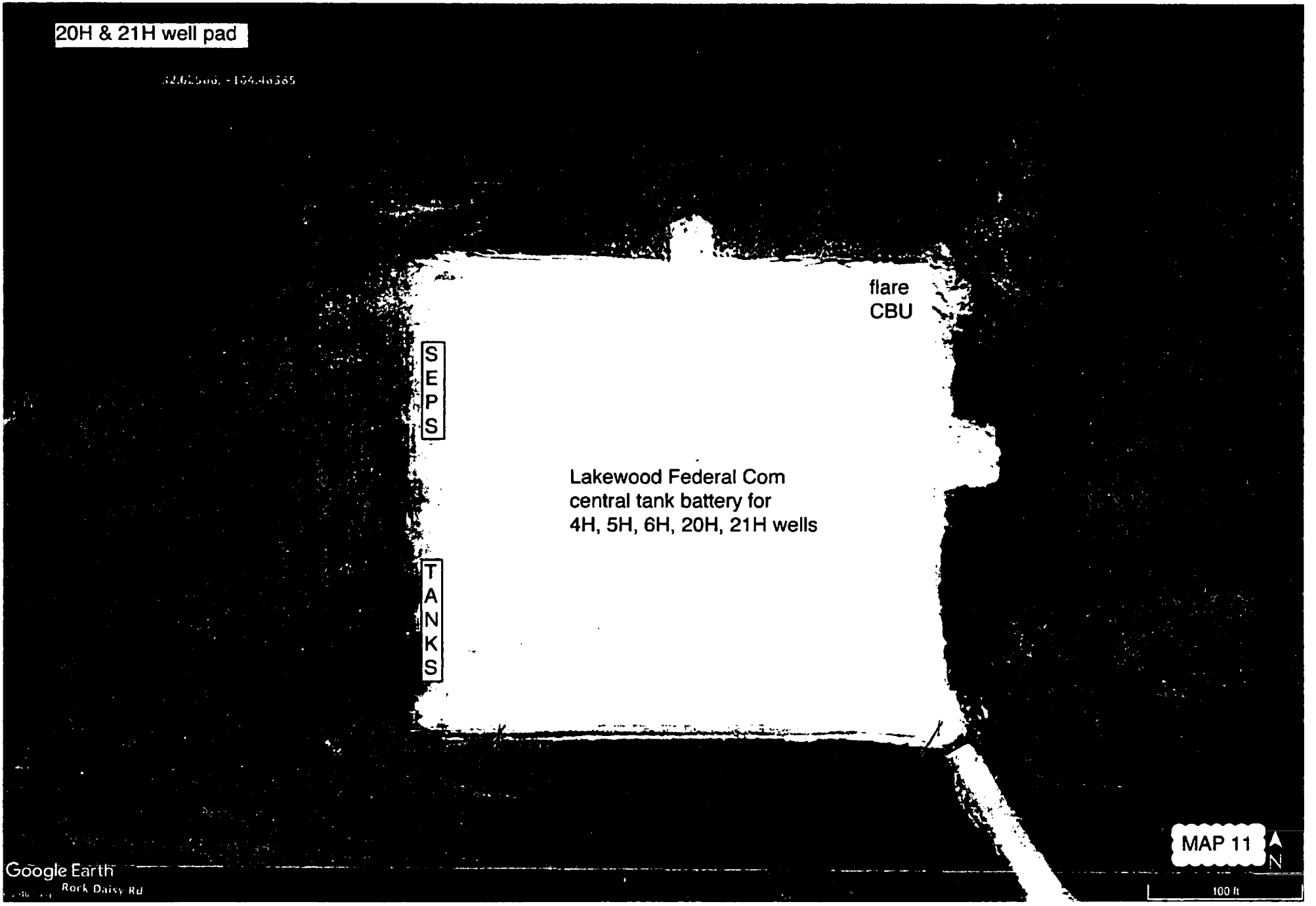
Scale: 1"=1000'

