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DISTRICT II-ARTESIA O.C.D.

Carlsbad Field Office
OCD Artesia

Form 3160-3
(June 2015)

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.: NMNM107384

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.: ROCK RIDGE FEDERAL WCB 8H 324981

2. Name of Operator: MURCHISON OIL & GAS LLC 15363

9. API Well No.: 30-015-45874

3a. Address: 7250 Dallas Parkway, Ste. 1400 Plano TX 75024

3b. Phone No. *(include area code)*: (972)931-0700

10. Field and Pool, or Exploratory: PURPLE SAGE WOLFCAMP GAS 98220

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

At surface: NENE / 805 FNL / 250 FEL / LAT 32.1935547 / LONG -104.0159954

At proposed prod. zone: SWNW / 1650 FNL / 330 FWL / LAT 32.1912292 / LONG -104.0309668

11. Sec., T. R. M. or Blk. and Survey or Area: SEC 30 / T24S / R29E / NMP

14. Distance in miles and direction from nearest town or post office*

12. County or Parish: EDDY

13. State: NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any): 250 feet

16. No of acres in lease: 398.24

17. Spacing Unit dedicated to this well: 320

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 40 feet

19. Proposed Depth: 10829 feet / 15558 feet

20. BLM/BIA Bond No. in file: FED: NMB001412

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 2915 feet

22. Approximate date work will start*: 04/01/2019

23. Estimated duration: 90 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)	Cindy Cottrell / Ph: (972)931-0700	10/24/2018

Title: Regulatory Coordinator

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	02/20/2019

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Conditions of approval, if any, are attached.

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

APPROVED WITH CONDITIONS

Approval Date: 02/20/2019

RLP 4-17-19

(Continued on page 2)

*(Instructions on page 2)

INSTRUCTIONS

GENERAL: This form is designed for submitting proposals to perform certain well operations, as indicated on Federal and Indian lands and leases for action by appropriate Federal agencies, pursuant to applicable Federal laws and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local, area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from local Federal offices.

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

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

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the 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.

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Additional Operator Remarks

Location of Well

1. SHL: NENE / 805 FNL / 250 FEL / TWSP: 24S / RANGE: 29E / SECTION: 30 / LAT: 32.1935547 / LONG: -104.0159954 (TVD: 0 feet, MD: 0 feet)
   PPP: SENE / 1650 FNL / 330 FEL / TWSP: 24S / RANGE: 29E / SECTION: 30 / LAT: 32.1935547 / LONG: -104.0159954 (TVD: 10924 feet, MD: 11310 feet)
   BHL: SWNW / 1650 FNL / 330 FWL / TWSP: 24S / RANGE: 29E / SECTION: 30 / LAT: 32.1912292 / LONG: -104.0309668 (TVD: 10829 feet, MD: 15558 feet)

BLM Point of Contact

Name: Katrina Ponder
Title: Geologist
Phone: 5752345969
Email: kponder@blm.gov

Review and Appeal Rights

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

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Murchison Oil and Gas Incorporated
LEASE NO.:	NMNM107384
WELL NAME & NO.:	Rock Ridge Federal WCB 8H
SURFACE HOLE FOOTAGE:	805'/N & 250'/E
BOTTOM HOLE FOOTAGE	1650'/N & 330'/W
LOCATION:	Section 30, T.24 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	◉ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	◉ Conventional	○ Multibowl	○ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☑ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☐ COM	☐ Unit

A. HYDROGEN SULFIDE

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **350 feet** (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

b. Second stage above DV tool:

- 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 or potash.

❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

Production casing must be kept fluid filled to meet BLM minimum collapse requirement.

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

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9-5/8** inch intermediate casing shoe shall be **5000 (5M)** psi.

GENERAL REQUIREMENTS

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

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

☒ Eddy County
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the

plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time.

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

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

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

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Murchison Oil and Gas Incorporated
LEASE NO.:	NMNM107384
WELL NAME & NO.:	Rock Ridge Federal WCB 8H
SURFACE HOLE FOOTAGE:	805'/N & 250'/E
BOTTOM HOLE FOOTAGE	1650'/N & 330'/W
LOCATION:	Section 30, T.24 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

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

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

Cave/Karst Surface Mitigation

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

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

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

Pad Berming:

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

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

Leak Detection System:
A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing

electronic sensors to alarm when a leak is present. Leak detection plan will be submitted to BLM for approval.

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

Cave/Karst Subsurface Mitigation

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

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

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

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

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

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

Pressure Testing:
The operator will perform annual pressure monitoring on all casing annuli and reported in a sundry notice. If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

Hydrology:
The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad

throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

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

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

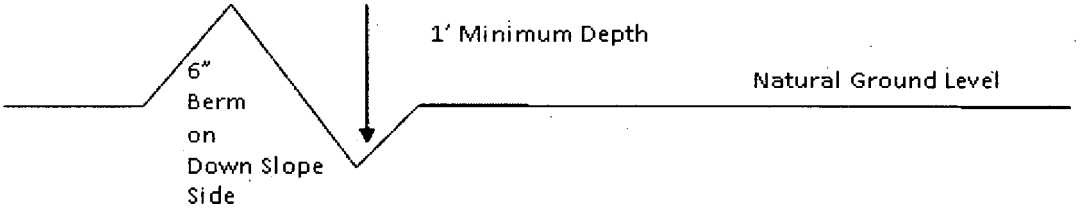
Ditching
Ditching shall be required on both sides of the road.

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

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

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

Fence Requirement

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

Public Access

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

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

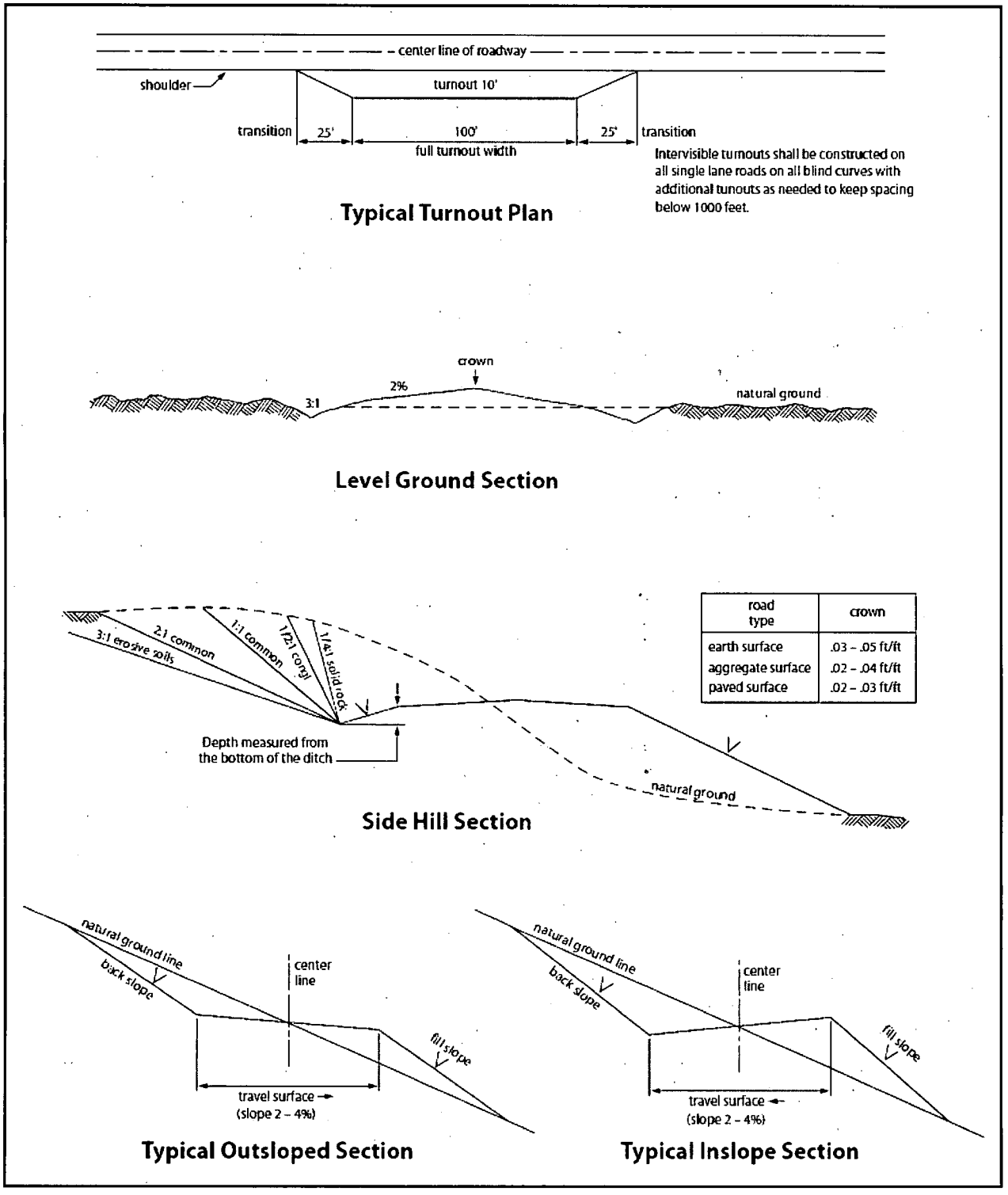


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

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

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

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

Seed Mixture 2, for Sandy Sites

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

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

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

Species	lb/acre
Sand dropseed (Sporobolus cryptandrus)	1.0
Sand love grass (Eragrostis trichodes)	1.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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

AFMSS

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

Operator Certification Data Report

04/01/2019

Operator Certification

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

NAME: Cindy Cottrell **Signed on:** 10/24/2018

Title: Regulatory Coordinator

Street Address: 7250 Dallas Parkway, Ste. 1400

City: Plano **State:** TX **Zip:** 75024

Phone: (972)931-0700

Email address: ccottrell@jdmii.com

Field Representative

Representative Name: Greg Boans

Street Address: 5325 Sierra Vista

City: Carlsbad **State:** NM **Zip:** 88220

Phone: (575)628-3932

Email address: gboans@jdmii.com

AFMSS

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

Application Data Report

04/01/2019

APD ID: 10400034373 **Submission Date:** 10/24/2018

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Well Type: CONVENTIONAL GAS WELL **Well Work Type:** Drill

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400034373 **Tie to previous NOS?** **Submission Date:** 10/24/2018

BLM Office: CARLSBAD **User:** Cindy Cottrell **Title:** Regulatory Coordinator

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM107384 **Lease Acres:** 398.24

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

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

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO **APD Operator:** MURCHISON OIL & GAS LLC

Operator letter of designation: Rock_Ridge_WCB_8H___Operator_Certification_20180920124156.pdf

Operator Info

Operator Organization Name: MURCHISON OIL & GAS LLC

Operator Address: 7250 Dallas Parkway, Ste. 1400 **Zip:** 75024

Operator PO Box:

Operator City: Plano **State:** TX

Operator Phone: (972)931-0700

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? EXISTING **Mater Development Plan name:** ROCK RIDGE

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

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

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** PURPLE SAGE WOLFCAMP GAS **Pool Name:**

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

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Describe other minerals:

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

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** ROCK RIDGE **Number:** 2

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

Well Work Type: Drill

Well Type: CONVENTIONAL GAS WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: **Distance to nearest well:** 40 FT **Distance to lease line:** 250 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Rock_Ridge_Federal_WCB_8H___C102_20181009151153.pdf

ROCK_RIDGE_WCB_8H___KOP_FTP_LTP_20181024103030.pdf

Well work start Date: 04/01/2019 **Duration:** 90 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number:

	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	805	FNL	250	FEL	24S	29E	30	Aliquot NENE	32.1935547	-104.0159954	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 107384	2915	0	0
KOP Leg #1	805	FNL	250	FEL	24S	29E	30	Aliquot NENE	32.1935547	-104.0159954	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 107384	915	2000	2000
PPP Leg #1	1650	FNL	330	FEL	24S	29E	30	Aliquot SENE	32.1935547	-104.0159954	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 107384	-8009	11310	10924

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

	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
EXIT Leg #1	1650	FNL	330	FWL	24S	29E	30	Aliquot SWNW	32.1912292	-104.0309668	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 107384	-7914	15558	10829
BHL Leg #1	1650	FNL	330	FWL	24S	29E	30	Aliquot SWNW	32.1912292	-104.0309668	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 107384	-7914	15558	10829

Murchison Oil & Gas, Inc.
Rock Ridge Federal WCB 8H
SHL: 805' FNL & 250' FEL, NENE, Sec. 30, T24S, R29E
BHL: 1650' FNL & 330' FWL, SWNW, Sec. 30, T24S, R29E
Eddy County, New Mexico

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 Murchison Oil & Gas, Inc., am/is 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 13th day of September 2018.

Gary Cooper, Vice President Operations
Murchison Oil & Gas, Inc.
7250 Dallas Parkway, Suite 1400
Plano, TX 75024
972-931-0700
rcooper@jdmii.com

Field Representatives:
Greg Boans
575-628-3932
gboans@jdmii.com

Drilling Plan Data Report
04/01/2019

APD ID: 10400034373
Submission Date: 10/24/2018
Operator Name: MURCHISON OIL & GAS LLC
Well Name: ROCK RIDGE FEDERAL WCB
Well Number: 8H
Well Type: CONVENTIONAL GAS WELL
Well Work Type: Drill

Highlighted data reflects the most recent changes

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Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	QUATERNARY	2916	0	0	ALLUVIUM	USEABLE WATER	No
2	RUSTLER	2294	622	622	DOLOMITE,GYPSUM,SILTSTONE	NONE	No
3	SALADO	1894	1022	1022	SALT	OTHER : Salt	No
4	CASTILE	938	1978	1978	ANHYDRITE	NONE	No
5	LAMAR	167	2749	2749	LIMESTONE	NONE	No
6	BELL CANYON	117	2799	2799	LIMESTONE,SHALE,SANDSTONE	NONE	No
7	CHERRY CANYON	-712	3628	3628	SANDSTONE	NATURAL GAS,OIL	No
8	BRUSHY CANYON	-2009	4925	4925	SANDSTONE	NATURAL GAS,OIL	No
9	BONE SPRING	-3576	6492	6492	LIMESTONE	NATURAL GAS,OIL	No
10	BONE SPRING 1ST	-4548	7464	7464	SANDSTONE	NATURAL GAS,OIL	No
11	BONE SPRING 2ND	-5338	8254	8254	SANDSTONE	NATURAL GAS,OIL	No
12	BONE SPRING 3RD	-6418	9334	9334	SANDSTONE	NATURAL GAS,OIL	No
13	WOLFCAMP	-6800	9716	9716	LIMESTONE,SHALE,SANDSTONE	NATURAL GAS,OIL	No

Section 2 - Blowout Prevention

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Pressure Rating (PSI): 5M **Rating Depth:** 11000

Equipment: A 5K BOP stack consisting of 3 rams with 2 pipe rams, 1 blind ram and 1 annular preventer will be installed. The BOP will be used below surface casing to TD. An accumulator complying with Onshore Order 2 requirements for the BOP stack pressure rating will be present. Rotating head will be installed as needed.
Requesting Variance? YES

Variance request: A variance is requested for the use of a co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. If the specific hose is not available, then one of equal or higher rating will be used.
Testing Procedure: A third party will test the BOPs. After surface casing is set and the BOP is nippled up, the BOP will be tested to 250 psi low and 5000 psi high. Intermediate pressure tests will be made to 250 psi low and 5000 psi high. Annular preventor will be tested to 250 psi low and 2500 psi high on the surface casing and 250 psi low and 2500 psi high on the intermediate casing. Wellhead seals will be tested to 5000 psi once the intermediate casing has been landed and cemented. BOP will then be lifted to install C-section of wellhead. BOP will then be nippled back up and pressure tests made to 250 psi low and 5000 psi high. The annular will be tested to 250 psi low and 2500 psi high.

Choke Diagram Attachment:

Rock_Ridge___5M_choke_manifold_20180920125404.pdf

Flex_Hose_Certification_20181030102846.PDF

Flex_Hose_Pressure_Graph_20181030102847.PDF

BOP Diagram Attachment:

Rock_Ridge_5M_BOP_20190131083847.pdf

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	16	13.375	NEW	API	N	0	683	0	683			683	H-40	48	STC	2.45	2.8	DRY	9.82	DRY	9.82
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	6500	0	6500			6500	P-110	40	LTC	1.36	3.48	DRY	2.33	DRY	2.33
3	INTERMEDIATE	12.25	9.625	NEW	API	N	6500	10000	6500	10000			3500	P-110	43.5	LTC	1.2	14.71	DRY	7.46	DRY	7.46
4	PRODUCTION	8.5	5.5	NEW	API	N	0	15558	0	10829			15558	P-110	17	BUTT	1.29	1.33	DRY	2.27	DRY	2.27

Casing Attachments

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Rock_Ridge_WCB_8H___Casing_Assumptions_Document_20181009152619.pdf

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Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Rock_Ridge_WCB_8H___Casing_Assumptions_Document_20181009152632.pdf

Data_Sheet_9.625_Inch_40.00__P110HC_API_Connections_USS_20190118103915.pdf

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Casing ID: 3 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Rock_Ridge_WCB_8H___Casing_Assumptions_Document_20181009152645.pdf

---

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Casing Attachments

Casing ID: 4 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Rock_Ridge_WCB_8H___Casing_Assumptions_Document_20181009152655.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	683	430	1.34	12.8	576	100	Class C	LCM, Gel, Salt
INTERMEDIATE	Lead	3000	0	2500	768	1.69	12.5	1298	80	Class C	LCM, Gel, Extender, Salt
INTERMEDIATE	Tail		2500	3000	212	1.33	14.8	282	80	Class C	Retarder
INTERMEDIATE	Lead	3000	3000	9500	1410	2.6	11.5	3666	80	Class C	Gel, Retarder, Defoamer
INTERMEDIATE	Tail		9500	10000	173	1.63	13.2	282	80	Class H	Retarder, Fluid Loss, Dispersant, Defoamer
PRODUCTION	Lead		6000	10300	446	2.47	12.5	1101	30	TXI	Gel, Defoamer, Retarder, Fluid Loss
PRODUCTION	Tail		10300	15558	955	1.64	14.8	1566	30	TXI	Retarder, Defoamer, Dispersant

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

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 for weight addition and fluid loss control.

Describe the mud monitoring system utilized: An electronic Pason mud monitoring system/PVT

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
10000	10829	OTHER : High Performance Water-Based Mud	10	13							
0	683	OTHER : Fresh Water Mud	8.4	8.8							
2800	10000	OTHER : Cut Brine & Water-Based Mud	8.6	10							
683	2800	SALT SATURATED	10	10							

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Section 6 - Test, Logging, Coring

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

2-person mud-logging program will be used from 683' to TD; GR/MWD from 683' to TD.

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

DS,GR,MWD,MUDLOG

Coring operation description for the well:

None

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4858 **Anticipated Surface Pressure:** 2454.71

Anticipated Bottom Hole Temperature(F): 160

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:

H2S_Contingency_Plan_20180924143538.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

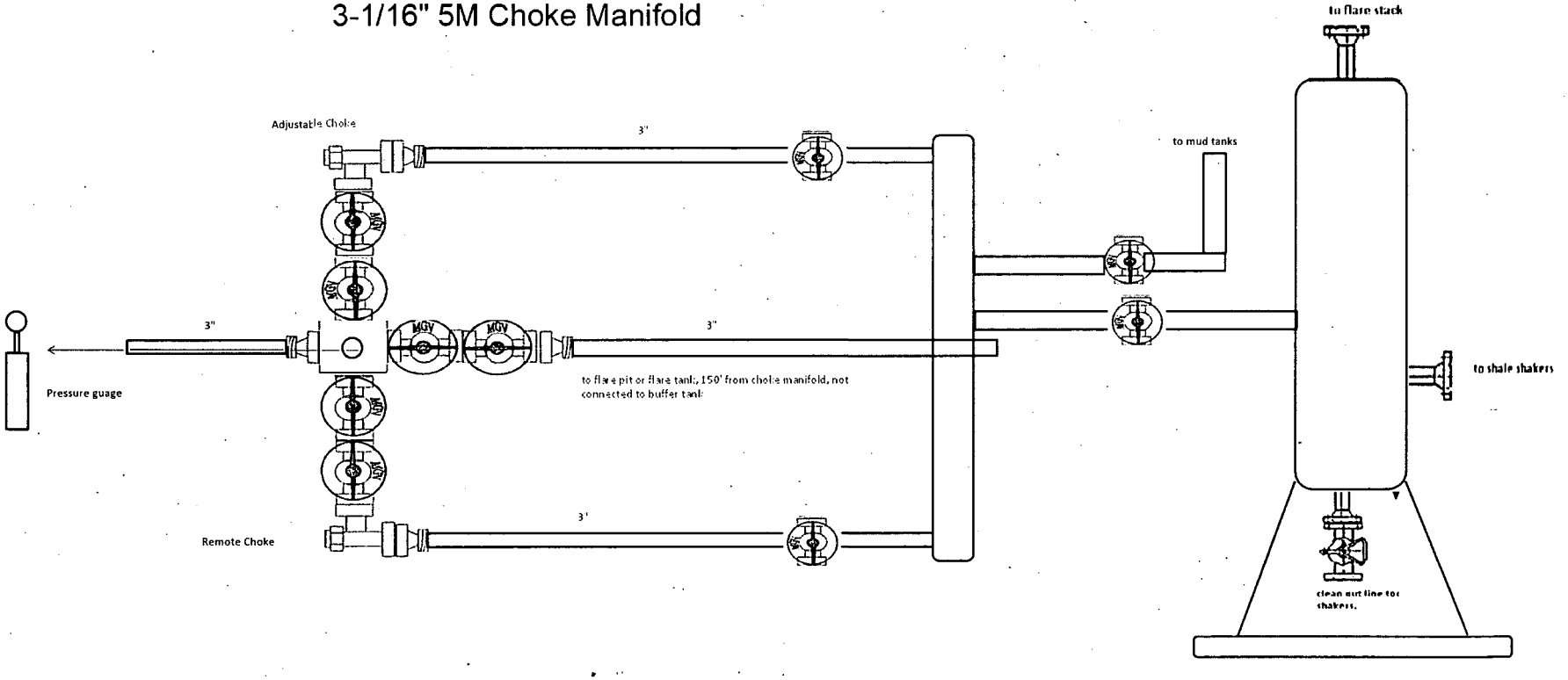
Rock_Ridge_Federal_WCB_8H___Well_Plan_v2_20180924143641.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Other Variance attachment:

3-1/16" 5M Choke Manifold



Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Certificate

General Information		Hose Specifications	
Customer	**LATSHAW DRILLING**	*Hose Assembly Type*	**Mud & Cement**
MWH Sales Representative	**GREG WAGNER**	*Certification*	**API 7K**
Date Assembled	**6/26/2014**	*Hose Grade*	**MUD**
Location Assembled	**OKC**	*Hose Working Pressure*	**10000**
Sales Order #	**216527**	*Hose Lot # and Date Code*	**10890-07/13**
Customer Purchase Order #	**RIG# 11**	*Hose I.D. (Inches)*	**2"**
Assembly Serial # (Pick Ticket #)	**260488**	*Hose O.D. (Inches)*	**4.01"**
Hose Assembly Length	**25'**	*Armor (yes/no)*	YES

Fittings			
End A		**End B**	
Stem (Part and Revision #)	**R2.0X32-1502M**	*Stem (Part and Revision #)*	**R2.0X32-1502F**
Stem (Heat #)	**132681**	*Stem (Heat #)*	**3M87721**
Ferrule (Part and Revision #)	**RF2.0 10K**	*Ferrule (Part and Revision #)*	**RF2.0 10K**
Ferrule (Heat #)	**A132527**	*Ferrule (Heat #)*	**A132527**
Connection (Part #)		*Connection (Part #)*	
Connection (Heat #)		*Connection (Heat #)*	
Dies Used	**97MM**	*Dies Used*	**97MM**

Hydrostatic Test Requirements		
Test Pressure (psi)	**15,000**	***Hose assembly was tested with ambient water temperature.***
Test Pressure Hold Time (minutes)	**15 1/2**	

Date Tested	*Tested By*	*Approved By*
6/26/2014		

Midwest Hose
& Specialty, Inc.

Certificate of Conformity

Customer: **LATSHAW DRILLING**	*Customer P.O.#* **RIG# 11**
Sales Order # **216527**	*Date Assembled:* **6/26/2014**

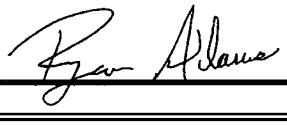
Specifications

Hose Assembly Type:	**Mud & Cement**		
Assembly Serial #	**260488**	*Hose Lot # and Date Code*	**10890-07/13**
Hose Working Pressure (psi)	**10000**	*Test Pressure (psi)*	**15000**

We hereby certify that the above material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards.

Supplier:
Midwest Hose & Specialty, Inc.
3312 S I-35 Service Rd
Oklahoma City, OK 73129

Comments:

Approved By	*Date*
	**6/26/2014**

Midwest Hose & Specialty, Inc.

Internal Hydrostatic Test Graph

June 26, 2014

Customer: Latshaw Drilling

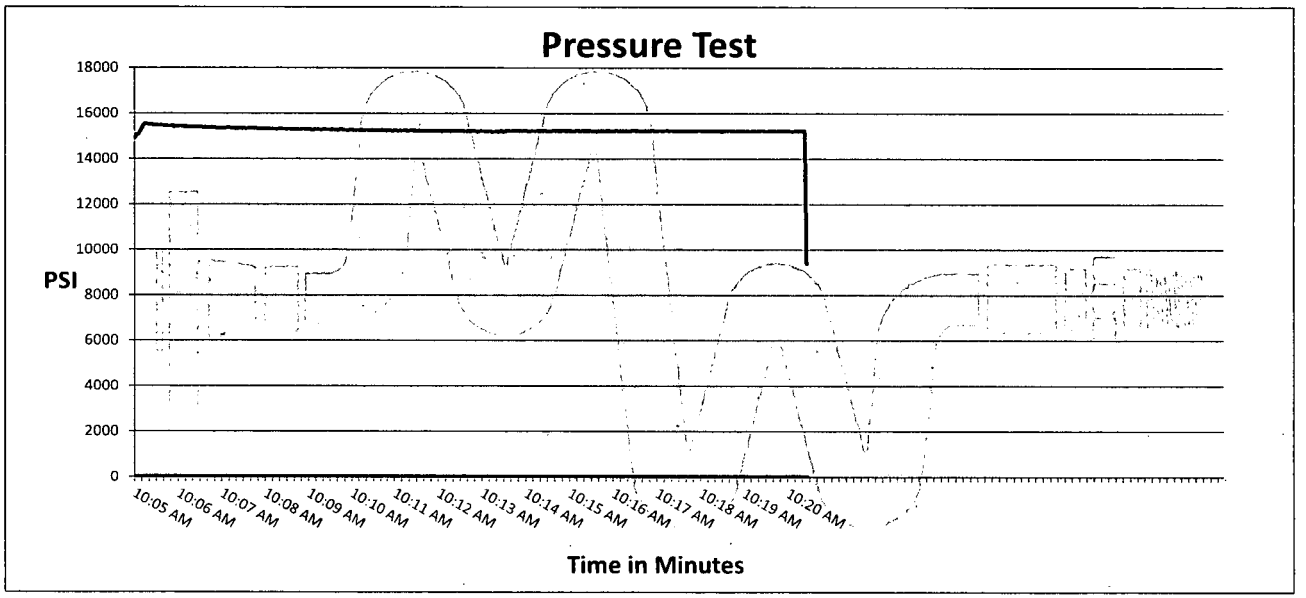
Pick Ticket #: 260488

Hose Specifications

Hose Type	Length
Mud	25'
I.D.	**O.D.**
2"	3.64"
Working Pressure	**Burst Pressure**
10000 PSI	Standard Safety Multiplier Applies

Verification

Type of Fitting	Coupling Method
2"1502	Swage
Die Size	**Final O.D.**
97MM	3 49/50
Hose Serial #	**Hose Assembly Serial #**
10890	260488



Test Pressure	Time Held at Test Pressure	Actual Burst Pressure	Peak Pressure
15000 PSI	15 2/4 Minutes		15600 PSI

Comments: Hose assembly pressure tested with water at ambient temperature.

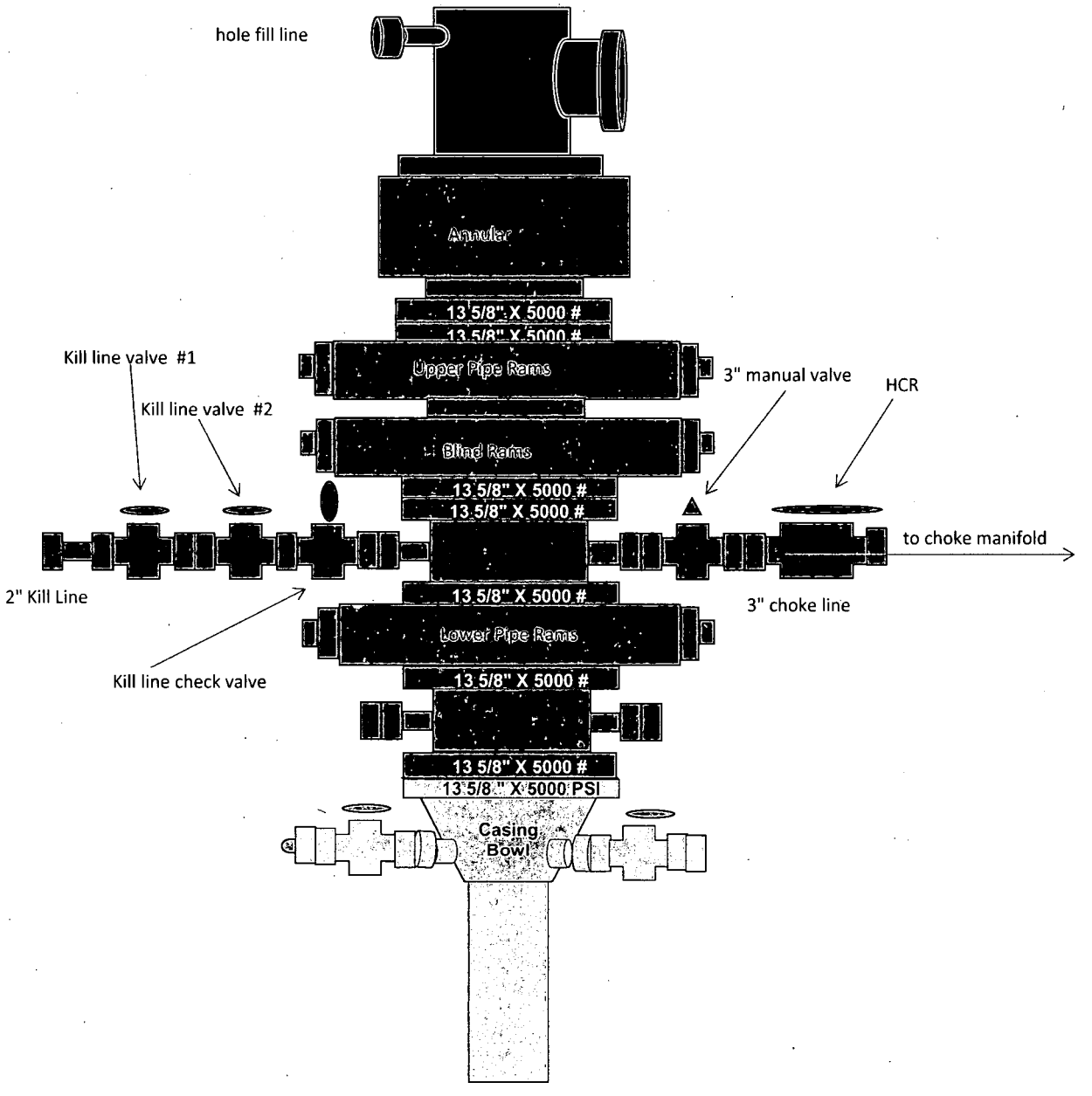
Tested By: *Charles Ash*

x Charles Ash

Approved By: *Ryan Adams*

x Ryan Adams

13-5/8" 5M BOP stack



Murchison Oil & Gas Inc.
Rock Ridge Federal WCB 8H
Eddy County, New Mexico

Casing Assumptions Worksheet

Casing Program:

Hole Size	Casing Size	Grade	Weight	Thread	SF Collapse	SF Burst	SF Tension	MW	Set Depth MD	Set Depth TVD
16	13 3/8	H40	48#	STC	2.45	2.8	9.82	8.5	683	
12.25	9 5/8	P110 HC	40#	LTC	1.36	3.48	2.33	9.2	0-6,500	
12.25	9 5/8	P110 HP	43.5#	LTC	1.2	14.71	7.46	9.5	6,500-10,000	
8.5	5 1/2	P110 HP	17#	BTC	1.29	1.33	2.27	13	15,558	10,829

Casing Design Criteria and Loading Assumptions:

Collapse: 1.2 Design Factor with full internal evacuation.

Burst: 1.125 Design with a surface pressure equal to fracture gradient at depth set minus gas gradient

Production Casing: Design with 1.25 factor of max pressure of stimulation

Tension: 2.0 Design Factor without effects of buoyancy

Murchison Oil & Gas Inc.
Rock Ridge Federal WCB 8H
Eddy County, New Mexico

Casing Assumptions Worksheet

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12.25	9 5/8	P110 HC	40#	LTC	1.36	3.48	2.33	9.2	0-6,500	
12.25	9 5/8	P110 HP	43.5#	LTC	1.2	14.71	7.46	9.5	6,500-10,000	
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U. S. Steel Tubular Products

1/17/2019 10:25:20 AM

9.625" 40.00lbs/ft (0.395" Wall) P110 HC

MECHANICAL PROPERTIES	Pipe	BTC	LTC	STC	
Minimum Yield Strength	110,000	--	--	--	psi
Maximum Yield Strength	140,000	--	--	--	psi
Minimum Tensile Strength	125,000	--	--	--	psi
DIMENSIONS	**Pipe**	**BTC**	**LTC**	**STC**	
Outside Diameter	9.625	10.625	10.625	--	in.
Wall Thickness	0.395	--	--	--	in.
Inside Diameter	8.835	8.835	8.835	--	in.
Standard Drift	8.679	8.679	8.679	--	in.
Alternate Drift	8.750	8.750	8.750	--	in.
Nominal Linear Weight, T&C	40.00	--	--	--	lbs/ft
Plain End Weight	38.97	--	--	--	lbs/ft
PERFORMANCE	**Pipe**	**BTC**	**LTC**	**STC**	
Minimum Collapse Pressure	4,230	4,230	4,230	--	psi
Minimum Internal Yield Pressure	7,910	7,910	7,910	--	psi
Minimum Pipe Body Yield Strength	1,260	--	--	--	1,000 lbs
Joint Strength	--	1,266	988	--	1,000 lbs
Reference Length	--	21,097	16,465	--	ft
MAKE-UP DATA	**Pipe**	**BTC**	**LTC**	**STC**	
Make-Up Loss	--	4.81	4.75	--	in.
Minimum Make-Up Torque	--	--	7,410	--	ft-lbs
Maximum Make-Up Torque	--	--	12,350	--	ft-lbs

U. S. Steel Tubular Products
460 Wildwood Forest Drive, Suite 300S
Spring, Texas 77380

1-877-893-9461
connections@uss.com
www.usstubular.com

Murchison Oil & Gas Inc.
Rock Ridge Federal WCB 8H
Eddy County, New Mexico

Casing Assumptions Worksheet

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Murchison Oil & Gas Inc.
Rock Ridge Federal WCB 8H
Eddy County, New Mexico

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Murchison Oil and Gas, Inc.

Hydrogen Sulfide Drilling Operations Plan

H2S Safety Instructions for Employees and Contractors

1. Physical and chemical properties of H2S.
2. Health hazards of H2S.
3. Principal and operation of H2S detectors, warning system, and briefing areas.
4. Evacuation procedures, routes, and first aid.
5. Proper use of safety equipment and life support systems.
6. Essential personnel meeting medical evaluation criteria will receive additional training on the proper use of 30-minute pressure demand air packs.

H2S Detection and Alarm Systems

1. H2S sensor/detectors will be located on the drilling rig floor, in the base of the sub structure/cellar area, and on the mud pits in the shale shaker area. Additional H2S detectors may be placed as deemed necessary.
2. An audio alarm system will be installed on the derrick floor and in the dog house.

Windsocks and Wind Streamers

1. Windsocks at the mud pit area should be high enough to be visible.
2. Windsock on the rig floor and on top of the dog house should be high enough to be visible.

Condition Flags and Signs

1. Warning sign on access road to location.
2. Flags to be displayed on sign at entrance to location:
    a. Green Flag: Normal Safe Operation Condition
    b. Yellow Flag: Potential Pressure and Danger
    c. Red Flag: Danger
        i. H2S present in dangerous concentrations
        ii. Only H2S trained personnel admitted to location

Well Control Equipment

1. Flare line 150' from wellhead with igniter.
2. Choke manifold with a remotely operated choke.
3. Mud/gas separator.

Mud Program

1. In the event of H2S concentrations of 100 ppm or greater, the following will be considered:
    a. Use of a degasser.
    b. Use of a zinc based mud treatment.
    c. Increasing mud weight.

Communication

1. While working under masks, chalkboards will be used for communications.
2. Hand signals will be used where chalkboard is inappropriate.
3. A two way radio will be used to communicate off location in case emergency help is required. Cellular telephones will be available at most drilling foreman's trailer or living quarters.

Drill Stem Testing

1. No DST or cores are planned at this time.

Drilling Equipment

1. Drilling contractor supervisor will be required to be familiar with the effects H2S has on tubular goods and other mechanical equipment.

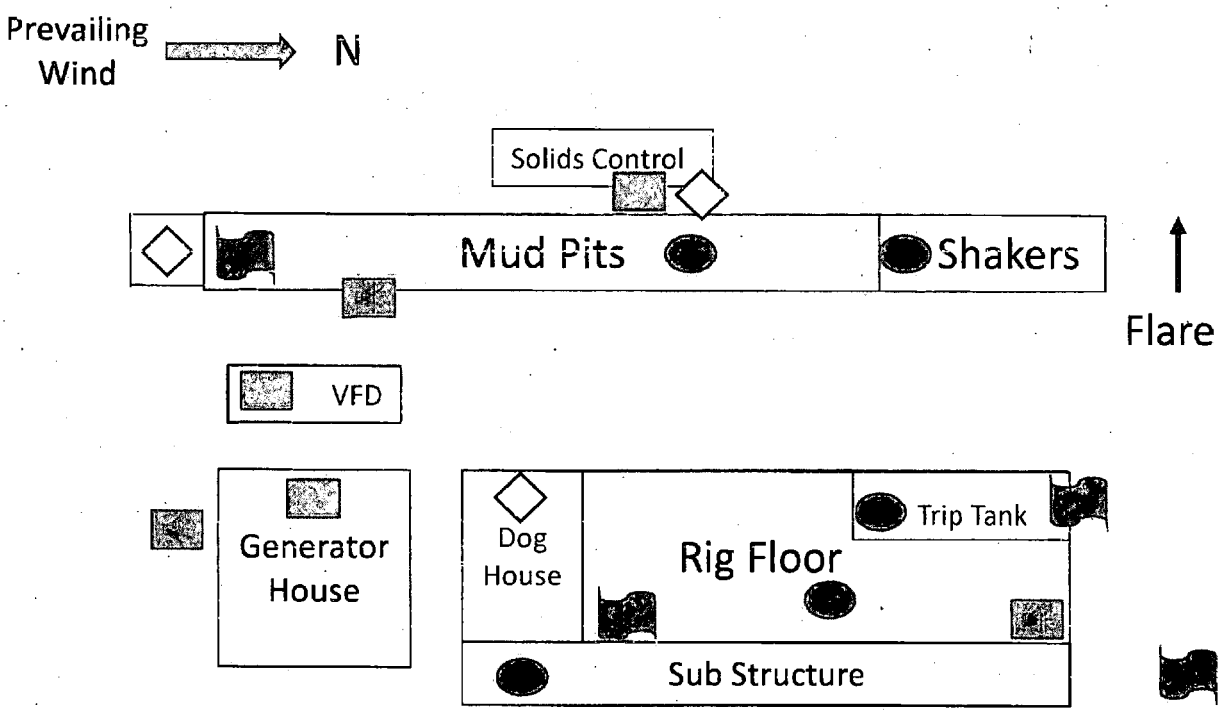
Public Safety - Emergency Contacts

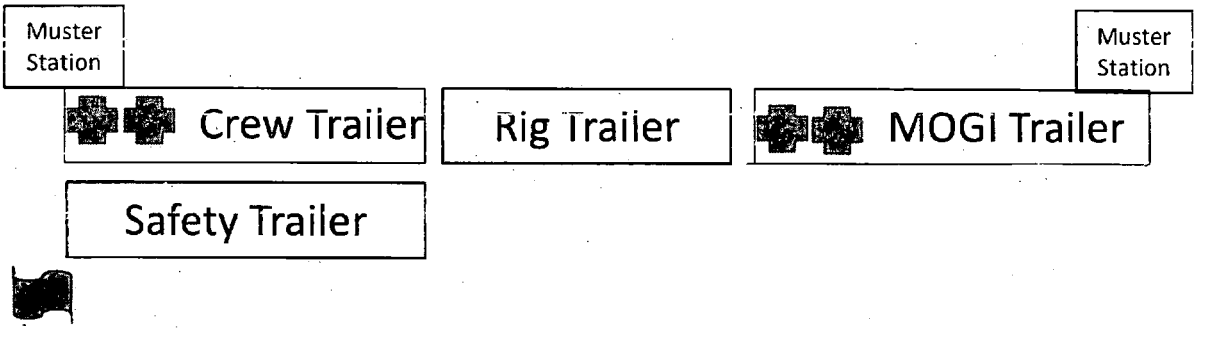
Agency	Telephone Number
Eddy County Sheriff's Department	575-887-7551
Carlsbad Medical Center	575-887-4100
Carlsbad Fire Department	575-885-3125
Artesia Fire Department	575-746-5050
Eddy County Emergency Management	575-628-5450
Poison Control Center	800-222-1222

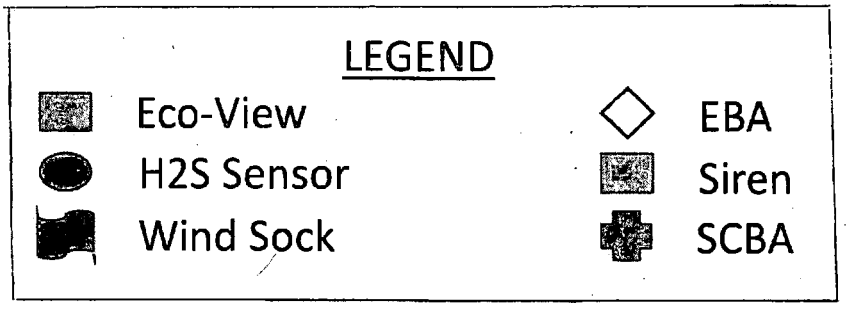
Murchison – Emergency Contacts

Name	Title	Office Number	Cell Number
Rusty Cooper	VP Operations	972-931-0700	972-322-7466
Greg Boans	Production Manager	575-628-3932	575-706-0667

H2S Drilling Rig Diagram







MURCHISON OIL & GAS, INC.

Company: Murchison Oil & Gas
Site: Rock Ridge Federal 5-8
Well: Rock Ridge Federal WCB 8H
Project: Eddy County, New Mexico (NAD 83)
Rig: H&P 451

MS Directional

T G M

Azimuths to Grid North
True North: -0.17°
Magnetic North: 6.90°

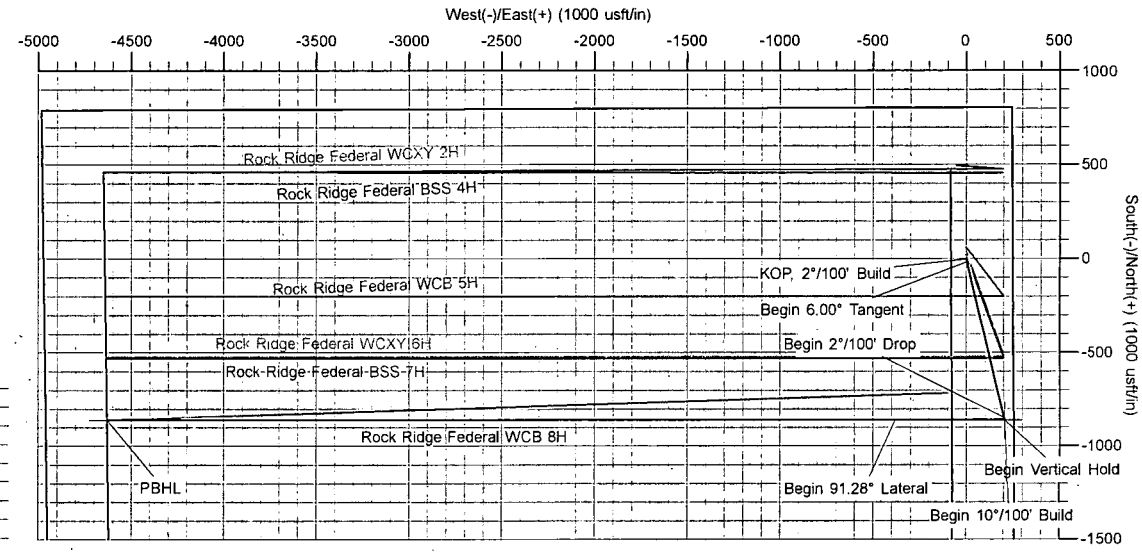
Magnetic Field
Strength: 47766.6nT
Dip Angle: 59.88°
Date: 12/22/2018
Model: BGGM2018

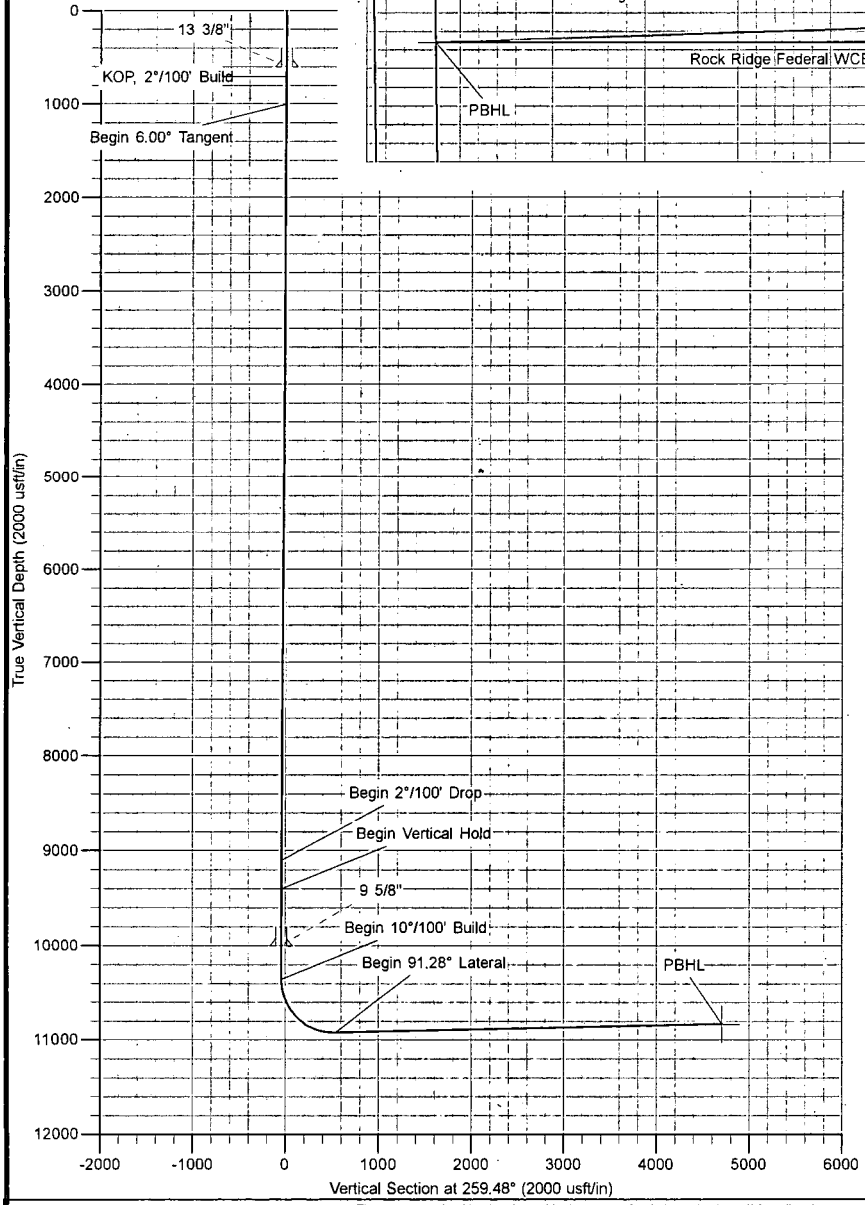
US State Plane 1983
New Mexico Eastern Zone

Created By: DLD
Date: 10:27, September 20 2018
Plan: Design #2

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	KOP, 2°/100' Build
1000.15	6.00	166.63	999.60	-15.28	3.63	-0.78	15.71	Begin 6.00° Tangent
9145.61	6.00	166.63	9100.40	-844.04	200.66	-43.23	867.56	Begin 2°/100' Drop
9445.76	0.00	166.63	9400.00	-859.32	204.29	-44.01	883.27	Begin Vertical Hold
10396.95	0.00	0.00	10351.19	-859.32	204.29	-44.01	883.27	Begin 10°/100' Build
11309.76	91.28	270.00	10924.00	-859.32	-381.48	531.92	1469.04	Begin 91.28° Lateral
15558.18	91.28	270.00	10829.00	-859.32	-4628.83	4707.92	5716.39	PBHL





MURCHISON OIL & GAS, INC.

Company: Murchison Oil & Gas
Site: Rock Ridge Federal 5-8
Well: Rock Ridge Federal WCB 8H
Project: Eddy County, New Mexico (NAD 83)
Rig: H&P 451

MS Directional

T G M

Azimuths to Grid North
True North: -0.17°
Magnetic North: 6.90°

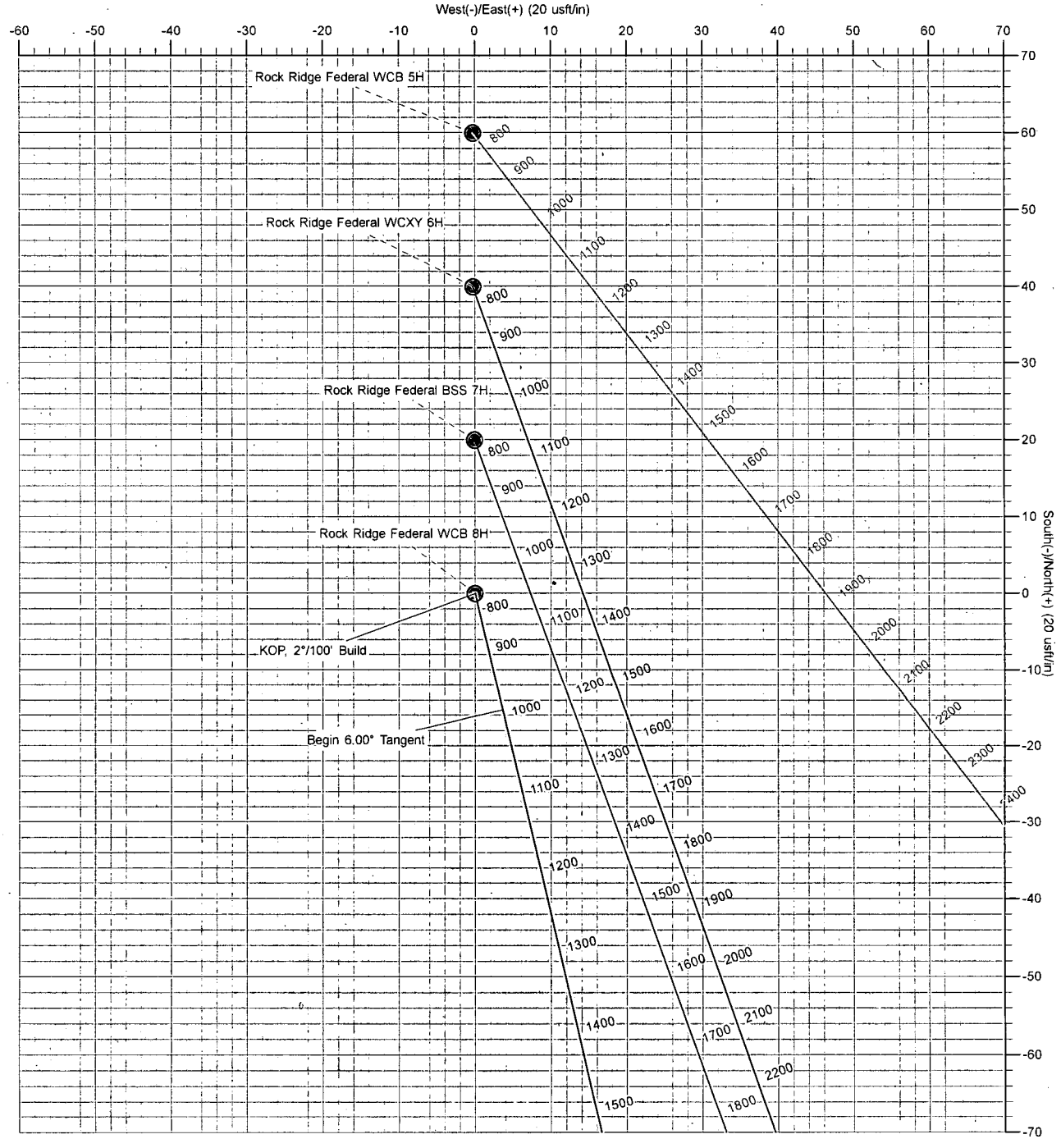
Magnetic Field
Strength: 47766.6nT
Dip Angle: 59.88°
Date: 12/22/2018
Model: BGGM2018

US State Plane 1983
New Mexico Eastern Zone

Created By: DLD
Date: 10:26, September 20 2018
Plan: Design #2

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	KOP, 2°/100' Build
1000.15	6.00	166.63	999.60	-15.28	3.63	-0.78	15.71	Begin 6.00° Tangent
9145.61	6.00	166.63	9100.40	-844.04	200.66	-43.23	867.56	Begin 2°/100' Drop
9445.76	0.00	166.63	9400.00	-859.32	204.29	-44.01	883.27	Begin Vertical Hold
10396.95	0.00	0.00	10351.19	-859.32	204.29	-44.01	883.27	Begin 10°/100' Build
11309.76	91.28	270.00	10924.00	-859.32	-381.48	531.92	1469.04	Begin 91.28° Lateral
15558.18	91.28	270.00	10829.00	-859.32	-4628.83	4707.92	5716.39	PBHL



MURCHISON OIL & GAS, INC.

Murchison Oil & Gas

Eddy County, New Mexico (NAD 83)
Rock Ridge Federal 5-8
Rock Ridge Federal WCB 8H

Wellbore #1

Plan: Design #2

Standard Planning Report

20 September, 2018

MS Directional

Database:	Conroe Server	**Local Co-ordinate Reference:**	Well Rock Ridge Federal WCB 8H
Company:	Murchison Oil & Gas	**TVD Reference:**	WELL @ 2939.50usft (H&P 451)
Project:	Eddy County, New Mexico (NAD 83)	**MD Reference:**	WELL @ 2939.50usft (H&P 451)
Site:	Rock Ridge Federal 5-8	**North Reference:**	Grid
Well:	Rock Ridge Federal WCB 8H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Project Eddy County, New Mexico (NAD 83)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Rock Ridge Federal 5-8

Site Position:		**Northing:**	434,354.45 usft	**Latitude:**	32° 11' 37.391 N
From:	Lat/Long	**Easting:**	639,501.24 usft	**Longitude:**	104° 0' 57.584 W
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "		

Well Rock Ridge Federal WCB 8H

Well Position	**+N/-S**	0.00 usft	**Northing:**	434,294.46 usft	**Latitude:**	32° 11' 36.797 N
	+E/-W	0.00 usft	**Easting:**	639,501.48 usft	**Longitude:**	104° 0' 57.583 W
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	2,914.50 usft
Grid Convergence:		0.169 °				

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2018	12/22/2018	7.068	59.882	47,766.60

Design Design #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	259.48

Plan Survey Tool Program **Date** 9/20/2018

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	15,558.18	Design #2 (Wellbore #1)	MWD	
				OWSG MWD - Standard	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.000	
1,000.15	6.00	166.63	999.60	-15.28	3.63	2.00	2.00	0.00	166.627	
9,145.62	6.00	166.63	9,100.40	-844.04	200.66	0.00	0.00	0.00	0.000	
9,445.76	0.00	0.00	9,400.00	-859.32	204.29	2.00	-2.00	0.00	180.000	vert v2 - Rock Ridg
10,396.95	0.00	0.00	10,351.18	-859.32	204.29	0.00	0.00	0.00	0.000	
11,309.76	91.28	270.00	10,924.00	-859.32	-381.48	10.00	10.00	0.00	270.000	
15,558.18	91.28	270.00	10,829.00	-859.32	-4,628.83	0.00	0.00	0.00	0.000	PBHL - Rock Ridge

Database:	Conroe Server	**Local Co-ordinate Reference:**	Well Rock Ridge Federal WCB 8H
Company:	Murchison Oil & Gas	**TVD Reference:**	WELL @ 2939.50usft (H&P 451)
Project:	Eddy County, New Mexico (NAD 83)	**MD Reference:**	WELL @ 2939.50usft (H&P 451)
Site:	Rock Ridge Federal 5-8	**North Reference:**	Grid
Well:	Rock Ridge Federal WCB 8H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 2°/100' Build									
800.00	2.00	166.63	799.98	-1.70	0.40	-0.09	2.00	2.00	0.00
900.00	4.00	166.63	899.84	-6.79	1.61	-0.35	2.00	2.00	0.00
1,000.00	6.00	166.63	999.45	-15.27	3.63	-0.78	2.00	2.00	0.00
1,000.15	6.00	166.63	999.60	-15.28	3.63	-0.78	1.98	1.98	0.00
Begin 6.00° Tangent									
1,100.00	6.00	166.63	1,098.90	-25.44	6.05	-1.30	0.00	0.00	0.00
1,200.00	6.00	166.63	1,198.36	-35.62	8.47	-1.82	0.00	0.00	0.00
1,300.00	6.00	166.63	1,297.81	-45.79	10.89	-2.35	0.00	0.00	0.00
1,400.00	6.00	166.63	1,397.26	-55.97	13.31	-2.87	0.00	0.00	0.00
1,500.00	6.00	166.63	1,496.71	-66.14	15.72	-3.39	0.00	0.00	0.00
1,600.00	6.00	166.63	1,596.16	-76.31	18.14	-3.91	0.00	0.00	0.00
1,700.00	6.00	166.63	1,695.61	-86.49	20.56	-4.43	0.00	0.00	0.00
1,800.00	6.00	166.63	1,795.07	-96.66	22.98	-4.95	0.00	0.00	0.00
1,900.00	6.00	166.63	1,894.52	-106.84	25.40	-5.47	0.00	0.00	0.00
2,000.00	6.00	166.63	1,993.97	-117.01	27.82	-5.99	0.00	0.00	0.00
2,100.00	6.00	166.63	2,093.42	-127.19	30.24	-6.51	0.00	0.00	0.00
2,200.00	6.00	166.63	2,192.87	-137.36	32.66	-7.04	0.00	0.00	0.00
2,300.00	6.00	166.63	2,292.32	-147.54	35.07	-7.56	0.00	0.00	0.00
2,400.00	6.00	166.63	2,391.78	-157.71	37.49	-8.08	0.00	0.00	0.00
2,500.00	6.00	166.63	2,491.23	-167.88	39.91	-8.60	0.00	0.00	0.00
2,600.00	6.00	166.63	2,590.68	-178.06	42.33	-9.12	0.00	0.00	0.00
2,700.00	6.00	166.63	2,690.13	-188.23	44.75	-9.64	0.00	0.00	0.00
2,800.00	6.00	166.63	2,789.58	-198.41	47.17	-10.16	0.00	0.00	0.00
2,900.00	6.00	166.63	2,889.03	-208.58	49.59	-10.68	0.00	0.00	0.00
3,000.00	6.00	166.63	2,988.48	-218.76	52.01	-11.20	0.00	0.00	0.00
3,100.00	6.00	166.63	3,087.94	-228.93	54.43	-11.72	0.00	0.00	0.00
3,200.00	6.00	166.63	3,187.39	-239.11	56.84	-12.25	0.00	0.00	0.00
3,300.00	6.00	166.63	3,286.84	-249.28	59.26	-12.77	0.00	0.00	0.00
3,400.00	6.00	166.63	3,386.29	-259.45	61.68	-13.29	0.00	0.00	0.00
3,500.00	6.00	166.63	3,485.74	-269.63	64.10	-13.81	0.00	0.00	0.00
3,600.00	6.00	166.63	3,585.19	-279.80	66.52	-14.33	0.00	0.00	0.00
3,700.00	6.00	166.63	3,684.65	-289.98	68.94	-14.85	0.00	0.00	0.00
3,800.00	6.00	166.63	3,784.10	-300.15	71.36	-15.37	0.00	0.00	0.00
3,900.00	6.00	166.63	3,883.55	-310.33	73.78	-15.89	0.00	0.00	0.00
4,000.00	6.00	166.63	3,983.00	-320.50	76.19	-16.41	0.00	0.00	0.00
4,100.00	6.00	166.63	4,082.45	-330.68	78.61	-16.94	0.00	0.00	0.00
4,200.00	6.00	166.63	4,181.90	-340.85	81.03	-17.46	0.00	0.00	0.00
4,300.00	6.00	166.63	4,281.36	-351.02	83.45	-17.98	0.00	0.00	0.00
4,400.00	6.00	166.63	4,380.81	-361.20	85.87	-18.50	0.00	0.00	0.00
4,500.00	6.00	166.63	4,480.26	-371.37	88.29	-19.02	0.00	0.00	0.00
4,600.00	6.00	166.63	4,579.71	-381.55	90.71	-19.54	0.00	0.00	0.00
4,700.00	6.00	166.63	4,679.16	-391.72	93.13	-20.06	0.00	0.00	0.00
4,800.00	6.00	166.63	4,778.61	-401.90	95.55	-20.58	0.00	0.00	0.00

Database:	Conroe Server	**Local Co-ordinate Reference:**	Well Rock Ridge Federal WCB 8H
Company:	Murchison Oil & Gas	**TVD Reference:**	WELL @ 2939.50usft (H&P 451)
Project:	Eddy County, New Mexico (NAD 83)	**MD Reference:**	WELL @ 2939.50usft (H&P 451)
Site:	Rock Ridge Federal 5-8	**North Reference:**	Grid
Well:	Rock Ridge Federal WCB 8H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,900.00	6.00	166.63	4,878.07	-412.07	97.96	-21.10	0.00	0.00	0.00
5,000.00	6.00	166.63	4,977.52	-422.25	100.38	-21.63	0.00	0.00	0.00
5,100.00	6.00	166.63	5,076.97	-432.42	102.80	-22.15	0.00	0.00	0.00
5,200.00	6.00	166.63	5,176.42	-442.59	105.22	-22.67	0.00	0.00	0.00
5,300.00	6.00	166.63	5,275.87	-452.77	107.64	-23.19	0.00	0.00	0.00
5,400.00	6.00	166.63	5,375.32	-462.94	110.06	-23.71	0.00	0.00	0.00
5,500.00	6.00	166.63	5,474.78	-473.12	112.48	-24.23	0.00	0.00	0.00
5,600.00	6.00	166.63	5,574.23	-483.29	114.90	-24.75	0.00	0.00	0.00
5,700.00	6.00	166.63	5,673.68	-493.47	117.31	-25.27	0.00	0.00	0.00
5,800.00	6.00	166.63	5,773.13	-503.64	119.73	-25.79	0.00	0.00	0.00
5,900.00	6.00	166.63	5,872.58	-513.82	122.15	-26.32	0.00	0.00	0.00
6,000.00	6.00	166.63	5,972.03	-523.99	124.57	-26.84	0.00	0.00	0.00
6,100.00	6.00	166.63	6,071.49	-534.16	126.99	-27.36	0.00	0.00	0.00
6,200.00	6.00	166.63	6,170.94	-544.34	129.41	-27.88	0.00	0.00	0.00
6,300.00	6.00	166.63	6,270.39	-554.51	131.83	-28.40	0.00	0.00	0.00
6,400.00	6.00	166.63	6,369.84	-564.69	134.25	-28.92	0.00	0.00	0.00
6,500.00	6.00	166.63	6,469.29	-574.86	136.67	-29.44	0.00	0.00	0.00
6,600.00	6.00	166.63	6,568.74	-585.04	139.08	-29.96	0.00	0.00	0.00
6,700.00	6.00	166.63	6,668.20	-595.21	141.50	-30.48	0.00	0.00	0.00
6,800.00	6.00	166.63	6,767.65	-605.39	143.92	-31.01	0.00	0.00	0.00
6,900.00	6.00	166.63	6,867.10	-615.56	146.34	-31.53	0.00	0.00	0.00
7,000.00	6.00	166.63	6,966.55	-625.73	148.76	-32.05	0.00	0.00	0.00
7,100.00	6.00	166.63	7,066.00	-635.91	151.18	-32.57	0.00	0.00	0.00
7,200.00	6.00	166.63	7,165.45	-646.08	153.60	-33.09	0.00	0.00	0.00
7,300.00	6.00	166.63	7,264.91	-656.26	156.02	-33.61	0.00	0.00	0.00
7,400.00	6.00	166.63	7,364.36	-666.43	158.43	-34.13	0.00	0.00	0.00
7,500.00	6.00	166.63	7,463.81	-676.61	160.85	-34.65	0.00	0.00	0.00
7,600.00	6.00	166.63	7,563.26	-686.78	163.27	-35.17	0.00	0.00	0.00
7,700.00	6.00	166.63	7,662.71	-696.96	165.69	-35.70	0.00	0.00	0.00
7,800.00	6.00	166.63	7,762.16	-707.13	168.11	-36.22	0.00	0.00	0.00
7,900.00	6.00	166.63	7,861.62	-717.30	170.53	-36.74	0.00	0.00	0.00
8,000.00	6.00	166.63	7,961.07	-727.48	172.95	-37.26	0.00	0.00	0.00
8,100.00	6.00	166.63	8,060.52	-737.65	175.37	-37.78	0.00	0.00	0.00
8,200.00	6.00	166.63	8,159.97	-747.83	177.79	-38.30	0.00	0.00	0.00
8,300.00	6.00	166.63	8,259.42	-758.00	180.20	-38.82	0.00	0.00	0.00
8,400.00	6.00	166.63	8,358.87	-768.18	182.62	-39.34	0.00	0.00	0.00
8,500.00	6.00	166.63	8,458.33	-778.35	185.04	-39.86	0.00	0.00	0.00
8,600.00	6.00	166.63	8,557.78	-788.53	187.46	-40.38	0.00	0.00	0.00
8,700.00	6.00	166.63	8,657.23	-798.70	189.88	-40.91	0.00	0.00	0.00
8,800.00	6.00	166.63	8,756.68	-808.87	192.30	-41.43	0.00	0.00	0.00
8,900.00	6.00	166.63	8,856.13	-819.05	194.72	-41.95	0.00	0.00	0.00
9,000.00	6.00	166.63	8,955.58	-829.22	197.14	-42.47	0.00	0.00	0.00
9,100.00	6.00	166.63	9,055.04	-839.40	199.55	-42.99	0.00	0.00	0.00
9,145.61	6.00	166.63	9,100.40	-844.04	200.66	-43.23	0.00	0.00	0.00
Begin 2°/100' Drop									
9,200.00	4.92	166.63	9,154.54	-849.07	201.85	-43.49	2.00	-2.00	0.00
9,300.00	2.92	166.63	9,254.30	-855.72	203.43	-43.83	2.00	-2.00	0.00
9,400.00	0.92	166.63	9,354.24	-858.97	204.21	-43.99	2.00	-2.00	0.00
9,445.76	0.00	166.63	9,400.00	-859.32	204.29	-44.01	2.00	-2.00	0.00
Begin Vertical Hold									
9,500.00	0.00	0.00	9,454.24	-859.32	204.29	-44.01	0.00	0.00	0.00
9,600.00	0.00	0.00	9,554.24	-859.32	204.29	-44.01	0.00	0.00	0.00
9,700.00	0.00	0.00	9,654.24	-859.32	204.29	-44.01	0.00	0.00	0.00
9,800.00	0.00	0.00	9,754.24	-859.32	204.29	-44.01	0.00	0.00	0.00

Database:	Conroe Server	**Local Co-ordinate Reference:**	Well Rock Ridge Federal WCB 8H
Company:	Murchison Oil & Gas	**TVD Reference:**	WELL @ 2939.50usft (H&P 451)
Project:	Eddy County, New Mexico (NAD 83)	**MD Reference:**	WELL @ 2939.50usft (H&P 451)
Site:	Rock Ridge Federal 5-8	**North Reference:**	Grid
Well:	Rock Ridge Federal WCB 8H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,900.00	0.00	0.00	9,854.24	-859.32	204.29	-44.01	0.00	0.00	0.00
10,000.00	0.00	0.00	9,954.24	-859.32	204.29	-44.01	0.00	0.00	0.00
10,045.76	0.00	0.00	10,000.00	-859.32	204.29	-44.01	0.00	0.00	0.00
9 5/8"									
10,100.00	0.00	0.00	10,054.24	-859.32	204.29	-44.01	0.00	0.00	0.00
10,200.00	0.00	0.00	10,154.24	-859.32	204.29	-44.01	0.00	0.00	0.00
10,300.00	0.00	0.00	10,254.24	-859.32	204.29	-44.01	0.00	0.00	0.00
10,396.95	0.00	0.00	10,351.19	-859.32	204.29	-44.01	0.00	0.00	0.00
Begin 10°/100' Build									
10,400.00	0.31	270.00	10,354.24	-859.32	204.28	-44.00	10.01	10.01	0.00
10,500.00	10.31	270.00	10,453.68	-859.32	195.05	-34.92	10.00	10.00	0.00
10,600.00	20.31	270.00	10,550.01	-859.32	168.69	-9.00	10.00	10.00	0.00
10,700.00	30.31	270.00	10,640.30	-859.32	126.00	32.97	10.00	10.00	0.00
10,800.00	40.31	270.00	10,721.81	-859.32	68.28	89.72	10.00	10.00	0.00
10,900.00	50.31	270.00	10,792.05	-859.32	-2.72	159.52	10.00	10.00	0.00
11,000.00	60.31	270.00	10,848.90	-859.32	-84.83	240.26	10.00	10.00	0.00
11,100.00	70.31	270.00	10,890.63	-859.32	-175.57	329.47	10.00	10.00	0.00
11,200.00	80.31	270.00	10,915.96	-859.32	-272.18	424.46	10.00	10.00	0.00
11,300.00	90.31	270.00	10,924.13	-859.32	-371.72	522.32	10.00	10.00	0.00
11,309.76	91.28	270.00	10,924.00	-859.32	-381.48	531.92	10.00	10.00	0.00
Begin 91.28° Lateral									
11,400.00	91.28	270.00	10,921.98	-859.32	-471.69	620.62	0.00	0.00	0.00
11,500.00	91.28	270.00	10,919.75	-859.32	-571.67	718.91	0.00	0.00	0.00
11,600.00	91.28	270.00	10,917.51	-859.32	-671.64	817.21	0.00	0.00	0.00
11,700.00	91.28	270.00	10,915.27	-859.32	-771.62	915.51	0.00	0.00	0.00
11,800.00	91.28	270.00	10,913.04	-859.32	-871.59	1,013.80	0.00	0.00	0.00
11,900.00	91.28	270.00	10,910.80	-859.32	-971.57	1,112.10	0.00	0.00	0.00
12,000.00	91.28	270.00	10,908.56	-859.32	-1,071.54	1,210.39	0.00	0.00	0.00
12,100.00	91.28	270.00	10,906.33	-859.32	-1,171.52	1,308.69	0.00	0.00	0.00
12,200.00	91.28	270.00	10,904.09	-859.32	-1,271.49	1,406.98	0.00	0.00	0.00
12,300.00	91.28	270.00	10,901.86	-859.32	-1,371.47	1,505.28	0.00	0.00	0.00
12,400.00	91.28	270.00	10,899.62	-859.32	-1,471.44	1,603.57	0.00	0.00	0.00
12,500.00	91.28	270.00	10,897.38	-859.32	-1,571.42	1,701.87	0.00	0.00	0.00
12,600.00	91.28	270.00	10,895.15	-859.32	-1,671.39	1,800.17	0.00	0.00	0.00
12,700.00	91.28	270.00	10,892.91	-859.32	-1,771.37	1,898.46	0.00	0.00	0.00
12,800.00	91.28	270.00	10,890.68	-859.32	-1,871.34	1,996.76	0.00	0.00	0.00
12,900.00	91.28	270.00	10,888.44	-859.32	-1,971.32	2,095.05	0.00	0.00	0.00
13,000.00	91.28	270.00	10,886.20	-859.32	-2,071.29	2,193.35	0.00	0.00	0.00
13,100.00	91.28	270.00	10,883.97	-859.32	-2,171.27	2,291.64	0.00	0.00	0.00
13,200.00	91.28	270.00	10,881.73	-859.32	-2,271.24	2,389.94	0.00	0.00	0.00
13,300.00	91.28	270.00	10,879.50	-859.32	-2,371.22	2,488.23	0.00	0.00	0.00
13,400.00	91.28	270.00	10,877.26	-859.32	-2,471.19	2,586.53	0.00	0.00	0.00
13,500.00	91.28	270.00	10,875.02	-859.32	-2,571.17	2,684.82	0.00	0.00	0.00
13,600.00	91.28	270.00	10,872.79	-859.32	-2,671.14	2,783.12	0.00	0.00	0.00
13,700.00	91.28	270.00	10,870.55	-859.32	-2,771.12	2,881.42	0.00	0.00	0.00
13,800.00	91.28	270.00	10,868.31	-859.32	-2,871.09	2,979.71	0.00	0.00	0.00
13,900.00	91.28	270.00	10,866.08	-859.32	-2,971.07	3,078.01	0.00	0.00	0.00
14,000.00	91.28	270.00	10,863.84	-859.32	-3,071.04	3,176.30	0.00	0.00	0.00
14,100.00	91.28	270.00	10,861.61	-859.32	-3,171.02	3,274.60	0.00	0.00	0.00
14,200.00	91.28	270.00	10,859.37	-859.32	-3,270.99	3,372.89	0.00	0.00	0.00
14,300.00	91.28	270.00	10,857.13	-859.32	-3,370.97	3,471.19	0.00	0.00	0.00
14,400.00	91.28	270.00	10,854.90	-859.32	-3,470.94	3,569.48	0.00	0.00	0.00
14,500.00	91.28	270.00	10,852.66	-859.32	-3,570.92	3,667.78	0.00	0.00	0.00

Database:	Conroe Server	**Local Co-ordinate Reference:**	Well Rock Ridge Federal WCB 8H
Company:	Murchison Oil & Gas	**TVD Reference:**	WELL @ 2939.50usft (H&P 451)
Project:	Eddy County, New Mexico (NAD 83)	**MD Reference:**	WELL @ 2939.50usft (H&P 451)
Site:	Rock Ridge Federal 5-8	**North Reference:**	Grid
Well:	Rock Ridge Federal WCB 8H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,600.00	91.28	270.00	10,850.43	-859.32	-3,670.89	3,766.08	0.00	0.00	0.00
14,700.00	91.28	270.00	10,848.19	-859.32	-3,770.87	3,864.37	0.00	0.00	0.00
14,800.00	91.28	270.00	10,845.95	-859.32	-3,870.84	3,962.67	0.00	0.00	0.00
14,900.00	91.28	270.00	10,843.72	-859.32	-3,970.82	4,060.96	0.00	0.00	0.00
15,000.00	91.28	270.00	10,841.48	-859.32	-4,070.79	4,159.26	0.00	0.00	0.00
15,100.00	91.28	270.00	10,839.25	-859.32	-4,170.77	4,257.55	0.00	0.00	0.00
15,200.00	91.28	270.00	10,837.01	-859.32	-4,270.74	4,355.85	0.00	0.00	0.00
15,300.00	91.28	270.00	10,834.77	-859.32	-4,370.72	4,454.14	0.00	0.00	0.00
15,400.00	91.28	270.00	10,832.54	-859.32	-4,470.69	4,552.44	0.00	0.00	0.00
15,500.00	91.28	270.00	10,830.30	-859.32	-4,570.67	4,650.73	0.00	0.00	0.00
15,558.18	91.28	270.00	10,829.00	-859.32	-4,628.83	4,707.92	0.00	0.00	0.00
PBHL									

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
vert v2 - Rock Ridge F - plan hits target center - Point	0.00	0.00	9,400.00	-859.32	204.29	433,435.14	639,705.77	32° 11' 28.287 N	104° 0' 55.236 W
PBHL - Rock Ridge F - plan hits target center - Point	0.00	0.00	10,829.00	-859.32	-4,628.83	433,435.14	634,872.65	32° 11' 28.425 N	104° 1' 51.480 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
600.00	600.00	13 3/8"	13-3/8	17-1/2
10,045.76	10,000.00	9 5/8"	9-5/8	12-1/4

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
700.00	700.00	0.00	0.00	KOP, 2°/100' Build
1,000.15	999.60	-15.28	3.63	Begin 6.00° Tangent
9,145.61	9,100.40	-844.04	200.66	Begin 2°/100' Drop
9,445.76	9,400.00	-859.32	204.29	Begin Vertical Hold
10,396.95	10,351.19	-859.32	204.29	Begin 10°/100' Build
11,309.76	10,924.00	-859.32	-381.48	Begin 91.28° Lateral
15,558.18	10,829.00	-859.32	-4,628.83	PBHL

APD ID: 10400034373 **Submission Date:** 10/24/2018

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Well Type: CONVENTIONAL GAS 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:

ROCK_RIDGE_FEDERAL_WCB_8H_Access_Road_Map_20181016143514.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT **Row(s) Exist?** YES

ROW ID(s)

ID: NM-127218

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:

ACCESS_ROAD_ROCK_RIDGE_FEDERAL_WELLS_20181024082445.pdf

New road type: LOCAL

Length: 1449.56 Feet **Width (ft.):** 30

Max slope (%): 2 **Max grade (%):** 3

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: CROWN AND DITCH SURFACE WITH CALICHE

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

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: Approximately 6 inches of top soil (root zone) will be stripped from the proposed access road prior to construction activity. The topsoil will be spread along the edge of the road and within the ditch. The topsoil will be seeded with BLM designated mixture.

Access other construction information:

Access miscellaneous information:

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

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: WATERSHED DIVERSION EVERY 200' IF NEEDED

Road Drainage Control Structures (DCS) description: The access road and associated drainage structures will be constructed and maintained in accordance with BLM guidelines.

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:

Rock_Ridge_Pad_2___One_Mile_Radius_Map_20181016143637.pdf

Existing Wells description:

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

Submit or defer a Proposed Production Facilities plan? DEFER

Estimated Production Facilities description: The Rock Ridge Central Tank Battery (CTB) will be located to the south at Rock Ridge Federal 3H (30-015-39543) H-30-24S-29E. The existing pad will be enlarged to accommodate facilities for 10 new wells. A sundry will be submitted with facility details and a site survey.

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Section 5 - Location and Types of Water Supply

Water Source Table

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

Water source type: GW WELL

Describe type:

Source latitude:

Source longitude:

Source datum:

Water source permit type: WATER WELL

Source land ownership: PRIVATE

Water source transport method: TRUCKING

Source transportation land ownership: COMMERCIAL

Water source volume (barrels): 330000

Source volume (acre-feet): 42.53472

Source volume (gal): 13860000

Water source and transportation map:

Rock_Ridge_Pad_2_Source_Map_20181016144514.pdf

Water source comments: The well will be drilled using a combination of water and mud systems. The water will be purchased from S. B. Energy Services. The frac pond is located in NENW 25-24S-28E. The water source is Water Well C-3423 located in SENW 26-24S-28E. The water will be hauled by truck using existing and proposed roads.

New water well? NO

New Water Well Info

Well latitude:

Well Longitude:

Well datum:

Well target aquifer:

Est. depth to top of aquifer(ft):

Est thickness of aquifer:

Aquifer comments:

Aquifer documentation:

Well depth (ft):

Well casing type:

Well casing outside diameter (in.):

Well casing inside diameter (in.):

New water well casing?

Used casing source:

Drilling method:

Drill material:

Grout material:

Grout depth:

Casing length (ft.):

Casing top depth (ft.):

Well Production type:

Completion Method:

Water well additional information:

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: All caliche utilized for the drilling pad and proposed access road will be obtained from an existing BLM/State/Fee approved pit or from prevailing deposits on location. Caliche pit owned by Scott Branson located in NENW 26-24S-28E.
Construction Materials source location attachment:

Rock_Ridge_Pad_2_Source_Map_20181016144531.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Cuttings

Amount of waste: 4700 barrels

Waste disposal frequency : Daily

Safe containment description: A closed loop system consisting of above ground steel tanks and haul-off bins will be used. Disposal of liquids, drilling fluids and cuttings will be at an approved facility.
Safe containmant attachment:

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

Disposal location description: R360 Environmental Solutions, Halfway, NM

Waste type: GARBAGE

Waste content description: Trash, non-flammable waste and junk.

Amount of waste: 200 pounds

Waste disposal frequency : Weekly

Safe containment description: All trash, non-flammable waste and junk will be contained in a portable dumpster or trash cage.
Safe containmant attachment:

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

Disposal location description: A licensed 3rd party vendor will be contracted to haul and safely dispose of garbage.

Waste type: SEWAGE

Waste content description: Human waste

Amount of waste: 250 gallons

Waste disposal frequency : Weekly

Safe containment description: Portable, self-contained toilets will be provided for human waste.

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Safe containmant attachment:

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

Disposal type description:

Disposal location description: A licensed 3rd party vendor will be contracted to haul and dispose of sewage.

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? NO

Description of cuttings location

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:

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Section 9 - Well Site Layout

Well Site Layout Diagram:

ROCK_RIDGE_FEDERAL_WCB_8H_Site_Map_20181016144621.pdf

ROCK_RIDGE_PAD_2_Drill_Site_Diagram_20181016144658.pdf

ROCK_RIDGE_PAD_2_CUT_AND_FILL_20181030102924.pdf

Comments: 4 Well Pad - Rock Ridge Federal WCB 5H, Rock Ridge Federal WCXY 6H, Rock Ridge Federal BSS 7H and Rock Ridge Federal WCB 8H

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** ROCK RIDGE

Multiple Well Pad Number: 2

Recontouring attachment:

ROCK_RIDGE_PAD_2_Interim_Reclamation_Map_20181016144912.pdf

Drainage/Erosion control construction: Berm stockpiled top soil as needed to control erosion.

Drainage/Erosion control reclamation: Reclamation to be wind rowed as needed to control erosion.

Well pad proposed disturbance (acres): 3.289
Road proposed disturbance (acres): 0.998
Powerline proposed disturbance (acres): 0
Pipeline proposed disturbance (acres): 0
Other proposed disturbance (acres): 0
Total proposed disturbance: 4.287

Well pad interim reclamation (acres): 1.6
Road interim reclamation (acres): 0
Powerline interim reclamation (acres): 0
Pipeline interim reclamation (acres): 0
Other interim reclamation (acres): 0
Total interim reclamation: 1.6

Well pad long term disturbance (acres): 1.7
Road long term disturbance (acres): 0.998
Powerline long term disturbance (acres): 0
Pipeline long term disturbance (acres): 0
Other long term disturbance (acres): 0
Total long term disturbance: 2.698

Disturbance Comments:

Reconstruction method: Interim reclamation will reduce the pad size to 300' x 250'. The remaining disturbed area will be restored as close as possible to original topography.
Topsoil redistribution: The original stock piled topsoil will be spread evenly over the interim reclamation area and contoured to match pre-construction grades. Some topsoil will be retained for final reclamation.
Soil treatment: The site will be re-seeded in accordance with BLM requirements to re-establish the native plant community. Noxious weed will be controlled.
Existing Vegetation at the well pad: According to the Natural Resources Conservation Service's online database, the area soils consist of Pajarito soils. The vegetative community consists of mesquite, broom snakeweed, four-wing saltbush, creosote, javelina bush, horse crippler, soapweed yucca, desert grasses and forbs. Grasses and mesquite were observed at the BLM onsite.
Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: The vegetative community consists of mesquite, broom snakeweed, four-wing saltbush, creosote, javelina bush, horse crippler, soapweed yucca, desert grasses and forbs. Grasses and mesquite were observed at the BLM onsite.

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: The vegetative community consists of mesquite, broom snakeweed, four-wing saltbush, creosote, javelina bush, horse crippler, soapweed yucca, desert grasses and forbs. Grasses and mesquite were observed at the BLM onsite.

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type:

Seed source:

Seed name:

Source name:

Source address:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Proposed seeding season:

Seed Summary

Total pounds/Acre:

Seed Type	Pounds/Acre

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

First Name: Greg **Last Name:** Boans

Phone: (575)628-3932 **Email:** gboans@jdmii.com

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: Herbicide

Weed treatment plan attachment:

Monitoring plan description: Visual inspection as needed.

Monitoring plan attachment:

Success standards: 100% compliance with applicable regulations.

Pit closure description: NA

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

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: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Disturbance type: NEW ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

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

Operator Name: MURCHISON OIL & GAS LLC

Well Name: ROCK RIDGE FEDERAL WCB **Well Number:** 8H

Section 12 - Other Information

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

ROW Type(s):

ROW Applications

SUPO Additional Information: NMCRIS 140154

Use a previously conducted onsite? YES

Previous Onsite information: Onsite performed 10/27/17.

Other SUPO Attachment

SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

ACCESS AERIAL ROUTE MAP

NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEBRUARY 2017

MURCHISON OIL & GAS, INC.

ROCK RIDGE FEDERAL WCB 8H

LOCATED 805 FT. FROM THE NORTH LINE
AND 250 FT. FROM THE EAST LINE OF
SECTION 30, TOWNSHIP 24 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

SEPTEMBER 21, 2018

SURVEY NO. 5513B

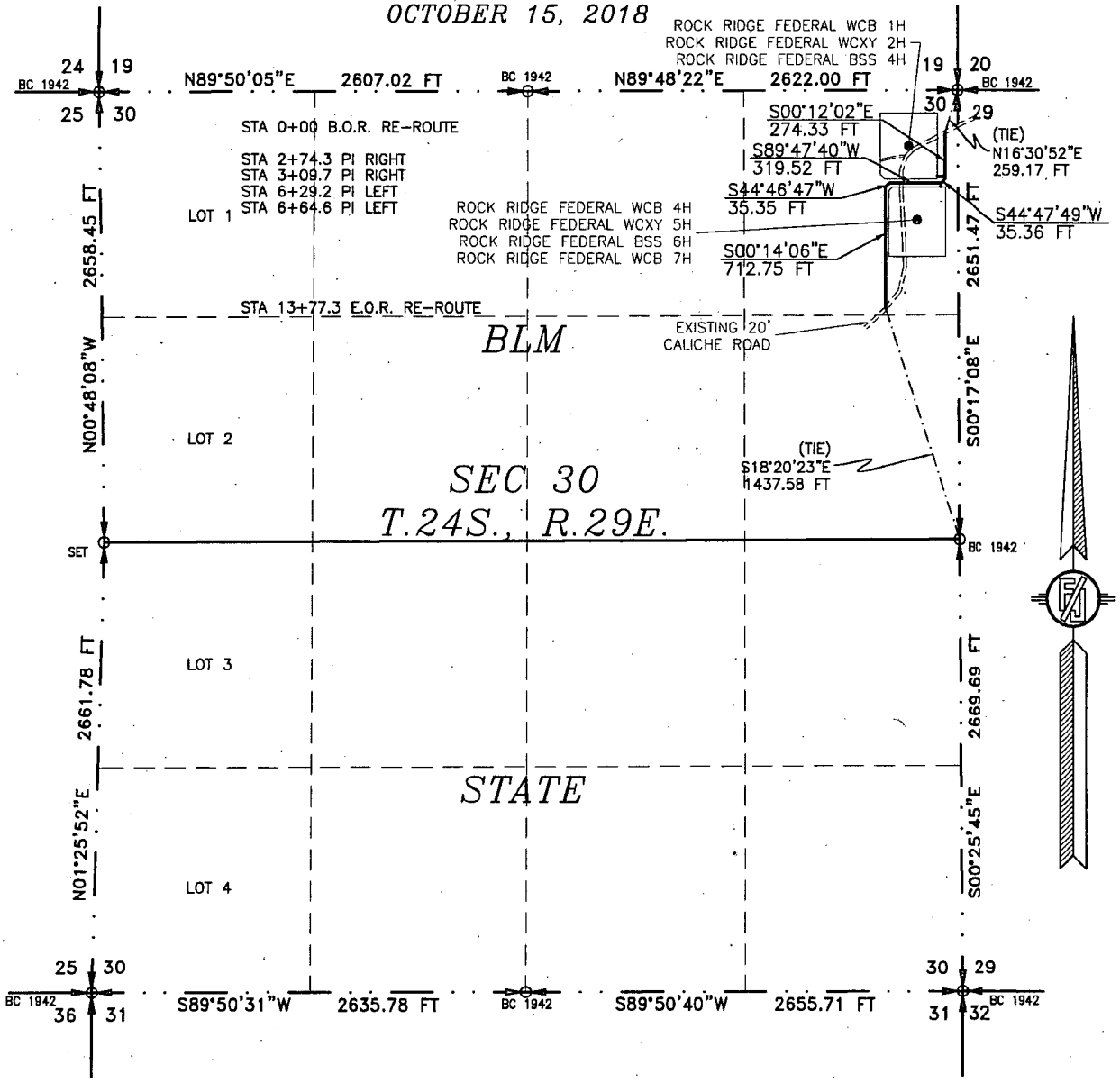
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

RE-ROUTE OF AN EXISTING 20' CALICHE ROAD TO CONNECT THE ROCK RIDGE FEDERAL WELLS (WCB 1H, WCXY 2H, BSS 4H, WCB 4H, WCXY 5H, BSS 6H, & WCB 7H)

MURCHISON OIL & GAS, INC.

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
OCTOBER 15, 2018



SEE NEXT SHEET (2-6) FOR DESCRIPTION

1000 0 1000
Scale: 1" = 1000'

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 15 DAY OF OCTOBER 2018

FILIMON F. JARAMILLO NEW MEXICO 12797 REGISTERED PROFESSIONAL SURVEYOR

FILIMON F. JARAMILLO, PLS #12797
301 SOUTH CANAL CARLSBAD
(575) 234-3341

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

SHEET: 1-6

SURVEY NO. 5746B

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

RE-ROUTE OF AN EXISTING 20' CALICHE ROAD TO CONNECT THE ROCK RIDGE FEDERAL WELLS (WCB 1H, WCXY 2H, BSS 4H, WCB 4H, WCXY 5H, BSS 6H, & WCB 7H)

MURCHISON OIL & GAS, INC.

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
OCTOBER 15, 2018

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

MAIN ACCESS ROAD

BEGINNING AT A POINT WITHIN THE NE/4 NE/4 OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N16°30'52"E, A DISTANCE OF 259.17 FEET;
THENCE S00°12'02"E A DISTANCE OF 274.33 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S44°47'49"W A DISTANCE OF 35.36 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S89°47'40"W A DISTANCE OF 319.52 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S44°46'47"W A DISTANCE OF 35.35 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S00°14'06"E A DISTANCE OF 712.75 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE EAST QUARTER CORNER OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS S18°20'23"E, A DISTANCE OF 1437.58 FEET;

SAID STRIP OF LAND BEING 1377.31 FEET OR 83.47 RODS IN LENGTH, CONTAINING 0.949 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NE/4	1377.31 L.F.	83.47 RODS	0.949 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 25 DAY OF OCTOBER 2018

FILIMON F. JARAMILLO, PLS 12797

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

SHEET: 2-6

SURVEY NO. 5746B

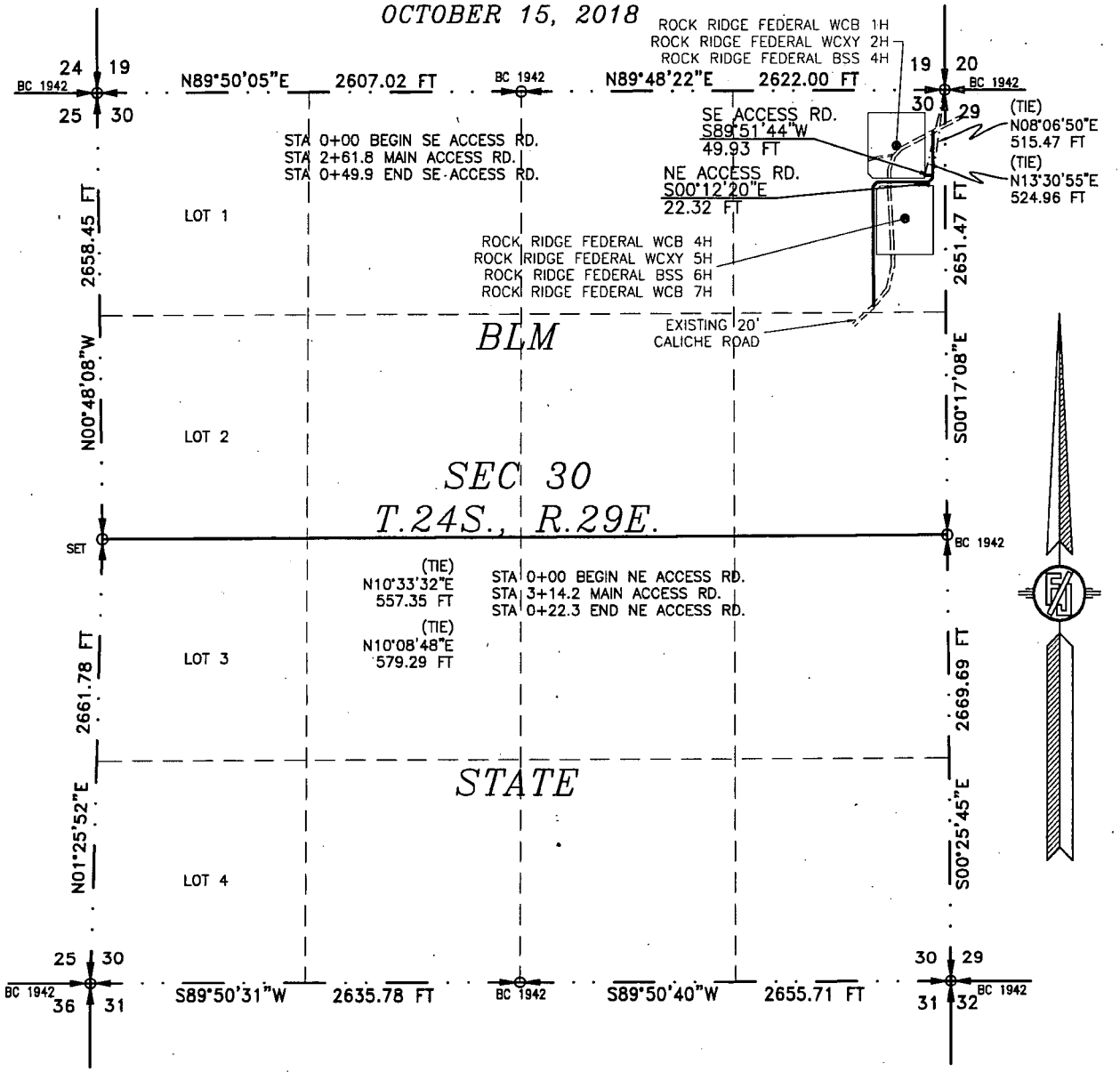
MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

RE-ROUTE OF AN EXISTING 20' CALICHE ROAD TO CONNECT THE ROCK RIDGE FEDERAL WELLS (WCB 1H, WCXY 2H, BSS 4H, WCB 4H, WCXY 5H, BSS 6H, & WCB 7H)

MURCHISON OIL & GAS, INC.

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
OCTOBER 15, 2018



SEE NEXT SHEET (4-6) FOR DESCRIPTION

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Scale: 1" = 1000'

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 22 DAY OF OCTOBER 2018

FILIMON F. JARAMILLO PLS 12797

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

ACCESS ROAD PLAT

RE-ROUTE OF AN EXISTING 20' CALICHE ROAD TO CONNECT THE ROCK RIDGE FEDERAL WELLS (WCB 1H, WCXY 2H, BSS 4H, WCB 4H, WCXY 5H, BSS 6H, & WCB 7H)

MURCHISON OIL & GAS, INC.

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO OCTOBER 15, 2018

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

SOUTHEAST ACCESS ROAD

BEGINNING AT A POINT WITHIN THE NE/4 NE/4 OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N08°06'50"E, A DISTANCE OF 515.47 FEET;
THENCE S89°51'44"W A DISTANCE OF 49.93 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHEAST CORNER OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N13°30'55"E, A DISTANCE OF 524.96 FEET;

SAID STRIP OF LAND BEING 49.93 FEET OR 3.03 RODS IN LENGTH, CONTAINING 0.034 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NE/4	49.93 L.F.	3.03 RODS	0.034 ACRES

NORTHEAST ACCESS ROAD

BEGINNING AT A POINT WITHIN THE NE/4 NE/4 OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N10°33'32"E, A DISTANCE OF 557.35 FEET;
THENCE S00°12'20"E A DISTANCE OF 22.32 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHEAST CORNER OF SAID SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N10°08'48"E, A DISTANCE OF 579.29 FEET;

SAID STRIP OF LAND BEING 22.32 FEET OR 1.35 RODS IN LENGTH, CONTAINING 0.015 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NE/4	22.32 L.F.	1.35 RODS	0.015 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 15 DAY OF OCTOBER 2018.

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

FILIMON F. JARAMILLO PLS# 12797

SHEET: 4-6

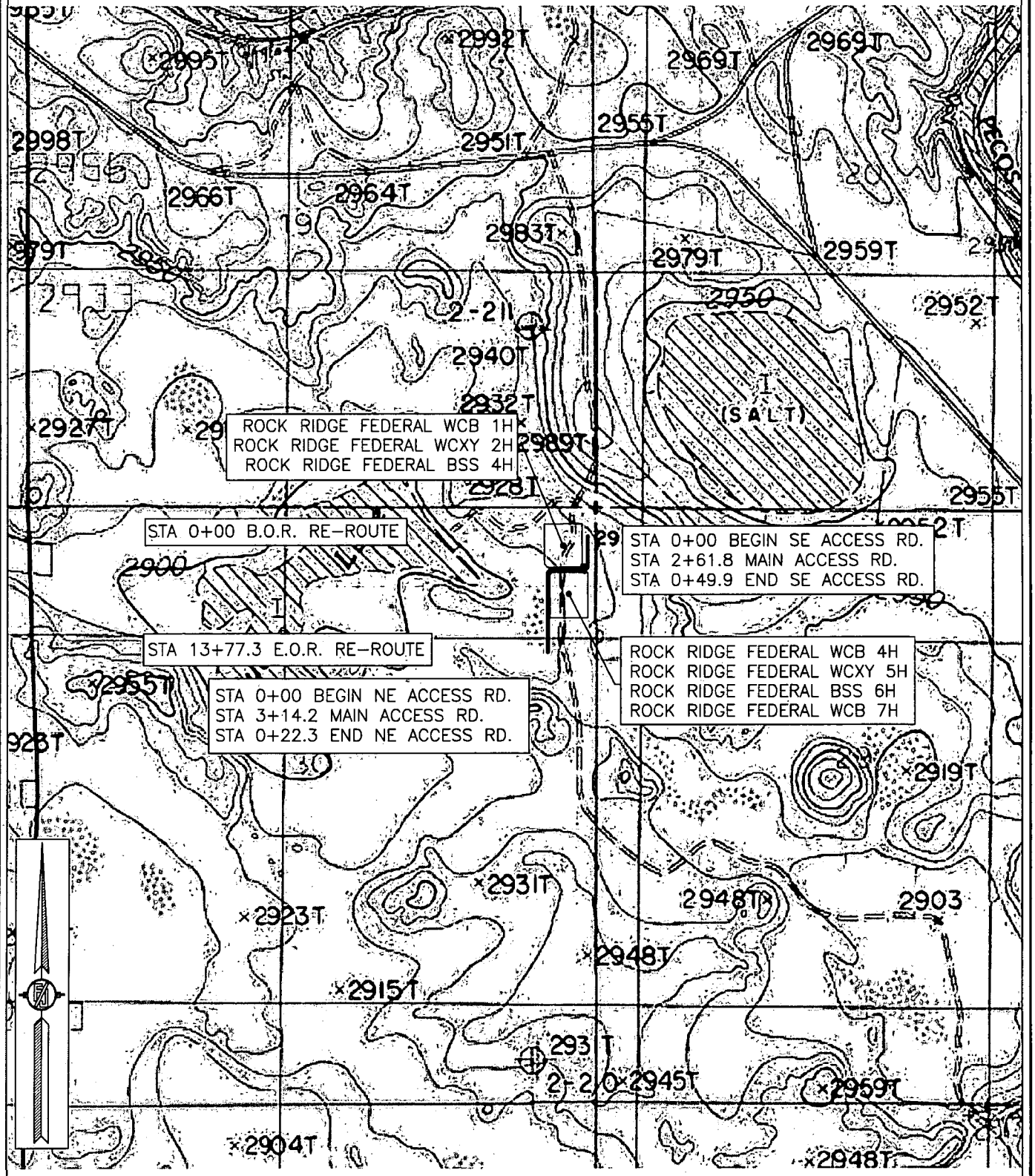
SURVEY NO. 5746B

ACCESS ROAD PLAT

RE-ROUTE OF AN EXISTING 20' CALICHE ROAD TO CONNECT THE ROCK RIDGE FEDERAL WELLS (WCB 1H, WCXY 2H, BSS 4H, WCB 4H, WCXY 5H, BSS 6H, & WCB 7H)

MURCHISON OIL & GAS, INC.

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
OCTOBER 15, 2018



SHEET: 5-6 *SURVEY NO. 5746B*

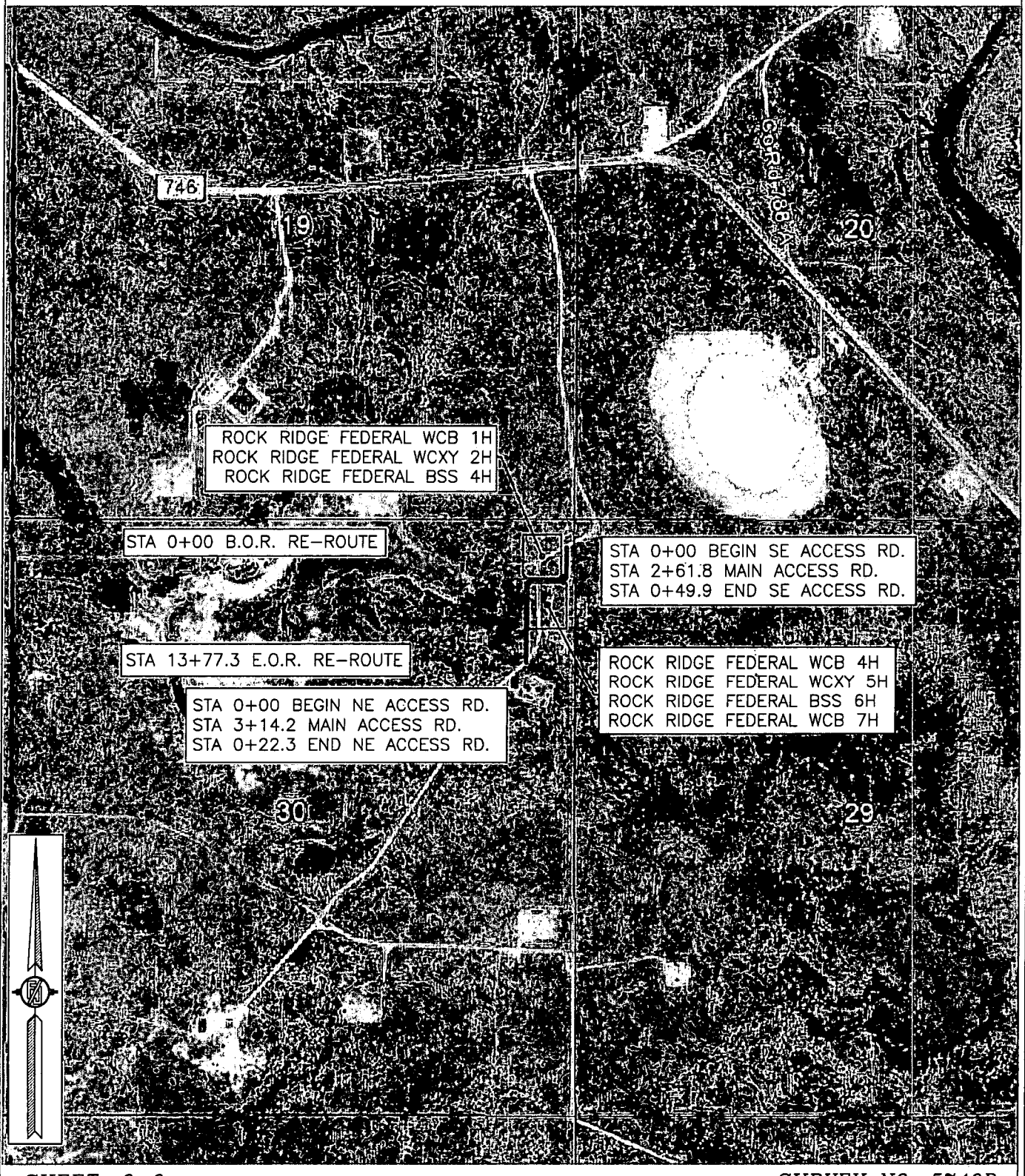
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

ACCESS ROAD PLAT

RE-ROUTE OF AN EXISTING 20' CALICHE ROAD TO CONNECT THE ROCK RIDGE FEDERAL WELLS (WCB 1H, WCXY 2H, BSS 4H, WCB 4H, WCXY 5H, BSS 6H, & WCB 7H)

MURCHISON OIL & GAS, INC.

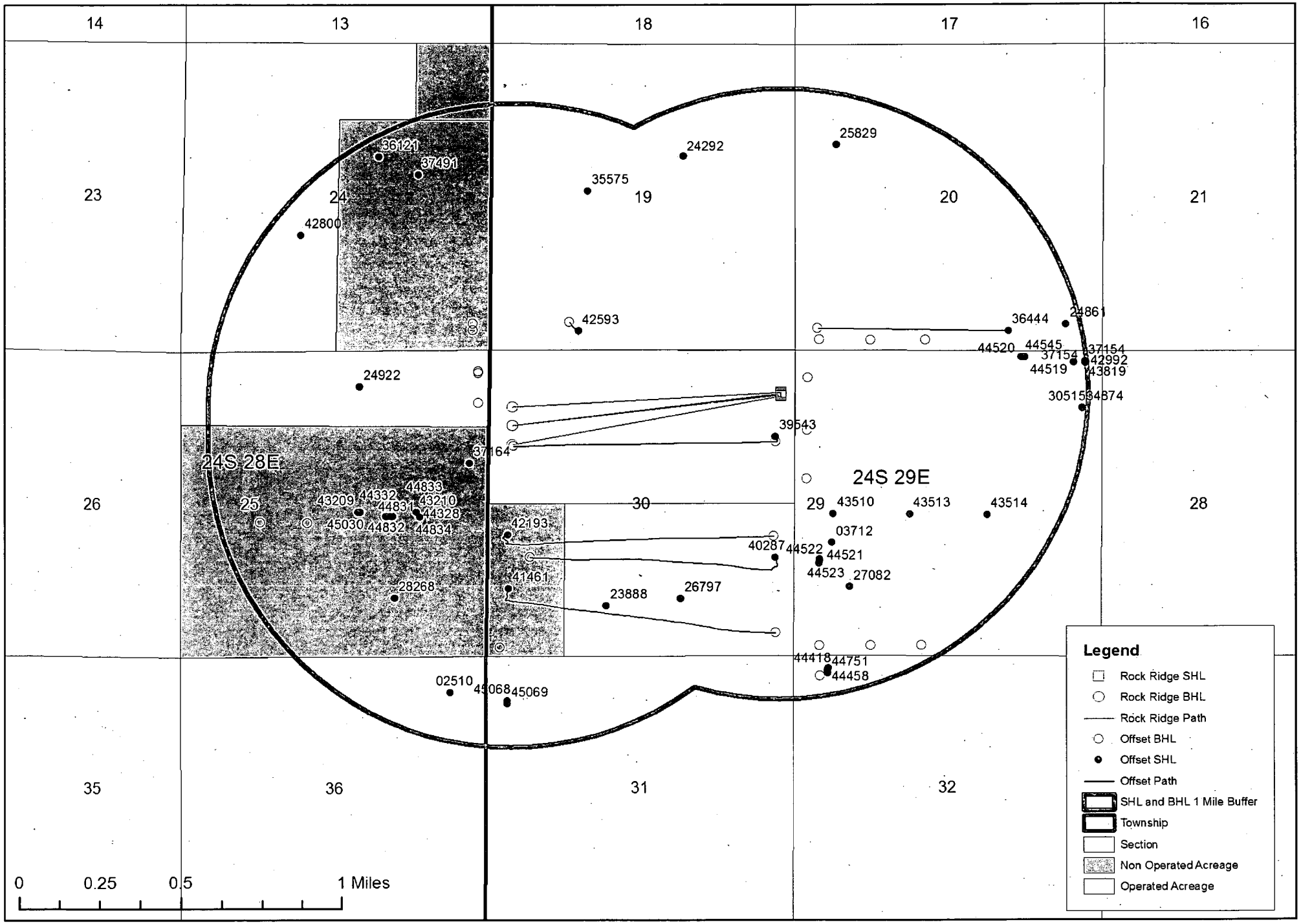
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
OCTOBER 15, 2018

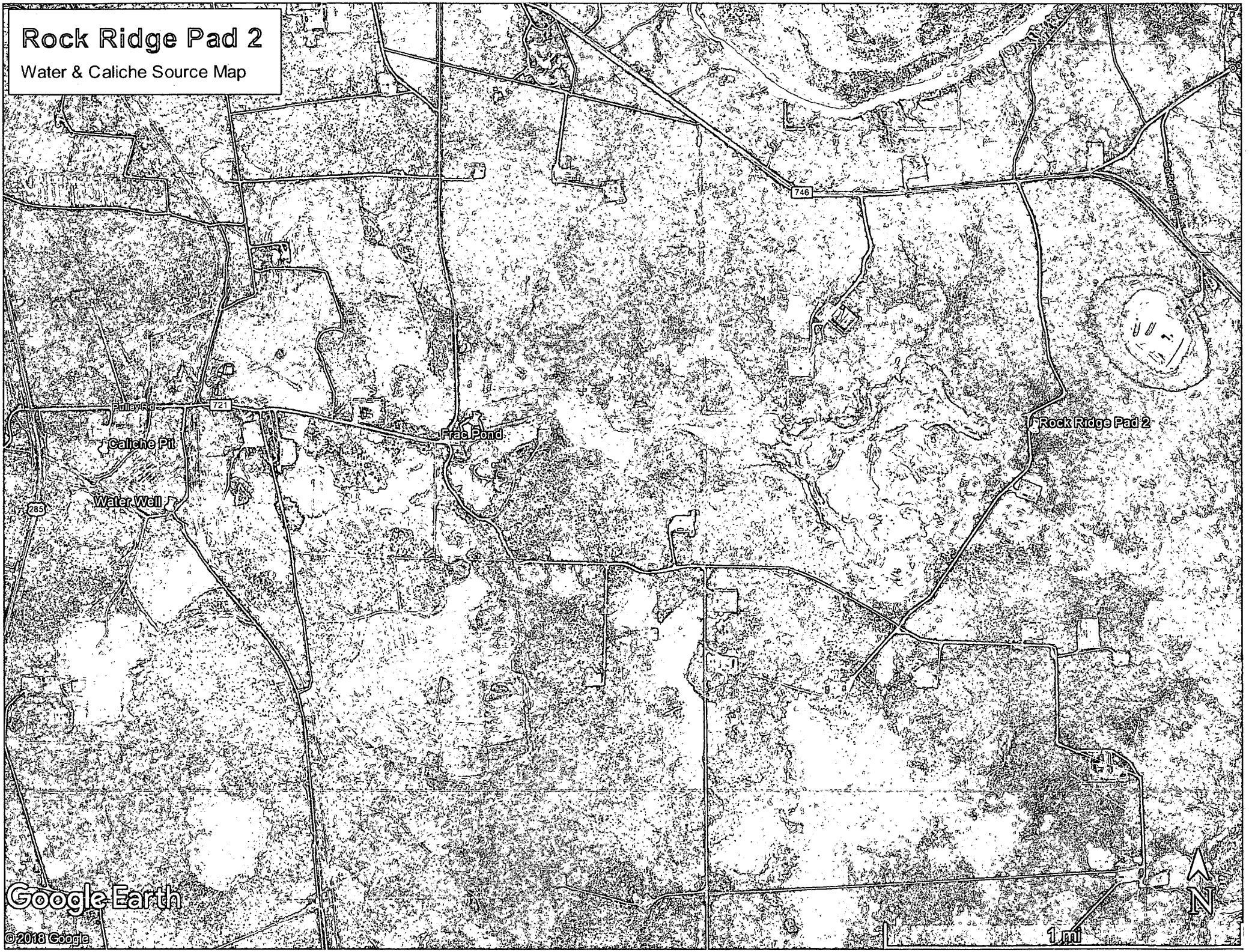


SHEET: 6-6 *SURVEY NO. 5746B*

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

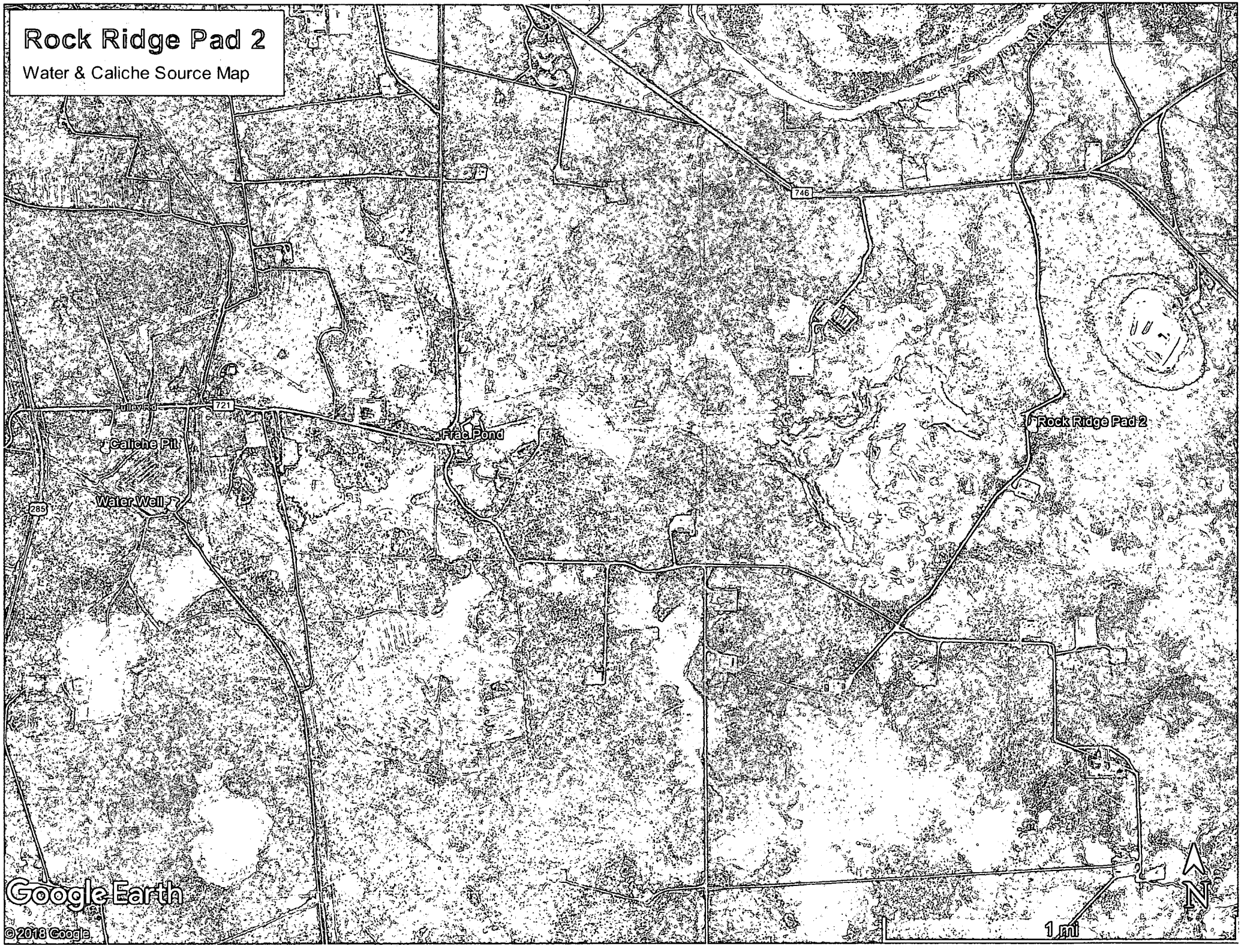
Wells Within 1 Mile Radius of Rock Ridge Surface and Bottom Hole Locations




Rock Ridge Pad 2
Water & Caliche Source Map
746
Pulley Rd
721
Caliche Pit
Frac Pond
Rock Ridge Pad 2
Water Well
285
Google Earth
© 2018 Google
1 mi
N

Rock Ridge Pad 2

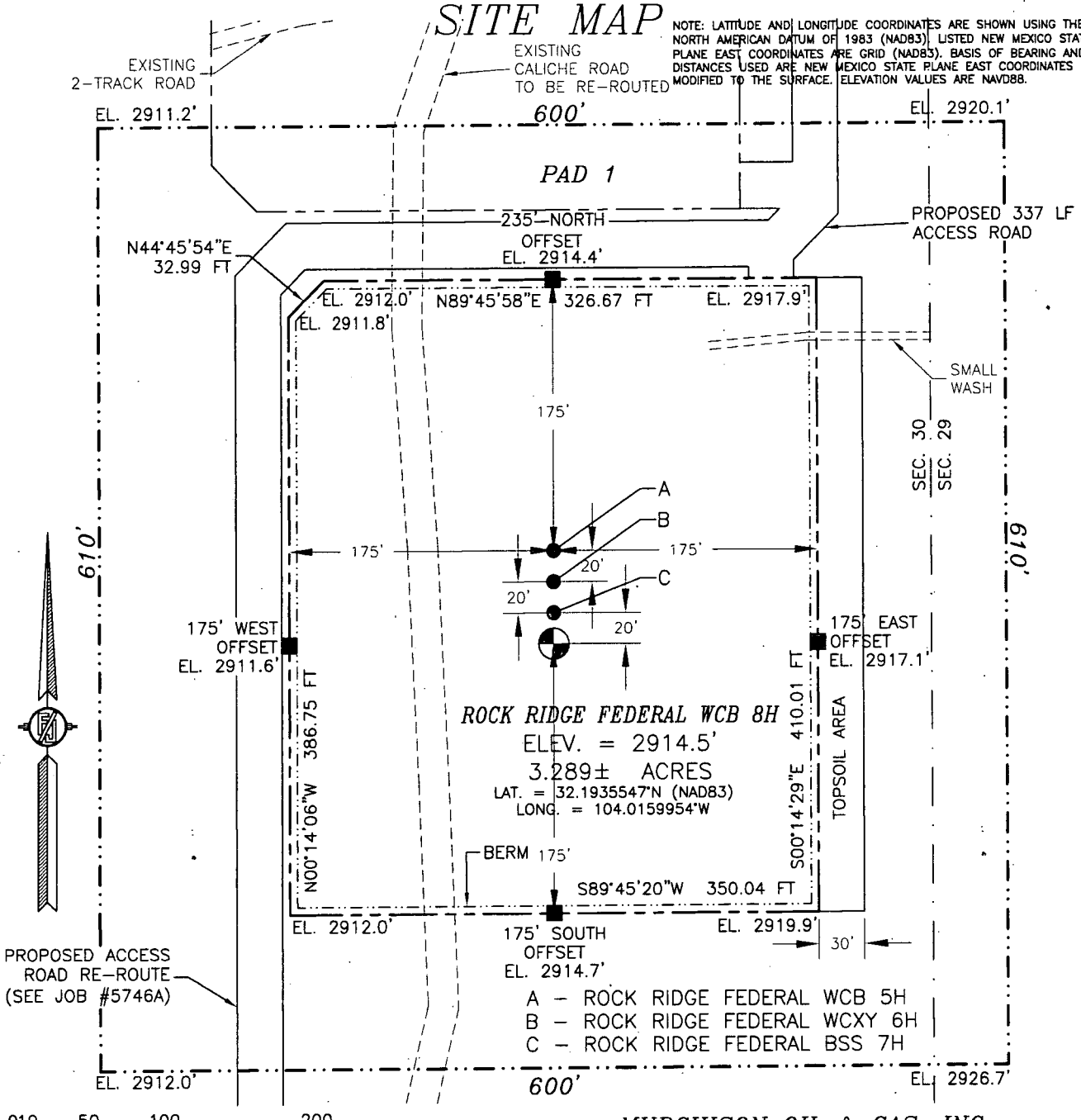
Water & Caliche Source Map



SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE. ELEVATION VALUES ARE NAVD88.



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM U.S. HIGHWAY 285 AND PAVED CR 720 (DUARTE) GO EAST ON CR 720 1.3 MILES, TURN RIGHT ON PAVED CR 746 (McDONALD) AND GO SOUTH THEN EAST A TOTAL OF 2.88 MILES, TURN RIGHT ON CALICHE ROAD AND GO SOUTH 0.62 OF A MILE, BEND RIGHT AND GO SOUTHWEST 340' TO EXISTING ROAD RE-ROUTE AND FOLLOW FLAGS SOUTH 337', TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

MURCHISON OIL & GAS, INC.

ROCK RIDGE FEDERAL WCB 8H

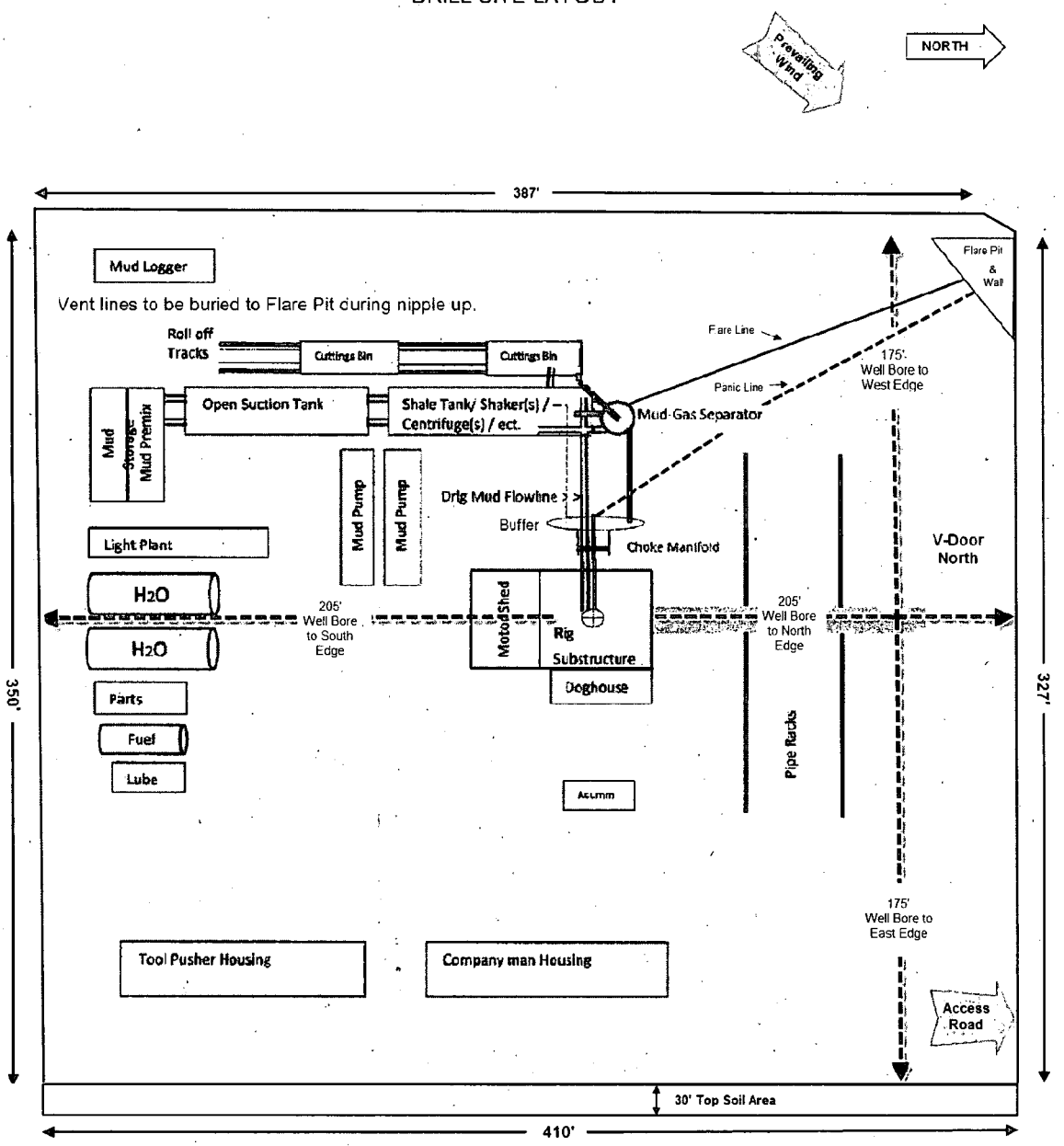
LOCATED 805 FT. FROM THE NORTH LINE AND 250 FT. FROM THE EAST LINE OF SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

SEPTEMBER 21, 2018

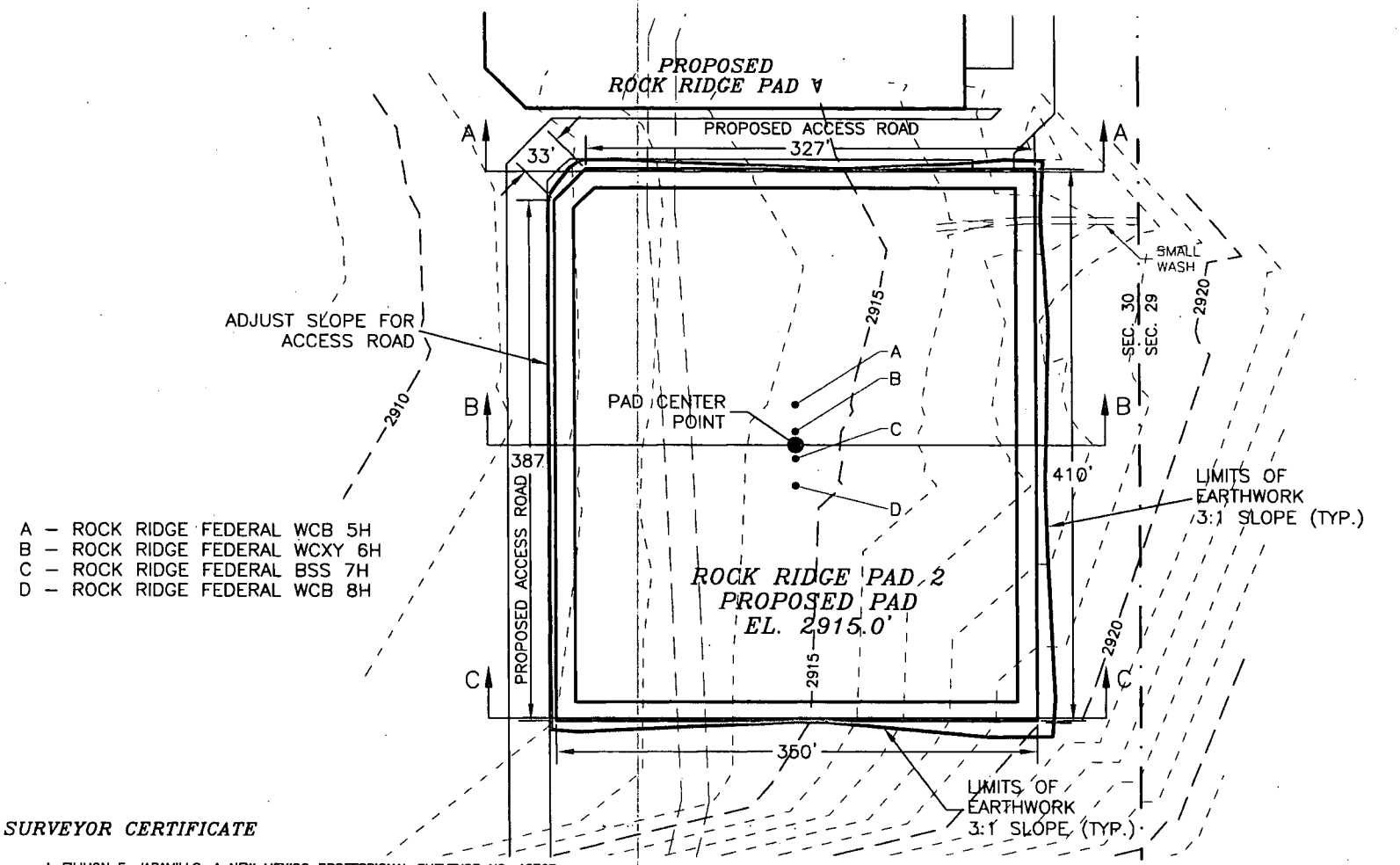
SURVEY NO. 5513B

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

DRILL SITE LAYOUT



PLAN VIEW



A – ROCK RIDGE FEDERAL WCB 5H
B – ROCK RIDGE FEDERAL WCXY 6H
C – ROCK RIDGE FEDERAL BSS 7H
D – ROCK RIDGE FEDERAL WCB 8H

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 17TH DAY OF OCTOBER 2018.

FILIMON F. JARAMILLO PLS. 12797

MURCHISON OIL & GAS, INC.
GRADING PLAN AND CROSS SECTIONS
FOR ROCK RIDGE PAD 2
SECTION 30, TOWNSHIP 24 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

OCTOBER 17, 2018

012 60 120 240
SCALE 1" = 120'

CUT	FILL	NET
3265 CU. YD	5699 CU. YD	2434 CU. YD (FILL)

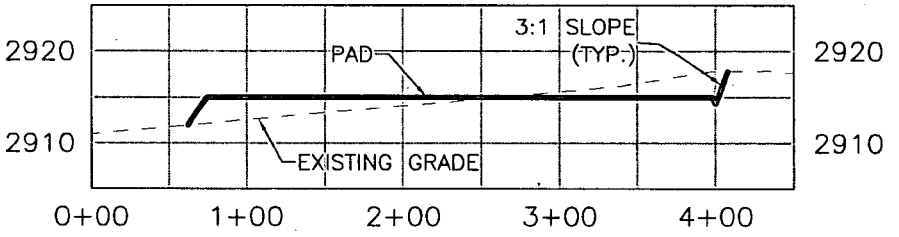
EARTHWORK QUANTITIES ARE ESTIMATED

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

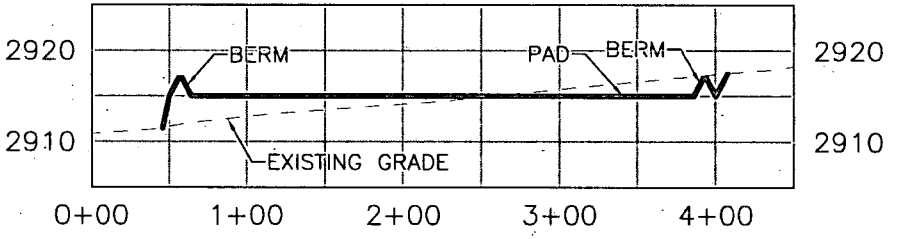
SHEET 1-2
SURVEY NO. 5510B

CROSS SECTIONS

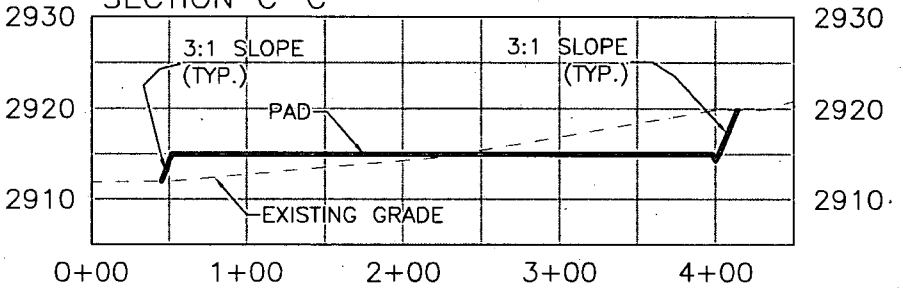
SECTION A–A

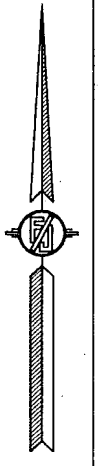


SECTION B–B



SECTION C–C





SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 17 DAY OF OCTOBER 2018.

FILIMON F. JARAMILLO, PLS 12797

NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR

MURCHISON OIL & GAS, INC.
GRADING PLAN AND CROSS SECTIONS
FOR ROCK RIDGE PAD 2
SECTION 30, TOWNSHIP 24 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

OCTOBER 17, 2018

012 60 120 240
SCALE 1" = 120' – 1" = 20' VER

CUT	FILL	NET
3265 CU. YD	5699 CU. YD	2434 CU. YD (FILL)

EARTHWORK QUANTITIES ARE ESTIMATED

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

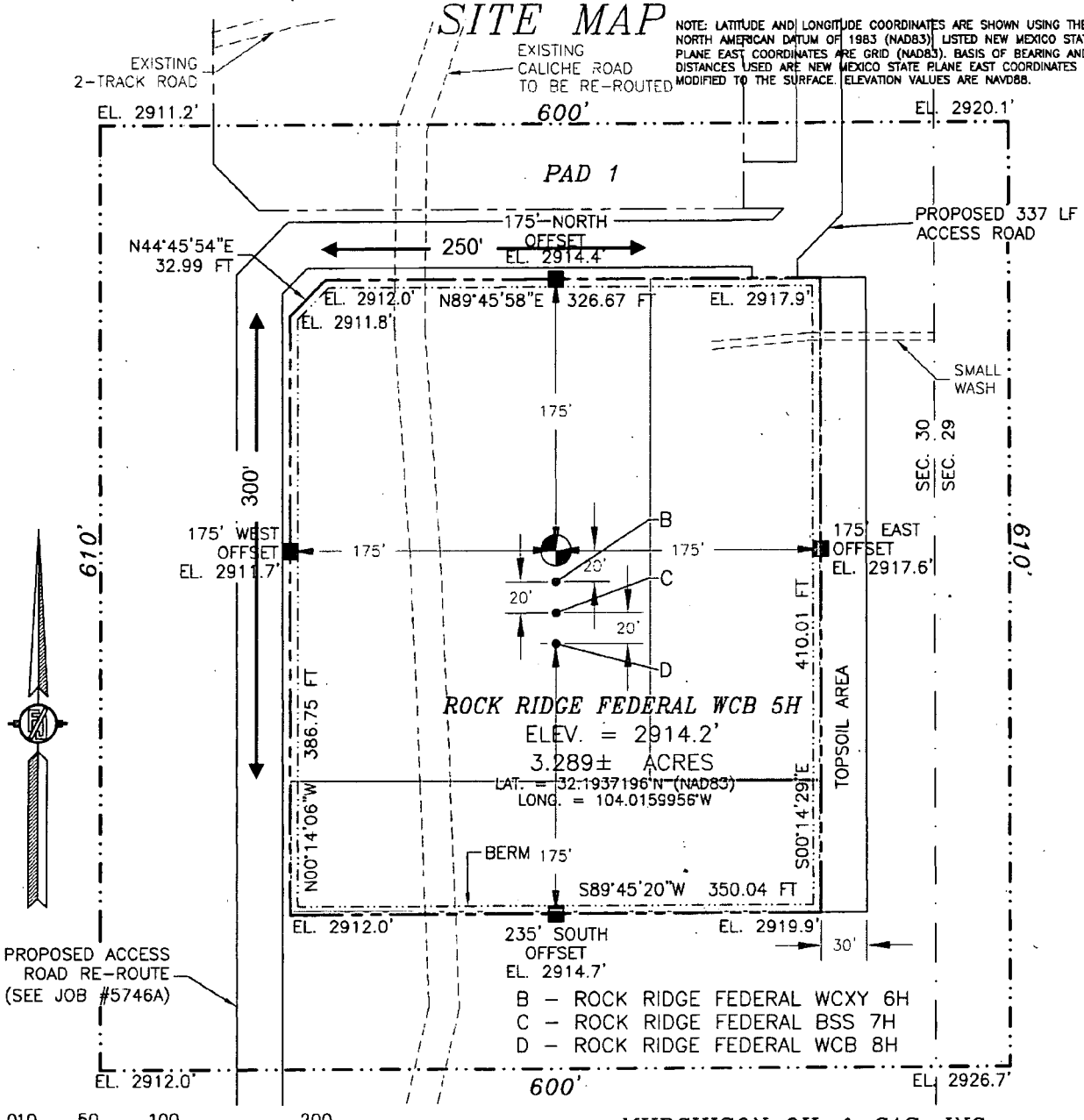
SHEET 2–2
SURVEY NO. 5510B

ROCK RIDGE PAD 2 - INTERIM RECLAMATION

SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE. ELEVATION VALUES ARE NAVD88.



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM U.S. HIGHWAY 285 AND PAVED CR 720 (DUARTE) GO EAST ON CR 720 1.3 MILES, TURN RIGHT ON PAVED CR 746 (McDONALD) AND GO SOUTH THEN EAST A TOTAL OF 2.88 MILES, TURN RIGHT ON CALICHE ROAD AND GO SOUTH 0.62 OF A MILE, BEND RIGHT AND GO SOUTHWEST 340' TO EXISTING ROAD RE-ROUTE AND FOLLOW FLAGS SOUTH 337', TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

MURCHISON OIL & GAS, INC.

ROCK RIDGE FEDERAL WCB 5H

LOCATED 745 FT. FROM THE NORTH LINE AND 250 FT. FROM THE EAST LINE OF SECTION 30, TOWNSHIP 24 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

SEPTEMBER 21, 2018

SURVEY NO. 5510B

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

AREA OF INTERIM RECLAMATION: 1.6 AC
FINAL PAD SIZE: 1.7 AC

Section 1 - General

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

Section 1 - General

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

Section 1 - General

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

Section 1 - General

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

Section 1 - General

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

Section 1 - General

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

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

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

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Section 4 - Injection

Would you like to utilize Injection PWD options? NO

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

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

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Would you like to utilize Surface Discharge PWD options? NO

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Would you like to utilize Surface Discharge PWD options? NO

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

Section 6 - Other

Would you like to utilize Other PWD options? NO

Section 6 - Other

Would you like to utilize Other PWD options? NO

Section 6 - Other

Would you like to utilize Other PWD options? NO

Section 6 - Other

Would you like to utilize Other PWD options? NO

Section 6 - Other

Would you like to utilize Other PWD options? NO

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

04/01/2019

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001412

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: