Rec'd 08/12/2020 - NMOCD

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.: NMNM059383

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.: RANA SALADA FED COM 0504 216H

2. Name of Operator: NOVO OIL AND GAS NORTHERN DELAWARE LLC

9. API Well No.: 3001547331

3a. Address: 1001 West Wilshire Boulevard Suite 206 Oklahoma City O

3b. Phone No. *(include area code)*: (405)404-0414

10. Field and Pool, or Exploratory: CORRAL DRAW BONE SPRING

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

At surface: NESE / 1441 FSL / 672 FEL / LAT 32.3309832 / LONG -104.0177696

At proposed prod. zone: NESE / 2310 FSL / 130 FEL / LAT 32.3334928 / LONG -103.9817014

11. Sec., T. R. M. or Blk. and Survey or Area: SEC 6 / T23S / R29E / NMP

14. Distance in miles and direction from nearest town or post office*: 5 miles

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): 672 feet

16. No of acres in lease: 601.92

17. Spacing Unit dedicated to this well: 640

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.: 20 feet

19. Proposed Depth: 10149 feet / 20444 feet

20. BLM/BIA Bond No. in file: FED: NMB001536

21. Elevations (Show whether DF, KDB, RT, GL, etc.): 3041 feet

22. Approximate date work will start*: 10/01/2019

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) | BRIAN WOOD / Ph: (505)466-8120 | 07/16/2019 |

Title: President

| Approved by *(Signature)* | Name *(Printed/Typed)* | Date |
|---|---|---|
| (Electronic Submission) | Cody Layton / Ph: (575)234-5959 | 08/11/2020 |

| 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

(Continued on page 2)

*(Instructions on page 2)

**Approval Date: 08/11/2020**

Entered - KMS NMOCD

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| [1] API Number | [2] Pool Code | [3] Pool Name |
|---|---|---|
| 30-015- 47331 | 98220 | PURPLE SAGE; WOLFCAMP (GAS) |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| 325748 | RANA SALADA FED COM 0504 | 216H |

| [7] OGRID No. | [8] Operator Name | [9] Elevation |
|---|---|---|
| 372920 | NOVO OIL & GAS NORTHERN DELAWARE, LLC | 3041.1 |

## [10] Surface Location

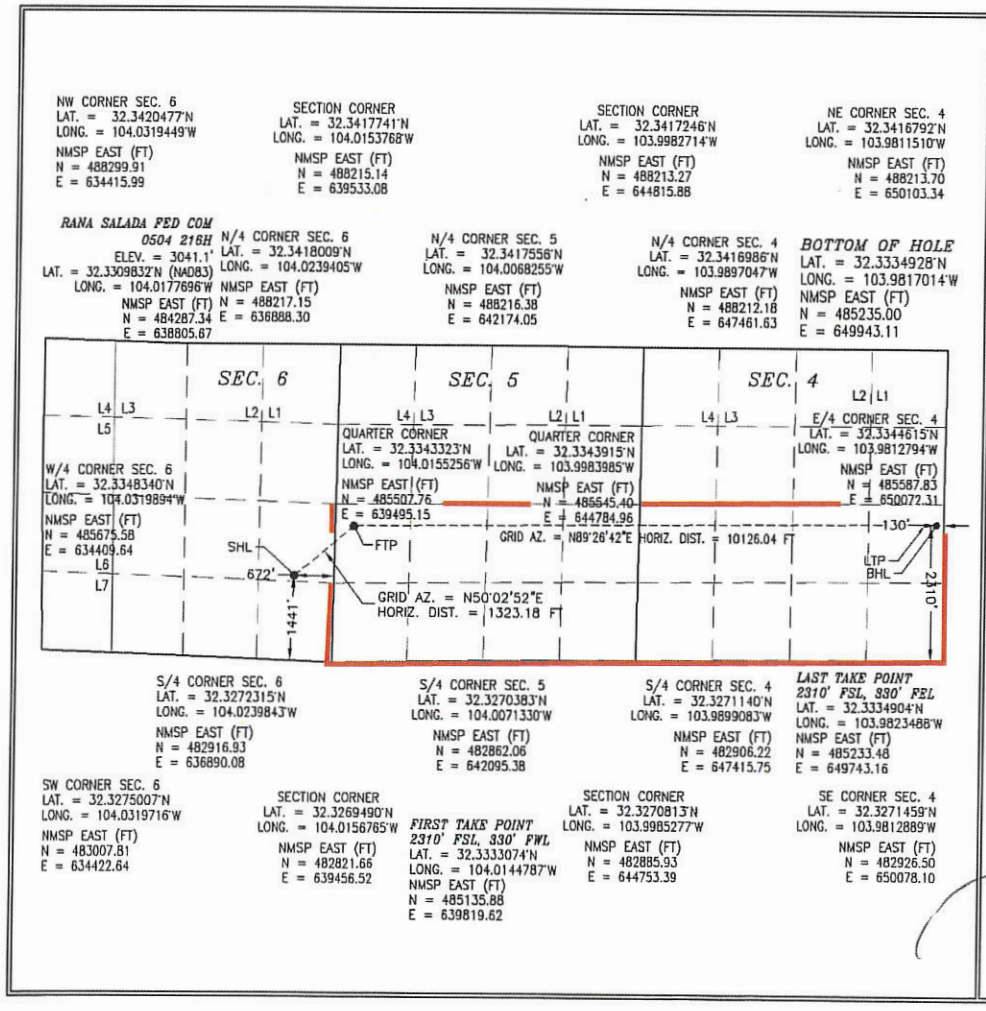
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| I | 6 | 23 S | 29 E | | 1441 | SOUTH | 672 | EAST | EDDY |

## [11] Bottom Hole Location If Different From Surface

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| I | 4 | 23 S | 29 E | | 2310 | SOUTH | 130 | EAST | EDDY |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| 640 | | C | |

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.




## [17] OPERATOR CERTIFICATION

*I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.*

7-4-19
Signature Date

BRIAN WOOD
Printed Name

brian@permitswest.com
E-mail Address

(505) 466-8120

## [18] SURVEYOR CERTIFICATION

*I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.*

APRIL 18, 2019
Date of Survey

FILIMON F. JARAMILLO
NEW MEXICO
12797
REGISTERED PROFESSIONAL SURVEYOR

Signature and Seal of Professional Surveyor:

Certificate Number: FILIMON F. JARAMILLO, PLS 12797

SURVEY NO. 7192

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

Submit Original
to Appropriate
District Office

# GAS CAPTURE PLAN

Date: 6/30/2019

X Original Operator & OGRID No.: Novo Oil & Gas Northern Delaware, LLC (372920)
□ Amended - Reason for Amendment: _____

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

*Note: A C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule 19.15.18.12.A*

## Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

| Well | API | SHL (ULSTR) | SHL Footages | Expected MCF/D | Flared or Vented | Comments |
|---|---|---|---|---|---|---|
| Rana Salada Fed Com 0504 136H | 30-015- | I-6-23S-29E | 1442 FSL & 652 FEL | 2500 | 30 days | Time depends on well clean up |
| Rana Salada Fed Com 0504 213H | 30-015- | I-6-23S-29E | 1442 FSL & 632 FEL | 7500 | 30 days | Time depends on well clean up |
| Rana Salada Fed Com 0504 216H | 30-015- | I-6-23S-29E | 1441 FSL & 672 FEL | 7500 | 30 days | Time depends on well clean up |
| Rana Salada Fed Com 0504 223H | 30-015- | P-6-23S-29E | 1240 FSL & 689 FEL | 7500 | 30 days | Time depends on well clean up |
| Rana Salada Fed Com 0504 226H | 30-015- | I-6-23S-29E | 1440 FSL & 692 FEL | 7500 | 30 days | Time depends on well clean up |
| Rana Salada Fed Com 0504 223H | 30-015- | P-6-23S-29E | 1240 FSL & 709 FEL | 7500 | 30 days | Time depends on well clean up |

## Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is not yet dedicated. However, negotiations are underway. One possible connection is an existing Enterprise line that is 100 yards south. Novo Oil & Gas Northern Delaware, LLC will provide (periodically) to its Gas Transporter a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Novo Oil & Gas Northern Delaware, LLC and its Gas Transporter have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at an as yet undetermined Gas Transporter Processing Plant located in Eddy County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

## Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on its Gas Transporter system at that time. Based on current information, it is Novo Oil & Gas Northern Delaware, LLC's belief an existing or new system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

**Alternatives to Reduce Flaring**

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

Intent YES As Drilled

| API # |
|---|
| |

| Operator Name: | Property Name: | Well Number |
|---|---|---|
| NOVO OIL & GAS NORTHERN DELAWARE,LLC | RANA SALADA FED COM 0504 | 216H |

Kick Off Point (KOP)

| UL | Section | Township | Range | Lot | Feet | From N/S | Feet | From E/W | County |
|---|---|---|---|---|---|---|---|---|---|
| I | 6 | 23S | 29E | | 1441 | SOUTH | 672 | EAST | EDDY |

| Latitude | Longitude | NAD |
|---|---|---|
| 32.3309832 | 104.0177696 | 83 |

First Take Point (FTP)

| UL | Section | Township | Range | Lot | Feet | From N/S | Feet | From E/W | County |
|---|---|---|---|---|---|---|---|---|---|
| L | 5 | 23S | 29E | | 2310 | SOUTH | 330 | WEST | EDDY |

| Latitude | Longitude | NAD |
|---|---|---|
| 32.3333074 | 104.0144787 | 83 |

Last Take Point (LTP)

| UL | Section | Township | Range | Lot | Feet | From N/S | Feet | From E/W | County |
|---|---|---|---|---|---|---|---|---|---|
| I | 4 | 23S | 29E | | 2310 | SOUTH | 330 | EAST | EDDY |

| Latitude | Longitude | NAD |
|---|---|---|
| 32.3334904 | 103.9823488 | 83 |

Is this well the defining well for the Horizontal Spacing Unit? NO

Is this well an infill well? YES

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

| API # 30-015-46087<br>30-015-46088 |
|---|

| Operator Name: | Property Name: | Well Number |
|---|---|---|
| Novo Oil & Gas Northern Delaware, LLC | Rana Salada Fed Com 0504<br>(OCD property code 325748) | 214H<br>234H |

KZ 06/29/2018

# PECOS DISTRICT
# DRILLING CONDITIONS OF APPROVAL

| | |
|---|---|
| **OPERATOR'S NAME:** | **NOVO OIL & GAS NORTHERN DELAWARE** |
| **LEASE NO.:** | **NMNM059383** |
| **WELL NAME & NO.:** | **Rana Salada Fed Com 0504 216H** |
| **SURFACE HOLE FOOTAGE:** | **1441'/S & 672'/E** |
| **BOTTOM HOLE FOOTAGE** | **2310'/S & 130'/E** |
| **LOCATION:** | **Section 6, T.23 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 |
| Cave/Karst Potential | ○ Critical | | |
| 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 **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

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

**<u>24 hours in the Potash Area</u>** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

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

2. The minimum required fill of cement behind the **9-5/8** inch 1st intermediate casing is:

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash. Excess cement calculates to 16%, additional cement might be required.**

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

❖ In <u>R111 Potash Areas</u> if cement does not circulate to surface on the first two salt protection casing strings, the cement on the 3rd casing string must come to surface.

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

3. The minimum required fill of cement behind the **7-5/8** inch 2nd intermediate casing is:

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. **Excess cement calculates to 16%, additional cement might be required.**

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

    - Cement should tie-back **200 feet** into the previous casing. Operator shall provide method of verification. **Excess cement calculates to 19%, additional cement might be required.**

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

## D. SPECIAL REQUIREMENT (S)

**Communitization Agreement**

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.
  **JJP272020**

# 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)

☒ 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. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

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

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

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

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

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

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

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

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

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

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. 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, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug 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.

**APD ID:** 10400043458 **Submission Date:** 07/16/2019

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** RANA SALADA FED COM 0504 **Well Number:** 216H

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

Highlighted data reflects the most recent changes

Show Final Text

## Section 1 - Geologic Formations

| Formation ID | Formation Name | Elevation | True Vertical Depth | Measured Depth | Lithologies | Mineral Resources | Producing Formation |
|---|---|---|---|---|---|---|---|
| 494148 | QUATERNARY | 3041 | 0 | 0 | | USEABLE WATER | N |
| 494149 | RUSTLER ANHYDRITE | 2763 | 278 | 278 | | NONE | N |
| 494150 | SALADO | 2257 | 784 | 784 | SALT | NONE | N |
| 494137 | CASTILE | 1610 | 1431 | 1431 | ANHYDRITE | NONE | N |
| 494138 | BASE OF SALT | 175 | 2866 | 2880 | | NONE | N |
| 494142 | BELL CANYON | 175 | 2866 | 2880 | SANDSTONE | NATURAL GAS, OIL | N |
| 494151 | CHERRY CANYON | -920 | 3961 | 3998 | SANDSTONE | NATURAL GAS, OIL | N |
| 494143 | BRUSHY CANYON | -2345 | 5386 | 5456 | SANDSTONE | NATURAL GAS, OIL | N |
| 494144 | BONE SPRING LIME | -3435 | 6476 | 6570 | | NATURAL GAS, OIL | N |
| 494145 | BONE SPRING 1ST | -4520 | 7561 | 7662 | SANDSTONE | NATURAL GAS, OIL | N |
| 494146 | BONE SPRING 2ND | -4775 | 7816 | 7917 | OTHER : Carbonate | NATURAL GAS, OIL | N |
| 494152 | BONE SPRING 2ND | -5265 | 8306 | 8407 | SANDSTONE | NATURAL GAS, OIL | N |
| 494139 | BONE SPRING 3RD | -5625 | 8666 | 8767 | OTHER : Carbonate | NATURAL GAS, OIL | N |
| 494140 | BONE SPRING 3RD | -5940 | 8981 | 9082 | SANDSTONE | NATURAL GAS, OIL | N |
| 494147 | WOLFCAMP | -6775 | 9816 | 9962 | OTHER : XY Carbonate | NATURAL GAS, OIL | N |
| 494141 | WOLFCAMP | -6930 | 9971 | 11650 | OTHER : A Carbonate | NATURAL GAS, OIL | Y |

## Section 2 - Blowout Prevention

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** RANA SALADA FED COM 0504 **Well Number:** 216H

**Pressure Rating (PSI):** 5M **Rating Depth:** 12000

**Equipment:** A 13.625” 5,000-psi BOP system will be installed on a multi-bowl (speed head) wellhead with a 13.625” flanged casing spool. Top flange of casing spool will be set in a cellar below ground level. The BOP system will consist of a single pipe ram on the bottom, mud cross, double pipe ram with blind rams on bottom and pipe rams on top, and annular preventer. Blowout preventer will be installed on top of the 13.375” surface casing and will remain installed to TD of the well.
**Requesting Variance?** YES

**Variance request:** Variance is requested to use a co-flex hose between the BOP system and choke manifold. A co-flex pressure test certificate will be on the location when testing the BOP.
**Testing Procedure:** BOP system will be isolated with a test plug and tested by an independent tester to 250-psi low and 5000-psi high for 10 minutes. All casing strings will be tested in accordance with Onshore Order 2 III.B.1.h.
**Choke Diagram Attachment:**

RS_0504_216H_Choke_20200127094256.pdf

**BOP Diagram Attachment:**

RS_0504_216H_BOP_20190709101202.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 | 17.5 | 13.75 | NEW | API | N | 0 | 350 | 0 | 350 | 3041 | | 350 | J-55 | 54.5 | BUTT | 1.125 | 1.125 | DRY | 1.6 | DRY | 1.6 |
| 2 | OTHER | 12.25 | 9.625 | NEW | API | N | 0 | 2970 | 0 | 2970 | 3041 | | 2970 | J-55 | 40 | BUTT | 1.125 | 1.125 | DRY | 1.6 | DRY | 1.6 |
| 3 | INTERMEDIATE | 8.75 | 7.625 | NEW | API | N | 0 | 9500 | 0 | 9399 | 3041 | | 9500 | HCL-80 | 29.7 | OTHER - TMK UP Ultra SF semi-FJ | 1.125 | 1.125 | DRY | 1.6 | DRY | 1.6 |
| 4 | PRODUCTION | 6.75 | 5.5 | NEW | API | N | 0 | 20444 | 0 | 10149 | 3041 | | 20444 | OTHER | 20 | OTHER - USS Eagle SFH semi-FJ | 1.125 | 1.125 | DRY | 1.6 | DRY | 1.6 |

**Casing Attachments**

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** RANA SALADA FED COM 0504 **Well Number:** 216H

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

RS_0504_216H_Casing_Design_Assumptions_20190709102227.pdf

**Casing ID:** 2 **String Type:** OTHER - Salt Protect

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

RS_0504_216H_Casing_Design_Assumptions_20190709102248.pdf

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

RS_0504_216H_Casing_Design_Assumptions_20190709102334.pdf

7.625_TMK_Ultra_SF_20190709102346.pdf

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** RANA SALADA FED COM 0504 **Well Number:** 216H

**Casing Attachments**

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

**Inspection Document:**

**Spec Document:**

**Tapered String Spec:**

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

RS_0504_216H_Casing_Design_Assumptions_20190709102417.pdf

5.50in__USS_Eagle_SFH_20190709102425.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 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| SURFACE | Tail | | 0 | 350 | 305 | 1.62 | 13.8 | 494 | 100 | Class C | gel + accelerator + LCM |
| OTHER | Lead | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| OTHER | Tail | | 0 | 2970 | 833 | 1.34 | 6.33 | 1116 | 20 | Class C | gel + retarder + LCM |
| INTERMEDIATE | Lead | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| INTERMEDIATE | Tail | | 0 | 9500 | 147 | 2.28 | 11.9 | 335 | 20 | Class C or H | gel + extender + LCM |
| PRODUCTION | Lead | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | None | None |
| PRODUCTION | Tail | | 9000 | 20444 | 667 | 1.72 | 13.2 | 1147 | 20 | Class H | fluid loss + retard + LCM |
| INTERMEDIATE | Lead | 2770 | 2770 | 9500 | 238 | 2.28 | 11.9 | 542 | 20 | Class C or H | gel + extender + LCM |
| INTERMEDIATE | Tail | | 2770 | 9500 | 200 | 1.34 | 14.8 | 268 | 20 | Class C or H | fluid loss + retarder + LCM |

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** RANA SALADA FED COM 0504 **Well Number:** 216H

## 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 (barite, bentonite, LCM) to control weight and fluid loss will be on site at all times. Mud program may change due to hole conditions.

**Describe the mud monitoring system utilized:** An electronic PVT mud system will monitor flow rate, pump pressure, stroke rate, and volume.

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 350 | OTHER : Fresh water spud | 8.3 | 8.3 | | | | | | | |
| 350 | 2970 | OTHER : Brine or cut brine | 9.8 | 10.2 | | | | | | | |
| 2970 | 9500 | OTHER : Brine or LSND | 9.8 | 10.2 | | | | | | | |
| 9500 | 20444 | OIL-BASED MUD | 8.5 | 12.5 | | | | | | | |

## Section 6 - Test, Logging, Coring

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

A 2-person mud logging program will be used from 3000’ to TD. GR will be log will be acquired by MDW tools from the intermediate casing to TD.

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

GR

**Coring operation description for the well:**

No core or drill stem test is planned.

**Operator Name:** NOVO OIL AND GAS NORTHERN DELAWARE LLC

**Well Name:** RANA SALADA FED COM 0504 **Well Number:** 216H

## Section 7 - Pressure

**Anticipated Bottom Hole Pressure:** 6597 **Anticipated Surface Pressure:** 4364.21

**Anticipated Bottom Hole Temperature(F):** 165

**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:**

RS_0504_216H_H2S_Plan_20190709104742.pdf

## Section 8 - Other Information

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

RS_0504_216H_Horizontal_Drill_Plan_20190709121009.pdf

**Other proposed operations facets description:**

**Other proposed operations facets attachment:**

RS_0504_216H_Speedhead_Specs_20190709105319.pdf
RS_0504_216H_Alternative_Casing_Spec_Request_20190709105424.pdf
RS_0504_216H_Anti_Collision_Report_20190709121028.pdf
CoFlex_Certs_20200127094413.pdf

**Other Variance attachment:**

RS_0504_216H_Casing_Cement_Variance_20190709105309.pdf

Novo Oil & Gas Northern Delaware, LLC
Rana Salada Fed Com 0504 216H
SHL 1441' FSL & 672' FEL 6-23S-29E
BHL 2310' FSL & 130' FEL 4-23S-29e
Eddy County, NM



Drilling Program

1. ESTIMATED TOPS

| Formation Name | TVD | MD | Bearing |
|---|---|---|---|
| Quaternary | 0' | 0' | water |
| Rustler anhydrite | 278' | 278' | N/A |
| Salado salt | 784' | 784' | N/A |
| Castile anhydrite | 1431' | 1431' | N/A |
| Base salt | 2866' | 2880' | N/A |
| Bell Canyon sandstone | 2866' | 2880' | hydrocarbons |
| Cherry Canyon sandstone | 3961' | 3998' | hydrocarbons |
| Brushy Canyon sandstone | 5386' | 5456' | hydrocarbons |
| Bone Spring limestone | 6476' | 6570' | hydrocarbons |
| 1st Bone Spring sandstone | 7561' | 7662' | hydrocarbons |
| 2nd Bone Spring carbonate | 7816' | 7917' | hydrocarbons |
| 2nd Bone Spring sandstone | 8306' | 8407' | hydrocarbons |
| 3rd Bone Spring carbonate | 8666' | 8767' | hydrocarbons |
| 3rd Bone Spring sandstone | 8981' | 9082' | hydrocarbons |
| (KOP | 9467' | 9568' | hydrocarbons) |
| Wolfcamp XY carbonate | 9816' | 9962' | hydrocarbons |
| Wolfcamp A carbonate | 9971' | 11650' | hydrocarbons |
| TD | 10149' | 20444' | hydrocarbons |

2. NOTABLE ZONES

Wolfcamp XY and A carbonates are the goal. All perforations will be ≥130' from the dedication perimeter. Closest water well (C 02804) is 0.63 mile southeast. Depth to water was not reported in the 100' deep well.

3. PRESSURE CONTROL

A 13.625" 5,000-psi BOP system will be installed on a multi-bowl (speed head) wellhead with a 13.625" flanged casing spool. Top flange of casing spool will be set in a cellar below ground level. The BOP system will consist of a single pipe ram on the bottom, mud cross, double pipe ram with blind rams on bottom and pipe rams on top, and annular preventer. Blowout preventer will be installed on top of the 13.375" surface casing and will remain installed to TD of the well. Wellhead, blowout preventer, and choke manifold diagram are included.

BOP system will be isolated with a test plug and tested by an independent tester to 250-psi low and 5000-psi high for 10 minutes. Variance is requested to use a co-flex hose between the BOP system and choke manifold. A co-flex pressure test certificate will be on the location when testing the BOP.

All casing strings will be tested in accordance with Onshore Order 2 III.B.1.h.

4. CASING & CEMENT

Variance is requested for the option to use a surface rig to drill the surface hole, set the surface casing, and cement the surface casing. If the schedule between rigs would preclude presetting the surface casing, then the primary rig will MIRU and drill all of the well.

All casing will be API and new. See attached casing assumption worksheet.

Novo Oil & Gas Northern Delaware, LLC
Rana Salada Fed Com 0504 216H
SHL 1441' FSL & 672' FEL 6-23S-29E
BHL 2310' FSL & 130' FEL 4-23S-29e
Eddy County, NM

| Hole O. D. | Set MD | Set TVD | Casing O. D. | Weight (lb/ft) | Grade | Joint | Collapse | Burst | Tension |
|---|---|---|---|---|---|---|---|---|---|
| 17.5" | 0' - 350' | 0' - 350' | 13.375" surface | 54.5 | J-55 | BTC | 1.125 | 1.125 | 1.6 |
| 12.25" | 0' - 2970' | 0' - 2970' | 9.625" other (salt protect) | 40 | J-55 | BTC | 1.125 | 1.125 | 1.6 |
| 8.75" | 0' - 9500' | 0' – 9399' | 7.625" inter. | 29.7 | HCL-80 | TMK UP Ultra SF semi-FJ | 1.125 | 1.125 | 1.6 |
| 6.75" | 0' – 20444' | 0' – 10149' | 5.5" product. | 20 | P-110 HP | USS Eagle SFH semi-FJ | 1.125 | 1.125 | 1.6 |
| 6.75" | 0' – 20444' | 0' – 10149' | 5.5" alternate product. | 23 | P-110 HC | TMK UP Ultra SF semi-FJ | 1.125 | 1.125 | 1.6 |

| Name | Type | Sacks | Yield | Cu. Ft. | Weight | Blend |
|---|---|---|---|---|---|---|
| Surface | Tail | 305 | 1.62 | 494 | 13.8 | Class C + gel + accelerator + LCM |
| TOC = GL | | 100% Excess | | | Centralizers on every jt to GL | |
| Other – Salt Protection | Tail | 833 | 1.34 | 1116 | 6.33 | Class C + gel + retarder + LCM |
| TOC = GL | | 20% Excess | | | Centralizers on bottom 3 jts and then 1 centralizer every 4th jt to GL | |
| Intermediate stage 1 (stage tool set @ 2770') | Lead | 238 | 2.28 | 542 | 11.9 | Class C or H + gel + extender + LCM |
| | Tail | 200 | 1.34 | 268 | 14.8 | Class C or H+ fluid loss + retarder + LCM |
| TOC = 2770' | | 20% Excess | | | Centralizers on bottom 3 jts and then 1 centralizer every 4th jt to GL | |
| Intermediate stage 2 | Tail | 147 | 2.28 | 335 | 11.9 | Class C or H + gel + extender + LCM |
| TOC = GL | | 20% Excess | | | Centralizers on bottom 3 jts and then 1 centralizer every 4th jt to TOC | |
| Production | Tail | 667 | 1.72 | 1147 | 13.2 | Class H + fluid loss + retard + LCM |
| TOC = 9000' | | 20% Excess | | | No centralizers planned | |

5. MUD PROGRAM

An electronic PVT mud system will monitor flow rate, pump pressure, stroke rate, and volume. All necessary mud products (barite, bentonite, LCM) to control weight and fluid loss will be on site at all times. Mud program may change due to hole conditions. A closed loop system will be used.

| Type | Interval (MD) | lb/gal | Viscosity | Fluid Loss |
|---|---|---|---|---|
| fresh water spud | 0' - 350' | 8.3 | 30 - 60 | NC |
| brine or cut brine | 350' - 2970' | 9.8 – 10.2 | 35 - 45 | NC |
| Brine or LSND | 2970' - 9500' | 9.8 – 10.2 | 35 - 45 | NC |
| OBM | 9500' – 20444' | 8.5 - 12.5 | 35 - 65 | 4 - 6 |

6. CORES, TESTS, & LOGS

No core or drill stem test is planned. A 2-person mud logging program will be used from ≈3000' to TD. GR will be log will be acquired by MDW tools from the intermediate casing to TD.

7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is ≈5321 psi. Expected bottom hole temperature is ≈165° F.

An H2S plan is attached.

8. OTHER INFORMATION

Anticipated spud date is upon approval. It is expected it will take ≈3-4 months to drill and complete the well.

# RANA SALADA FED COM 0504 216H

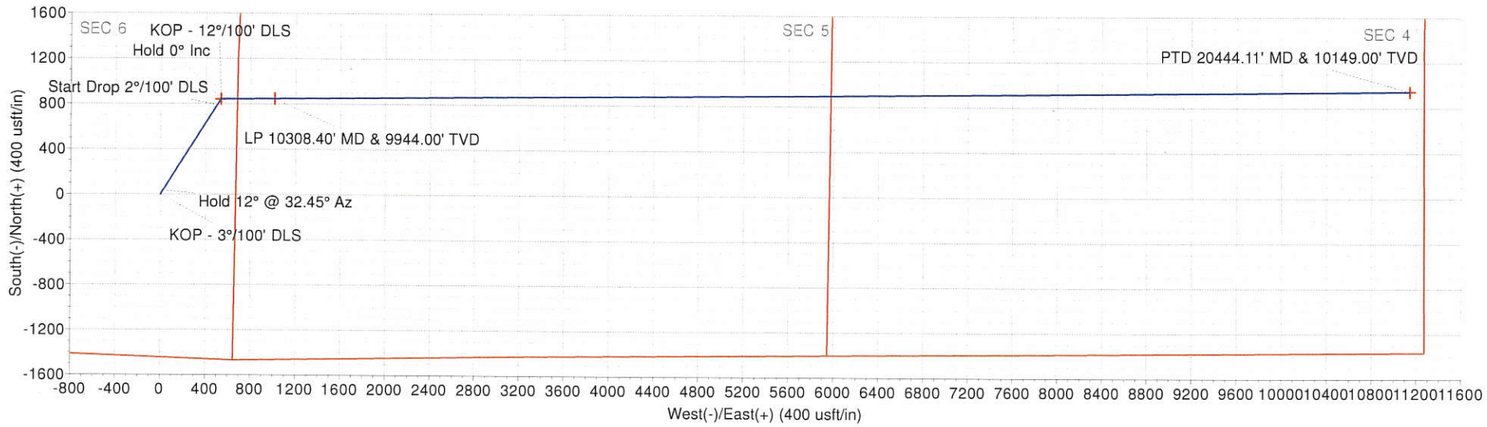
NOVO

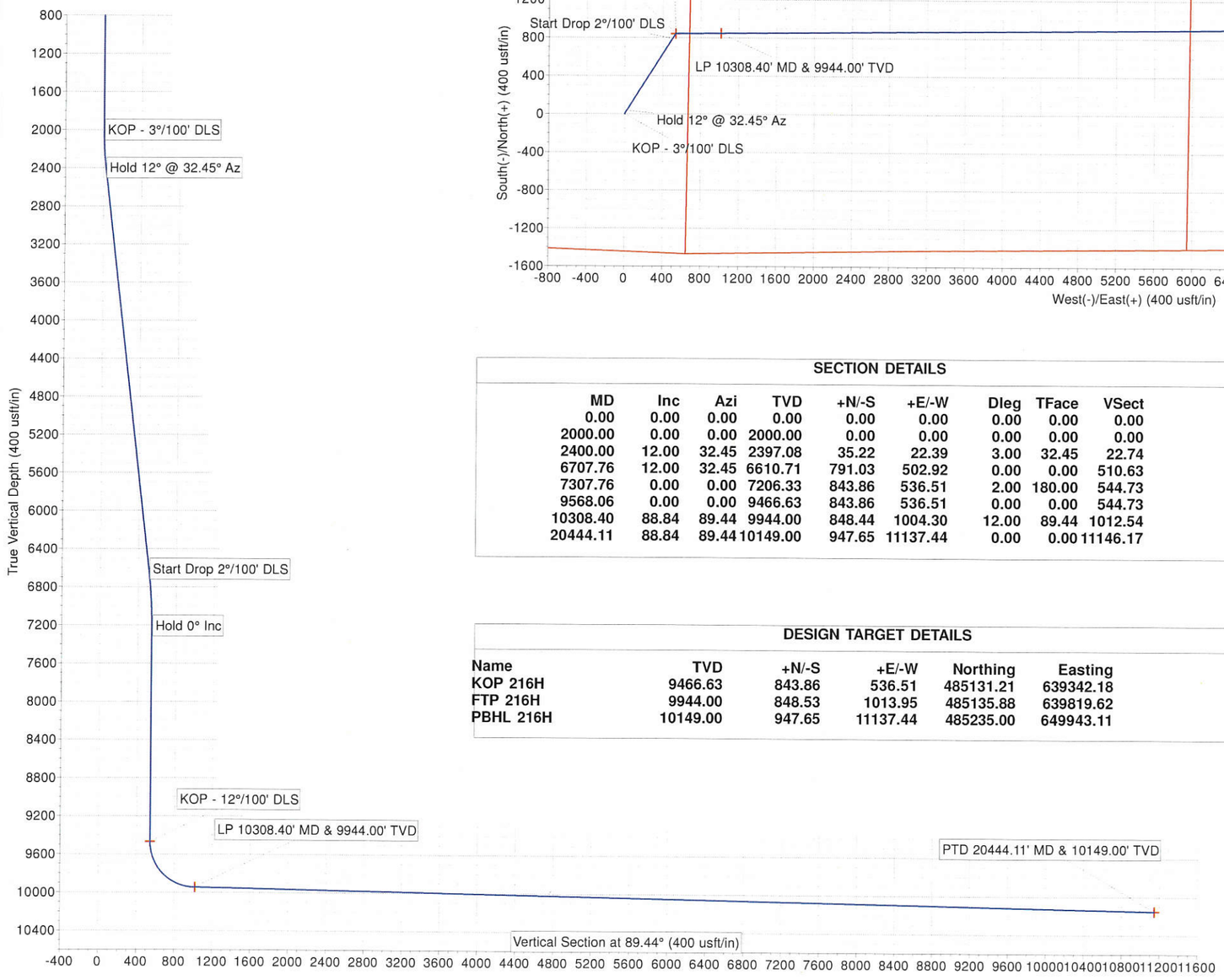
| | |
|---|---|
| Project: | EDDY CO., NEW MEXICO (NM27E) |
| Site: | SEC 06-T23S-R29E |
| Well: | RANA SALADA FED COM 0504 216H |
| Wellbore: | 216H |
| Design: | PLAN 1 V1 |

**WELL DETAILS: RANA SALADA FED COM 0504 216H**

3041.10

| +N/-S | +E/-W | Northing | Easting | Latittude | Longitude |
|---|---|---|---|---|---|
| 0.00 | 0.00 | 484287.35 | 638805.67 | 32.33098 | -104.01777 |




**SECTION DETAILS**

| MD | Inc | Azi | TVD | +N/-S | +E/-W | Dleg | TFace | VSect |
|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2000.00 | 0.00 | 0.00 | 2000.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2400.00 | 12.00 | 32.45 | 2397.08 | 35.22 | 22.39 | 3.00 | 32.45 | 22.74 |
| 6707.76 | 12.00 | 32.45 | 6610.71 | 791.03 | 502.92 | 0.00 | 0.00 | 510.63 |
| 7307.76 | 0.00 | 0.00 | 7206.33 | 843.86 | 536.51 | 2.00 | 180.00 | 544.73 |
| 9568.06 | 0.00 | 0.00 | 9466.63 | 843.86 | 536.51 | 0.00 | 0.00 | 544.73 |
| 10308.40 | 88.84 | 89.44 | 9944.00 | 848.44 | 1004.30 | 12.00 | 89.44 | 1012.54 |
| 20444.11 | 88.84 | 89.44 | 10149.00 | 947.65 | 11137.44 | 0.00 | 0.00 | 11146.17 |

**DESIGN TARGET DETAILS**

| Name | TVD | +N/-S | +E/-W | Northing | Easting |
|---|---|---|---|---|---|
| KOP 216H | 9466.63 | 843.86 | 536.51 | 485131.21 | 639342.18 |
| FTP 216H | 9944.00 | 848.53 | 1013.95 | 485135.88 | 639819.62 |
| PBHL 216H | 10149.00 | 947.65 | 11137.44 | 485235.00 | 649943.11 |

| | | | |
|---|---|---|---|
| **Company:** | NOVO OIL & GAS, LLC | **Local Co-ordinate Reference:** | Well RANA SALADA FED COM 0504 216H |
| **Project:** | EDDY CO., NEW MEXICO (NM27E) | **TVD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Site:** | SEC 06-T23S-R29E | **MD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Well:** | RANA SALADA FED COM 0504 216H | **North Reference:** | Grid |
| **Wellbore:** | 216H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | PLAN 1 V1 | **Database:** | EDM 5000.15 Single User Db |

**Project** EDDY CO., NEW MEXICO (NM27E)

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

**Site** SEC 06-T23S-R29E

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 484,087.23usft | **Latitude:** | 32.33043 |
| **From:** | Map | **Easting:** | 638,836.04usft | **Longitude:** | -104.01767 |
| **Position Uncertainty:** | 0.00 usft | **Slot Radius:** | 13-3/16" | **Grid Convergence:** | 0.17 ° |

**Well** RANA SALADA FED COM 0504 216H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.00 usft | **Northing:** | 484,287.35 usft | **Latitude:** | 32.33098 |
| | **+E/-W** | 0.00 usft | **Easting:** | 638,805.67 usft | **Longitude:** | -104.01777 |
| **Position Uncertainty** | | 0.00 usft | **Wellhead Elevation:** | 3,041.10 usft | **Ground Level:** | 3,041.10usft |

**Wellbore** 216H

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2015 | 05/17/19 | 6.96 | 60.07 | 47,760.15178415 |

**Design** PLAN 1 V1

**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 | 89.44 |

**Survey Tool Program** **Date** 05/28/19

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.00 | 20,444.11 | PLAN 1 V1 (216H) | MWD | OWSG MWD - Standard |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) |
|---|---|---|---|---|---|---|---|
| 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 |
| 200.00 | 0.00 | 0.00 | 200.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 300.00 | 0.00 | 0.00 | 300.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 400.00 | 0.00 | 0.00 | 400.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 500.00 | 0.00 | 0.00 | 500.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 600.00 | 0.00 | 0.00 | 600.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 700.00 | 0.00 | 0.00 | 700.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 800.00 | 0.00 | 0.00 | 800.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 900.00 | 0.00 | 0.00 | 900.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,000.00 | 0.00 | 0.00 | 1,000.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,100.00 | 0.00 | 0.00 | 1,100.00 | 0.00 | 0.00 | 0.00 | 0.00 |

| | | | |
|---|---|---|---|
| **Company:** | NOVO OIL & GAS, LLC | **Local Co-ordinate Reference:** | Well RANA SALADA FED COM 0504 216H |
| **Project:** | EDDY CO., NEW MEXICO (NM27E) | **TVD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Site:** | SEC 06-T23S-R29E | **MD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Well:** | RANA SALADA FED COM 0504 216H | **North Reference:** | Grid |
| **Wellbore:** | 216H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | PLAN 1 V1 | **Database:** | EDM 5000.15 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) |
|---|---|---|---|---|---|---|---|
| 1,200.00 | 0.00 | 0.00 | 1,200.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,300.00 | 0.00 | 0.00 | 1,300.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,400.00 | 0.00 | 0.00 | 1,400.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,500.00 | 0.00 | 0.00 | 1,500.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,600.00 | 0.00 | 0.00 | 1,600.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,700.00 | 0.00 | 0.00 | 1,700.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,800.00 | 0.00 | 0.00 | 1,800.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1,900.00 | 0.00 | 0.00 | 1,900.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2,000.00 | 0.00 | 0.00 | 2,000.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **KOP - 3°/100' DLS** | | | | | | | |
| 2,100.00 | 3.00 | 32.45 | 2,099.95 | 2.21 | 1.40 | 1.43 | 3.00 |
| 2,200.00 | 6.00 | 32.45 | 2,199.63 | 8.83 | 5.61 | 5.70 | 3.00 |
| 2,300.00 | 9.00 | 32.45 | 2,298.77 | 19.84 | 12.62 | 12.81 | 3.00 |
| 2,400.00 | 12.00 | 32.45 | 2,397.08 | 35.22 | 22.39 | 22.74 | 3.00 |
| **Hold 12° @ 32.45° Az** | | | | | | | |
| 2,500.00 | 12.00 | 32.45 | 2,494.90 | 52.76 | 33.55 | 34.06 | 0.00 |
| 2,600.00 | 12.00 | 32.45 | 2,592.71 | 70.31 | 44.70 | 45.39 | 0.00 |
| 2,700.00 | 12.00 | 32.45 | 2,690.53 | 87.86 | 55.86 | 56.71 | 0.00 |
| 2,800.00 | 12.00 | 32.45 | 2,788.34 | 105.40 | 67.01 | 68.04 | 0.00 |
| 2,900.00 | 12.00 | 32.45 | 2,886.16 | 122.95 | 78.17 | 79.36 | 0.00 |
| 3,000.00 | 12.00 | 32.45 | 2,983.97 | 140.49 | 89.32 | 90.69 | 0.00 |
| 3,100.00 | 12.00 | 32.45 | 3,081.79 | 158.04 | 100.48 | 102.02 | 0.00 |
| 3,200.00 | 12.00 | 32.45 | 3,179.60 | 175.58 | 111.63 | 113.34 | 0.00 |
| 3,300.00 | 12.00 | 32.45 | 3,277.41 | 193.13 | 122.79 | 124.67 | 0.00 |
| 3,400.00 | 12.00 | 32.45 | 3,375.23 | 210.67 | 133.94 | 135.99 | 0.00 |
| 3,500.00 | 12.00 | 32.45 | 3,473.04 | 228.22 | 145.10 | 147.32 | 0.00 |
| 3,600.00 | 12.00 | 32.45 | 3,570.86 | 245.76 | 156.25 | 158.65 | 0.00 |
| 3,700.00 | 12.00 | 32.45 | 3,668.67 | 263.31 | 167.41 | 169.97 | 0.00 |
| 3,800.00 | 12.00 | 32.45 | 3,766.49 | 280.85 | 178.56 | 181.30 | 0.00 |
| 3,900.00 | 12.00 | 32.45 | 3,864.30 | 298.40 | 189.72 | 192.62 | 0.00 |
| 4,000.00 | 12.00 | 32.45 | 3,962.12 | 315.94 | 200.87 | 203.95 | 0.00 |
| 4,100.00 | 12.00 | 32.45 | 4,059.93 | 333.49 | 212.03 | 215.28 | 0.00 |
| 4,200.00 | 12.00 | 32.45 | 4,157.75 | 351.04 | 223.18 | 226.60 | 0.00 |
| 4,300.00 | 12.00 | 32.45 | 4,255.56 | 368.58 | 234.34 | 237.93 | 0.00 |
| 4,400.00 | 12.00 | 32.45 | 4,353.38 | 386.13 | 245.49 | 249.25 | 0.00 |
| 4,500.00 | 12.00 | 32.45 | 4,451.19 | 403.67 | 256.65 | 260.58 | 0.00 |
| 4,600.00 | 12.00 | 32.45 | 4,549.01 | 421.22 | 267.80 | 271.91 | 0.00 |
| 4,700.00 | 12.00 | 32.45 | 4,646.82 | 438.76 | 278.96 | 283.23 | 0.00 |
| 4,800.00 | 12.00 | 32.45 | 4,744.64 | 456.31 | 290.11 | 294.56 | 0.00 |
| 4,900.00 | 12.00 | 32.45 | 4,842.45 | 473.85 | 301.27 | 305.88 | 0.00 |
| 5,000.00 | 12.00 | 32.45 | 4,940.27 | 491.40 | 312.42 | 317.21 | 0.00 |
| 5,100.00 | 12.00 | 32.45 | 5,038.08 | 508.94 | 323.58 | 328.54 | 0.00 |
| 5,200.00 | 12.00 | 32.45 | 5,135.90 | 526.49 | 334.73 | 339.86 | 0.00 |
| 5,300.00 | 12.00 | 32.45 | 5,233.71 | 544.03 | 345.89 | 351.19 | 0.00 |
| 5,400.00 | 12.00 | 32.45 | 5,331.52 | 561.58 | 357.04 | 362.51 | 0.00 |

| | | | |
|---|---|---|---|
| **Company:** | NOVO OIL & GAS, LLC | **Local Co-ordinate Reference:** | Well RANA SALADA FED COM 0504 216H |
| **Project:** | EDDY CO., NEW MEXICO (NM27E) | **TVD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Site:** | SEC 06-T23S-R29E | **MD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Well:** | RANA SALADA FED COM 0504 216H | **North Reference:** | Grid |
| **Wellbore:** | 216H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | PLAN 1 V1 | **Database:** | EDM 5000.15 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) |
|---|---|---|---|---|---|---|---|
| 5,500.00 | 12.00 | 32.45 | 5,429.34 | 579.13 | 368.20 | 373.84 | 0.00 |
| 5,600.00 | 12.00 | 32.45 | 5,527.15 | 596.67 | 379.35 | 385.16 | 0.00 |
| 5,700.00 | 12.00 | 32.45 | 5,624.97 | 614.22 | 390.51 | 396.49 | 0.00 |
| 5,800.00 | 12.00 | 32.45 | 5,722.78 | 631.76 | 401.66 | 407.82 | 0.00 |
| 5,900.00 | 12.00 | 32.45 | 5,820.60 | 649.31 | 412.82 | 419.14 | 0.00 |
| 6,000.00 | 12.00 | 32.45 | 5,918.41 | 666.85 | 423.97 | 430.47 | 0.00 |
| 6,100.00 | 12.00 | 32.45 | 6,016.23 | 684.40 | 435.13 | 441.79 | 0.00 |
| 6,200.00 | 12.00 | 32.45 | 6,114.04 | 701.94 | 446.28 | 453.12 | 0.00 |
| 6,300.00 | 12.00 | 32.45 | 6,211.86 | 719.49 | 457.44 | 464.45 | 0.00 |
| 6,400.00 | 12.00 | 32.45 | 6,309.67 | 737.03 | 468.59 | 475.77 | 0.00 |
| 6,500.00 | 12.00 | 32.45 | 6,407.49 | 754.58 | 479.75 | 487.10 | 0.00 |
| 6,600.00 | 12.00 | 32.45 | 6,505.30 | 772.12 | 490.90 | 498.42 | 0.00 |
| 6,707.76 | 12.00 | 32.45 | 6,610.71 | 791.03 | 502.92 | 510.63 | 0.00 |
| **Start Drop 2°/100' DLS** | | | | | | | |
| 6,800.00 | 10.16 | 32.45 | 6,701.22 | 805.99 | 512.43 | 520.28 | 2.00 |
| 6,900.00 | 8.16 | 32.45 | 6,799.95 | 819.41 | 520.97 | 528.95 | 2.00 |
| 7,000.00 | 6.16 | 32.45 | 6,899.16 | 829.92 | 527.65 | 535.74 | 2.00 |
| 7,100.00 | 4.16 | 32.45 | 6,998.75 | 837.51 | 532.47 | 540.63 | 2.00 |
| 7,200.00 | 2.16 | 32.45 | 7,098.60 | 842.15 | 535.42 | 543.63 | 2.00 |
| 7,307.76 | 0.00 | 0.00 | 7,206.33 | 843.86 | 536.51 | 544.73 | 2.00 |
| **Hold 0° Inc** | | | | | | | |
| 7,400.00 | 0.00 | 0.00 | 7,298.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 7,500.00 | 0.00 | 0.00 | 7,398.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 7,600.00 | 0.00 | 0.00 | 7,498.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 7,700.00 | 0.00 | 0.00 | 7,598.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 7,800.00 | 0.00 | 0.00 | 7,698.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 7,900.00 | 0.00 | 0.00 | 7,798.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,000.00 | 0.00 | 0.00 | 7,898.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,100.00 | 0.00 | 0.00 | 7,998.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,200.00 | 0.00 | 0.00 | 8,098.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,300.00 | 0.00 | 0.00 | 8,198.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,400.00 | 0.00 | 0.00 | 8,298.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,500.00 | 0.00 | 0.00 | 8,398.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,600.00 | 0.00 | 0.00 | 8,498.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,700.00 | 0.00 | 0.00 | 8,598.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,800.00 | 0.00 | 0.00 | 8,698.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 8,900.00 | 0.00 | 0.00 | 8,798.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 9,000.00 | 0.00 | 0.00 | 8,898.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 9,100.00 | 0.00 | 0.00 | 8,998.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 9,200.00 | 0.00 | 0.00 | 9,098.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 9,300.00 | 0.00 | 0.00 | 9,198.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 9,400.00 | 0.00 | 0.00 | 9,298.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 9,500.00 | 0.00 | 0.00 | 9,398.57 | 843.86 | 536.51 | 544.73 | 0.00 |
| 9,568.06 | 0.00 | 0.00 | 9,466.63 | 843.86 | 536.51 | 544.73 | 0.00 |
| **KOP - 12°/100' DLS - KOP 216H** | | | | | | | |

| | | | |
|---|---|---|---|
| **Company:** | NOVO OIL & GAS, LLC | **Local Co-ordinate Reference:** | Well RANA SALADA FED COM 0504 216H |
| **Project:** | EDDY CO., NEW MEXICO (NM27E) | **TVD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Site:** | SEC 06-T23S-R29E | **MD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Well:** | RANA SALADA FED COM 0504 216H | **North Reference:** | Grid |
| **Wellbore:** | 216H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | PLAN 1 V1 | **Database:** | EDM 5000.15 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) |
|---|---|---|---|---|---|---|---|
| 9,575.00 | 0.83 | 89.44 | 9,473.57 | 843.86 | 536.56 | 544.78 | 12.00 |
| 9,600.00 | 3.83 | 89.44 | 9,498.55 | 843.87 | 537.58 | 545.80 | 12.00 |
| 9,625.00 | 6.83 | 89.44 | 9,523.44 | 843.89 | 539.90 | 548.12 | 12.00 |
| 9,650.00 | 9.83 | 89.44 | 9,548.17 | 843.93 | 543.52 | 551.75 | 12.00 |
| 9,675.00 | 12.83 | 89.44 | 9,572.68 | 843.98 | 548.44 | 556.66 | 12.00 |
| 9,700.00 | 15.83 | 89.44 | 9,596.90 | 844.04 | 554.62 | 562.85 | 12.00 |
| 9,725.00 | 18.83 | 89.44 | 9,620.76 | 844.11 | 562.07 | 570.29 | 12.00 |
| 9,750.00 | 21.83 | 89.44 | 9,644.20 | 844.20 | 570.76 | 578.98 | 12.00 |
| 9,775.00 | 24.83 | 89.44 | 9,667.15 | 844.29 | 580.66 | 588.88 | 12.00 |
| 9,800.00 | 27.83 | 89.44 | 9,689.56 | 844.40 | 591.74 | 599.97 | 12.00 |
| 9,825.00 | 30.83 | 89.44 | 9,711.35 | 844.52 | 603.99 | 612.21 | 12.00 |
| 9,850.00 | 33.83 | 89.44 | 9,732.47 | 844.65 | 617.36 | 625.58 | 12.00 |
| 9,875.00 | 36.83 | 89.44 | 9,752.86 | 844.79 | 631.81 | 640.04 | 12.00 |
| 9,900.00 | 39.83 | 89.44 | 9,772.47 | 844.95 | 647.32 | 655.54 | 12.00 |
| 9,925.00 | 42.83 | 89.44 | 9,791.24 | 845.11 | 663.82 | 672.05 | 12.00 |
| 9,950.00 | 45.83 | 89.44 | 9,809.12 | 845.28 | 681.29 | 689.52 | 12.00 |
| 9,975.00 | 48.83 | 89.44 | 9,826.06 | 845.46 | 699.67 | 707.90 | 12.00 |
| 10,000.00 | 51.83 | 89.44 | 9,842.02 | 845.65 | 718.91 | 727.14 | 12.00 |
| 10,025.00 | 54.83 | 89.44 | 9,856.95 | 845.84 | 738.96 | 747.19 | 12.00 |
| 10,050.00 | 57.83 | 89.44 | 9,870.80 | 846.05 | 759.77 | 768.00 | 12.00 |
| 10,075.00 | 60.83 | 89.44 | 9,883.55 | 846.26 | 781.27 | 789.50 | 12.00 |
| 10,100.00 | 63.83 | 89.44 | 9,895.16 | 846.47 | 803.40 | 811.64 | 12.00 |
| 10,125.00 | 66.83 | 89.44 | 9,905.59 | 846.70 | 826.12 | 834.35 | 12.00 |
| 10,150.00 | 69.83 | 89.44 | 9,914.82 | 846.92 | 849.35 | 857.59 | 12.00 |
| 10,175.00 | 72.83 | 89.44 | 9,922.82 | 847.16 | 873.03 | 881.27 | 12.00 |
| 10,200.00 | 75.83 | 89.44 | 9,929.57 | 847.39 | 897.10 | 905.34 | 12.00 |
| 10,225.00 | 78.83 | 89.44 | 9,935.05 | 847.63 | 921.48 | 929.73 | 12.00 |
| 10,250.00 | 81.83 | 89.44 | 9,939.25 | 847.87 | 946.13 | 954.37 | 12.00 |
| 10,275.00 | 84.83 | 89.44 | 9,942.15 | 848.11 | 970.95 | 979.20 | 12.00 |
| 10,300.00 | 87.83 | 89.44 | 9,943.75 | 848.36 | 995.90 | 1,004.14 | 12.00 |
| 10,308.40 | 88.84 | 89.44 | 9,944.00 | 848.44 | 1,004.29 | 1,012.54 | 12.00 |
| **LP 10308.40' MD & 9944.00' TVD** | | | | | | | |
| 10,318.06 | 88.84 | 89.44 | 9,944.19 | 848.53 | 1,013.95 | 1,022.19 | 0.00 |
| **FTP 216H** | | | | | | | |
| 10,400.00 | 88.84 | 89.44 | 9,945.85 | 849.34 | 1,095.87 | 1,104.12 | 0.00 |
| 10,500.00 | 88.84 | 89.44 | 9,947.87 | 850.32 | 1,195.84 | 1,204.10 | 0.00 |
| 10,600.00 | 88.84 | 89.44 | 9,949.89 | 851.29 | 1,295.82 | 1,304.08 | 0.00 |
| 10,700.00 | 88.84 | 89.44 | 9,951.92 | 852.27 | 1,395.79 | 1,404.06 | 0.00 |
| 10,800.00 | 88.84 | 89.44 | 9,953.94 | 853.25 | 1,495.77 | 1,504.04 | 0.00 |
| 10,900.00 | 88.84 | 89.44 | 9,955.96 | 854.23 | 1,595.74 | 1,604.02 | 0.00 |
| 11,000.00 | 88.84 | 89.44 | 9,957.99 | 855.21 | 1,695.72 | 1,704.00 | 0.00 |
| 11,100.00 | 88.84 | 89.44 | 9,960.01 | 856.19 | 1,795.69 | 1,803.98 | 0.00 |
| 11,200.00 | 88.84 | 89.44 | 9,962.03 | 857.17 | 1,895.67 | 1,903.96 | 0.00 |
| 11,300.00 | 88.84 | 89.44 | 9,964.05 | 858.15 | 1,995.64 | 2,003.93 | 0.00 |
| 11,400.00 | 88.84 | 89.44 | 9,966.08 | 859.12 | 2,095.62 | 2,103.91 | 0.00 |

| | | | |
|---|---|---|---|
| **Company:** | NOVO OIL & GAS, LLC | **Local Co-ordinate Reference:** | Well RANA SALADA FED COM 0504 216H |
| **Project:** | EDDY CO., NEW MEXICO (NM27E) | **TVD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Site:** | SEC 06-T23S-R29E | **MD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Well:** | RANA SALADA FED COM 0504 216H | **North Reference:** | Grid |
| **Wellbore:** | 216H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | PLAN 1 V1 | **Database:** | EDM 5000.15 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) |
|---|---|---|---|---|---|---|---|
| 11,500.00 | 88.84 | 89.44 | 9,968.10 | 860.10 | 2,195.59 | 2,203.89 | 0.00 |
| 11,600.00 | 88.84 | 89.44 | 9,970.12 | 861.08 | 2,295.57 | 2,303.87 | 0.00 |
| 11,700.00 | 88.84 | 89.44 | 9,972.14 | 862.06 | 2,395.54 | 2,403.85 | 0.00 |
| 11,800.00 | 88.84 | 89.44 | 9,974.17 | 863.04 | 2,495.52 | 2,503.83 | 0.00 |
| 11,900.00 | 88.84 | 89.44 | 9,976.19 | 864.02 | 2,595.49 | 2,603.81 | 0.00 |
| 12,000.00 | 88.84 | 89.44 | 9,978.21 | 865.00 | 2,695.47 | 2,703.79 | 0.00 |
| 12,100.00 | 88.84 | 89.44 | 9,980.23 | 865.98 | 2,795.44 | 2,803.77 | 0.00 |
| 12,200.00 | 88.84 | 89.44 | 9,982.26 | 866.96 | 2,895.42 | 2,903.75 | 0.00 |
| 12,300.00 | 88.84 | 89.44 | 9,984.28 | 867.93 | 2,995.39 | 3,003.73 | 0.00 |
| 12,400.00 | 88.84 | 89.44 | 9,986.30 | 868.91 | 3,095.37 | 3,103.71 | 0.00 |
| 12,500.00 | 88.84 | 89.44 | 9,988.32 | 869.89 | 3,195.34 | 3,203.69 | 0.00 |
| 12,600.00 | 88.84 | 89.44 | 9,990.35 | 870.87 | 3,295.31 | 3,303.67 | 0.00 |
| 12,700.00 | 88.84 | 89.44 | 9,992.37 | 871.85 | 3,395.29 | 3,403.65 | 0.00 |
| 12,800.00 | 88.84 | 89.44 | 9,994.39 | 872.83 | 3,495.26 | 3,503.63 | 0.00 |
| 12,900.00 | 88.84 | 89.44 | 9,996.41 | 873.81 | 3,595.24 | 3,603.61 | 0.00 |
| 13,000.00 | 88.84 | 89.44 | 9,998.44 | 874.79 | 3,695.21 | 3,703.59 | 0.00 |
| 13,100.00 | 88.84 | 89.44 | 10,000.46 | 875.76 | 3,795.19 | 3,803.57 | 0.00 |
| 13,200.00 | 88.84 | 89.44 | 10,002.48 | 876.74 | 3,895.16 | 3,903.55 | 0.00 |
| 13,300.00 | 88.84 | 89.44 | 10,004.50 | 877.72 | 3,995.14 | 4,003.53 | 0.00 |
| 13,400.00 | 88.84 | 89.44 | 10,006.53 | 878.70 | 4,095.11 | 4,103.51 | 0.00 |
| 13,500.00 | 88.84 | 89.44 | 10,008.55 | 879.68 | 4,195.09 | 4,203.48 | 0.00 |
| 13,600.00 | 88.84 | 89.44 | 10,010.57 | 880.66 | 4,295.06 | 4,303.46 | 0.00 |
| 13,700.00 | 88.84 | 89.44 | 10,012.59 | 881.64 | 4,395.04 | 4,403.44 | 0.00 |
| 13,800.00 | 88.84 | 89.44 | 10,014.62 | 882.62 | 4,495.01 | 4,503.42 | 0.00 |
| 13,900.00 | 88.84 | 89.44 | 10,016.64 | 883.60 | 4,594.99 | 4,603.40 | 0.00 |
| 14,000.00 | 88.84 | 89.44 | 10,018.66 | 884.57 | 4,694.96 | 4,703.38 | 0.00 |
| 14,100.00 | 88.84 | 89.44 | 10,020.69 | 885.55 | 4,794.94 | 4,803.36 | 0.00 |
| 14,200.00 | 88.84 | 89.44 | 10,022.71 | 886.53 | 4,894.91 | 4,903.34 | 0.00 |
| 14,300.00 | 88.84 | 89.44 | 10,024.73 | 887.51 | 4,994.89 | 5,003.32 | 0.00 |
| 14,400.00 | 88.84 | 89.44 | 10,026.75 | 888.49 | 5,094.86 | 5,103.30 | 0.00 |
| 14,500.00 | 88.84 | 89.44 | 10,028.78 | 889.47 | 5,194.84 | 5,203.28 | 0.00 |
| 14,600.00 | 88.84 | 89.44 | 10,030.80 | 890.45 | 5,294.81 | 5,303.26 | 0.00 |
| 14,700.00 | 88.84 | 89.44 | 10,032.82 | 891.43 | 5,394.78 | 5,403.24 | 0.00 |
| 14,800.00 | 88.84 | 89.44 | 10,034.84 | 892.40 | 5,494.76 | 5,503.22 | 0.00 |
| 14,900.00 | 88.84 | 89.44 | 10,036.87 | 893.38 | 5,594.73 | 5,603.20 | 0.00 |
| 15,000.00 | 88.84 | 89.44 | 10,038.89 | 894.36 | 5,694.71 | 5,703.18 | 0.00 |
| 15,100.00 | 88.84 | 89.44 | 10,040.91 | 895.34 | 5,794.68 | 5,803.16 | 0.00 |
| 15,200.00 | 88.84 | 89.44 | 10,042.93 | 896.32 | 5,894.66 | 5,903.14 | 0.00 |
| 15,300.00 | 88.84 | 89.44 | 10,044.96 | 897.30 | 5,994.63 | 6,003.12 | 0.00 |
| 15,400.00 | 88.84 | 89.44 | 10,046.98 | 898.28 | 6,094.61 | 6,103.10 | 0.00 |
| 15,500.00 | 88.84 | 89.44 | 10,049.00 | 899.26 | 6,194.58 | 6,203.08 | 0.00 |
| 15,600.00 | 88.84 | 89.44 | 10,051.02 | 900.24 | 6,294.56 | 6,303.06 | 0.00 |
| 15,700.00 | 88.84 | 89.44 | 10,053.05 | 901.21 | 6,394.53 | 6,403.03 | 0.00 |
| 15,800.00 | 88.84 | 89.44 | 10,055.07 | 902.19 | 6,494.51 | 6,503.01 | 0.00 |

| | | | |
|---|---|---|---|
| **Company:** | NOVO OIL & GAS, LLC | **Local Co-ordinate Reference:** | Well RANA SALADA FED COM 0504 216H |
| **Project:** | EDDY CO., NEW MEXICO (NM27E) | **TVD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Site:** | SEC 06-T23S-R29E | **MD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Well:** | RANA SALADA FED COM 0504 216H | **North Reference:** | Grid |
| **Wellbore:** | 216H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | PLAN 1 V1 | **Database:** | EDM 5000.15 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) |
|---|---|---|---|---|---|---|---|
| 15,900.00 | 88.84 | 89.44 | 10,057.09 | 903.17 | 6,594.48 | 6,602.99 | 0.00 |
| 16,000.00 | 88.84 | 89.44 | 10,059.11 | 904.15 | 6,694.46 | 6,702.97 | 0.00 |
| 16,100.00 | 88.84 | 89.44 | 10,061.14 | 905.13 | 6,794.43 | 6,802.95 | 0.00 |
| 16,200.00 | 88.84 | 89.44 | 10,063.16 | 906.11 | 6,894.41 | 6,902.93 | 0.00 |
| 16,300.00 | 88.84 | 89.44 | 10,065.18 | 907.09 | 6,994.38 | 7,002.91 | 0.00 |
| 16,400.00 | 88.84 | 89.44 | 10,067.20 | 908.07 | 7,094.36 | 7,102.89 | 0.00 |
| 16,500.00 | 88.84 | 89.44 | 10,069.23 | 909.04 | 7,194.33 | 7,202.87 | 0.00 |
| 16,600.00 | 88.84 | 89.44 | 10,071.25 | 910.02 | 7,294.30 | 7,302.85 | 0.00 |
| 16,700.00 | 88.84 | 89.44 | 10,073.27 | 911.00 | 7,394.28 | 7,402.83 | 0.00 |
| 16,800.00 | 88.84 | 89.44 | 10,075.30 | 911.98 | 7,494.25 | 7,502.81 | 0.00 |
| 16,900.00 | 88.84 | 89.44 | 10,077.32 | 912.96 | 7,594.23 | 7,602.79 | 0.00 |
| 17,000.00 | 88.84 | 89.44 | 10,079.34 | 913.94 | 7,694.20 | 7,702.77 | 0.00 |
| 17,100.00 | 88.84 | 89.44 | 10,081.36 | 914.92 | 7,794.18 | 7,802.75 | 0.00 |
| 17,200.00 | 88.84 | 89.44 | 10,083.39 | 915.90 | 7,894.15 | 7,902.73 | 0.00 |
| 17,300.00 | 88.84 | 89.44 | 10,085.41 | 916.88 | 7,994.13 | 8,002.71 | 0.00 |
| 17,400.00 | 88.84 | 89.44 | 10,087.43 | 917.85 | 8,094.10 | 8,102.69 | 0.00 |
| 17,500.00 | 88.84 | 89.44 | 10,089.45 | 918.83 | 8,194.08 | 8,202.67 | 0.00 |
| 17,600.00 | 88.84 | 89.44 | 10,091.48 | 919.81 | 8,294.05 | 8,302.65 | 0.00 |
| 17,700.00 | 88.84 | 89.44 | 10,093.50 | 920.79 | 8,394.03 | 8,402.63 | 0.00 |
| 17,800.00 | 88.84 | 89.44 | 10,095.52 | 921.77 | 8,494.00 | 8,502.61 | 0.00 |
| 17,900.00 | 88.84 | 89.44 | 10,097.54 | 922.75 | 8,593.98 | 8,602.58 | 0.00 |
| 18,000.00 | 88.84 | 89.44 | 10,099.57 | 923.73 | 8,693.95 | 8,702.56 | 0.00 |
| 18,100.00 | 88.84 | 89.44 | 10,101.59 | 924.71 | 8,793.93 | 8,802.54 | 0.00 |
| 18,200.00 | 88.84 | 89.44 | 10,103.61 | 925.68 | 8,893.90 | 8,902.52 | 0.00 |
| 18,300.00 | 88.84 | 89.44 | 10,105.63 | 926.66 | 8,993.88 | 9,002.50 | 0.00 |
| 18,400.00 | 88.84 | 89.44 | 10,107.66 | 927.64 | 9,093.85 | 9,102.48 | 0.00 |
| 18,500.00 | 88.84 | 89.44 | 10,109.68 | 928.62 | 9,193.83 | 9,202.46 | 0.00 |
| 18,600.00 | 88.84 | 89.44 | 10,111.70 | 929.60 | 9,293.80 | 9,302.44 | 0.00 |
| 18,700.00 | 88.84 | 89.44 | 10,113.72 | 930.58 | 9,393.77 | 9,402.42 | 0.00 |
| 18,800.00 | 88.84 | 89.44 | 10,115.75 | 931.56 | 9,493.75 | 9,502.40 | 0.00 |
| 18,900.00 | 88.84 | 89.44 | 10,117.77 | 932.54 | 9,593.72 | 9,602.38 | 0.00 |
| 19,000.00 | 88.84 | 89.44 | 10,119.79 | 933.52 | 9,693.70 | 9,702.36 | 0.00 |
| 19,100.00 | 88.84 | 89.44 | 10,121.81 | 934.49 | 9,793.67 | 9,802.34 | 0.00 |
| 19,200.00 | 88.84 | 89.44 | 10,123.84 | 935.47 | 9,893.65 | 9,902.32 | 0.00 |
| 19,300.00 | 88.84 | 89.44 | 10,125.86 | 936.45 | 9,993.62 | 10,002.30 | 0.00 |
| 19,400.00 | 88.84 | 89.44 | 10,127.88 | 937.43 | 10,093.60 | 10,102.28 | 0.00 |
| 19,500.00 | 88.84 | 89.44 | 10,129.90 | 938.41 | 10,193.57 | 10,202.26 | 0.00 |
| 19,600.00 | 88.84 | 89.44 | 10,131.93 | 939.39 | 10,293.55 | 10,302.24 | 0.00 |
| 19,700.00 | 88.84 | 89.44 | 10,133.95 | 940.37 | 10,393.52 | 10,402.22 | 0.00 |
| 19,800.00 | 88.84 | 89.44 | 10,135.97 | 941.35 | 10,493.50 | 10,502.20 | 0.00 |
| 19,900.00 | 88.84 | 89.44 | 10,138.00 | 942.32 | 10,593.47 | 10,602.18 | 0.00 |
| 20,000.00 | 88.84 | 89.44 | 10,140.02 | 943.30 | 10,693.45 | 10,702.16 | 0.00 |
| 20,100.00 | 88.84 | 89.44 | 10,142.04 | 944.28 | 10,793.42 | 10,802.13 | 0.00 |
| 20,200.00 | 88.84 | 89.44 | 10,144.06 | 945.26 | 10,893.40 | 10,902.11 | 0.00 |

| | | | |
|---|---|---|---|
| **Company:** | NOVO OIL & GAS, LLC | **Local Co-ordinate Reference:** | Well RANA SALADA FED COM 0504 216H |
| **Project:** | EDDY CO., NEW MEXICO (NM27E) | **TVD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Site:** | SEC 06-T23S-R29E | **MD Reference:** | GE+25' @ 3066.10usft (RKB) |
| **Well:** | RANA SALADA FED COM 0504 216H | **North Reference:** | Grid |
| **Wellbore:** | 216H | **Survey Calculation Method:** | Minimum Curvature |
| **Design:** | PLAN 1 V1 | **Database:** | EDM 5000.15 Single User Db |

**Planned Survey**

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | N/S (usft) | E/W (usft) | V. Sec (usft) | DLeg (°/100usft) |
|---|---|---|---|---|---|---|---|
| 20,300.00 | 88.84 | 89.44 | 10,146.09 | 946.24 | 10,993.37 | 11,002.09 | 0.00 |
| 20,400.00 | 88.84 | 89.44 | 10,148.11 | 947.22 | 11,093.35 | 11,102.07 | 0.00 |
| 20,444.11 | 88.84 | 89.44 | 10,149.00 | 947.65 | 11,137.44 | 11,146.17 | 0.00 |
| **PTD 20444.11' MD & 10149.00' TVD - PBHL 216H** | | | | | | | |

**Plan Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 2,000.00 | 2,000.00 | 0.00 | 0.00 | KOP - 3°/100' DLS |
| 2,400.00 | 2,397.08 | 35.22 | 22.39 | Hold 12° @ 32.45° Az |
| 6,707.76 | 6,610.71 | 791.03 | 502.92 | Start Drop 2°/100' DLS |
| 7,307.76 | 7,206.33 | 843.86 | 536.51 | Hold 0° Inc |
| 9,568.06 | 9,466.63 | 843.86 | 536.51 | KOP - 12°/100' DLS |
| 10,308.40 | 9,944.00 | 848.44 | 1,004.29 | LP 10308.40' MD & 9944.00' TVD |
| 20,444.11 | 10,149.00 | 947.65 | 11,137.44 | PTD 20444.11' MD & 10149.00' TVD |

Checked By: _____ Approved By: _____ Date: _____

NOVO

## $H_2S$ Drilling Operations Plan

a. All personnel will be trained in $H_2S$ working conditions as required by Onshore Order 6 before drilling out of the surface casing.

b. Two briefing areas will be established. Each will be at least 150' from the wellhead, perpendicular from one another, and easily entered and exited. See $H_2S$ page 5 for more details.

c. $H_2S$ Safety Equipment/Systems:

i. Well Control Equipment

- Flare line will be ≥150' from the wellhead and ignited by a pilot light.
- Beware of $SO_2$ created by flaring.
- Choke manifold will include a remotely operated choke.
- Mud gas separator

ii. Protective Equipment for Essential Personnel

- Every person on site will be required to wear a personal $H_2S$ and $SO_2$ monitor at all times while on site. Monitors will not be worn on hard hats. Monitors will be worn on the front of the chest.
- One self-contained breathing apparatus (SCBA) 30-minute rescue pack will be at each briefing area. Two 30-minute SCBA packs will be stored in the safety trailer.
- Four work/escape packs will be on the rig floor. Each pack will have a long enough hose to allow unimpaired work activity.
- Four emergency escape packs will be in the doghouse for emergency evacuation.
- Hand signals will be used when wearing protective breathing apparatus.
- Stokes litter or stretcher
- Two full OSHA compliant body harnesses
- A 100-foot long x 5/8" OSHA compliant rope
- One 20-pound ABC fire extinguisher

iii. $H_2S$ Detection & Monitoring Equipment

- Every person on site will be required to wear a personal $H_2S$ and $SO_2$ monitor at all times while on site. Monitors will not be worn on hard hats. Monitors will be worn on the front of the chest.
- A stationary detector with three sensors will be in the doghouse.
- Sensors will be installed on the rig floor, bell nipple, and at the end of the flow line or where drilling fluids are discharged.
- Visual alarm will be triggered at 10 ppm.
- Audible alarm will be triggered at 10 ppm.
- Calibration will occur at least every 30 days. Gas sample tubes will be kept in the safety trailer.

iv. Visual Warning System

- Color-coded $H_2S$ condition sign will be set at the entrance to the pad.
- Color-coded condition flag will be installed to indicate current $H_2S$ conditions.
- Two wind socks will be installed that will be visible from all sides.

v. Mud Program

- A water based mud with a pH of $\geq$10 will be maintained to control corrosion, $H_2S$ gas returns to the surface, and minimize sulfide stress cracking and embrittlement.
- Drilling mud containing $H_2S$ gas will be degassed at an optimum location for the rig configuration.
- This gas will be piped into the flare system.
- Enough mud additives will be on location to scavenge and/or neutralize $H_2S$ where formation pressures are unknown.

vi. Metallurgy

- All equipment that has the potential to be exposed to $H_2S$ will be suitable for $H_2S$ service.
- Equipment that will meet these metallurgical standards include the drill string, casing, wellhead, BOP assembly, casing head and spool, rotating head, kill lines, choke, choke manifold and lines, valves, mud-gas separators, DST tools, test units, tubing, flanges, and other related equipment (elastomer packings and seals).

vii. Communication from well site

- Cell phones and/or two-way radios will be used to communicate from the well site.

d. A remote-controlled choke, mud-gas separator, and a rotating head will be installed before drilling or testing any formation expected to contain $H_2S$.

Company Personnel to be Notified

| | |
|---|---|
| Kurt Shipley, Vice-President - Operations | Office: (405) 609-1596 |

Local & County Agencies

| | |
|---|---|
| Loving Fire Department | 911 or (575) 745-3600 |
| Eddy County Sheriff (Carlsbad) | 911 (575) 887-7551 |
| Eddy County Emergency Management (Carlsbad) | (575) 887-9511 |
| Carlsbad Medical Center Hospital | (575) 887-4100 |
| Eddy County South Road Department (Carlsbad) | (575) 885-4835 |

State Agencies

| | |
|---|---|
| NM State Police (Carlsbad) | (575) 885-3138 |
| NM Oil Conservation (Artesia) | (575) 748-1283 |
| NM Oil Conservation (Santa Fe) | (505) 476-3440 |
| NM Dept. of Transportation (Roswell) | (575) 637-7201 |

Federal Agencies

| | |
|---|---|
| BLM Carlsbad Field Office | (575) 234-5972 |
| National Response Center | (800) 424-8802 |
| US EPA Region 6 (Dallas) | (800) 887-6063 |
| | (214) 665-6444 |

Residents within 2 miles

none

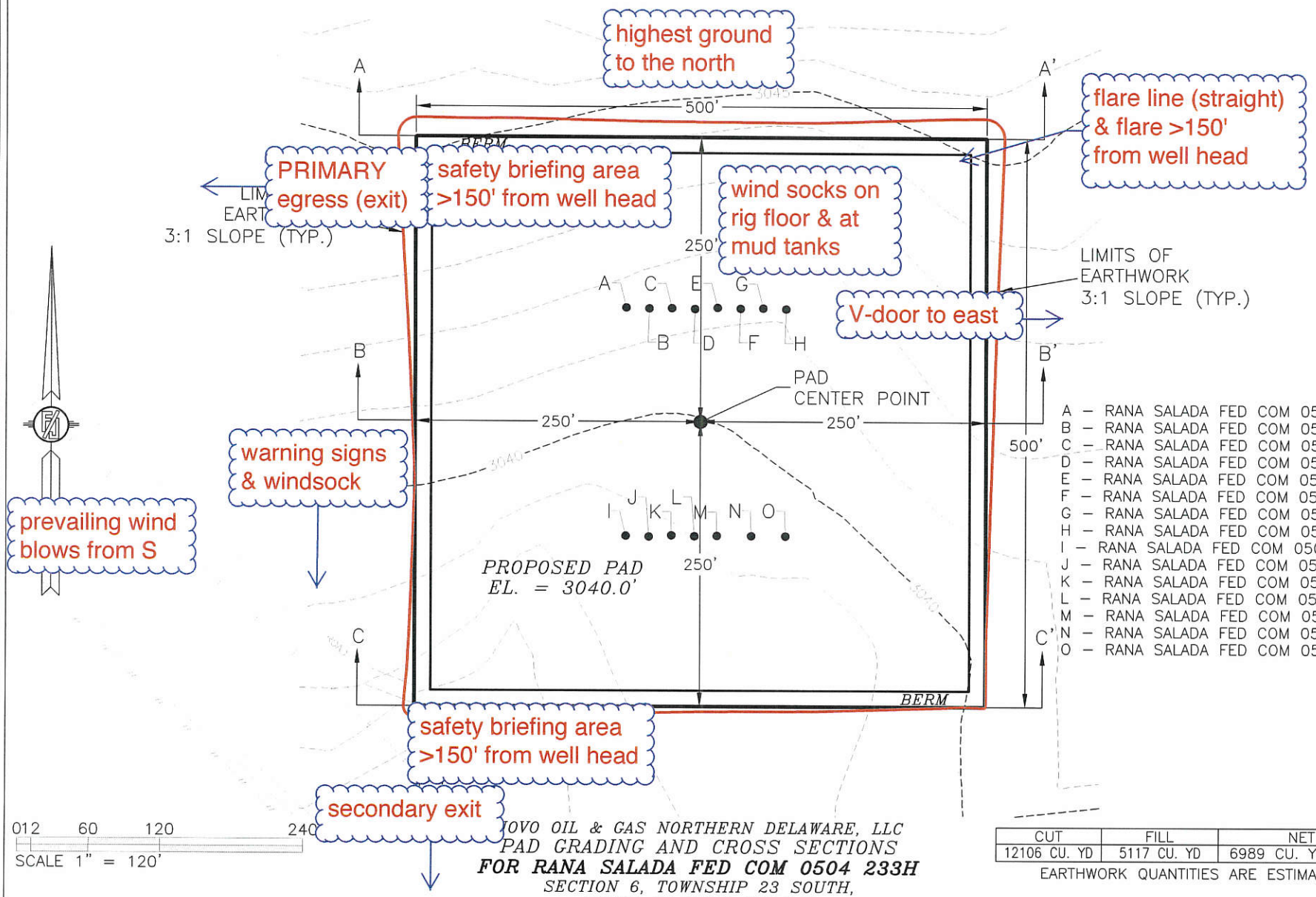
Air Evacuation

| | |
|---|---|
| Med Flight Air Ambulance (Albuquerque) | (800) 842-4431 |
| Lifeguard (Albuquerque) | (888) 866-7256 |

Veterinarians

| | |
|---|---|
| Desert Willow Veterinary Services (Carlsbad) | (575) 885-3399 |
| Animal Care Center (Carlsbad) | (575) 885-5352 |

# PLAN VIEW




A – RANA SALADA FED COM 0504 116H
B – RANA SALADA FED COM 0504 113H
C – RANA SALADA FED COM 0504 236H
D – RANA SALADA FED COM 0504 226H
E – RANA SALADA FED COM 0504 216H
F – RANA SALADA FED COM 0504 136H
G – RANA SALADA FED COM 0504 213H
H – RANA SALADA FED COM 0504 133H
I – RANA SALADA FED COM 0504 114H
J – RANA SALADA FED COM 0504 224H
K – RANA SALADA FED COM 0504 233H
L – RANA SALADA FED COM 0504 223H
M – RANA SALADA FED COM 0504 234H
N – RANA SALADA FED COM 0504 214H
O – RANA SALADA FED COM 0504 134H

| CUT | FILL | NET |
|---|---|---|
| 12106 CU. YD | 5117 CU. YD | 6989 CU. YD (CUT) |

EARTHWORK QUANTITIES ARE ESTIMATED

*OVO OIL & GAS NORTHERN DELAWARE, LLC*
*PAD GRADING AND CROSS SECTIONS*
***FOR RANA SALADA FED COM 0504 233H***
*SECTION 6, TOWNSHIP 23 SOUTH,*
*RANGE 29 EAST, N.M.P.M.*
*EDDY COUNTY, STATE OF NEW MEXICO*

*APRIL 18, 2019*

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

*SHEET 1-2*
*SURVEY NO. 7195*

# Novo Oil and Gas & Northern Delaware

**Rana Salada Fed Com 0504 Pad E**
**H2S Contingency Plan**
**1 & 2 Mile Radius Map**

Section 5, Township 23S, Range 29E
Eddy County, New Mexico


Surface Hole Location

1:27,000

0 0.25 0.5 1

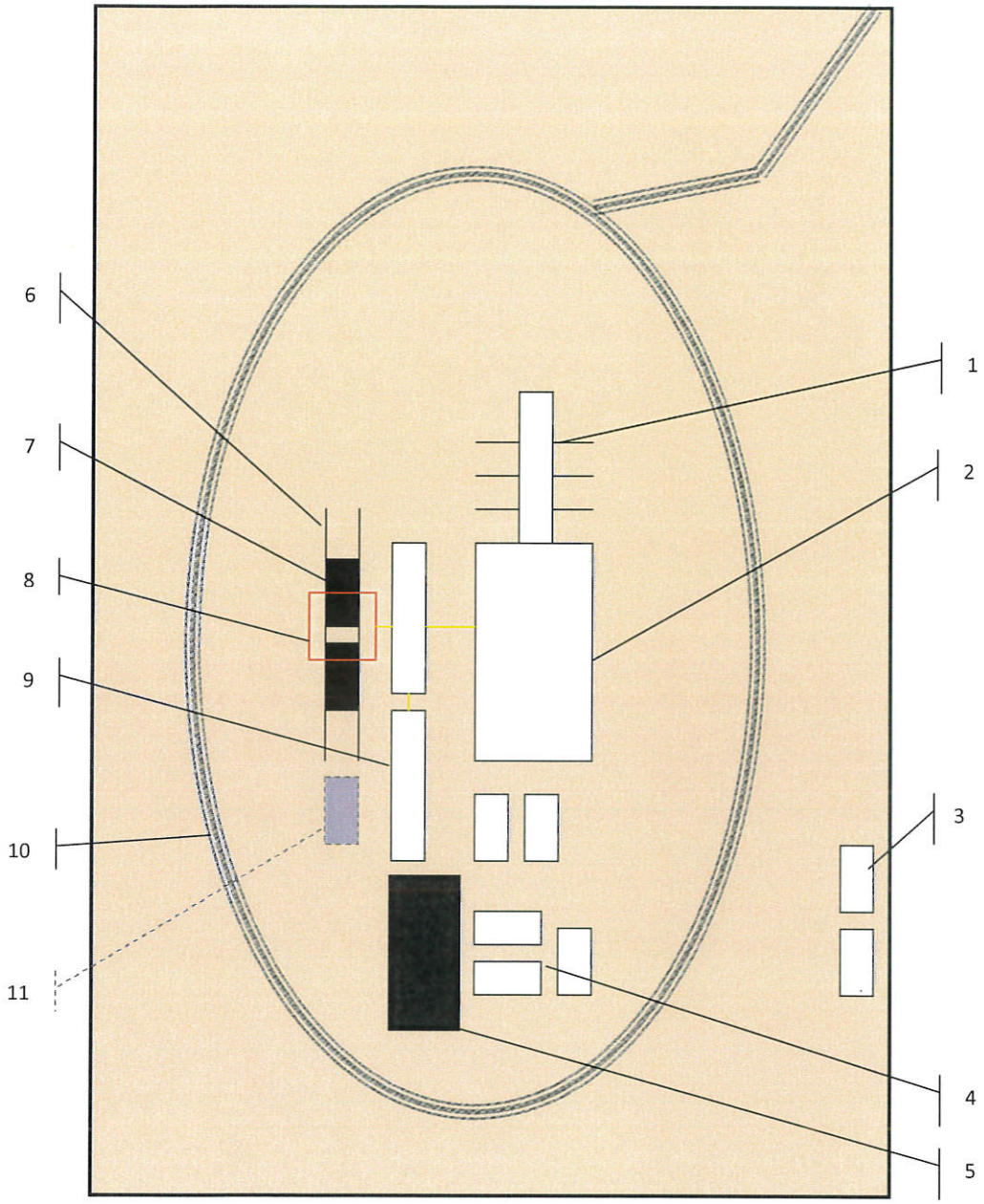
Miles

N

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

PERMITS WEST

Prepared by Permits West, Inc., July 3, 2019
for Novo Oil and Gas & Northern Delaware, LLC




**Schematic Closed Loop Drilling Rig***

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

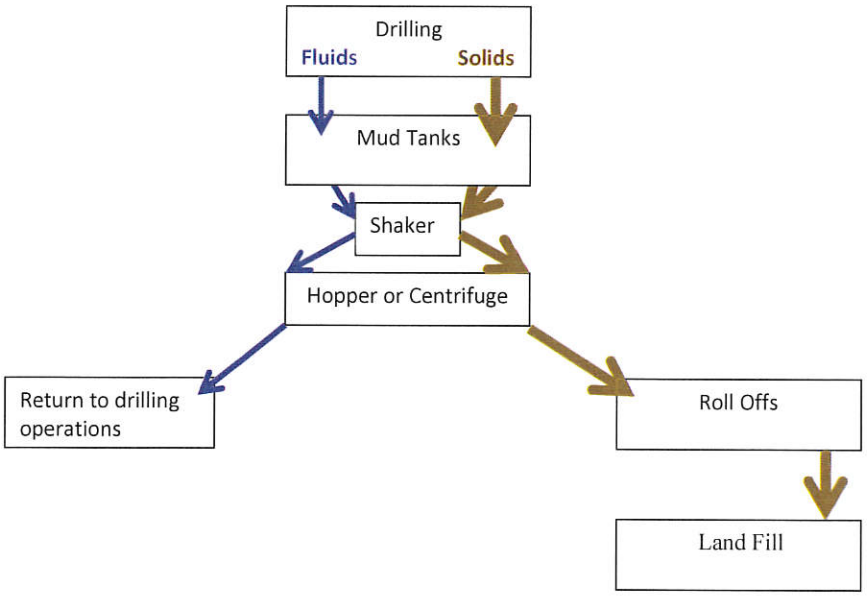
*Not drawn to scale: Closed loop system requires at least 30 feet beyond mud tanks. Ideally 60 feet would be available

Above: Centrifugal Closed Loop System

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


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

## Flow Chart for Drilling Fluids and Solids




**Photos Courtesy of Gandy Corporation Oil Field Service**

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37Verano Loop, Santa Fe, New Mexico 87508 (505) 466-8120