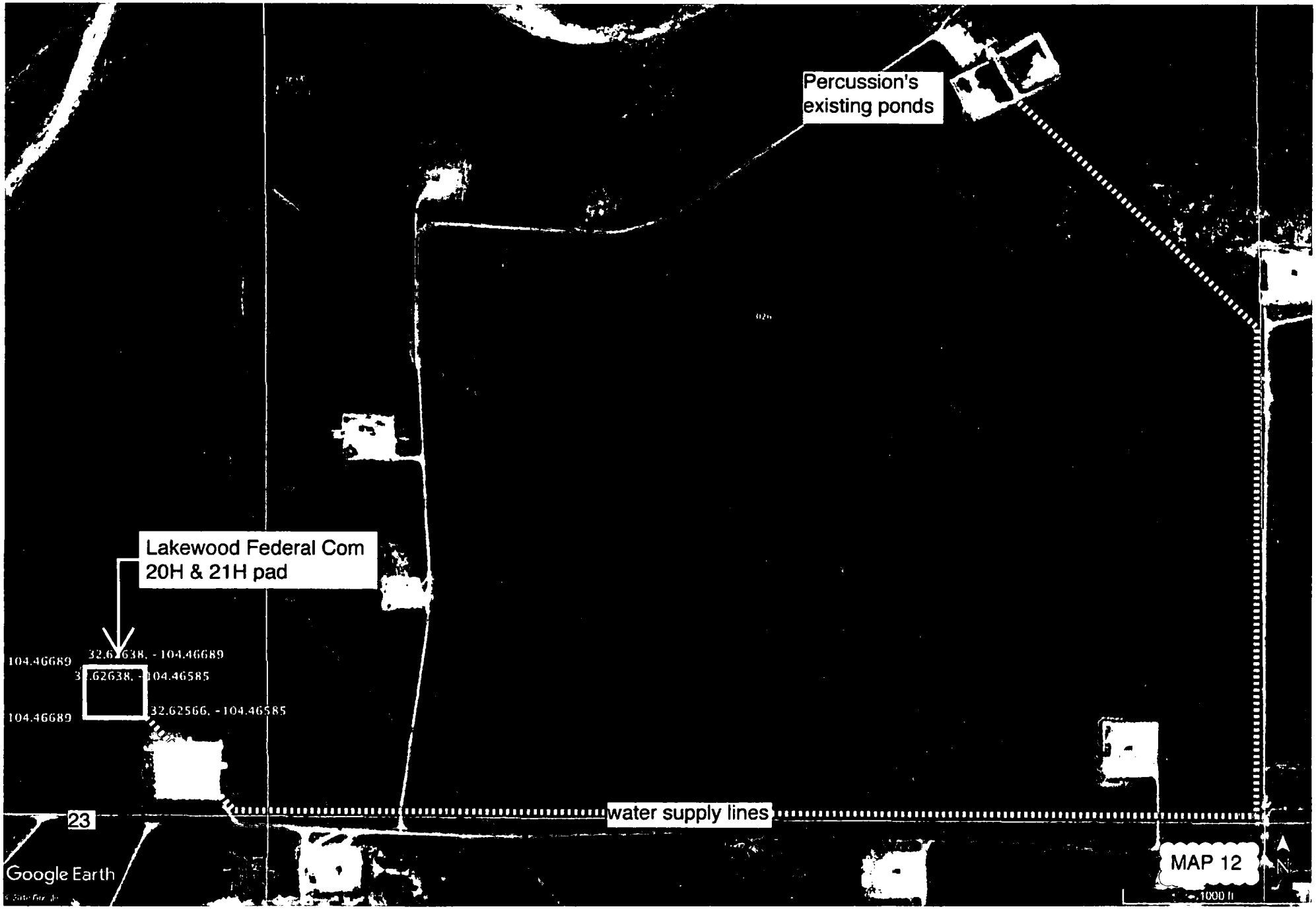
PERCUSSION PETROLEUM OPERATING, LLC

SURVEY FOR AN SWD PIPELINE FROM AN EXISTING SWD PIPELINE TO AN EXISTING PAD CROSSING SECTION 27, TOWNSHIP 19 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

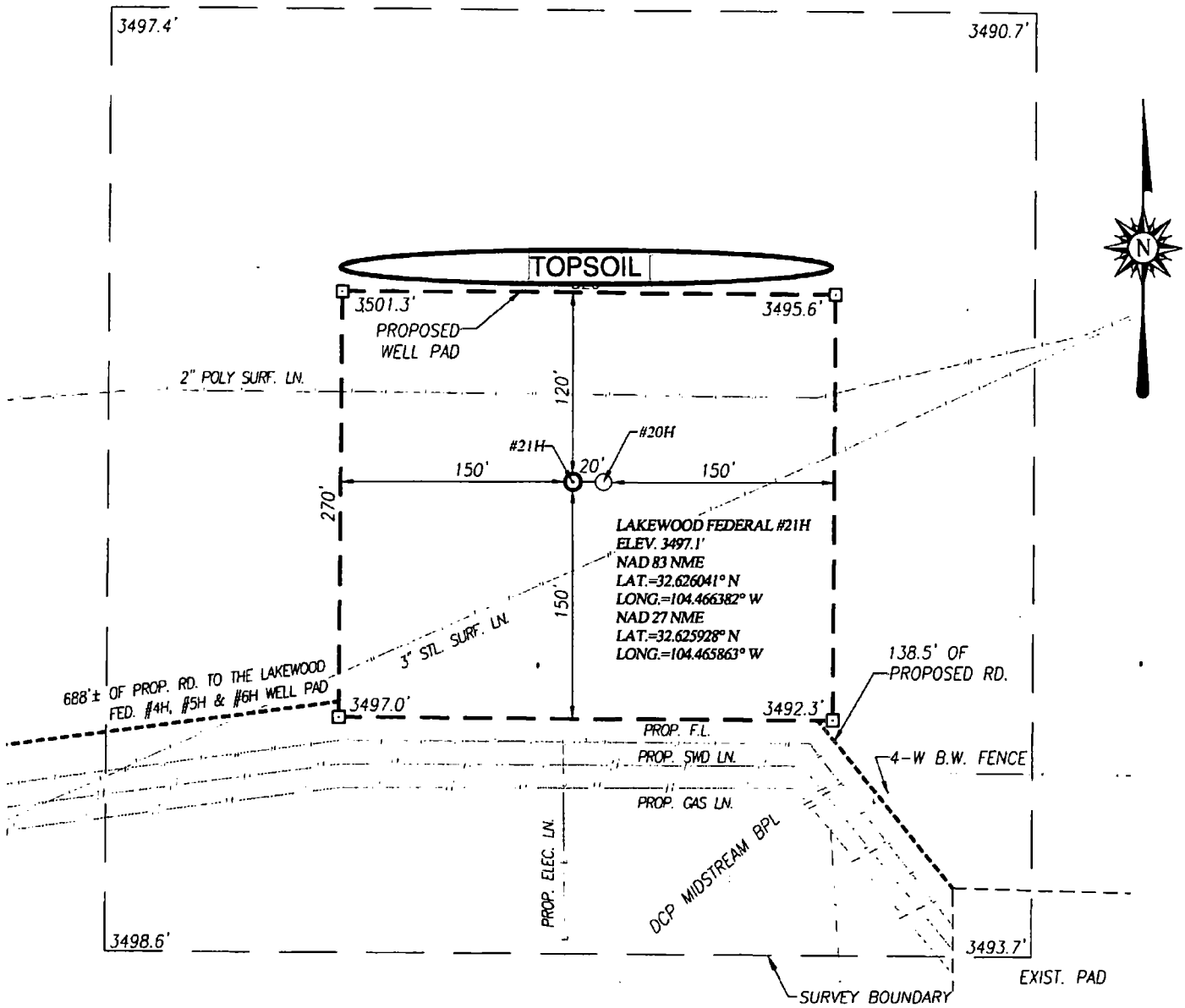
Survey Date: 2/26/18	CAD Date: 3/08/18	Drawn By: ACK	
W.O No.: 18110179	Rev.:	Rel. W.O.:	Sheet 1 of 1


20H & 21H well pad
flare
CBU
SEPS
Lakewood Federal Com
central tank battery for
4H, 5H, 6H, 20H, 21H wells
TANKS
MAP 11
N
Google Earth
Rock Daisy Rd
100 ft


Percussion's existing ponds
Lakewood Federal Com 20H & 21H pad
104.46689
32.62638, -104.46689
32.62638, -104.46585
104.46689
32.62566, -104.46585
water supply lines
23
Google Earth
MAP 12
1000 ft

WELL SITE PLAN

MAP 13



NOTE:
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 DAISY RD.), GO WEST ON CO. RD. 23 APPROX. 3.1 MILES TO CO. RD. 21A DIRT ROAD. FOLLOW DIRT ROAD NORTHWEST APPROX. 164 FEET TO EXIST. PAD. FOLLOW STAKED FROM NORTHWEST CORNER OF EXIST. PAD APPROX. 138.5 FEET TO THE SOUTH EDGE OF THIS LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

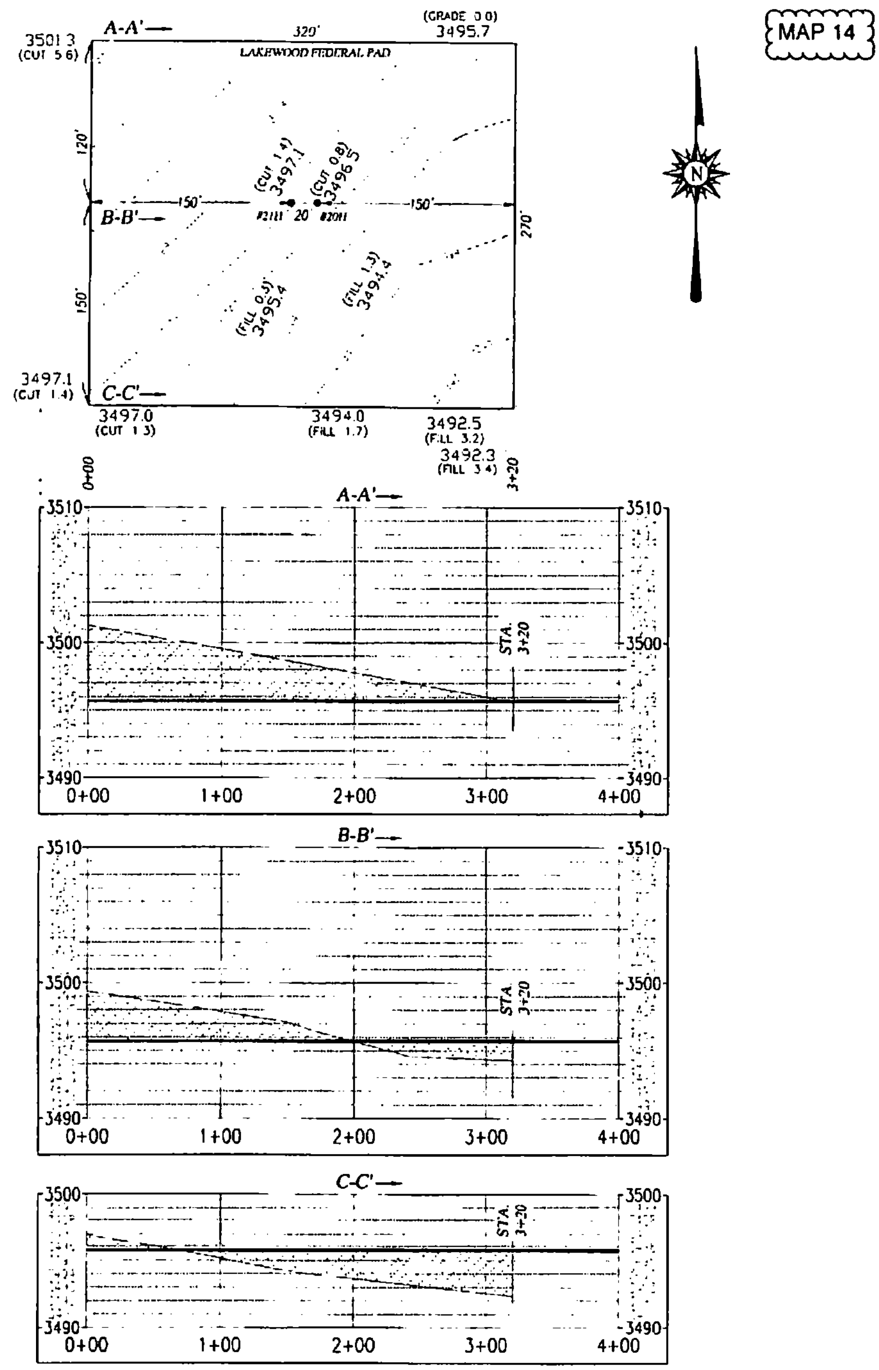
PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #21H WELL LOCATED 592 FEET FROM THE SOUTH LINE AND 708 FEET FROM THE EAST LINE OF SECTION 27, TOWNSHIP 19 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: 02/23/18	CAD Date: 3/08/18	Drawn By: ACK
W.O. No.: 18110124	Rev: .06/19/18	Rel. W.O.:	Sheet 1 of 1

MAP 14



100 0 100

Scale: 1"=100'

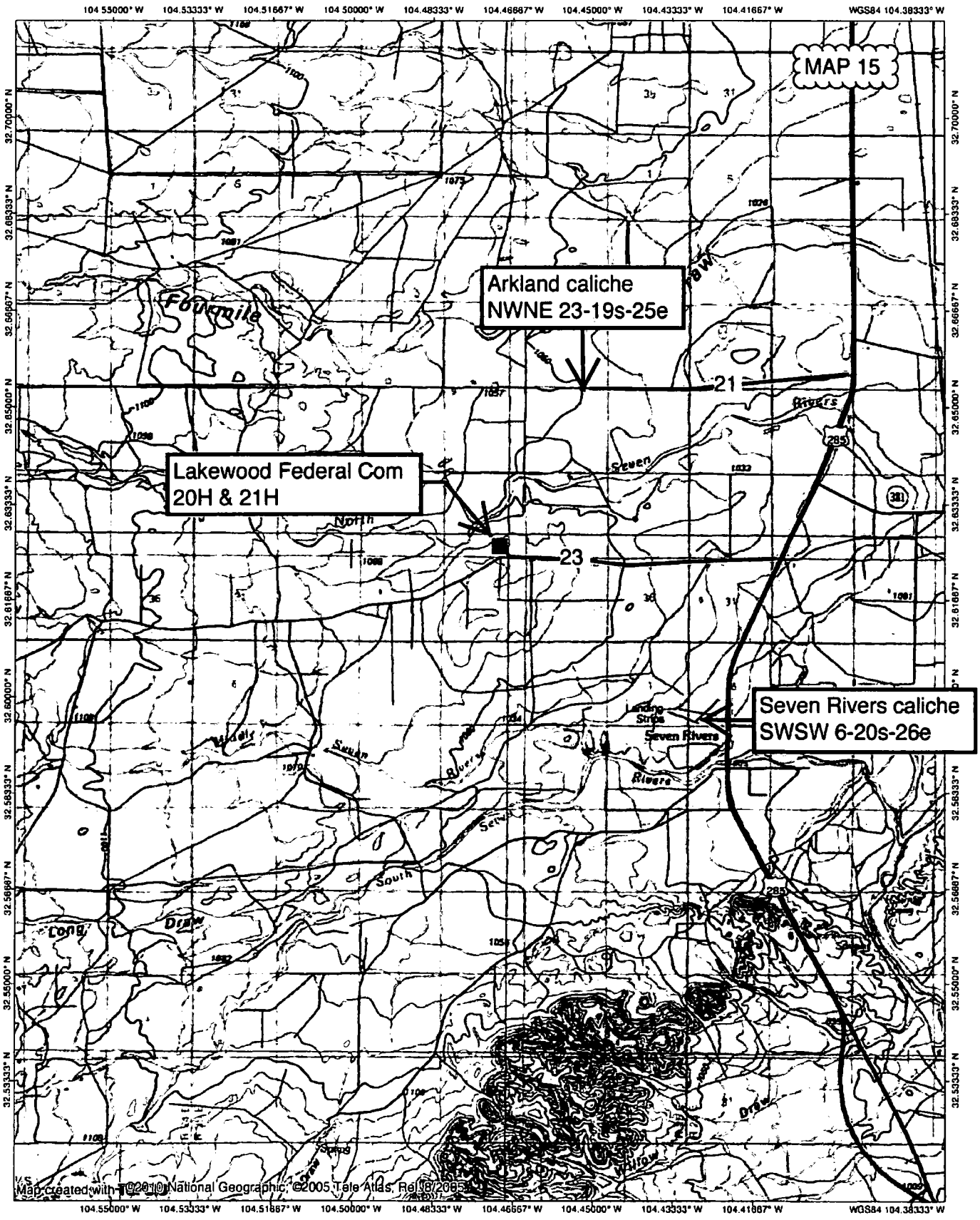
PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #20H & #21H WELL PAD IN SECTION 27, TOWNSHIP 19 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.:18110123	Sheet 1 of 1

TOPO! map printed on 07/28/17 from "Untitled.tpo"



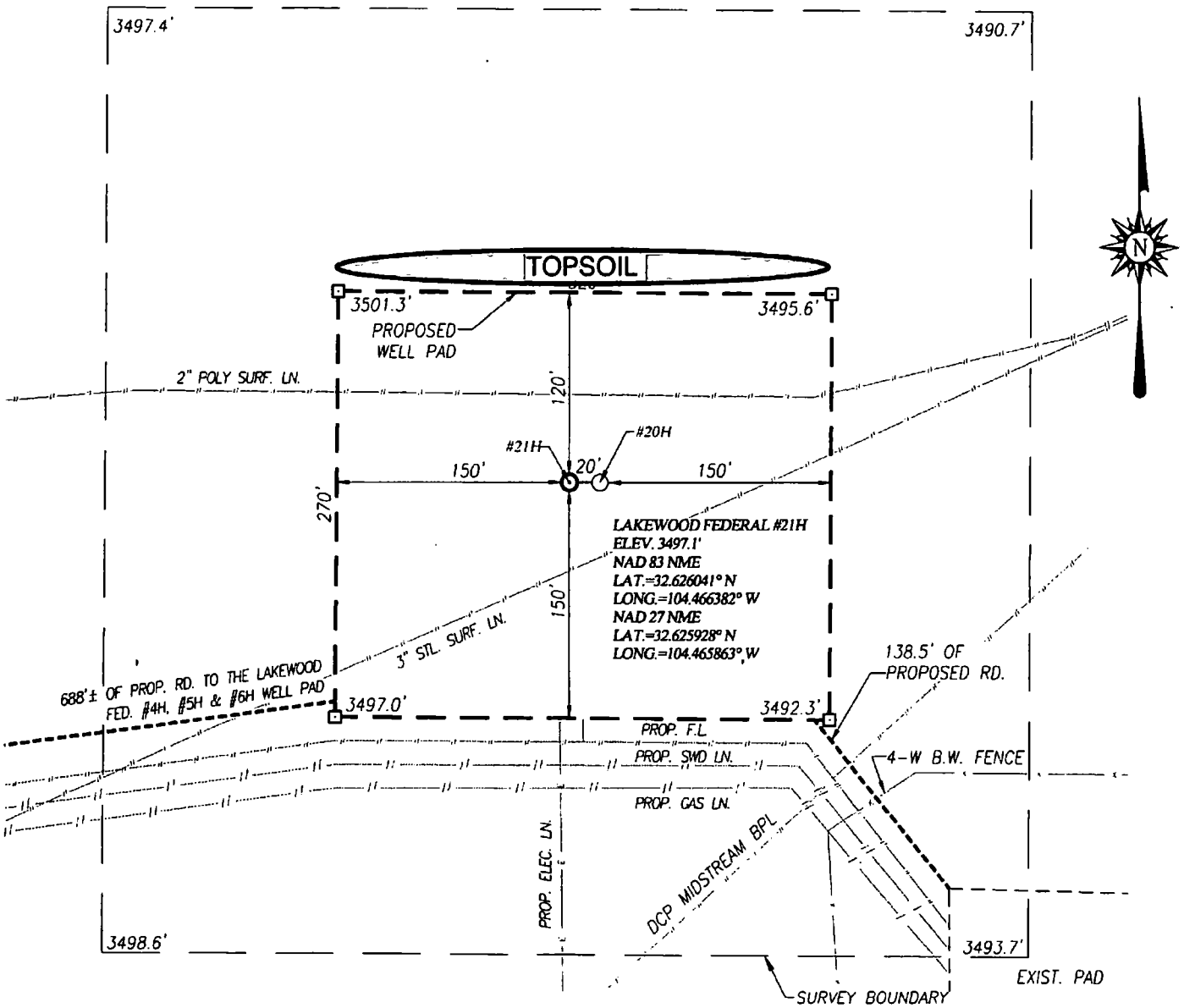
NATIONAL GEOGRAPHIC

0.0 0.5 1.0 1.5 2.0 2.5 3.0 miles
0 1 2 3 4 5 km

TN
MN
7.5°
07/28/17

WELL SITE PLAN

MAP 16



NOTE:
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 DAISY RD.), GO WEST ON CO. RD. 23 APPROX. 3.1 MILES TO CO. RD. 21A DIRT ROAD. FOLLOW DIRT ROAD NORTHWEST APPROX. 164 FEET TO EXIST. PAD. FOLLOW STAKED FROM NORTHWEST CORNER OF EXIST. PAD APPROX. 138.5 FEET TO THE SOUTH EDGE OF THIS LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

PERCUSSION PETROLEUM OPERATING, LLC

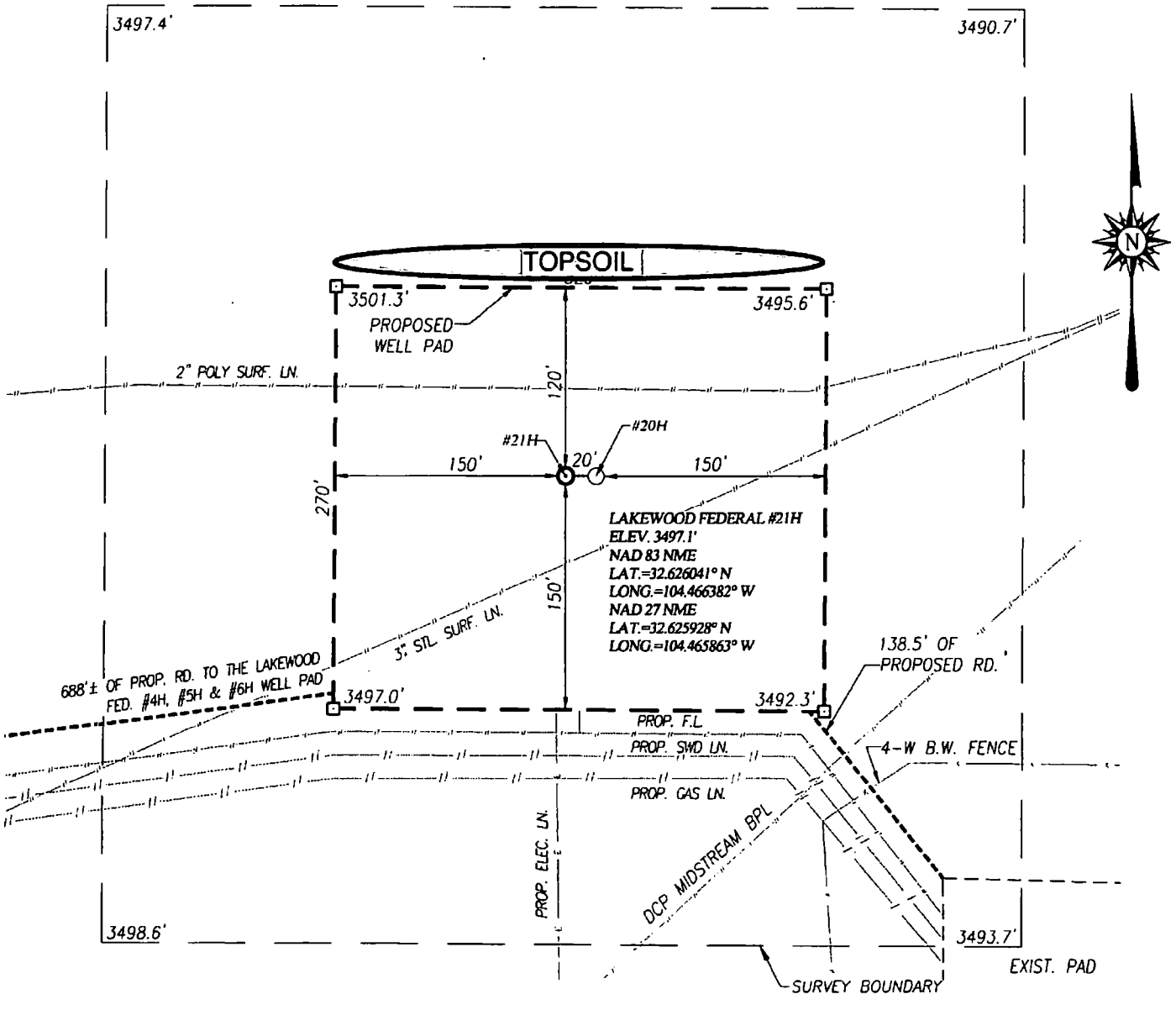
LAKEWOOD FEDERAL #21H WELL LOCATED 592 FEET FROM THE SOUTH LINE AND 708 FEET FROM THE EAST LINE OF SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

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: 02/23/18	CAD Date: 3/08/18	Drawn By: ACK
W.O. No.: 18110124	Rev: .06/19/18	Rel. W.O.:	Sheet 1 of 1

WELL SITE PLAN

MAP 16



NOTE:
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 DAISY RD.), GO WEST ON CO. RD. 23 APPROX. 3.1 MILES TO CO. RD. 21A DIRT ROAD. FOLLOW DIRT ROAD NORTHWEST APPROX. 164 FEET TO EXIST. PAD. FOLLOW STAKED FROM NORTHWEST CORNER OF EXIST. PAD APPROX. 138.5 FEET TO THE SOUTH EDGE OF THIS LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

PERCUSSION PETROLEUM OPERATING, LLC

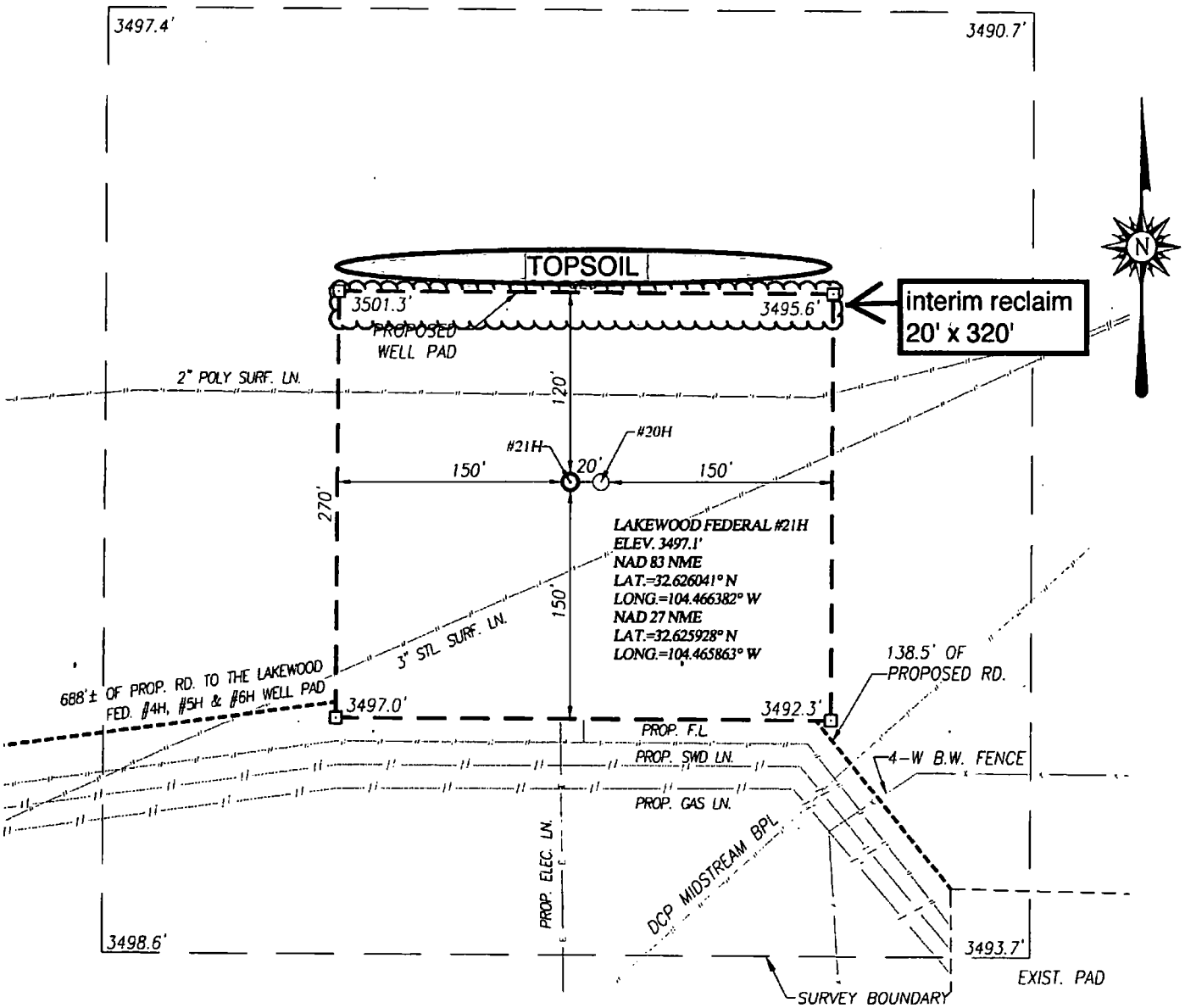
LAKEWOOD FEDERAL #21H WELL LOCATED 592 FEET FROM THE SOUTH LINE AND 708 FEET FROM THE EAST LINE OF SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

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: 02/23/18	CAD Date: 3/08/18	Drawn By: ACK
W.O. No.: 18110124	Rev: .06/19/18	Rel. W.O.:	Sheet 1 of 1

WELL SITE PLAN

MAP 17



NOTE:
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 DAISY RD.), GO WEST ON CO. RD. 23 APPROX. 3.1 MILES TO CO. RD. 21A DIRT ROAD. FOLLOW DIRT ROAD NORTHWEST APPROX. 164 FEET TO EXIST. PAD. FOLLOW STAKED FROM NORTHWEST CORNER OF EXIST. PAD APPROX. 138.5 FEET TO THE SOUTH EDGE OF THIS LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

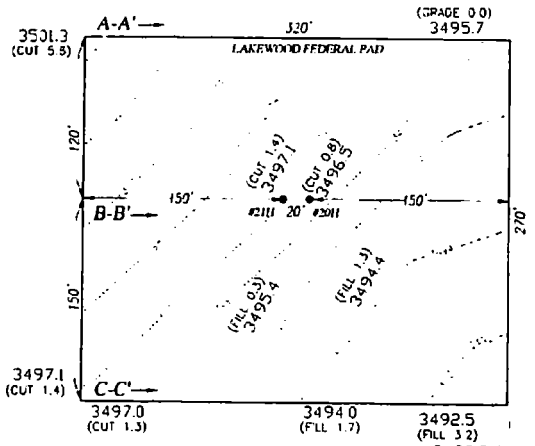
PERCUSSION PETROLEUM OPERATING, LLC

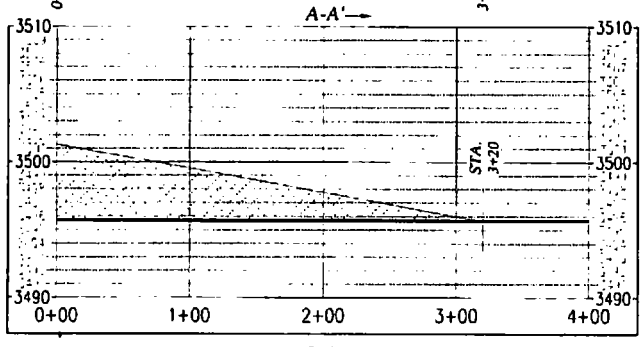
LAKEWOOD FEDERAL #21H WELL LOCATED 592 FEET FROM THE SOUTH LINE AND 708 FEET FROM THE EAST LINE OF SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

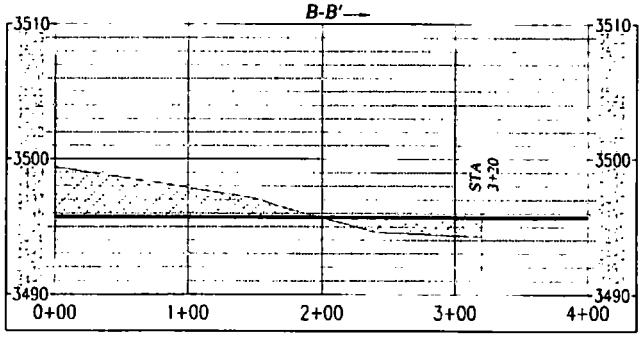
PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

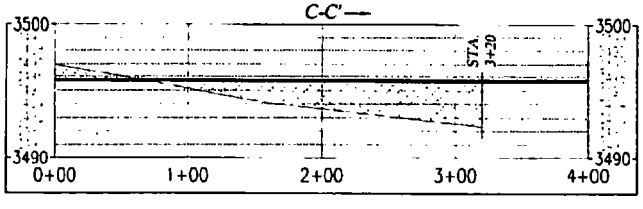
Survey Date: 02/23/18	CAD Date: 3/08/18	Drawn By: ACK
W.O. No.: 18110124	Rev: .06/19/18	Rel. W.O.:	Sheet 1 of 1

MAP 18









PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #20H & #21H WELL PAD IN SECTION 27, TOWNSHIP 19 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

100 0 100

Scale: 1"=100'

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.:18110123	Sheet 1 of 1

Surface Use Plan

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

From the junction of US 82 & US 285 in Artesia...
Go South 15.6 miles on US 285 to the equivalent of Mile Post 54.1
Then turn right and go West 3.1 miles on paved County Road 23 (Rock Daisy)
Then turn right and go Northwest 600' across Unit's abandoned 5H pad
Continue Northwest 138.5' cross-country to the 20H/21H pad

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

2. ROAD TO BE BUILT OR UPGRADED (See MAPS 4 & 5)

The 138.5' of new resource road will be crowned and ditched, have a 14' wide driving surface, and be surfaced with caliche. Maximum disturbed width = 30'. Maximum grade = 1%. Maximum cut or fill = 1'. No culvert, new cattle guard, or vehicle turn out is needed. A gap will be left in the fence northwest of the 5H pad. No upgrade is needed.

3. EXISTING WELLS (See MAP 6)

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

4. PROPOSED PRODUCTION FACILITIES (See MAPS 7 - 11)

A 307.6' long ≈4" O D. HDPE flow line will be laid on the surface south 15' and southeast 292.6' to a central tank battery on the existing Pan Canadian 5H

pad. Maximum operating pressure will be <100 psi. A 424.5' long overhead raptor safe 3-phase power line will be built south to an existing power line.

Three 2837.9' long ≈4" O. D. HDPE saltwater disposal (SWD) lines will be laid on the surface west to Percussion's existing SWD line south of its Aikman SWD State 1 well. Maximum operating pressure will be <100 psi. A third-party will come to the CTB and take the gas. They will be responsible for their route and their application.

A CTB will be built on the existing abandoned (never drilled) Pan Canadian 5H pad. Separators, heater-treaters, etc. will be on the west side. Tank battery will be south of the separators. Battery will be lined and surrounded by a berm ≥150% of the volume of the largest tank. Water tanks will be to the north. Oil tanks will be to the south. Flare and/or CBU will be in the northeast corner.

5. WATER SUPPLY (See MAP 12)

Water will be piped via temporary ≈10,500' long surface 10" Kevlar lay flat pipelines (2) from Percussion's existing lined fresh water pond on its own land in NE4 26-19s-25e. Pipeline route will not be bladed or excavated. Route is all private.

6. CONSTRUCTION MATERIALS & METHODS (See MAPS 13 - 15)

NM One Call (811) will be notified before construction starts. Percussion will move its two surface lines north of the pad. Top ≈6" of soil and brush will be stockpiled northwest of the pad. V-door will face east. 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.

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 16)

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 17 & 18)

Interim reclamation will be completed within 6 months of completing the well. Interim reclamation will consist of shrinking the well pad 0.15 acre by removing caliche and reclaiming 20' on the north side of the pad. This will leave 1.83 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 surface owner's requirements.

Enough stockpiled topsoil will be retained to cover the remainder of the pad when the well is plugged. Once the last well is plugged, then the rest of the pad and new road will be similarly reclaimed within 6 months of plugging. Noxious weeds will be controlled.

Land use will be:

30' x 138.5' road = 0.10 acre
30' x 307.6' flowline = 0.21 acre
30' x 424.5' power line = 0.29 acre
30' x 2837.9' SWD lines = 1.95 acres
20' x 10,500' water line from pond = 4.82 acres
+ 270' x 320' well pad = 1.98 acres
9.35 acres short term
- 0.21 acre flowline
- 0.29 acre power line
- 1.95 acres SWD lines
- 4.82 acres water line from pond
- 0.15 acre interim reclamation on well pad
1.93 acres long term (0.10 ac. road + 1.83 ac. pad)

11. SURFACE OWNER

Some (629') of SWD line construction will be on NM State Land Office land (SESW Section 27 of 19s-25e). NMSLO address is P. O. Box 1148, Santa Fe NM 87504. Phone is 505 827-5763. Percussion will apply for easement.

All remaining construction will be on private land (S2SE 27-19s-25e) owned by Ross Ranch Inc. (P. O. Box 216, Lakewood NM 88254; (575) 365-4797). Percussion has an agreement with Ross.

12. OTHER INFORMATION

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

Lone Mountain inspected the project area and submitted archaeology report NMCRIS-140197 on April 11, 2018.

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 11th day of August, 2018.

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:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number:

Injection well name:

Assigned injection well API number?

Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

AFMSS

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

Bond Info Data Report

12/27/2018

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001424

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: