

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT  
**APPLICATION FOR PERMIT TO DRILL OR REENTER**

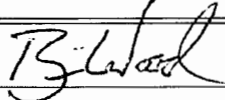
FORM APPROVED  
OMB No. 1004-0137  
Expires October 31, 2014

|                                                                                                                                                                                                                        |                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| 5. Lease Serial No.<br>NMNM -091078 / -061349 / -059383                                                                                                                                                                |                                                                                                         |
| 6. If Indian, Allottee or Tribe Name<br>N/A                                                                                                                                                                            |                                                                                                         |
| 7. If Unit or CA Agreement, Name and No.<br>N/A                                                                                                                                                                        |                                                                                                         |
| 8. Lease Name and Well No.<br>RANA SALADA FED COM 0605 231H                                                                                                                                                            |                                                                                                         |
| 9. API Well No.<br>30-015-                                                                                                                                                                                             |                                                                                                         |
| 1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER                                                                                                                           | 10. Field and Pool, or Exploratory<br>PURPLE SAGE; WOLFCAMP (GAS)                                       |
| 1b. Type of Well: <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone | 11. Sec., T. R. M. or Blk. and Survey or Area<br>SHL: Lot 1 1-23S-28E NMPM<br>BHL: Lot 1 5-23S-29E NMPM |
| 2. Name of Operator NOVO OIL & GAS NORTHERN, DELAWARE, LLC                                                                                                                                                             |                                                                                                         |
| 3a. Address 105 NORTH HUDSON AVE., SUITE 500<br>OKLAHOMA CITY, OK 73102                                                                                                                                                | 3b. Phone No. (include area code)<br>(4045) 609-1596                                                    |
| 4. Location of Well (Report location clearly and in accordance with any State requirements.)*<br>At surface 1127' FNL & 395' FEL 1-23S-28E<br>At proposed prod. zone 330' FNL & 330' FEL 5-23S-29E                     |                                                                                                         |
| 14. Distance in miles and direction from nearest town or post office*<br>5 AIR MILES NE OF LOVING, NM                                                                                                                  |                                                                                                         |
| 15. Distance from proposed*<br>location to nearest<br>property or lease line, ft.<br>(Also to nearest drig. unit line, if any)<br>SHL: 395'<br>BHL: 330'                                                               | 16. No. of acres in lease<br>SHL: 798.88<br>BHL: 602.12                                                 |
| 17. Spacing Unit dedicated to this well<br>LOTS 1-4 & S2N2 5-23S-29E<br>LOTS 1-5, SENW & S2NE4 6-23S-29E                                                                                                               |                                                                                                         |
| 18. Distance from proposed location*<br>to nearest well, drilling, completed,<br>applied for, on this lease, ft.<br>SHL: 674' (Longview 14)<br>BHL: 2321' (Carthel 2)                                                  | 19. Proposed Depth<br>TVD: 10339'<br>MD: 20606'                                                         |
| 20. BLM/BIA Bond No. on file<br>BLM NMB-011130                                                                                                                                                                         |                                                                                                         |
| 21. Elevations (Show whether DF, KDB, RT, GL, etc.)<br>3089' UNGRADED                                                                                                                                                  | 22. Approximate date work will start*<br>09/01/2018                                                     |
| 23. Estimated duration<br>3 MONTHS                                                                                                                                                                                     |                                                                                                         |

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

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

|                                                                                                   |                                                          |                    |
|---------------------------------------------------------------------------------------------------|----------------------------------------------------------|--------------------|
| 25. Signature  | Name (Printed Typed)<br>BRIAN WOOD (PHONE: 505 466-8120) | Date<br>06/30/2018 |
| Title<br>CONSULTANT (FAX: 505 466-9682)                                                           |                                                          |                    |
| Approved by (Signature)                                                                           | Name (Printed Typed)                                     | Date               |
| Title                                                                                             | Office                                                   |                    |

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.  
Conditions of approval, if any, are attached.

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

(Continued on page 2)

\*(Instructions on page 2)

SURVEY NO. 6144B

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: 6/30/2018

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, recomple 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<br>0605 231H | 30-015- | A-1-23S-28E | 1127 FNL &<br>395 FEL | 7500           | 30 days          | Time depends on well<br>clean up |
| Rana Salada Fed Com<br>0605 211H | 30-015- | A-1-23S-28E | 1127 FNL &<br>365 FEL | 7500           | 30 days          | Time depends on well<br>clean up |
| Rana Salada Fed Com<br>0605 121H | 30-015- | A-1-23S-28E | 1127 FNL &<br>335 FEL | 2500           | 30 days          | Time depends on well<br>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 Southern Union Gas Services, Ltd. line that is 200 yards west. 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

Novo Oil & Gas Northern Delaware, LLC  
Rana Salada Fed Com 0605 231H  
SHL 1127' FNL & 395' FEL 1-23S-28E  
BHL 330' FNL & 330' FEL 5-23S-29e  
Eddy County, NM

DRILL PLAN PAGE 1

Drilling Program

1. ESTIMATED TOPS

| Formation Name                        | TVD    | MD     | Bearing       |
|---------------------------------------|--------|--------|---------------|
| Quaternary                            | 0'     | 0'     | water         |
| Rustler anhydrite                     | 311'   | 311'   | N/A           |
| Salado salt                           | 757'   | 757'   | N/A           |
| Castile anhydrite                     | 1404'  | 1404'  | N/A           |
| Base salt                             | 2625'  | 2625'  | N/A           |
| Bell Canyon sandstone                 | 2824'  | 2824'  | hydrocarbons  |
| Cherry Canyon sandstone               | 3915'  | 3915'  | hydrocarbons  |
| Brushy Canyon sandstone               | 5358'  | 5358'  | hydrocarbons  |
| Bone Spring limestone                 | 6349'  | 6349'  | hydrocarbons  |
| 1 <sup>st</sup> Bone Spring sandstone | 7479'  | 7505'  | hydrocarbons  |
| 2 <sup>nd</sup> Bone Spring carbonate | 7749'  | 7784'  | hydrocarbons  |
| 2nd Bone Spring sandstone             | 8189'  | 8238'  | hydrocarbons  |
| 3 <sup>rd</sup> Bone Spring carbonate | 8604'  | 8667'  | hydrocarbons  |
| 3 <sup>rd</sup> Bone Spring sandstone | 9454'  | 9537'  | hydrocarbons  |
| Wolfcamp XY carbonate                 | 9774'  | 9857'  | hydrocarbons  |
| (KOP                                  | 9862'  | 9945'  | hydrocarbons) |
| Wolfcamp A carbonate                  | 9964'  | 10048' | hydrocarbons  |
| Wolfcamp B carbonate (goal)           | 10189' | 10306' | hydrocarbons  |
| TD                                    | 10339' | 20606' | hydrocarbons  |

2. NOTABLE ZONES

Wolfcamp B is the goal. All perforations will be  $\geq 330'$  from the dedication perimeter. Closest water well (C 02804) is 8977' southeast. Depth to water was not reported in this 100' deep well.

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Rana Salada Fed Com 0605 231H  
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Eddy County, NM

DRILL PLAN PAGE 2

### 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. The 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.

Surface casing will be pressure tested to 250-psi low and 1500-psi high. Intermediate casing will be pressure tested to 250-psi low and 70% of burst pressure (4025 psi) for 30 minutes. Intermediate II casing will be pressure tested to 250 psi low and 70% (4823 psi) high for 30 minutes.

### 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 0605 231H  
SHL 1127' FNL & 395' FEL 1-23S-28E  
BHL 330' FNL & 330' FEL 5-23S-29e  
Eddy County, NM

DRILL PLAN PAGE 3

| Hole O. D. | Set MD      | Set TVD     | Casing O. D.    | Weight (lb/ft) | Grade  | Joint                   | Collapse | Burst | Tension |
|------------|-------------|-------------|-----------------|----------------|--------|-------------------------|----------|-------|---------|
| 17.5"      | 0' - 500'   | 0' - 500'   | 13.375" surface | 54.5           | J-55   | BTC                     | 1.125    | 1.2   | 1.6     |
| 12.25"     | 0' - 5200'  | 0' - 5200'  | 9.625" inter. 1 | 40             | HCL-80 | BTC                     | 1.125    | 1.2   | 1.6     |
| 8.75"      | 0' - 9500'  | 0' - 9417'  | 7.625" inter. 2 | 29.7           | HCL-80 | TMK UP Ultra SF semi-FJ | 1.125    | 1.2   | 1.6     |
| 6.75"      | 0' - 20606' | 0' - 10339' | 5.5" product.   | 20             | P-110  | TMK UP Ultra SF semi-FJ | 1.125    | 1.125 | 1.8     |

| Name           | Type | Sacks       | Yield | Cu. Ft. | Weight                                                                  | Blend                                 |
|----------------|------|-------------|-------|---------|-------------------------------------------------------------------------|---------------------------------------|
| Surface        | Tail | 429         | 1.62  | 694     | 13.8                                                                    | Class C + gel + accelerator + LCM     |
| TOC = GL       |      | 100% Excess |       |         | Centralizers on every jt to GL                                          |                                       |
| Intermediate 1 | Lead | 716         | 2.28  | 1632    | 11.9                                                                    | Class C + gel + accelerator + LCM     |
|                | Tail | 200         | 1.34  | 268     | 14.8                                                                    | Class C + gel + retarder + LCM        |
| TOC = GL       |      | 20% Excess  |       |         | Centralizers on bottom 3 jts and then 1 centralizer every 4th jt to GL  |                                       |
| Intermediate 2 | Lead | 113         | 2.28  | 257     | 11.9                                                                    | Class C + gel + extender + LCM        |
|                | Tail | 200         | 1.34  | 268     | 14.8                                                                    | Class C + fluid loss + retarder + LCM |
| TOC = 4700'    |      | 20% Excess  |       |         | Centralizers on bottom 3 jts and then 1 centralizer every 4th jt to TOC |                                       |
| Production     | Tail | 676         | 1.72  | 1162    | 13.2                                                                    | Class H + fluid loss + retarder + LCM |
| TOC = 9000'    |      | 20% Excess  |       |         | None 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

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SHL 1127' FNL & 395' FEL 1-23S-28E  
BHL 330' FNL & 330' FEL 5-23S-29e  
Eddy County, NM

DRILL PLAN PAGE 4

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' - 500'      | 8.4        | 30 - 60   | NC         |
| brine or cut brine | 500' - 5200'   | 9.8 - 10.5 | 35 - 45   | NC         |
| Brine or LSND      | 5200' - 9500'  | 9.8 - 10.5 | 35 - 45   | NC         |
| OBM                | 9500' - 20606' | 8.5 - 10.5 | 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 ≈5532 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.



# NOVO

Well: Rana Salada Fed Com 0605 231H  
 Site: Section 01-T23S-R28E  
 Project: Eddy County, New Mexico  
 Design: rev1

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

System Datum: Mean Sea Level  
 Depth Reference: RKB=3089.1+25 @ 3114.10ft

## SECTION DETAILS

| Sec | MD       | Inc   | Azi   | TVD      | +N/-S  | +E/-W    | Diag  | TFace  | VSec    | Annotation                       |
|-----|----------|-------|-------|----------|--------|----------|-------|--------|---------|----------------------------------|
| 1   | 0.00     | 0.00  | 0.00  | 0.00     | 0.00   | 0.00     | 0.00  | 0.00   | 0.00    |                                  |
| 2   | 6200.00  | 0.00  | 0.00  | 6200.00  | 0.00   | 0.00     | 0.00  | 0.00   | 0.00    | KOP Begin 2"/100' build          |
| 3   | 6923.02  | 14.46 | 5.99  | 6915.37  | 90.28  | 9.46     | 2.00  | 5.99   | 9.46    | Begin 14.46° tangent section     |
| 4   | 9059.98  | 14.46 | 5.99  | 8984.63  | 820.97 | 65.12    | 0.00  | 0.00   | 65.12   | Begin 2"/100' drop               |
| 5   | 9783.00  | 0.00  | 0.00  | 9700.00  | 711.23 | 74.58    | 2.00  | 180.00 | 74.58   | Begin vertical hold section      |
| 6   | 9944.54  | 0.00  | 0.00  | 9861.54  | 711.23 | 74.58    | 0.00  | 0.00   | 74.58   | Begin 12"/100' build             |
| 7   | 10694.54 | 90.00 | 90.00 | 10339.00 | 711.23 | 552.05   | 12.00 | 90.00  | 552.05  | Begin 90.00° lateral section     |
| 8   | 20606.22 | 90.00 | 90.00 | 10339.00 | 711.23 | 10463.72 | 0.00  | 0.00   | 0463.72 | PBHL/TD 20606.22 MD 10339.00 TVD |

## DESIGN TARGET DETAILS

| Name                                   | TVD      | +N/-S  | +E/-W    | Northing  | Easting   | Latitude    | Longitude     |
|----------------------------------------|----------|--------|----------|-----------|-----------|-------------|---------------|
| Rana Salada 1H VT r1                   | 9700.00  | 711.23 | 74.58    | 487883.69 | 634092.95 | 32.34090613 | -104.03299471 |
| Rana Salada 1H FTP 330 FNL 330 FWL r1  | 10339.00 | 786.27 | 726.77   | 487958.73 | 634745.14 | 32.34110736 | -104.03088228 |
| Rana Salada 1H PBHL 330 FNL 330 FEL r1 | 10339.00 | 711.23 | 10463.72 | 487883.69 | 644482.07 | 32.34082156 | -103.99935560 |

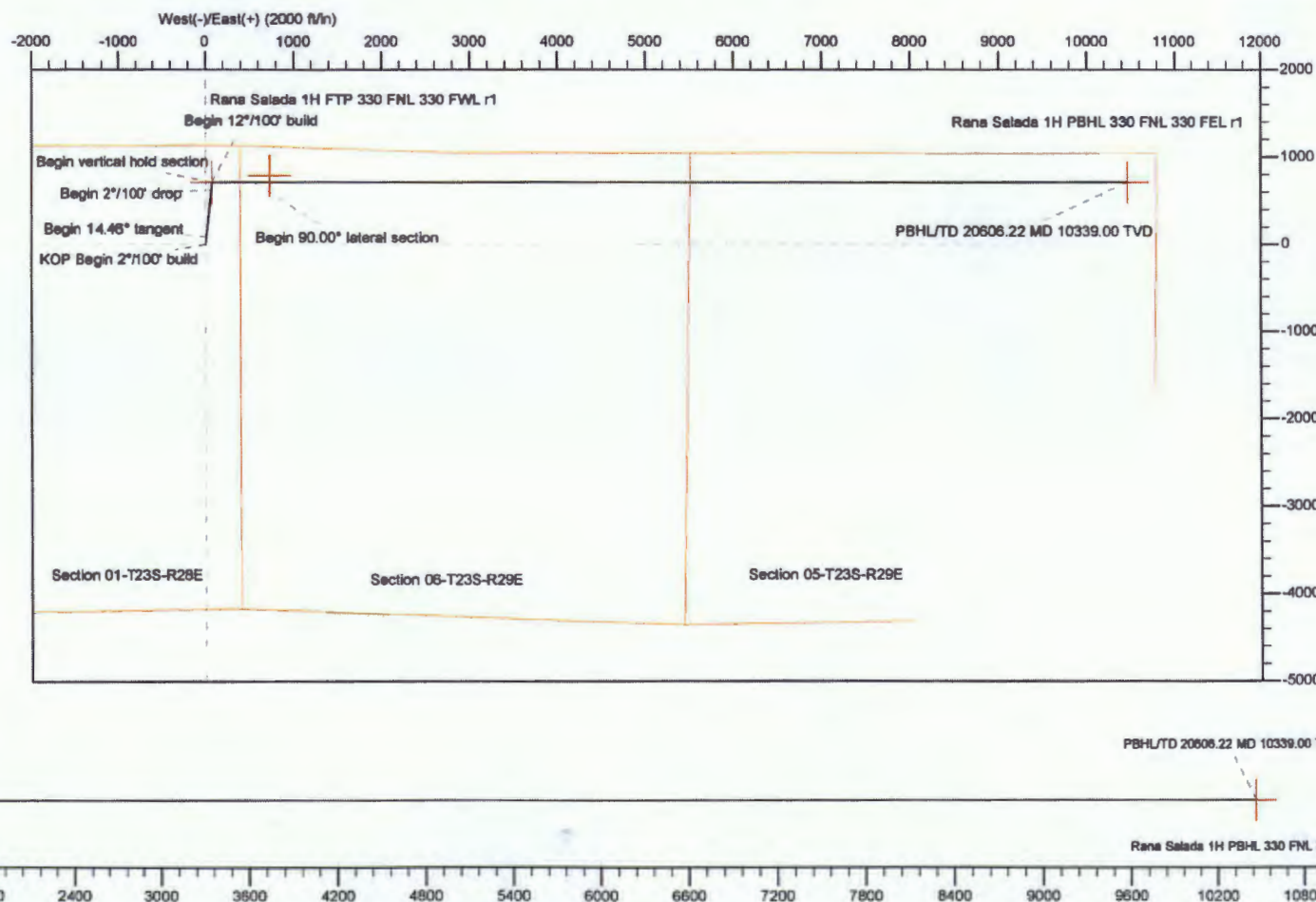
Northing 487172.46 Easting 634018.37 Latitude 32.33895166 Longitude -104.03324265



Azimuths to Grid North  
 True North: -0.16°  
 Magnetic North: 8.92°

Magnetic Field  
 Strength: 47666.3nT  
 Dip Angle: 60.08°  
 Date: 5/14/2018  
 Model: IGRF2015

True Vertical Depth (1200 ft/in)

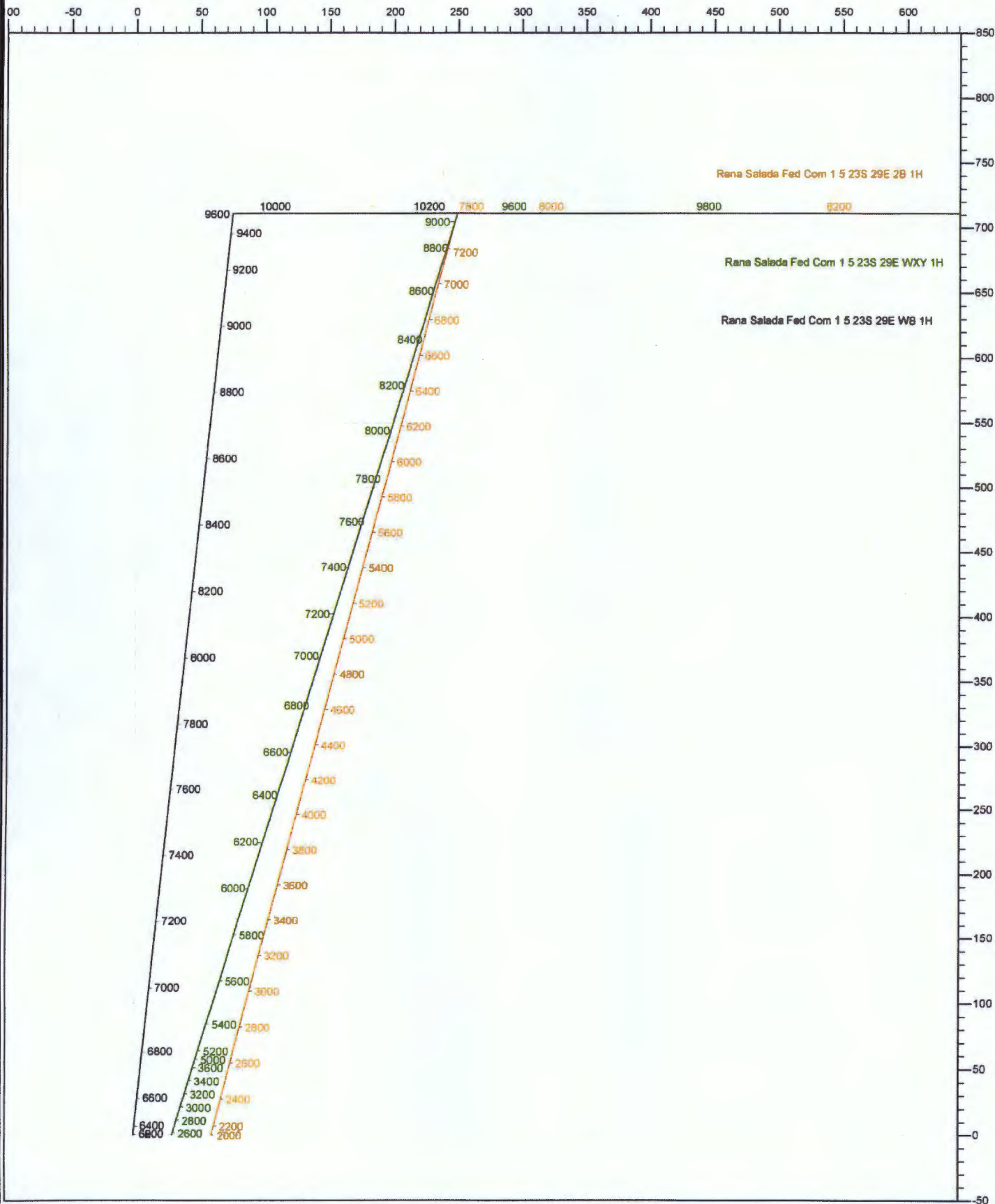


South(-)/North(+) (2000 ft/in)



Well: Rana Salada Fed Com 0605 231H  
Site: Section 01-T23S-R28E  
Project: Eddy County, New Mexico  
Design: rev1

West(-)/East(+) (100 ft/in)





# Standard\_Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Site:** Section 01-T23S-R28E  
**Well:** Rana Salada Fed Com 0605 231H  
**Wellbore:** Original Hole  
**Design:** rev1

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** DB\_Aug0116\_LT\_v14

|                    |                           |  |  |                      |                |
|--------------------|---------------------------|--|--|----------------------|----------------|
| <b>Project</b>     | Eddy County, New Mexico   |  |  | <b>System Datum:</b> | Mean Sea Level |
| <b>Map System:</b> | US State Plane 1983       |  |  |                      |                |
| <b>Geo Datum:</b>  | North American Datum 1983 |  |  |                      |                |
| <b>Map Zone:</b>   | New Mexico Eastern Zone   |  |  |                      |                |

|                              |                      |                     |                 |                          |               |
|------------------------------|----------------------|---------------------|-----------------|--------------------------|---------------|
| <b>Site</b>                  | Section 01-T23S-R28E |                     |                 |                          |               |
| <b>Site Position:</b>        |                      | <b>North:</b>       | 485,631.24 usft | <b>Latitude:</b>         | 32.33473233   |
| <b>From:</b>                 | Map                  | <b>East:</b>        | 631,756.43 usft | <b>Longitude:</b>        | -104.04058012 |
| <b>Position Uncertainty:</b> | 0.00 ft              | <b>Slot Radius:</b> | 13-3/16 "       | <b>Grid Convergence:</b> | 0.16 °        |

|                      |                                                                                        |         |                     |                 |               |               |
|----------------------|----------------------------------------------------------------------------------------|---------|---------------------|-----------------|---------------|---------------|
| Well                 | Rana Salada Fed Com 1 5 23S 29E WB 1H, Surf loc: 1127 FNL 395 FEL Section 01-T23S-R28E |         |                     |                 |               |               |
| Well Position        | +N-S                                                                                   | 0.00 ft | North:              | 487,172.46 usft | Latitude:     | 32.33895166   |
|                      | +E-W                                                                                   | 0.00 ft | East:               | 634,018.37 usft | Longitude:    | -104.03324265 |
| Position Uncertainty |                                                                                        | 0.00 ft | Wellhead Elevation: | ft              | Ground Level: | 3,089.10 ft   |

|                  |                   |                    |                        |                      |                            |
|------------------|-------------------|--------------------|------------------------|----------------------|----------------------------|
| <b>Wellbore</b>  | Original Hole     |                    |                        |                      |                            |
| <b>Magnetics</b> | <b>Model Name</b> | <b>Sample Date</b> | <b>Declination (°)</b> | <b>Dip Angle (°)</b> | <b>Field Strength (nT)</b> |
|                  | IGRF2015          | 5/14/2018          | 7.08                   | 60.08                | 47,866.29933562            |

|                          |                              |               |             |                      |                      |
|--------------------------|------------------------------|---------------|-------------|----------------------|----------------------|
| <b>Design</b>            | rev1                         |               |             |                      |                      |
| <b>Audit Notes:</b>      |                              |               |             |                      |                      |
| <b>Version:</b>          |                              |               |             |                      |                      |
| <b>Vertical Section:</b> | <b>Depth From (TVD) (ft)</b> | <b>Phase:</b> | <b>PLAN</b> | <b>Tie On Depth:</b> | <b>0.00</b>          |
|                          | 0.00                         |               |             | <b>+E-W (ft)</b>     | <b>Direction (°)</b> |
|                          |                              |               |             | 0.00                 | 90.00                |

|                            |                  |                |                      |                 |                     |
|----------------------------|------------------|----------------|----------------------|-----------------|---------------------|
| <b>Survey Tool Program</b> | <b>From (ft)</b> | <b>To (ft)</b> | <b>Date</b>          | <b>6/2/2018</b> | <b>Description</b>  |
|                            | 0.00             | 20,606.22      | rev1 (Original Hole) |                 | OWSG MWD - Standard |



# Standard\_Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Site: Section 01-T23S-R28E  
Well: Rana Salada Fed Com 0605 231H  
Wellbore: Original Hole  
Design: rev1

Local Co-ordinate Reference:  
TVL Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:  
Database:

Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
RKB=3089.1+25 @ 3114.10ft  
RKB=3089.1+25 @ 3114.10ft  
Grid  
Minimum Curvature  
DB\_Aug0116\_LT\_v14

## Planned Survey

| MD<br>(ft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | D/Leg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|------------|------------|----------------------|-------------|-------------|-------------|--------------------|----------------|--------------------|-------------------|
| 0.00       | 0.00       | 0.00                 | 0.00        | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 100.00     | 0.00       | 0.00                 | 100.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 200.00     | 0.00       | 0.00                 | 200.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 300.00     | 0.00       | 0.00                 | 300.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 400.00     | 0.00       | 0.00                 | 400.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 500.00     | 0.00       | 0.00                 | 500.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 600.00     | 0.00       | 0.00                 | 600.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 700.00     | 0.00       | 0.00                 | 700.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 800.00     | 0.00       | 0.00                 | 800.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 900.00     | 0.00       | 0.00                 | 900.00      | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,000.00   | 0.00       | 0.00                 | 1,000.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,100.00   | 0.00       | 0.00                 | 1,100.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,200.00   | 0.00       | 0.00                 | 1,200.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,300.00   | 0.00       | 0.00                 | 1,300.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,400.00   | 0.00       | 0.00                 | 1,400.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,500.00   | 0.00       | 0.00                 | 1,500.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,600.00   | 0.00       | 0.00                 | 1,600.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,700.00   | 0.00       | 0.00                 | 1,700.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,800.00   | 0.00       | 0.00                 | 1,800.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 1,900.00   | 0.00       | 0.00                 | 1,900.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 2,000.00   | 0.00       | 0.00                 | 2,000.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 2,100.00   | 0.00       | 0.00                 | 2,100.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 2,200.00   | 0.00       | 0.00                 | 2,200.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 2,300.00   | 0.00       | 0.00                 | 2,300.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 2,400.00   | 0.00       | 0.00                 | 2,400.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 2,500.00   | 0.00       | 0.00                 | 2,500.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |
| 2,600.00   | 0.00       | 0.00                 | 2,600.00    | 0.00        | 0.00        | 0.00               | 0.00           | 487,172.46         | 634,018.37        |



Standard\_Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Site: Section 01-T23S-R28E  
Well: Rana Salada Fed Com 0605 231H  
Wellbore: Original Hole  
Design: rev1

Local Co-ordinate Reference:  
TVD Reference:  
MD Reference:  
North Reference:  
Survey Calculation Method:  
Database:

Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
RKB=3089.1+25 @ 3114.10ft  
RKB=3089.1+25 @ 3114.10ft  
Grid  
Minimum Curvature  
DB\_Aug0116\_LT\_v14

Planned Survey

| MD<br>(ft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | EW<br>(ft) | DLeg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|------------|------------|----------------------|-------------|-------------|------------|-------------------|----------------|--------------------|-------------------|
| 2,700.00   | 0.00       | 0.00                 | 2,700.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 2,800.00   | 0.00       | 0.00                 | 2,800.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 2,900.00   | 0.00       | 0.00                 | 2,900.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,000.00   | 0.00       | 0.00                 | 3,000.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,100.00   | 0.00       | 0.00                 | 3,100.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,200.00   | 0.00       | 0.00                 | 3,200.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,300.00   | 0.00       | 0.00                 | 3,300.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,400.00   | 0.00       | 0.00                 | 3,400.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,500.00   | 0.00       | 0.00                 | 3,500.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,600.00   | 0.00       | 0.00                 | 3,600.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,700.00   | 0.00       | 0.00                 | 3,700.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,800.00   | 0.00       | 0.00                 | 3,800.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 3,900.00   | 0.00       | 0.00                 | 3,900.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,000.00   | 0.00       | 0.00                 | 4,000.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,100.00   | 0.00       | 0.00                 | 4,100.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,200.00   | 0.00       | 0.00                 | 4,200.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,300.00   | 0.00       | 0.00                 | 4,300.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,400.00   | 0.00       | 0.00                 | 4,400.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,500.00   | 0.00       | 0.00                 | 4,500.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,600.00   | 0.00       | 0.00                 | 4,600.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,700.00   | 0.00       | 0.00                 | 4,700.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,800.00   | 0.00       | 0.00                 | 4,800.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 4,900.00   | 0.00       | 0.00                 | 4,900.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,000.00   | 0.00       | 0.00                 | 5,000.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,100.00   | 0.00       | 0.00                 | 5,100.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,200.00   | 0.00       | 0.00                 | 5,200.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,300.00   | 0.00       | 0.00                 | 5,300.00    | 0.00        | 0.00       | 0.00              | 0.00           | 487,172.46         | 634,018.37        |



# Standard\_Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Site:** Section 01-T23S-R28E  
**Well:** Rana Salada Fed Com 0605 231H  
**Wellbore:** Original Hole  
**Design:** rev1

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** DB\_Aug0116\_LT\_v14

## Planned Survey

| MD<br>(ft)                   | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | DLeg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|------------------------------|------------|----------------------|-------------|-------------|-------------|-------------------|----------------|--------------------|-------------------|
| 5,400.00                     | 0.00       | 0.00                 | 5,400.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,500.00                     | 0.00       | 0.00                 | 5,500.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,600.00                     | 0.00       | 0.00                 | 5,600.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,700.00                     | 0.00       | 0.00                 | 5,700.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,800.00                     | 0.00       | 0.00                 | 5,800.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 5,900.00                     | 0.00       | 0.00                 | 5,900.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 6,000.00                     | 0.00       | 0.00                 | 6,000.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 6,100.00                     | 0.00       | 0.00                 | 6,100.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| 6,200.00                     | 0.00       | 0.00                 | 6,200.00    | 0.00        | 0.00        | 0.00              | 0.00           | 487,172.46         | 634,018.37        |
| KOP Begin 2°/100' build      |            |                      |             |             |             |                   |                |                    |                   |
| 6,300.00                     | 2.00       | 5.99                 | 6,299.98    | 1.74        | 0.18        | 2.00              | 0.18           | 487,174.20         | 634,018.55        |
| 6,400.00                     | 4.00       | 5.99                 | 6,399.84    | 6.94        | 0.73        | 2.00              | 0.73           | 487,179.40         | 634,019.10        |
| 6,500.00                     | 6.00       | 5.99                 | 6,499.45    | 15.81       | 1.84        | 2.00              | 1.84           | 487,188.07         | 634,020.01        |
| 6,600.00                     | 8.00       | 5.99                 | 6,598.70    | 27.73       | 2.91        | 2.00              | 2.91           | 487,200.19         | 634,021.28        |
| 6,700.00                     | 10.00      | 5.99                 | 6,697.47    | 43.29       | 4.54        | 2.00              | 4.54           | 487,215.75         | 634,022.91        |
| 6,800.00                     | 12.00      | 5.99                 | 6,795.62    | 62.26       | 6.53        | 2.00              | 6.53           | 487,234.72         | 634,024.90        |
| 6,900.00                     | 14.00      | 5.99                 | 6,893.06    | 84.63       | 8.87        | 2.00              | 8.87           | 487,257.09         | 634,027.24        |
| 6,923.02                     | 14.46      | 5.99                 | 6,915.37    | 90.26       | 9.46        | 2.00              | 9.46           | 487,262.72         | 634,027.83        |
| Begin 14.46° tangent section |            |                      |             |             |             |                   |                |                    |                   |
| 7,000.00                     | 14.46      | 5.99                 | 6,989.91    | 109.38      | 11.47       | 0.00              | 11.47          | 487,281.84         | 634,029.84        |
| 7,100.00                     | 14.46      | 5.99                 | 7,086.74    | 134.21      | 14.07       | 0.00              | 14.07          | 487,306.67         | 634,032.44        |
| 7,200.00                     | 14.46      | 5.99                 | 7,183.57    | 159.05      | 16.68       | 0.00              | 16.68          | 487,331.51         | 634,035.05        |
| 7,300.00                     | 14.46      | 5.99                 | 7,280.41    | 183.88      | 19.28       | 0.00              | 19.28          | 487,356.34         | 634,037.65        |
| 7,400.00                     | 14.46      | 5.99                 | 7,377.24    | 208.72      | 21.89       | 0.00              | 21.89          | 487,381.18         | 634,040.26        |
| 7,500.00                     | 14.46      | 5.99                 | 7,474.07    | 233.55      | 24.49       | 0.00              | 24.49          | 487,406.01         | 634,042.86        |
| 7,600.00                     | 14.46      | 5.99                 | 7,570.90    | 258.39      | 27.09       | 0.00              | 27.09          | 487,430.85         | 634,045.46        |
| 7,700.00                     | 14.46      | 5.99                 | 7,667.73    | 283.22      | 29.70       | 0.00              | 29.70          | 487,455.68         | 634,048.07        |



# Standard\_Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Site: Section 01-T23S-R28E  
Well: Rana Salada Fed Com 0605 231H  
Wellbore: Original Hole  
Design: rev1

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: DB\_Aug0116\_LT\_v14

## Planned Survey

| MD<br>(ft)                  | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | D Leg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|-----------------------------|------------|----------------------|-------------|-------------|-------------|--------------------|----------------|--------------------|-------------------|
| 7,800.00                    | 14.46      | 5.99                 | 7,764.57    | 308.06      | 32.30       | 0.00               | 32.30          | 487,480.52         | 634,050.67        |
| 7,900.00                    | 14.46      | 5.99                 | 7,861.40    | 332.89      | 34.91       | 0.00               | 34.91          | 487,505.35         | 634,053.28        |
| 8,000.00                    | 14.46      | 5.99                 | 7,958.23    | 357.73      | 37.51       | 0.00               | 37.51          | 487,530.19         | 634,055.88        |
| 8,100.00                    | 14.46      | 5.99                 | 8,055.06    | 382.58      | 40.12       | 0.00               | 40.12          | 487,555.02         | 634,058.49        |
| 8,200.00                    | 14.46      | 5.99                 | 8,151.89    | 407.40      | 42.72       | 0.00               | 42.72          | 487,579.86         | 634,061.09        |
| 8,300.00                    | 14.46      | 5.99                 | 8,248.73    | 432.23      | 45.32       | 0.00               | 45.32          | 487,604.69         | 634,063.69        |
| 8,400.00                    | 14.46      | 5.99                 | 8,345.56    | 457.07      | 47.93       | 0.00               | 47.93          | 487,629.53         | 634,066.30        |
| 8,500.00                    | 14.46      | 5.99                 | 8,442.39    | 481.90      | 50.53       | 0.00               | 50.53          | 487,654.36         | 634,068.90        |
| 8,600.00                    | 14.46      | 5.99                 | 8,539.22    | 506.74      | 53.14       | 0.00               | 53.14          | 487,679.19         | 634,071.51        |
| 8,700.00                    | 14.46      | 5.99                 | 8,636.06    | 531.57      | 55.74       | 0.00               | 55.74          | 487,704.03         | 634,074.11        |
| 8,800.00                    | 14.46      | 5.99                 | 8,732.89    | 556.41      | 58.35       | 0.00               | 58.35          | 487,728.86         | 634,076.71        |
| 8,900.00                    | 14.46      | 5.99                 | 8,829.72    | 581.24      | 60.95       | 0.00               | 60.95          | 487,753.70         | 634,079.32        |
| 9,000.00                    | 14.46      | 5.99                 | 8,926.55    | 606.08      | 63.55       | 0.00               | 63.55          | 487,778.53         | 634,081.92        |
| 9,059.98                    | 14.46      | 5.99                 | 8,984.63    | 620.97      | 65.12       | 0.00               | 65.12          | 487,793.43         | 634,083.49        |
| Begin 2°/100' drop          |            |                      |             |             |             |                    |                |                    |                   |
| 9,100.00                    | 13.66      | 5.99                 | 9,023.45    | 630.64      | 66.13       | 2.00               | 66.13          | 487,803.10         | 634,084.50        |
| 9,200.00                    | 11.66      | 5.99                 | 9,121.02    | 652.44      | 68.41       | 2.00               | 68.41          | 487,824.90         | 634,086.78        |
| 9,300.00                    | 9.66       | 5.99                 | 9,219.28    | 670.83      | 70.34       | 2.00               | 70.34          | 487,843.29         | 634,088.71        |
| 9,400.00                    | 7.66       | 5.99                 | 9,318.14    | 685.81      | 71.91       | 2.00               | 71.91          | 487,858.27         | 634,090.28        |
| 9,500.00                    | 5.66       | 5.99                 | 9,417.46    | 697.34      | 73.12       | 2.00               | 73.12          | 487,869.80         | 634,091.49        |
| 9,600.00                    | 3.66       | 5.99                 | 9,517.12    | 705.42      | 73.97       | 2.00               | 73.97          | 487,877.88         | 634,092.34        |
| 9,700.00                    | 1.66       | 5.99                 | 9,617.01    | 710.04      | 74.45       | 2.00               | 74.45          | 487,882.49         | 634,092.82        |
| 9,783.00                    | 0.00       | 0.00                 | 9,700.00    | 711.23      | 74.58       | 2.00               | 74.58          | 487,883.69         | 634,092.95        |
| Begin vertical hold section |            |                      |             |             |             |                    |                |                    |                   |
| 9,800.00                    | 0.00       | 0.00                 | 9,717.00    | 711.23      | 74.58       | 0.00               | 74.58          | 487,883.69         | 634,092.95        |
| 9,900.00                    | 0.00       | 0.00                 | 9,817.00    | 711.23      | 74.58       | 0.00               | 74.58          | 487,883.69         | 634,092.95        |



# Standard\_Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Site: Section 01-T23S-R28E  
Well: Rana Salada Fed Com 0605 231H  
Wellbore: Original Hole  
Design: rev1

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: DB\_Aug0116\_LT\_v14

## Planned Survey

| MD<br>(ft)                   | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | E/W<br>(ft) | D/Leg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|------------------------------|------------|----------------------|-------------|-------------|-------------|--------------------|----------------|--------------------|-------------------|
| 9,944.54                     | 0.00       | 0.00                 | 9,861.54    | 711.23      | 74.58       | 0.00               | 74.58          | 487,883.69         | 634,092.95        |
| Begin 12°/100' build         |            |                      |             |             |             |                    |                |                    |                   |
| 10,000.00                    | 6.66       | 90.00                | 9,916.88    | 711.23      | 77.80       | 12.00              | 77.80          | 487,883.69         | 634,096.17        |
| 10,100.00                    | 18.66      | 90.00                | 10,014.27   | 711.23      | 99.67       | 12.00              | 99.67          | 487,883.69         | 634,118.04        |
| 10,200.00                    | 30.66      | 90.00                | 10,104.99   | 711.23      | 141.31      | 12.00              | 141.31         | 487,883.69         | 634,159.67        |
| 10,300.00                    | 42.66      | 90.00                | 10,185.06   | 711.23      | 200.90      | 12.00              | 200.90         | 487,883.69         | 634,219.27        |
| 10,400.00                    | 54.66      | 90.00                | 10,251.00   | 711.23      | 275.83      | 12.00              | 275.83         | 487,883.69         | 634,294.20        |
| 10,500.00                    | 66.66      | 90.00                | 10,299.92   | 711.23      | 362.84      | 12.00              | 362.84         | 487,883.69         | 634,381.21        |
| 10,600.00                    | 78.66      | 90.00                | 10,329.68   | 711.23      | 458.12      | 12.00              | 458.12         | 487,883.69         | 634,476.49        |
| 10,694.54                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 552.05      | 12.00              | 552.05         | 487,883.69         | 634,570.41        |
| Begin 90.00° lateral section |            |                      |             |             |             |                    |                |                    |                   |
| 10,700.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 557.50      | 0.00               | 557.50         | 487,883.69         | 634,575.87        |
| 10,800.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 657.50      | 0.00               | 657.50         | 487,883.69         | 634,675.87        |
| 10,900.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 757.50      | 0.00               | 757.50         | 487,883.69         | 634,775.87        |
| 11,000.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 857.50      | 0.00               | 857.50         | 487,883.69         | 634,875.87        |
| 11,100.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 957.50      | 0.00               | 957.50         | 487,883.69         | 634,975.87        |
| 11,200.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,057.50    | 0.00               | 1,057.50       | 487,883.69         | 635,075.87        |
| 11,300.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,157.50    | 0.00               | 1,157.50       | 487,883.69         | 635,175.87        |
| 11,400.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,257.50    | 0.00               | 1,257.50       | 487,883.69         | 635,275.87        |
| 11,500.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,357.50    | 0.00               | 1,357.50       | 487,883.69         | 635,375.87        |
| 11,600.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,457.50    | 0.00               | 1,457.50       | 487,883.69         | 635,475.87        |
| 11,700.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,557.50    | 0.00               | 1,557.50       | 487,883.69         | 635,575.87        |
| 11,800.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,657.50    | 0.00               | 1,657.50       | 487,883.69         | 635,675.87        |
| 11,900.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,757.50    | 0.00               | 1,757.50       | 487,883.69         | 635,775.87        |
| 12,000.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,857.50    | 0.00               | 1,857.50       | 487,883.69         | 635,875.87        |
| 12,100.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 1,957.50    | 0.00               | 1,957.50       | 487,883.69         | 635,975.87        |
| 12,200.00                    | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,057.50    | 0.00               | 2,057.50       | 487,883.69         | 636,075.87        |



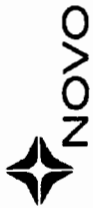
# Standard\_Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Site: Section 01-T23S-R28E  
Well: Rana Salada Fed Com 0605 231H  
Wellbore: Original Hole  
Design: rev1

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Database: DB\_Aug0116\_LT\_v14

## Planned Survey

| MD<br>(ft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | EW<br>(ft) | DLeg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|------------|------------|----------------------|-------------|-------------|------------|-------------------|----------------|--------------------|-------------------|
| 12,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,157.50   | 0.00              | 2,157.50       | 487,883.69         | 636,175.87        |
| 12,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,257.50   | 0.00              | 2,257.50       | 487,883.69         | 636,275.87        |
| 12,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,357.50   | 0.00              | 2,357.50       | 487,883.69         | 636,375.87        |
| 12,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,457.50   | 0.00              | 2,457.50       | 487,883.69         | 636,475.87        |
| 12,700.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,557.50   | 0.00              | 2,557.50       | 487,883.69         | 636,575.87        |
| 12,800.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,657.50   | 0.00              | 2,657.50       | 487,883.69         | 636,675.87        |
| 12,900.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,757.50   | 0.00              | 2,757.50       | 487,883.69         | 636,775.87        |
| 13,000.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,857.50   | 0.00              | 2,857.50       | 487,883.69         | 636,875.87        |
| 13,100.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 2,957.50   | 0.00              | 2,957.50       | 487,883.69         | 636,975.87        |
| 13,200.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,057.50   | 0.00              | 3,057.50       | 487,883.69         | 637,075.87        |
| 13,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,157.50   | 0.00              | 3,157.50       | 487,883.69         | 637,175.87        |
| 13,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,257.50   | 0.00              | 3,257.50       | 487,883.69         | 637,275.87        |
| 13,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,357.50   | 0.00              | 3,357.50       | 487,883.69         | 637,375.87        |
| 13,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,457.50   | 0.00              | 3,457.50       | 487,883.69         | 637,475.87        |
| 13,700.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,557.50   | 0.00              | 3,557.50       | 487,883.69         | 637,575.87        |
| 13,800.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,657.50   | 0.00              | 3,657.50       | 487,883.69         | 637,675.87        |
| 13,900.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,757.50   | 0.00              | 3,757.50       | 487,883.69         | 637,775.87        |
| 14,000.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,857.50   | 0.00              | 3,857.50       | 487,883.69         | 637,875.87        |
| 14,100.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 3,957.50   | 0.00              | 3,957.50       | 487,883.69         | 637,975.87        |
| 14,200.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,057.50   | 0.00              | 4,057.50       | 487,883.69         | 638,075.87        |
| 14,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,157.50   | 0.00              | 4,157.50       | 487,883.69         | 638,175.87        |
| 14,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,257.50   | 0.00              | 4,257.50       | 487,883.69         | 638,275.87        |
| 14,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,357.50   | 0.00              | 4,357.50       | 487,883.69         | 638,375.87        |
| 14,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,457.50   | 0.00              | 4,457.50       | 487,883.69         | 638,475.87        |
| 14,700.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,557.50   | 0.00              | 4,557.50       | 487,883.69         | 638,575.87        |
| 14,800.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,657.50   | 0.00              | 4,657.50       | 487,883.69         | 638,675.87        |
| 14,900.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,757.50   | 0.00              | 4,757.50       | 487,883.69         | 638,775.87        |



# Standard\_Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Site:** Section 01-T23S-R28E  
**Well:** Rana Salada Fed Com 0605 231H  
**Wellbore:** Original Hole  
**Design:** rev1

**Local Co-ordinate Reference:**  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** DB\_Aug0116\_LT\_v14

Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
RKB=3089.1+25 @ 3114.10ft  
RKB=3089.1+25 @ 3114.10ft  
Grid  
Minimum Curvature  
DB\_Aug0116\_LT\_v14

## Planned Survey

| MD<br>(ft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | EW<br>(ft) | D/Leg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|------------|------------|----------------------|-------------|-------------|------------|--------------------|----------------|--------------------|-------------------|
| 15,000.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,857.50   | 0.00               | 4,857.50       | 487,883.69         | 638,875.87        |
| 15,100.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 4,957.50   | 0.00               | 4,957.50       | 487,883.69         | 638,975.87        |
| 15,200.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,057.50   | 0.00               | 5,057.50       | 487,883.69         | 639,075.86        |
| 15,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,157.50   | 0.00               | 5,157.50       | 487,883.69         | 639,175.86        |
| 15,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,257.50   | 0.00               | 5,257.50       | 487,883.69         | 639,275.86        |
| 15,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,357.50   | 0.00               | 5,357.50       | 487,883.69         | 639,375.86        |
| 15,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,457.50   | 0.00               | 5,457.50       | 487,883.69         | 639,475.86        |
| 15,700.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,557.50   | 0.00               | 5,557.50       | 487,883.69         | 639,575.86        |
| 15,800.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,657.50   | 0.00               | 5,657.50       | 487,883.69         | 639,675.86        |
| 15,900.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,757.50   | 0.00               | 5,757.50       | 487,883.69         | 639,775.86        |
| 16,000.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,857.50   | 0.00               | 5,857.50       | 487,883.69         | 639,875.86        |
| 16,100.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 5,957.50   | 0.00               | 5,957.50       | 487,883.69         | 639,975.86        |
| 16,200.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,057.50   | 0.00               | 6,057.50       | 487,883.69         | 640,075.86        |
| 16,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,157.50   | 0.00               | 6,157.50       | 487,883.69         | 640,175.86        |
| 16,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,257.50   | 0.00               | 6,257.50       | 487,883.69         | 640,275.86        |
| 16,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,357.50   | 0.00               | 6,357.50       | 487,883.69         | 640,375.86        |
| 16,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,457.50   | 0.00               | 6,457.50       | 487,883.69         | 640,475.86        |
| 16,700.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,557.50   | 0.00               | 6,557.50       | 487,883.69         | 640,575.86        |
| 16,800.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,657.50   | 0.00               | 6,657.50       | 487,883.69         | 640,675.86        |
| 16,900.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,757.50   | 0.00               | 6,757.50       | 487,883.69         | 640,775.86        |
| 17,000.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,857.50   | 0.00               | 6,857.50       | 487,883.69         | 640,875.86        |
| 17,100.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 6,957.50   | 0.00               | 6,957.50       | 487,883.69         | 640,975.86        |
| 17,200.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,057.50   | 0.00               | 7,057.50       | 487,883.69         | 641,075.86        |
| 17,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,157.50   | 0.00               | 7,157.50       | 487,883.69         | 641,175.86        |
| 17,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,257.50   | 0.00               | 7,257.50       | 487,883.69         | 641,275.86        |
| 17,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,357.50   | 0.00               | 7,357.50       | 487,883.69         | 641,375.86        |
| 17,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,457.50   | 0.00               | 7,457.50       | 487,883.69         | 641,475.86        |



# Standard\_Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Site:** Section 01-T23S-R28E  
**Well:** Rana Salada Fed Com 0605 231H  
**Wellbore:** Original Hole  
**Design:** rev1

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** DB\_Aug0116\_LT\_v14

## Planned Survey

| MD<br>(ft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | EW<br>(ft) | DLeg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|------------|------------|----------------------|-------------|-------------|------------|-------------------|----------------|--------------------|-------------------|
| 17,700.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,557.50   | 0.00              | 7,557.50       | 487,883.69         | 641,575.86        |
| 17,800.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,657.50   | 0.00              | 7,657.50       | 487,883.69         | 641,675.86        |
| 17,900.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,757.50   | 0.00              | 7,757.50       | 487,883.69         | 641,775.86        |
| 18,000.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,857.50   | 0.00              | 7,857.50       | 487,883.69         | 641,875.86        |
| 18,100.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 7,957.50   | 0.00              | 7,957.50       | 487,883.69         | 641,975.86        |
| 18,200.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,057.50   | 0.00              | 8,057.50       | 487,883.69         | 642,075.86        |
| 18,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,157.50   | 0.00              | 8,157.50       | 487,883.69         | 642,175.86        |
| 18,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,257.50   | 0.00              | 8,257.50       | 487,883.69         | 642,275.86        |
| 18,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,357.50   | 0.00              | 8,357.50       | 487,883.69         | 642,375.86        |
| 18,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,457.50   | 0.00              | 8,457.50       | 487,883.69         | 642,475.86        |
| 18,700.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,557.50   | 0.00              | 8,557.50       | 487,883.69         | 642,575.86        |
| 18,800.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,657.50   | 0.00              | 8,657.50       | 487,883.69         | 642,675.86        |
| 18,900.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,757.50   | 0.00              | 8,757.50       | 487,883.69         | 642,775.86        |
| 19,000.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,857.50   | 0.00              | 8,857.50       | 487,883.69         | 642,875.86        |
| 19,100.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 8,957.50   | 0.00              | 8,957.50       | 487,883.69         | 642,975.86        |
| 19,200.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,057.50   | 0.00              | 9,057.50       | 487,883.69         | 643,075.86        |
| 19,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,157.50   | 0.00              | 9,157.50       | 487,883.69         | 643,175.86        |
| 19,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,257.50   | 0.00              | 9,257.50       | 487,883.69         | 643,275.86        |
| 19,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,357.50   | 0.00              | 9,357.50       | 487,883.69         | 643,375.86        |
| 19,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,457.50   | 0.00              | 9,457.50       | 487,883.69         | 643,475.86        |
| 19,700.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,557.50   | 0.00              | 9,557.50       | 487,883.69         | 643,575.86        |
| 19,800.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,657.50   | 0.00              | 9,657.50       | 487,883.69         | 643,675.86        |
| 19,900.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,757.50   | 0.00              | 9,757.50       | 487,883.69         | 643,775.86        |
| 20,000.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,857.50   | 0.00              | 9,857.50       | 487,883.69         | 643,875.86        |
| 20,100.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 9,957.50   | 0.00              | 9,957.50       | 487,883.69         | 643,975.86        |
| 20,200.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 10,057.50  | 0.00              | 10,057.50      | 487,883.69         | 644,075.85        |
| 20,300.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 10,157.50  | 0.00              | 10,157.50      | 487,883.69         | 644,175.85        |



# Standard\_Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Site:** Section 01-T23S-R28E  
**Well:** Rana Salada Fed Com 0605 231H  
**Wellbore:** Original Hole  
**Design:** rev1

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Database:** DB\_Aug0116\_LT\_v14

## Planned Survey

| MD<br>(ft) | Inc<br>(°) | Azi (azimuth)<br>(°) | TVD<br>(ft) | N/S<br>(ft) | EW<br>(ft) | Dleg<br>(°/100ft) | V. Sec<br>(ft) | Northing<br>(usft) | Easting<br>(usft) |
|------------|------------|----------------------|-------------|-------------|------------|-------------------|----------------|--------------------|-------------------|
| 20,400.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 10,257.50  | 0.00              | 10,257.50      | 487,883.69         | 644,275.85        |
| 20,500.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 10,357.50  | 0.00              | 10,357.50      | 487,883.69         | 644,375.85        |
| 20,600.00  | 90.00      | 90.00                | 10,339.00   | 711.23      | 10,457.50  | 0.00              | 10,457.50      | 487,883.69         | 644,475.85        |
| 20,606.22  | 90.00      | 90.00                | 10,339.00   | 711.23      | 10,463.72  | 0.00              | 10,463.72      | 487,883.69         | 644,482.07        |

PBHL/TD 20606.22 MD 10339.00 TVD

## Plan Annotations

| Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Local Coordinates<br>+N/-S<br>(ft) | +E/-W<br>(ft) | Comment                          |
|---------------------------|---------------------------|------------------------------------|---------------|----------------------------------|
| 6,200.00                  | 6,200.00                  | 0.00                               | 0.00          | KOP Begin 2°/100' build          |
| 6,923.02                  | 6,915.37                  | 90.26                              | 9.46          | Begin 14.46° tangent section     |
| 9,059.98                  | 8,984.63                  | 620.97                             | 65.12         | Begin 2°/100' drop               |
| 9,783.00                  | 9,700.00                  | 711.23                             | 74.58         | Begin vertical hold section      |
| 9,944.54                  | 9,861.54                  | 711.23                             | 74.58         | Begin 12°/100' build             |
| 10,694.54                 | 10,339.00                 | 711.23                             | 552.05        | Begin 90.00° lateral section     |
| 20,606.22                 | 10,339.00                 | 711.23                             | 10,463.72     | PBHL/TD 20606.22 MD 10339.00 TVD |



# Anticollision Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Reference Site:** Section 01-T23S-R28E  
**Site Error:** 0.00 ft Rana Salada Fed Com 0605 231H  
**Reference Well:** 0.00 ft  
**Well Error:** Original Hole  
**Reference Wellbore:** rev1  
**Reference Design:**

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at:** 2.00 sigma  
**Database:** DB\_Aug0116\_LT\_v14  
**Offset TVD Reference:** Offset Datum

|                                     |                                                                         |                       |                     |
|-------------------------------------|-------------------------------------------------------------------------|-----------------------|---------------------|
| <b>Reference</b>                    | rev1                                                                    |                       |                     |
| <b>Filter type:</b>                 | GLOBAL FILTER APPLIED: All wellpaths within 200'+ 100/1000 of reference |                       |                     |
| <b>Interpolation Method:</b>        | MD Interval 100.00ft                                                    | <b>Error Model:</b>   | ISCWSA              |
| <b>Depth Range:</b>                 | Unlimited                                                               | <b>Scan Method:</b>   | Closest Approach 3D |
| <b>Results Limited by:</b>          | Maximum center-center distance of 2,260.62 ft                           | <b>Error Surface:</b> | Pedal Curve         |
| <b>Warning Levels Evaluated at:</b> | 2.00 Sigma                                                              | <b>Casing Method:</b> | Not applied         |

|                            |                |                          |                  |                     |
|----------------------------|----------------|--------------------------|------------------|---------------------|
| <b>Survey Tool Program</b> | <b>Date</b>    | 6/2/2018                 |                  |                     |
| <b>From (ft)</b>           | <b>To (ft)</b> | <b>Survey (Wellbore)</b> | <b>Tool Name</b> | <b>Description</b>  |
| 0.00                       | 20,806.22      | rev1 (Original Hole)     | MWD              | OWSG MWD - Standard |

| Summary                         |                     |           |          |          |          |            |                      |
|---------------------------------|---------------------|-----------|----------|----------|----------|------------|----------------------|
| Site Name                       |                     | Reference | Offset   | Distance |          | Separation | Warning              |
|                                 |                     | Measured  | Measured | Between  | Between  |            |                      |
| Offset Well - Wellbore - Design |                     | Depth     | Depth    | Centres  | Ellipses | Factor     |                      |
| Section 01-T23S-R28E            |                     |           |          |          |          |            |                      |
| Rana Salada Fed Com 0605        | 121H - Original Hol | 2,000.00  | 2,001.80 | 59.96    | 46.06    | 4.315      | CC                   |
| Rana Salada Fed Com 0605        | 121H - Original Hol | 2,100.00  | 2,101.21 | 60.45    | 45.84    | 4.137      | ES                   |
| Rana Salada Fed Com 0605        | 121H - Original Hol | 2,200.00  | 2,200.39 | 62.16    | 46.84    | 4.058      | SF                   |
| Rana Salada Fed Com 0605        | 211H - Original H   | 2,500.00  | 2,501.00 | 29.96    | 12.48    | 1.714      | Level 3<2.00, CC     |
| Rana Salada Fed Com 0605        | 211H - Original H   | 2,600.00  | 2,600.65 | 30.53    | 12.34    | 1.678      | Level 3<2.00, ES, SF |

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 121H - Original Hole - rev1 |                     |                     |                     |                 |             |                       |                                   |                                   |                      |                       |                         |                   | Offset Site Error: | 0.00 ft |
|-------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|-----------------------------------|-----------------------------------|----------------------|-----------------------|-------------------------|-------------------|--------------------|---------|
| Survey Program: 0-MWD                                                                     |                     |                     |                     |                 |             |                       |                                   |                                   |                      |                       |                         |                   | Offset Well Error: | 0.00 ft |
| Reference                                                                                 |                     | Offset              |                     | Semi Major Axis |             |                       | Distance                          |                                   |                      |                       |                         | Separation Factor | Warning            |         |
| Measured Depth (ft)                                                                       | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft)  | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (ft) | Offset Wellbore Centre +E/-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) |                   |                    |         |
| 0.00                                                                                      | 0.00                | 1.80                | 1.80                | 0.00            | 0.00        | 89.93                 | 0.07                              | 59.96                             | 59.96                |                       |                         |                   |                    |         |
| 100.00                                                                                    | 100.00              | 101.80              | 101.80              | 0.13            | 0.14        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 59.68                 | 0.28                    | 217.794           |                    |         |
| 200.00                                                                                    | 200.00              | 201.80              | 201.80              | 0.49            | 0.50        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 58.97                 | 0.99                    | 60.429            |                    |         |
| 300.00                                                                                    | 300.00              | 301.80              | 301.80              | 0.85            | 0.86        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 58.25                 | 1.71                    | 35.081            |                    |         |
| 400.00                                                                                    | 400.00              | 401.80              | 401.80              | 1.21            | 1.22        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 57.53                 | 2.43                    | 24.714            |                    |         |
| 500.00                                                                                    | 500.00              | 501.80              | 501.80              | 1.57            | 1.57        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 56.82                 | 3.14                    | 19.077            |                    |         |
| 600.00                                                                                    | 600.00              | 601.80              | 601.80              | 1.93            | 1.93        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 56.10                 | 3.86                    | 15.534            |                    |         |
| 700.00                                                                                    | 700.00              | 701.80              | 701.80              | 2.29            | 2.29        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 55.38                 | 4.58                    | 13.100            |                    |         |
| 800.00                                                                                    | 800.00              | 801.80              | 801.80              | 2.64            | 2.65        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 54.67                 | 5.29                    | 11.326            |                    |         |
| 900.00                                                                                    | 900.00              | 901.80              | 901.80              | 3.00            | 3.01        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 53.95                 | 6.01                    | 9.975             |                    |         |
| 1,000.00                                                                                  | 1,000.00            | 1,001.80            | 1,001.80            | 3.36            | 3.37        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 53.23                 | 6.73                    | 8.912             |                    |         |
| 1,100.00                                                                                  | 1,100.00            | 1,101.80            | 1,101.80            | 3.72            | 3.73        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 52.52                 | 7.44                    | 8.054             |                    |         |
| 1,200.00                                                                                  | 1,200.00            | 1,201.80            | 1,201.80            | 4.08            | 4.08        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 51.80                 | 8.16                    | 7.347             |                    |         |
| 1,300.00                                                                                  | 1,300.00            | 1,301.80            | 1,301.80            | 4.44            | 4.44        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 51.08                 | 8.88                    | 6.753             |                    |         |
| 1,400.00                                                                                  | 1,400.00            | 1,401.80            | 1,401.80            | 4.79            | 4.80        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 50.36                 | 9.60                    | 6.249             |                    |         |
| 1,500.00                                                                                  | 1,500.00            | 1,501.80            | 1,501.80            | 5.15            | 5.16        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 49.65                 | 10.31                   | 5.814             |                    |         |
| 1,600.00                                                                                  | 1,600.00            | 1,601.80            | 1,601.80            | 5.51            | 5.52        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 48.93                 | 11.03                   | 5.436             |                    |         |
| 1,700.00                                                                                  | 1,700.00            | 1,701.80            | 1,701.80            | 5.87            | 5.88        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 48.21                 | 11.75                   | 5.105             |                    |         |
| 1,800.00                                                                                  | 1,800.00            | 1,801.80            | 1,801.80            | 6.23            | 6.23        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 47.50                 | 12.46                   | 4.811             |                    |         |
| 1,900.00                                                                                  | 1,900.00            | 1,901.80            | 1,901.80            | 6.59            | 6.59        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 46.78                 | 13.18                   | 4.549             |                    |         |
| 2,000.00                                                                                  | 2,000.00            | 2,001.80            | 2,001.80            | 6.95            | 6.95        | 89.93                 | 0.07                              | 59.96                             | 59.96                | 46.06                 | 13.90                   | 4.315 CC          |                    |         |

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



# Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Reference Site: Section 01-T23S-R28E  
Site Error: 0.00 ft Rana Salada Fed Com 0605 231H  
Reference Well: 0.00 ft  
Well Error: Original Hole  
Reference Wellbore: rev1  
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: DB\_Aug0116\_LT\_v14  
Offset TVD Reference: Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 121H - Original Hole - rev1 |                     |                     |                     |                 |             |                   |                                  |           |                    |                   |         |          | Offset Site Error: 0.00 ft |
|-------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|-----------------|-------------|-------------------|----------------------------------|-----------|--------------------|-------------------|---------|----------|----------------------------|
| Survey Program: 0-MWD                                                                     |                     |                     |                     |                 |             |                   |                                  |           |                    |                   |         |          | Offset Well Error: 0.00 ft |
| Reference                                                                                 |                     | Offset              |                     | Semi Major Axis |             | Highside Toolface | Distance                         |           | Minimum Separation | Separation Factor | Warning |          |                            |
| Measured Depth (ft)                                                                       | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft)  | Offset (ft) |                   | Offset Wellbore Centre +N-S (ft) | +E-W (ft) |                    |                   |         |          | Between Centres (ft)       |
| 2,100.00                                                                                  | 2,100.00            | 2,101.21            | 2,101.19            | 7.30            | 7.31        | 88.30             | 1.60                             | 60.42     | 60.45              | 45.84             | 14.61   | 4.137 ES |                            |
| 2,200.00                                                                                  | 2,200.00            | 2,200.39            | 2,200.22            | 7.66            | 7.66        | 83.68             | 8.84                             | 61.76     | 62.16              | 46.84             | 15.32   | 4.058 SF |                            |
| 2,300.00                                                                                  | 2,300.00            | 2,299.09            | 2,298.54            | 8.02            | 8.02        | 76.68             | 15.14                            | 63.97     | 65.82              | 49.80             | 16.02   | 4.109    |                            |
| 2,400.00                                                                                  | 2,400.00            | 2,409.12            | 2,395.72            | 8.38            | 8.41        | 68.35             | 26.60                            | 67.02     | 72.37              | 55.63             | 16.74   | 4.323    |                            |
| 2,500.00                                                                                  | 2,500.00            | 2,504.00            | 2,493.75            | 8.74            | 8.76        | 60.45             | 40.02                            | 70.60     | 81.55              | 64.13             | 17.42   | 4.681    |                            |
| 2,600.00                                                                                  | 2,600.00            | 2,604.99            | 2,591.78            | 9.10            | 9.13        | 54.23             | 53.44                            | 74.17     | 91.96              | 73.83             | 18.13   | 5.073    |                            |
| 2,700.00                                                                                  | 2,700.00            | 2,694.02            | 2,689.82            | 9.45            | 9.46        | 49.31             | 66.85                            | 77.74     | 103.23             | 84.43             | 18.79   | 5.492    |                            |
| 2,800.00                                                                                  | 2,800.00            | 2,806.97            | 2,787.85            | 9.81            | 9.89        | 45.37             | 80.27                            | 81.31     | 115.11             | 95.55             | 19.55   | 5.887    |                            |
| 2,900.00                                                                                  | 2,900.00            | 2,892.05            | 2,885.69            | 10.17           | 10.21       | 42.18             | 93.69                            | 84.88     | 127.42             | 107.21            | 20.21   | 6.305    |                            |
| 3,000.00                                                                                  | 3,000.00            | 3,008.94            | 2,983.92            | 10.53           | 10.66       | 39.55             | 107.10                           | 88.46     | 140.05             | 119.07            | 20.98   | 6.674    |                            |
| 3,100.00                                                                                  | 3,100.00            | 3,109.93            | 3,081.95            | 10.89           | 11.05       | 37.37             | 120.52                           | 92.03     | 152.93             | 131.23            | 21.70   | 7.046    |                            |
| 3,200.00                                                                                  | 3,200.00            | 3,189.08            | 3,179.99            | 11.25           | 11.35       | 35.52             | 133.94                           | 95.60     | 165.99             | 143.65            | 22.34   | 7.429    |                            |
| 3,300.00                                                                                  | 3,300.00            | 3,288.09            | 3,278.02            | 11.61           | 11.74       | 33.94             | 147.35                           | 99.17     | 179.20             | 156.15            | 23.06   | 7.772    |                            |
| 3,400.00                                                                                  | 3,400.00            | 3,387.10            | 3,376.05            | 11.96           | 12.13       | 32.58             | 160.77                           | 102.74    | 192.53             | 168.75            | 23.77   | 8.099    |                            |
| 3,500.00                                                                                  | 3,500.00            | 3,486.12            | 3,474.09            | 12.32           | 12.52       | 31.40             | 174.19                           | 106.32    | 205.94             | 181.46            | 24.49   | 8.410    |                            |
| 3,600.00                                                                                  | 3,600.00            | 3,585.13            | 3,572.12            | 12.68           | 12.91       | 30.36             | 187.60                           | 109.89    | 219.43             | 194.23            | 25.20   | 8.707    |                            |
| 3,700.00                                                                                  | 3,700.00            | 3,684.14            | 3,670.15            | 13.04           | 13.30       | 29.44             | 201.02                           | 113.46    | 232.99             | 207.07            | 25.92   | 8.989    |                            |
| 3,800.00                                                                                  | 3,800.00            | 3,783.15            | 3,768.19            | 13.40           | 13.69       | 28.62             | 214.44                           | 117.03    | 246.60             | 219.96            | 26.64   | 9.258    |                            |
| 3,900.00                                                                                  | 3,900.00            | 3,882.16            | 3,866.22            | 13.76           | 14.09       | 27.89             | 227.85                           | 120.61    | 260.25             | 232.89            | 27.35   | 9.514    |                            |
| 4,000.00                                                                                  | 4,000.00            | 3,981.18            | 3,964.26            | 14.11           | 14.46       | 27.23             | 241.27                           | 124.18    | 273.94             | 245.87            | 28.07   | 9.759    |                            |
| 4,100.00                                                                                  | 4,100.00            | 4,080.19            | 4,062.29            | 14.47           | 14.88       | 26.64             | 254.69                           | 127.75    | 287.66             | 258.87            | 28.79   | 9.992    |                            |
| 4,200.00                                                                                  | 4,200.00            | 4,179.20            | 4,160.32            | 14.83           | 15.28       | 26.10             | 268.10                           | 131.32    | 301.41             | 271.90            | 29.51   | 10.215   |                            |
| 4,300.00                                                                                  | 4,300.00            | 4,278.21            | 4,258.36            | 15.19           | 15.67       | 25.60             | 281.52                           | 134.89    | 315.18             | 284.95            | 30.23   | 10.427   |                            |
| 4,400.00                                                                                  | 4,400.00            | 4,377.22            | 4,356.39            | 15.55           | 16.07       | 25.15             | 294.94                           | 138.47    | 328.97             | 298.03            | 30.95   | 10.631   |                            |
| 4,500.00                                                                                  | 4,500.00            | 4,476.24            | 4,454.42            | 15.91           | 16.47       | 24.73             | 308.36                           | 142.04    | 342.79             | 311.12            | 31.66   | 10.826   |                            |
| 4,600.00                                                                                  | 4,600.00            | 4,575.25            | 4,552.46            | 16.27           | 16.87       | 24.35             | 321.77                           | 145.61    | 356.62             | 324.23            | 32.38   | 11.012   |                            |
| 4,700.00                                                                                  | 4,700.00            | 4,674.26            | 4,650.49            | 16.62           | 17.27       | 23.99             | 335.19                           | 149.18    | 370.46             | 337.36            | 33.10   | 11.191   |                            |
| 4,800.00                                                                                  | 4,800.00            | 4,773.27            | 4,748.52            | 16.98           | 17.67       | 23.66             | 348.61                           | 152.75    | 384.32             | 350.49            | 33.82   | 11.362   |                            |
| 4,900.00                                                                                  | 4,900.00            | 4,872.28            | 4,846.56            | 17.34           | 18.08       | 23.36             | 362.02                           | 156.33    | 398.16             | 363.64            | 34.54   | 11.527   |                            |
| 5,000.00                                                                                  | 5,000.00            | 4,971.30            | 4,944.59            | 17.70           | 18.48       | 23.07             | 375.44                           | 159.90    | 412.06             | 376.80            | 35.26   | 11.685   |                            |
| 5,100.00                                                                                  | 5,100.00            | 5,070.31            | 5,042.62            | 18.06           | 18.88       | 22.80             | 388.86                           | 163.47    | 425.95             | 389.97            | 35.98   | 11.837   |                            |
| 5,200.00                                                                                  | 5,200.00            | 5,169.32            | 5,140.66            | 18.42           | 19.28       | 22.55             | 402.27                           | 167.04    | 439.85             | 403.14            | 36.71   | 11.983   |                            |
| 5,300.00                                                                                  | 5,300.00            | 5,268.33            | 5,238.69            | 18.77           | 19.69       | 22.32             | 415.69                           | 170.62    | 453.75             | 416.33            | 37.43   | 12.124   |                            |
| 5,400.00                                                                                  | 5,400.00            | 5,367.34            | 5,336.73            | 19.13           | 20.09       | 22.09             | 429.11                           | 174.19    | 467.66             | 429.52            | 38.15   | 12.259   |                            |
| 5,500.00                                                                                  | 5,500.00            | 5,466.36            | 5,434.78            | 19.49           | 20.50       | 21.89             | 442.52                           | 177.76    | 481.58             | 442.71            | 38.87   | 12.390   |                            |
| 5,600.00                                                                                  | 5,600.00            | 5,565.37            | 5,532.79            | 19.85           | 20.90       | 21.69             | 455.94                           | 181.33    | 495.50             | 455.92            | 39.59   | 12.516   |                            |
| 5,700.00                                                                                  | 5,700.00            | 5,664.38            | 5,630.83            | 20.21           | 21.31       | 21.50             | 469.36                           | 184.90    | 509.43             | 469.12            | 40.31   | 12.636   |                            |
| 5,800.00                                                                                  | 5,800.00            | 5,763.39            | 5,728.86            | 20.57           | 21.71       | 21.33             | 482.77                           | 188.48    | 523.37             | 482.34            | 41.03   | 12.755   |                            |
| 5,900.00                                                                                  | 5,900.00            | 5,862.40            | 5,826.89            | 20.93           | 22.12       | 21.16             | 496.19                           | 192.05    | 537.31             | 495.55            | 41.75   | 12.868   |                            |
| 6,000.00                                                                                  | 6,000.00            | 5,961.42            | 5,924.93            | 21.28           | 22.52       | 21.00             | 509.61                           | 195.62    | 551.25             | 508.77            | 42.48   | 12.978   |                            |
| 6,100.00                                                                                  | 6,100.00            | 6,060.43            | 6,022.96            | 21.64           | 22.93       | 20.85             | 523.02                           | 199.19    | 565.20             | 522.00            | 43.20   | 13.084   |                            |
| 6,200.00                                                                                  | 6,200.00            | 6,159.44            | 6,120.99            | 22.00           | 23.34       | 20.71             | 536.44                           | 202.76    | 579.15             | 535.23            | 43.92   | 13.187   |                            |
| 6,300.00                                                                                  | 6,299.98            | 6,258.67            | 6,219.25            | 22.36           | 23.75       | 14.56             | 549.89                           | 206.34    | 591.43             | 546.76            | 44.64   | 13.248   |                            |
| 6,400.00                                                                                  | 6,399.84            | 6,356.27            | 6,317.86            | 22.72           | 24.15       | 14.51             | 563.38                           | 209.94    | 600.35             | 554.98            | 45.37   | 13.233   |                            |
| 6,500.00                                                                                  | 6,499.45            | 6,458.11            | 6,416.71            | 23.07           | 24.57       | 14.56             | 576.91                           | 213.54    | 605.90             | 559.81            | 46.09   | 13.145   |                            |
| 6,600.00                                                                                  | 6,598.70            | 6,558.06            | 6,515.68            | 23.43           | 24.98       | 14.71             | 590.46                           | 217.15    | 608.08             | 561.26            | 46.82   | 12.987   |                            |
| 6,700.00                                                                                  | 6,697.47            | 6,658.02            | 6,614.65            | 23.78           | 25.39       | 14.96             | 604.00                           | 220.75    | 606.89             | 559.34            | 47.55   | 12.764   |                            |
| 6,800.00                                                                                  | 6,795.62            | 6,757.65            | 6,713.49            | 24.14           | 25.80       | 15.31             | 617.53                           | 224.35    | 602.34             | 554.07            | 48.27   | 12.478   |                            |
| 6,900.00                                                                                  | 6,893.06            | 6,857.43            | 6,812.09            | 24.50           | 26.21       | 15.78             | 631.03                           | 227.95    | 594.46             | 545.47            | 49.00   | 12.133   |                            |
| 7,000.00                                                                                  | 6,989.91            | 6,956.78            | 6,910.46            | 24.86           | 26.62       | 16.29             | 644.49                           | 231.53    | 584.27             | 534.55            | 49.72   | 11.752   |                            |
| 7,100.00                                                                                  | 7,088.74            | 7,056.11            | 7,008.61            | 25.23           | 27.03       | 16.82             | 657.95                           | 235.11    | 574.03             | 523.59            | 50.44   | 11.380   |                            |

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



# Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Reference Site: Section 01-T23S-R28E  
Site Error: 0.00 ft Rana Salada Fed Com 0605 231H  
Reference Well: 0.00 ft  
Well Error: Original Hole  
Reference Wellbore: rev1  
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: DB\_Aug0116\_LT\_v14  
Offset TVD Reference: Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 121H - Original Hole - rev1 |                     |                     |                     |                 |             |                       |                        |           |                      |                       |                         |                   | Offset Site Error: 0.00 ft |
|-------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|------------------------|-----------|----------------------|-----------------------|-------------------------|-------------------|----------------------------|
| Survey Program: 0-MWD                                                                     |                     |                     |                     |                 |             |                       |                        |           |                      |                       |                         |                   | Offset Well Error: 0.00 ft |
| Reference                                                                                 |                     | Offset              |                     | Semi Major Axis |             | Highside Toolface (°) | Offset Wellbore Centre |           | Distance             |                       | Minimum Separation (ft) | Separation Factor | Warning                    |
| Measured Depth (ft)                                                                       | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft)  | Offset (ft) |                       | +N-S (ft)              | +E-W (ft) | Between Centres (ft) | Between Ellipses (ft) |                         |                   |                            |
| 7,200.00                                                                                  | 7,183.57            | 7,155.45            | 7,107.16            | 25.61           | 27.44       | 17.36                 | 671.41                 | 238.70    | 563.85               | 512.68                | 51.17                   | 11.019            |                            |
| 7,300.00                                                                                  | 7,280.41            | 7,256.51            | 7,207.23            | 25.99           | 27.86       | 17.93                 | 685.09                 | 242.34    | 553.70               | 501.78                | 51.92                   | 10.685            |                            |
| 7,400.00                                                                                  | 7,377.24            | 7,378.57            | 7,328.46            | 26.37           | 28.34       | 18.71                 | 698.77                 | 245.98    | 541.23               | 488.40                | 52.83                   | 10.245            |                            |
| 7,500.00                                                                                  | 7,474.07            | 7,499.04            | 7,448.59            | 26.76           | 28.79       | 19.62                 | 707.36                 | 248.27    | 524.71               | 471.05                | 53.65                   | 9.780             |                            |
| 7,600.00                                                                                  | 7,570.90            | 7,617.53            | 7,567.01            | 27.16           | 29.20       | 20.70                 | 711.05                 | 249.25    | 504.27               | 449.88                | 54.39                   | 9.271             |                            |
| 7,700.00                                                                                  | 7,667.73            | 7,720.06            | 7,669.53            | 27.56           | 29.54       | 21.80                 | 711.23                 | 249.30    | 481.06               | 425.96                | 55.09                   | 8.732             |                            |
| 7,800.00                                                                                  | 7,764.57            | 7,816.01            | 7,785.48            | 27.96           | 29.85       | 22.95                 | 711.23                 | 249.30    | 457.66               | 402.05                | 55.81                   | 8.204             |                            |
| 7,900.00                                                                                  | 7,861.40            | 7,882.37            | 7,831.61            | 28.37           | 30.07       | 24.37                 | 711.23                 | 254.18    | 438.43               | 381.92                | 56.51                   | 7.759             |                            |
| 8,000.00                                                                                  | 7,958.23            | 7,946.66            | 7,894.44            | 28.78           | 30.29       | 26.80                 | 711.23                 | 267.59    | 426.86               | 369.90                | 56.96                   | 7.494             |                            |
| 8,069.50                                                                                  | 8,025.53            | 7,989.01            | 7,934.60            | 29.07           | 30.44       | 28.93                 | 711.23                 | 280.99    | 424.34               | 367.31                | 57.03                   | 7.440             |                            |
| 8,100.00                                                                                  | 8,055.06            | 8,068.82            | 7,951.11            | 29.20           | 30.50       | 29.94                 | 711.23                 | 287.88    | 424.85               | 367.87                | 56.98                   | 7.456             |                            |
| 8,200.00                                                                                  | 8,151.90            | 8,061.55            | 8,000.10            | 29.62           | 30.70       | 33.40                 | 711.23                 | 312.02    | 434.09               | 377.68                | 56.41                   | 7.696             |                            |
| 8,300.00                                                                                  | 8,248.73            | 8,110.32            | 8,041.15            | 30.04           | 30.87       | 36.80                 | 711.23                 | 338.30    | 455.54               | 400.37                | 55.17                   | 8.257             |                            |
| 8,400.00                                                                                  | 8,345.56            | 8,150.00            | 8,072.44            | 30.47           | 31.02       | 39.89                 | 711.23                 | 362.68    | 489.13               | 435.89                | 53.24                   | 9.187             |                            |
| 8,500.00                                                                                  | 8,442.39            | 8,190.82            | 8,102.26            | 30.89           | 31.17       | 42.87                 | 711.23                 | 390.25    | 533.78               | 482.48                | 51.32                   | 10.401            |                            |
| 8,600.00                                                                                  | 8,539.22            | 8,225.00            | 8,125.59            | 31.33           | 31.30       | 45.15                 | 711.23                 | 415.49    | 587.96               | 538.68                | 49.29                   | 11.929            |                            |
| 8,700.00                                                                                  | 8,636.06            | 8,250.00            | 8,141.38            | 31.76           | 31.40       | 46.90                 | 711.23                 | 434.86    | 650.00               | 602.87                | 47.13                   | 13.792            |                            |
| 8,800.00                                                                                  | 8,732.89            | 8,275.00            | 8,156.14            | 32.20           | 31.50       | 48.80                 | 711.23                 | 455.04    | 718.37               | 673.00                | 45.36                   | 15.836            |                            |
| 8,900.00                                                                                  | 8,829.72            | 8,300.00            | 8,169.83            | 32.64           | 31.81       | 50.22                 | 711.23                 | 475.96    | 791.81               | 747.84                | 43.97                   | 18.008            |                            |
| 9,000.00                                                                                  | 8,926.55            | 8,316.93            | 8,178.46            | 33.08           | 31.89       | 51.28                 | 711.23                 | 490.52    | 869.30               | 826.72                | 42.58                   | 20.414            |                            |
| 9,100.00                                                                                  | 9,023.45            | 8,333.76            | 8,186.53            | 33.53           | 31.77       | 53.20                 | 711.23                 | 505.29    | 950.16               | 908.65                | 41.51                   | 22.890            |                            |
| 9,200.00                                                                                  | 9,121.02            | 8,350.00            | 8,193.82            | 33.96           | 31.85       | 56.68                 | 711.23                 | 519.80    | 1,034.53             | 993.84                | 40.69                   | 25.427            |                            |
| 9,300.00                                                                                  | 9,219.29            | 8,362.02            | 8,198.89            | 34.38           | 31.91       | 60.33                 | 711.23                 | 530.70    | 1,121.80             | 1,081.85              | 39.95                   | 28.078            |                            |
| 9,400.00                                                                                  | 9,318.14            | 8,375.00            | 8,204.06            | 34.79           | 31.98       | 64.46                 | 711.23                 | 542.60    | 1,211.38             | 1,171.92              | 39.44                   | 30.715            |                            |
| 9,500.00                                                                                  | 9,417.46            | 8,384.54            | 8,207.65            | 35.19           | 32.03       | 68.91                 | 711.23                 | 551.44    | 1,302.68             | 1,263.70              | 38.98                   | 33.418            |                            |
| 9,600.00                                                                                  | 9,517.12            | 8,400.00            | 8,213.09            | 35.56           | 32.12       | 73.98                 | 711.23                 | 565.91    | 1,395.43             | 1,356.63              | 38.80                   | 35.966            |                            |
| 9,700.00                                                                                  | 9,617.01            | 8,400.00            | 8,213.09            | 35.93           | 32.12       | 79.21                 | 711.23                 | 565.91    | 1,489.15             | 1,450.79              | 38.36                   | 38.822            |                            |
| 9,800.00                                                                                  | 9,717.00            | 8,410.34            | 8,216.47            | 36.27           | 32.18       | 90.00                 | 711.23                 | 575.69    | 1,583.70             | 1,545.45              | 38.25                   | 41.403            |                            |
| 9,900.00                                                                                  | 9,817.00            | 8,425.00            | 8,220.90            | 36.61           | 32.27       | 90.00                 | 711.23                 | 589.66    | 1,678.87             | 1,640.58              | 38.29                   | 43.848            |                            |
| 10,000.00                                                                                 | 9,916.88            | 8,425.00            | 8,220.90            | 36.94           | 32.27       | 0.00                  | 711.23                 | 589.66    | 1,773.26             | 1,735.21              | 38.05                   | 46.603            |                            |
| 10,100.00                                                                                 | 10,014.27           | 8,425.00            | 8,220.90            | 37.27           | 32.27       | 0.00                  | 711.23                 | 589.66    | 1,868.84             | 1,823.20              | 37.64                   | 49.441            |                            |
| 10,200.00                                                                                 | 10,104.99           | 8,450.00            | 8,227.45            | 37.58           | 32.43       | 0.00                  | 711.23                 | 613.78    | 1,937.82             | 1,900.36              | 37.46                   | 51.726            |                            |
| 10,300.00                                                                                 | 10,185.06           | 8,462.03            | 8,230.15            | 37.87           | 32.51       | 0.00                  | 711.23                 | 625.51    | 2,002.26             | 1,965.28              | 36.98                   | 54.148            |                            |
| 10,400.00                                                                                 | 10,261.00           | 8,475.00            | 8,232.72            | 38.14           | 32.60       | 0.00                  | 711.23                 | 638.22    | 2,052.33             | 2,015.86              | 36.47                   | 56.281            |                            |
| 10,500.00                                                                                 | 10,299.92           | 8,500.00            | 8,236.71            | 38.45           | 32.78       | 0.00                  | 711.23                 | 662.89    | 2,086.89             | 2,050.59              | 36.10                   | 57.803            |                            |
| 10,600.00                                                                                 | 10,329.68           | 8,514.29            | 8,238.41            | 38.87           | 32.89       | 0.00                  | 711.23                 | 677.09    | 2,104.48             | 2,068.80              | 35.68                   | 58.976            |                            |
| 10,700.00                                                                                 | 10,339.01           | 8,525.00            | 8,239.41            | 39.43           | 32.97       | 0.00                  | 711.23                 | 687.75    | 2,105.43             | 2,070.06              | 35.37                   | 59.527            |                            |
| 10,800.00                                                                                 | 10,339.01           | 8,550.00            | 8,240.80            | 40.13           | 33.17       | 0.00                  | 711.23                 | 712.70    | 2,100.73             | 2,065.42              | 35.31                   | 59.494            |                            |
| 10,865.67                                                                                 | 10,339.00           | 8,567.66            | 8,241.01            | 40.69           | 33.31       | 0.00                  | 711.23                 | 723.17    | 2,099.80             | 2,064.44              | 35.36                   | 59.391            |                            |
| 10,900.00                                                                                 | 10,339.00           | 8,605.20            | 8,241.00            | 40.99           | 33.64       | 0.00                  | 711.23                 | 757.50    | 2,099.80             | 2,064.29              | 35.51                   | 59.140            |                            |
| 11,000.00                                                                                 | 10,339.00           | 8,705.20            | 8,241.00            | 41.97           | 34.81       | 0.00                  | 711.23                 | 857.50    | 2,099.80             | 2,063.82              | 35.98                   | 58.368            |                            |
| 11,100.00                                                                                 | 10,339.00           | 8,805.20            | 8,241.00            | 43.08           | 35.74       | 0.00                  | 711.23                 | 957.50    | 2,099.80             | 2,063.29              | 36.51                   | 57.516            |                            |
| 11,200.00                                                                                 | 10,339.00           | 8,905.20            | 8,241.00            | 44.30           | 36.99       | 0.00                  | 711.23                 | 1,057.50  | 2,099.80             | 2,062.70              | 37.10                   | 56.597            |                            |
| 11,300.00                                                                                 | 10,339.00           | 9,005.20            | 8,241.00            | 45.61           | 38.37       | 0.00                  | 711.23                 | 1,157.50  | 2,099.80             | 2,062.05              | 37.75                   | 55.621            |                            |
| 11,400.00                                                                                 | 10,339.00           | 9,105.20            | 8,241.00            | 47.02           | 39.85       | 0.00                  | 711.23                 | 1,257.50  | 2,099.80             | 2,061.34              | 38.46                   | 54.602            |                            |
| 11,500.00                                                                                 | 10,339.00           | 9,205.20            | 8,241.00            | 48.52           | 41.43       | 0.00                  | 711.23                 | 1,357.50  | 2,099.80             | 2,060.59              | 39.21                   | 53.549            |                            |
| 11,600.00                                                                                 | 10,339.00           | 9,305.20            | 8,241.00            | 50.08           | 43.09       | 0.00                  | 711.23                 | 1,457.50  | 2,099.80             | 2,059.78              | 40.02                   | 52.473            |                            |
| 11,700.00                                                                                 | 10,339.00           | 9,405.20            | 8,241.00            | 51.72           | 44.82       | 0.00                  | 711.23                 | 1,557.50  | 2,099.80             | 2,058.93              | 40.87                   | 51.383            |                            |
| 11,800.00                                                                                 | 10,339.00           | 9,505.20            | 8,241.00            | 53.42           | 46.61       | 0.00                  | 711.23                 | 1,657.50  | 2,099.80             | 2,058.04              | 41.76                   | 50.286            |                            |
| 11,900.00                                                                                 | 10,339.00           | 9,605.20            | 8,241.00            | 55.17           | 48.47       | 0.00                  | 711.23                 | 1,757.50  | 2,099.80             | 2,057.11              | 42.69                   | 49.190            |                            |
| 12,000.00                                                                                 | 10,339.00           | 9,705.20            | 8,241.00            | 56.98           | 50.37       | 0.00                  | 711.23                 | 1,857.50  | 2,099.80             | 2,056.14              | 43.66                   | 48.100            |                            |

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



# Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Reference Site: Section 01-T23S-R28E  
Site Error: 0.00 ft Rana Salada Fed Com 0605 231H  
Reference Well: 0.00 ft  
Well Error: Original Hole  
Reference Wellbore: rev1  
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: DB\_Aug0116\_LT\_v14  
Offset TVD Reference: Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 065 121H - Original Hole - rev1 |                     |                     |                     |                 |             |                       |                                  |           |                      |                       |                         |                   | Offset Site Error: | 0.00 ft |
|------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|----------------------------------|-----------|----------------------|-----------------------|-------------------------|-------------------|--------------------|---------|
| Survey Program: 0-MWD                                                                    |                     |                     |                     |                 |             |                       |                                  |           |                      |                       |                         |                   | Offset Well Error: | 0.00 ft |
| Reference                                                                                |                     | Offset              |                     | Semi Major Axis |             |                       | Distance                         |           |                      |                       |                         |                   |                    |         |
| Measured Depth (ft)                                                                      | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft)  | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N-S (ft) | +E-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor | Warning            |         |
| 12,100.00                                                                                | 10,339.00           | 9,805.20            | 8,241.00            | 58.83           | 52.32       | 0.00                  | 711.23                           | 1,957.50  | 2,099.80             | 2,055.14              | 44.66                   | 47.021            |                    |         |
| 12,200.00                                                                                | 10,339.00           | 9,905.20            | 8,241.00            | 60.72           | 54.30       | 0.00                  | 711.23                           | 2,057.50  | 2,099.80             | 2,054.11              | 45.89                   | 45.957            |                    |         |
| 12,300.00                                                                                | 10,339.00           | 10,005.20           | 8,241.00            | 62.85           | 56.33       | 0.00                  | 711.23                           | 2,157.50  | 2,099.80             | 2,053.05              | 46.75                   | 44.911            |                    |         |
| 12,400.00                                                                                | 10,339.00           | 10,105.20           | 8,241.00            | 64.81           | 58.38       | 0.00                  | 711.23                           | 2,257.50  | 2,099.80             | 2,051.95              | 47.85                   | 43.887            |                    |         |
| 12,500.00                                                                                | 10,339.00           | 10,205.20           | 8,241.00            | 66.81           | 60.47       | 0.00                  | 711.23                           | 2,357.50  | 2,099.80             | 2,050.84              | 48.96                   | 42.885            |                    |         |
| 12,600.00                                                                                | 10,339.00           | 10,305.20           | 8,241.00            | 68.64           | 62.58       | 0.00                  | 711.23                           | 2,457.50  | 2,099.80             | 2,049.70              | 50.10                   | 41.908            |                    |         |
| 12,700.00                                                                                | 10,339.00           | 10,405.20           | 8,241.00            | 70.69           | 64.71       | 0.00                  | 711.23                           | 2,557.50  | 2,099.80             | 2,048.53              | 51.27                   | 40.957            |                    |         |
| 12,800.00                                                                                | 10,339.00           | 10,505.20           | 8,241.00            | 72.76           | 66.87       | 0.00                  | 711.23                           | 2,657.50  | 2,099.80             | 2,047.35              | 52.45                   | 40.032            |                    |         |
| 12,900.00                                                                                | 10,339.00           | 10,605.20           | 8,241.00            | 74.86           | 69.04       | 0.00                  | 711.23                           | 2,757.50  | 2,099.80             | 2,046.14              | 53.66                   | 39.133            |                    |         |
| 13,000.00                                                                                | 10,339.00           | 10,705.20           | 8,241.00            | 76.98           | 71.23       | 0.00                  | 711.23                           | 2,857.50  | 2,099.80             | 2,044.92              | 54.88                   | 38.261            |                    |         |
| 13,100.00                                                                                | 10,339.00           | 10,805.20           | 8,241.00            | 79.11           | 73.44       | 0.00                  | 711.23                           | 2,957.50  | 2,099.80             | 2,043.68              | 56.12                   | 37.416            |                    |         |
| 13,200.00                                                                                | 10,339.00           | 10,905.20           | 8,241.00            | 81.27           | 75.66       | 0.00                  | 711.23                           | 3,057.50  | 2,099.80             | 2,042.42              | 57.38                   | 36.597            |                    |         |
| 13,300.00                                                                                | 10,339.00           | 11,005.20           | 8,241.00            | 83.44           | 77.90       | 0.00                  | 711.23                           | 3,157.50  | 2,099.80             | 2,041.15              | 58.65                   | 35.804            |                    |         |
| 13,400.00                                                                                | 10,339.00           | 11,105.20           | 8,241.00            | 85.62           | 80.14       | 0.00                  | 711.23                           | 3,257.50  | 2,099.80             | 2,039.87              | 59.93                   | 35.036            |                    |         |
| 13,500.00                                                                                | 10,339.00           | 11,205.20           | 8,241.00            | 87.82           | 82.40       | 0.00                  | 711.23                           | 3,357.50  | 2,099.80             | 2,038.57              | 61.23                   | 34.294            |                    |         |
| 13,600.00                                                                                | 10,339.00           | 11,305.20           | 8,241.00            | 90.03           | 84.67       | 0.00                  | 711.23                           | 3,457.50  | 2,099.80             | 2,037.26              | 62.54                   | 33.575            |                    |         |
| 13,700.00                                                                                | 10,339.00           | 11,405.20           | 8,241.00            | 92.25           | 86.95       | 0.00                  | 711.23                           | 3,557.50  | 2,099.80             | 2,035.94              | 63.86                   | 32.880            |                    |         |
| 13,800.00                                                                                | 10,339.00           | 11,505.20           | 8,241.00            | 94.48           | 89.23       | 0.00                  | 711.23                           | 3,657.50  | 2,099.80             | 2,034.61              | 65.19                   | 32.208            |                    |         |
| 13,900.00                                                                                | 10,339.00           | 11,605.20           | 8,241.00            | 96.72           | 91.52       | 0.00                  | 711.23                           | 3,757.50  | 2,099.80             | 2,033.26              | 66.54                   | 31.558            |                    |         |
| 14,000.00                                                                                | 10,339.00           | 11,705.20           | 8,241.00            | 98.97           | 93.83       | 0.00                  | 711.23                           | 3,857.50  | 2,099.80             | 2,031.91              | 67.89                   | 30.930            |                    |         |
| 14,100.00                                                                                | 10,339.00           | 11,805.20           | 8,241.00            | 101.23          | 96.13       | 0.00                  | 711.23                           | 3,957.50  | 2,099.80             | 2,030.55              | 69.25                   | 30.322            |                    |         |
| 14,200.00                                                                                | 10,339.00           | 11,905.20           | 8,241.00            | 103.50          | 98.45       | 0.00                  | 711.23                           | 4,057.50  | 2,099.80             | 2,029.18              | 70.82                   | 29.733            |                    |         |
| 14,300.00                                                                                | 10,339.00           | 12,005.20           | 8,241.00            | 105.78          | 100.77      | 0.00                  | 711.23                           | 4,157.50  | 2,099.80             | 2,027.80              | 72.00                   | 29.164            |                    |         |
| 14,400.00                                                                                | 10,339.00           | 12,105.20           | 8,241.00            | 108.06          | 103.09      | 0.00                  | 711.23                           | 4,257.50  | 2,099.80             | 2,026.42              | 73.38                   | 28.614            |                    |         |
| 14,500.00                                                                                | 10,339.00           | 12,205.20           | 8,241.00            | 110.35          | 105.42      | 0.00                  | 711.23                           | 4,357.50  | 2,099.80             | 2,025.02              | 74.78                   | 28.081            |                    |         |
| 14,600.00                                                                                | 10,339.00           | 12,305.20           | 8,241.00            | 112.65          | 107.76      | 0.00                  | 711.23                           | 4,457.50  | 2,099.80             | 2,023.62              | 76.18                   | 27.565            |                    |         |
| 14,700.00                                                                                | 10,339.00           | 12,405.20           | 8,241.00            | 114.95          | 110.10      | 0.00                  | 711.23                           | 4,557.50  | 2,099.80             | 2,022.22              | 77.58                   | 27.065            |                    |         |
| 14,800.00                                                                                | 10,339.00           | 12,505.20           | 8,241.00            | 117.25          | 112.44      | 0.00                  | 711.23                           | 4,657.50  | 2,099.80             | 2,020.81              | 78.99                   | 26.582            |                    |         |
| 14,900.00                                                                                | 10,339.00           | 12,605.20           | 8,241.00            | 119.57          | 114.79      | 0.00                  | 711.23                           | 4,757.50  | 2,099.80             | 2,019.39              | 80.41                   | 26.113            |                    |         |
| 15,000.00                                                                                | 10,339.00           | 12,705.20           | 8,241.00            | 121.88          | 117.14      | 0.00                  | 711.23                           | 4,857.50  | 2,099.80             | 2,017.96              | 81.84                   | 25.659            |                    |         |
| 15,100.00                                                                                | 10,339.00           | 12,805.20           | 8,241.00            | 124.21          | 119.50      | 0.00                  | 711.23                           | 4,957.50  | 2,099.80             | 2,016.54              | 83.26                   | 25.219            |                    |         |
| 15,200.00                                                                                | 10,339.00           | 12,905.20           | 8,241.00            | 126.53          | 121.86      | 0.00                  | 711.23                           | 5,057.50  | 2,099.80             | 2,015.10              | 84.70                   | 24.792            |                    |         |
| 15,300.00                                                                                | 10,339.00           | 13,005.20           | 8,241.00            | 128.86          | 124.22      | 0.00                  | 711.23                           | 5,157.50  | 2,099.80             | 2,013.66              | 86.14                   | 24.378            |                    |         |
| 15,400.00                                                                                | 10,339.00           | 13,105.20           | 8,241.00            | 131.20          | 126.58      | 0.00                  | 711.23                           | 5,257.50  | 2,099.80             | 2,012.22              | 87.58                   | 23.976            |                    |         |
| 15,500.00                                                                                | 10,339.00           | 13,205.20           | 8,241.00            | 133.54          | 128.95      | 0.00                  | 711.23                           | 5,357.50  | 2,099.80             | 2,010.78              | 89.02                   | 23.587            |                    |         |
| 15,600.00                                                                                | 10,339.00           | 13,305.20           | 8,241.00            | 135.88          | 131.32      | 0.00                  | 711.23                           | 5,457.50  | 2,099.80             | 2,009.32              | 90.48                   | 23.208            |                    |         |
| 15,700.00                                                                                | 10,339.00           | 13,405.20           | 8,241.00            | 138.23          | 133.70      | 0.00                  | 711.23                           | 5,557.50  | 2,099.80             | 2,007.87              | 91.93                   | 22.841            |                    |         |
| 15,800.00                                                                                | 10,339.00           | 13,505.20           | 8,241.00            | 140.57          | 136.07      | 0.00                  | 711.23                           | 5,657.50  | 2,099.80             | 2,006.41              | 93.39                   | 22.485            |                    |         |
| 15,900.00                                                                                | 10,339.00           | 13,605.20           | 8,241.00            | 142.93          | 138.45      | 0.00                  | 711.23                           | 5,757.50  | 2,099.80             | 2,004.95              | 94.85                   | 22.138            |                    |         |
| 16,000.00                                                                                | 10,339.00           | 13,705.20           | 8,241.00            | 145.28          | 140.83      | 0.00                  | 711.23                           | 5,857.50  | 2,099.80             | 2,003.48              | 96.32                   | 21.801            |                    |         |
| 16,100.00                                                                                | 10,339.00           | 13,805.20           | 8,241.00            | 147.64          | 143.21      | 0.00                  | 711.23                           | 5,957.50  | 2,099.80             | 2,002.02              | 97.78                   | 21.474            |                    |         |
| 16,200.00                                                                                | 10,339.00           | 13,905.20           | 8,241.00            | 150.00          | 145.59      | 0.00                  | 711.23                           | 6,057.50  | 2,099.80             | 2,000.54              | 99.26                   | 21.155            |                    |         |
| 16,300.00                                                                                | 10,339.00           | 14,005.20           | 8,241.00            | 152.36          | 147.98      | 0.00                  | 711.23                           | 6,157.50  | 2,099.80             | 1,999.07              | 100.73                  | 20.846            |                    |         |
| 16,400.00                                                                                | 10,339.00           | 14,105.20           | 8,241.00            | 154.73          | 150.37      | 0.00                  | 711.23                           | 6,257.50  | 2,099.80             | 1,997.59              | 102.21                  | 20.544            |                    |         |
| 16,500.00                                                                                | 10,339.00           | 14,205.20           | 8,241.00            | 157.09          | 152.75      | 0.00                  | 711.23                           | 6,357.50  | 2,099.80             | 1,996.11              | 103.69                  | 20.251            |                    |         |
| 16,600.00                                                                                | 10,339.00           | 14,305.20           | 8,241.00            | 159.46          | 155.14      | 0.00                  | 711.23                           | 6,457.50  | 2,099.80             | 1,994.63              | 105.17                  | 19.966            |                    |         |
| 16,700.00                                                                                | 10,339.00           | 14,405.20           | 8,241.00            | 161.83          | 157.54      | 0.00                  | 711.23                           | 6,557.50  | 2,099.80             | 1,993.15              | 106.65                  | 19.688            |                    |         |
| 16,800.00                                                                                | 10,339.00           | 14,505.20           | 8,241.00            | 164.21          | 159.93      | 0.00                  | 711.23                           | 6,657.50  | 2,099.80             | 1,991.66              | 108.14                  | 19.417            |                    |         |
| 16,900.00                                                                                | 10,339.00           | 14,605.20           | 8,241.00            | 166.58          | 162.32      | 0.00                  | 711.23                           | 6,757.50  | 2,099.80             | 1,990.17              | 109.63                  | 19.153            |                    |         |
| 17,000.00                                                                                | 10,339.00           | 14,705.20           | 8,241.00            | 168.96          | 164.72      | 0.00                  | 711.23                           | 6,857.50  | 2,099.80             | 1,988.68              | 111.12                  | 18.896            |                    |         |
| 17,100.00                                                                                | 10,339.00           | 14,805.20           | 8,241.00            | 171.34          | 167.12      | 0.00                  | 711.23                           | 6,957.50  | 2,099.80             | 1,987.18              | 112.62                  | 18.645            |                    |         |

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



# Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Reference Site: Section 01-T23S-R28E  
Site Error: 0.00 ft Rana Salada Fed Com 0605 231H  
Reference Well: 0.00 ft  
Well Error: Original Hole  
Reference Wellbore: rev1  
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: DB\_Aug0116\_LT\_v14  
Offset TVD Reference: Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 06065 121H - Original Hole - rev1 |                           |                           |                           |                   |                |                              |                                        |              |                               |                      |         |        | Offset Site Error: 0.00 ft |
|--------------------------------------------------------------------------------------------|---------------------------|---------------------------|---------------------------|-------------------|----------------|------------------------------|----------------------------------------|--------------|-------------------------------|----------------------|---------|--------|----------------------------|
| Survey Program: 0-MWD                                                                      |                           |                           |                           |                   |                |                              |                                        |              |                               |                      |         |        | Offset Well Error: 0.00 ft |
| Reference                                                                                  |                           | Offset                    |                           | Semi Major Axis   |                | Highside<br>Toothface<br>(") | Distance                               |              | Minimum<br>Separation<br>(ft) | Separation<br>Factor | Warning |        |                            |
| Measured<br>Depth<br>(ft)                                                                  | Vertical<br>Depth<br>(ft) | Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Reference<br>(ft) | Offset<br>(ft) |                              | Offset Wellbore Centre<br>+N-S<br>(ft) | +E-W<br>(ft) |                               |                      |         |        |                            |
| 17,200.00                                                                                  | 10,339.00                 | 14,905.20                 | 8,241.00                  | 173.72            | 169.52         | 0.00                         | 711.23                                 | 7,057.50     | 2,099.80                      | 1,985.69             | 114.11  | 18.401 |                            |
| 17,300.00                                                                                  | 10,339.00                 | 15,005.20                 | 8,241.00                  | 178.10            | 171.91         | 0.00                         | 711.23                                 | 7,157.50     | 2,099.80                      | 1,984.19             | 115.61  | 18.183 |                            |
| 17,400.00                                                                                  | 10,339.00                 | 15,105.20                 | 8,241.00                  | 178.48            | 174.32         | 0.00                         | 711.23                                 | 7,257.50     | 2,099.80                      | 1,982.69             | 117.11  | 17.930 |                            |
| 17,500.00                                                                                  | 10,339.00                 | 15,205.20                 | 8,241.00                  | 180.87            | 176.72         | 0.00                         | 711.23                                 | 7,357.50     | 2,099.80                      | 1,981.19             | 118.61  | 17.703 |                            |
| 17,600.00                                                                                  | 10,339.00                 | 15,305.20                 | 8,241.00                  | 183.26            | 179.12         | 0.00                         | 711.23                                 | 7,457.50     | 2,099.80                      | 1,979.68             | 120.12  | 17.482 |                            |
| 17,700.00                                                                                  | 10,339.00                 | 15,405.20                 | 8,241.00                  | 185.64            | 181.52         | 0.00                         | 711.23                                 | 7,557.50     | 2,099.80                      | 1,978.18             | 121.62  | 17.265 |                            |
| 17,800.00                                                                                  | 10,339.00                 | 15,505.20                 | 8,241.00                  | 188.03            | 183.93         | 0.00                         | 711.23                                 | 7,657.50     | 2,099.80                      | 1,976.67             | 123.13  | 17.054 |                            |
| 17,900.00                                                                                  | 10,339.00                 | 15,605.20                 | 8,241.00                  | 190.42            | 186.33         | 0.00                         | 711.23                                 | 7,757.50     | 2,099.80                      | 1,975.17             | 124.63  | 16.848 |                            |
| 18,000.00                                                                                  | 10,339.00                 | 15,705.20                 | 8,241.00                  | 192.82            | 188.74         | 0.00                         | 711.23                                 | 7,857.50     | 2,099.80                      | 1,973.66             | 126.14  | 16.646 |                            |
| 18,100.00                                                                                  | 10,339.00                 | 15,805.20                 | 8,241.00                  | 195.21            | 191.15         | 0.00                         | 711.23                                 | 7,957.50     | 2,099.80                      | 1,972.14             | 127.66  | 16.449 |                            |
| 18,200.00                                                                                  | 10,339.00                 | 15,905.20                 | 8,241.00                  | 197.60            | 193.56         | 0.00                         | 711.23                                 | 8,057.50     | 2,099.80                      | 1,970.63             | 129.17  | 16.256 |                            |
| 18,300.00                                                                                  | 10,339.00                 | 16,005.20                 | 8,241.00                  | 200.00            | 195.96         | 0.00                         | 711.23                                 | 8,157.50     | 2,099.80                      | 1,969.12             | 130.68  | 16.068 |                            |
| 18,400.00                                                                                  | 10,339.00                 | 16,105.20                 | 8,241.00                  | 202.40            | 198.37         | 0.00                         | 711.23                                 | 8,257.50     | 2,099.80                      | 1,967.60             | 132.20  | 15.884 |                            |
| 18,500.00                                                                                  | 10,339.00                 | 16,205.20                 | 8,241.00                  | 204.79            | 200.78         | 0.00                         | 711.23                                 | 8,357.50     | 2,099.80                      | 1,966.09             | 133.71  | 15.704 |                            |
| 18,600.00                                                                                  | 10,339.00                 | 16,305.20                 | 8,241.00                  | 207.19            | 203.20         | 0.00                         | 711.23                                 | 8,457.50     | 2,099.80                      | 1,964.57             | 135.23  | 15.528 |                            |
| 18,700.00                                                                                  | 10,339.00                 | 16,405.20                 | 8,241.00                  | 209.58            | 205.61         | 0.00                         | 711.23                                 | 8,557.50     | 2,099.80                      | 1,963.05             | 136.75  | 15.355 |                            |
| 18,800.00                                                                                  | 10,339.00                 | 16,505.20                 | 8,241.00                  | 211.99            | 208.02         | 0.00                         | 711.23                                 | 8,657.50     | 2,099.80                      | 1,961.53             | 138.27  | 15.186 |                            |
| 18,900.00                                                                                  | 10,339.00                 | 16,605.20                 | 8,241.00                  | 214.39            | 210.43         | 0.00                         | 711.23                                 | 8,757.50     | 2,099.80                      | 1,960.01             | 139.79  | 15.021 |                            |
| 19,000.00                                                                                  | 10,339.00                 | 16,705.20                 | 8,241.00                  | 216.79            | 212.85         | 0.00                         | 711.23                                 | 8,857.50     | 2,099.80                      | 1,958.49             | 141.31  | 14.859 |                            |
| 19,100.00                                                                                  | 10,339.00                 | 16,805.20                 | 8,241.00                  | 219.20            | 215.26         | 0.00                         | 711.23                                 | 8,957.50     | 2,099.80                      | 1,956.97             | 142.83  | 14.701 |                            |
| 19,200.00                                                                                  | 10,339.00                 | 16,905.20                 | 8,241.00                  | 221.60            | 217.68         | 0.00                         | 711.23                                 | 9,057.50     | 2,099.80                      | 1,955.44             | 144.36  | 14.546 |                            |
| 19,300.00                                                                                  | 10,339.00                 | 17,005.20                 | 8,241.00                  | 224.00            | 220.09         | 0.00                         | 711.23                                 | 9,157.50     | 2,099.80                      | 1,953.92             | 145.88  | 14.394 |                            |
| 19,400.00                                                                                  | 10,339.00                 | 17,105.20                 | 8,241.00                  | 226.41            | 222.51         | 0.00                         | 711.23                                 | 9,257.50     | 2,099.80                      | 1,952.39             | 147.41  | 14.245 |                            |
| 19,500.00                                                                                  | 10,339.00                 | 17,205.20                 | 8,241.00                  | 228.82            | 224.92         | 0.00                         | 711.23                                 | 9,357.50     | 2,099.80                      | 1,950.87             | 148.93  | 14.099 |                            |
| 19,600.00                                                                                  | 10,339.00                 | 17,305.20                 | 8,241.00                  | 231.22            | 227.34         | 0.00                         | 711.23                                 | 9,457.50     | 2,099.80                      | 1,949.34             | 150.46  | 13.956 |                            |
| 19,700.00                                                                                  | 10,339.00                 | 17,405.20                 | 8,241.00                  | 233.63            | 229.76         | 0.00                         | 711.23                                 | 9,557.50     | 2,099.80                      | 1,947.81             | 151.99  | 13.815 |                            |
| 19,800.00                                                                                  | 10,339.00                 | 17,505.20                 | 8,241.00                  | 236.04            | 232.17         | 0.00                         | 711.23                                 | 9,657.50     | 2,099.80                      | 1,946.28             | 153.52  | 13.678 |                            |
| 19,900.00                                                                                  | 10,339.00                 | 17,605.20                 | 8,241.00                  | 238.45            | 234.59         | 0.00                         | 711.23                                 | 9,757.50     | 2,099.80                      | 1,944.75             | 155.05  | 13.543 |                            |
| 20,000.00                                                                                  | 10,339.00                 | 17,705.20                 | 8,241.00                  | 240.85            | 237.01         | 0.00                         | 711.23                                 | 9,857.50     | 2,099.80                      | 1,943.22             | 156.58  | 13.410 |                            |
| 20,100.00                                                                                  | 10,339.00                 | 17,805.20                 | 8,241.00                  | 243.26            | 239.43         | 0.00                         | 711.23                                 | 9,957.50     | 2,099.80                      | 1,941.69             | 158.11  | 13.280 |                            |
| 20,200.00                                                                                  | 10,339.00                 | 17,905.20                 | 8,241.00                  | 245.67            | 241.85         | 0.00                         | 711.23                                 | 10,057.50    | 2,099.80                      | 1,940.16             | 159.64  | 13.153 |                            |
| 20,300.00                                                                                  | 10,339.00                 | 18,005.20                 | 8,241.00                  | 248.09            | 244.27         | 0.00                         | 711.23                                 | 10,157.50    | 2,099.80                      | 1,938.62             | 161.18  | 13.028 |                            |
| 20,400.00                                                                                  | 10,339.00                 | 18,105.20                 | 8,241.00                  | 250.50            | 246.69         | 0.00                         | 711.23                                 | 10,257.50    | 2,099.80                      | 1,937.09             | 162.71  | 12.905 |                            |
| 20,500.00                                                                                  | 10,339.00                 | 18,205.20                 | 8,241.00                  | 252.91            | 249.11         | 0.00                         | 711.23                                 | 10,357.50    | 2,099.80                      | 1,935.55             | 164.25  | 12.785 |                            |
| 20,600.00                                                                                  | 10,339.00                 | 18,294.80                 | 8,241.00                  | 255.32            | 251.28         | 0.00                         | 711.23                                 | 10,457.50    | 2,099.80                      | 1,934.10             | 165.70  | 12.872 |                            |
| 20,606.22                                                                                  | 10,339.00                 | 18,301.02                 | 8,241.00                  | 255.47            | 251.43         | 0.00                         | 711.23                                 | 10,463.72    | 2,099.80                      | 1,934.00             | 165.80  | 12.665 |                            |



# Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Reference Site: Section 01-T23S-R28E  
Site Error: 0.00 ft Rana Salada Fed Com 0605 231H  
Reference Well: 0.00 ft  
Well Error: Original Hole  
Reference Wellbore: rev1  
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: DB\_Aug0116\_LT\_v14  
Offset TVD Reference: Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 121H - Original Hole - rev1 |                     |                     |                     |                 |             |                       |                                  |                                  |                      |                       |                         |                            | Offset Site Error: 0.00 ft |
|-------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|----------------------------------|----------------------------------|----------------------|-----------------------|-------------------------|----------------------------|----------------------------|
| Survey Program: O-MWD                                                                     |                     |                     |                     |                 |             |                       |                                  |                                  |                      |                       |                         |                            | Offset Well Error: 0.00 ft |
| Reference                                                                                 |                     | Offset              |                     | Semi Major Axis |             | Highside Toolface (°) | Distance                         |                                  |                      |                       | Minimum Separation (ft) | Separation Factor          | Warning                    |
| Measured Depth (ft)                                                                       | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft)  | Offset (ft) |                       | Offset Wellbore Centre +N-S (ft) | Offset Wellbore Centre +E-W (ft) | Between Centres (ft) | Between Ellipses (ft) |                         |                            |                            |
| 0.00                                                                                      | 0.00                | 1.00                | 1.00                | 0.00            | 0.00        | 89.94                 | 0.03                             | 29.96                            | 29.96                |                       |                         |                            |                            |
| 100.00                                                                                    | 100.00              | 101.00              | 101.00              | 0.13            | 0.14        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 29.69                 | 0.27                    | 109.970                    |                            |
| 200.00                                                                                    | 200.00              | 201.00              | 201.00              | 0.49            | 0.50        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 28.97                 | 0.99                    | 30.282                     |                            |
| 300.00                                                                                    | 300.00              | 301.00              | 301.00              | 0.85            | 0.85        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 28.25                 | 1.71                    | 17.558                     |                            |
| 400.00                                                                                    | 400.00              | 401.00              | 401.00              | 1.21            | 1.21        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 27.54                 | 2.42                    | 12.384                     |                            |
| 500.00                                                                                    | 500.00              | 501.00              | 501.00              | 1.57            | 1.57        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 26.82                 | 3.14                    | 9.541                      |                            |
| 600.00                                                                                    | 600.00              | 601.00              | 601.00              | 1.93            | 1.93        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 26.10                 | 3.86                    | 7.787                      |                            |
| 700.00                                                                                    | 700.00              | 701.00              | 701.00              | 2.29            | 2.29        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 25.39                 | 4.57                    | 6.550                      |                            |
| 800.00                                                                                    | 800.00              | 801.00              | 801.00              | 2.64            | 2.65        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 24.67                 | 5.29                    | 5.662                      |                            |
| 900.00                                                                                    | 900.00              | 901.00              | 901.00              | 3.00            | 3.01        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 23.95                 | 6.01                    | 4.987                      |                            |
| 1,000.00                                                                                  | 1,000.00            | 1,001.00            | 1,001.00            | 3.36            | 3.36        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 23.24                 | 6.72                    | 4.455                      |                            |
| 1,100.00                                                                                  | 1,100.00            | 1,101.00            | 1,101.00            | 3.72            | 3.72        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 22.52                 | 7.44                    | 4.026                      |                            |
| 1,200.00                                                                                  | 1,200.00            | 1,201.00            | 1,201.00            | 4.08            | 4.08        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 21.80                 | 8.16                    | 3.672                      |                            |
| 1,300.00                                                                                  | 1,300.00            | 1,301.00            | 1,301.00            | 4.44            | 4.44        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 21.08                 | 8.88                    | 3.375                      |                            |
| 1,400.00                                                                                  | 1,400.00            | 1,401.00            | 1,401.00            | 4.79            | 4.80        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 20.37                 | 9.59                    | 3.123                      |                            |
| 1,500.00                                                                                  | 1,500.00            | 1,501.00            | 1,501.00            | 5.15            | 5.16        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 19.65                 | 10.31                   | 2.906                      |                            |
| 1,600.00                                                                                  | 1,600.00            | 1,601.00            | 1,601.00            | 5.51            | 5.52        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 18.93                 | 11.03                   | 2.717                      |                            |
| 1,700.00                                                                                  | 1,700.00            | 1,701.00            | 1,701.00            | 5.87            | 5.87        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 18.22                 | 11.74                   | 2.551                      |                            |
| 1,800.00                                                                                  | 1,800.00            | 1,801.00            | 1,801.00            | 6.23            | 6.23        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 17.50                 | 12.46                   | 2.404                      |                            |
| 1,900.00                                                                                  | 1,900.00            | 1,901.00            | 1,901.00            | 6.59            | 6.59        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 16.78                 | 13.18                   | 2.274                      |                            |
| 2,000.00                                                                                  | 2,000.00            | 2,001.00            | 2,001.00            | 6.95            | 6.95        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 16.07                 | 13.89                   | 2.156                      |                            |
| 2,100.00                                                                                  | 2,100.00            | 2,101.00            | 2,101.00            | 7.30            | 7.31        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 15.35                 | 14.61                   | 2.050                      |                            |
| 2,200.00                                                                                  | 2,200.00            | 2,201.00            | 2,201.00            | 7.66            | 7.67        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 14.63                 | 15.33                   | 1.955 Level 3<2.00         |                            |
| 2,300.00                                                                                  | 2,300.00            | 2,301.00            | 2,301.00            | 8.02            | 8.02        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 13.91                 | 16.05                   | 1.867 Level 3<2.00         |                            |
| 2,400.00                                                                                  | 2,400.00            | 2,401.00            | 2,401.00            | 8.38            | 8.38        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 13.20                 | 16.76                   | 1.787 Level 3<2.00         |                            |
| 2,500.00                                                                                  | 2,500.00            | 2,501.00            | 2,501.00            | 8.74            | 8.74        | 89.94                 | 0.03                             | 29.96                            | 29.96                | 12.48                 | 17.48                   | 1.714 Level 3<2.00, CC     |                            |
| 2,600.00                                                                                  | 2,600.00            | 2,600.85            | 2,600.63            | 9.10            | 9.10        | 86.77                 | 1.72                             | 30.48                            | 30.53                | 12.34                 | 18.19                   | 1.678 Level 3<2.00, ES, SF |                            |
| 2,700.00                                                                                  | 2,700.00            | 2,700.33            | 2,700.19            | 9.45            | 9.45        | 78.83                 | 6.30                             | 31.89                            | 32.52                | 13.62                 | 18.90                   | 1.720 Level 3<2.00         |                            |
| 2,800.00                                                                                  | 2,800.00            | 2,800.19            | 2,799.92            | 9.81            | 9.81        | 71.34                 | 11.29                            | 33.43                            | 35.31                | 15.59                 | 19.62                   | 1.800 Level 3<2.00         |                            |
| 2,900.00                                                                                  | 2,900.00            | 2,900.06            | 2,899.64            | 10.17           | 10.17       | 65.03                 | 16.29                            | 34.97                            | 38.60                | 18.28                 | 20.33                   | 1.899 Level 3<2.00         |                            |
| 3,000.00                                                                                  | 3,000.00            | 3,000.08            | 2,999.37            | 10.53           | 10.53       | 59.78                 | 21.28                            | 36.51                            | 42.29                | 21.25                 | 21.04                   | 2.010                      |                            |
| 3,100.00                                                                                  | 3,100.00            | 3,100.22            | 3,099.10            | 10.89           | 10.89       | 55.38                 | 26.28                            | 38.05                            | 46.28                | 24.53                 | 21.76                   | 2.127                      |                            |
| 3,200.00                                                                                  | 3,200.00            | 3,200.36            | 3,198.82            | 11.25           | 11.25       | 51.70                 | 31.27                            | 39.59                            | 50.50                | 28.03                 | 22.47                   | 2.247                      |                            |
| 3,300.00                                                                                  | 3,300.00            | 3,300.49            | 3,298.55            | 11.61           | 11.61       | 48.80                 | 36.26                            | 41.13                            | 54.89                | 31.70                 | 23.19                   | 2.367                      |                            |
| 3,400.00                                                                                  | 3,400.00            | 3,400.63            | 3,398.27            | 11.96           | 11.97       | 45.97                 | 41.26                            | 42.68                            | 59.42                | 35.52                 | 23.91                   | 2.486                      |                            |
| 3,500.00                                                                                  | 3,500.00            | 3,500.77            | 3,498.00            | 12.32           | 12.33       | 43.71                 | 46.25                            | 44.22                            | 64.06                | 39.44                 | 24.62                   | 2.602                      |                            |
| 3,600.00                                                                                  | 3,600.00            | 3,600.90            | 3,597.73            | 12.68           | 12.69       | 41.76                 | 51.25                            | 45.76                            | 68.76                | 43.44                 | 25.34                   | 2.714                      |                            |
| 3,700.00                                                                                  | 3,700.00            | 3,700.14            | 3,698.65            | 13.04           | 13.05       | 40.18                 | 55.88                            | 47.19                            | 73.18                | 47.11                 | 26.06                   | 2.808                      |                            |
| 3,800.00                                                                                  | 3,800.00            | 3,802.57            | 3,801.06            | 13.40           | 13.41       | 39.66                 | 57.54                            | 47.70                            | 74.74                | 47.95                 | 26.80                   | 2.789                      |                            |
| 3,807.56                                                                                  | 3,807.56            | 3,810.31            | 3,808.81            | 13.42           | 13.44       | 39.66                 | 57.53                            | 47.69                            | 74.73                | 47.88                 | 26.85                   | 2.783                      |                            |
| 3,900.00                                                                                  | 3,900.00            | 3,902.51            | 3,901.00            | 13.76           | 13.77       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 47.23                 | 27.51                   | 2.717                      |                            |
| 4,000.00                                                                                  | 4,000.00            | 4,002.51            | 4,001.00            | 14.11           | 14.13       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 46.51                 | 28.23                   | 2.648                      |                            |
| 4,100.00                                                                                  | 4,100.00            | 4,102.51            | 4,101.00            | 14.47           | 14.48       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 45.80                 | 28.94                   | 2.582                      |                            |
| 4,200.00                                                                                  | 4,200.00            | 4,202.51            | 4,201.00            | 14.83           | 14.84       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 45.08                 | 29.66                   | 2.520                      |                            |
| 4,300.00                                                                                  | 4,300.00            | 4,302.51            | 4,301.00            | 15.19           | 15.20       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 44.37                 | 30.38                   | 2.460                      |                            |
| 4,400.00                                                                                  | 4,400.00            | 4,402.51            | 4,401.00            | 15.55           | 15.56       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 43.65                 | 31.09                   | 2.404                      |                            |
| 4,500.00                                                                                  | 4,500.00            | 4,502.51            | 4,501.00            | 15.91           | 15.91       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 42.93                 | 31.81                   | 2.350                      |                            |
| 4,600.00                                                                                  | 4,600.00            | 4,602.51            | 4,601.00            | 16.27           | 16.27       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 42.22                 | 32.53                   | 2.298                      |                            |
| 4,700.00                                                                                  | 4,700.00            | 4,702.51            | 4,701.00            | 16.62           | 16.63       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 41.50                 | 33.24                   | 2.248                      |                            |
| 4,800.00                                                                                  | 4,800.00            | 4,802.51            | 4,801.00            | 16.98           | 16.99       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 40.78                 | 33.96                   | 2.201                      |                            |
| 4,900.00                                                                                  | 4,900.00            | 4,902.51            | 4,901.00            | 17.34           | 17.35       | 39.65                 | 57.55                            | 47.70                            | 74.74                | 40.07                 | 34.68                   | 2.155                      |                            |

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



# Anticollision Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Reference Site:** Section 01-T23S-R28E  
**Site Error:** 0.00 ft Rana Salada Fed Com 0605 231H  
**Reference Well:** 0.00 ft  
**Well Error:** Original Hole  
**Reference Wellbore:** rev1  
**Reference Design:**

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** DB\_Aug0116\_LT\_v14  
**Offset TVD Reference:** Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1 |                     |                     |                     |                 |             |                   |                                  |           |                    |                   |         |                      |                       | Offset Site Error: | 0.00 ft |
|-------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|-----------------|-------------|-------------------|----------------------------------|-----------|--------------------|-------------------|---------|----------------------|-----------------------|--------------------|---------|
| Survey Program: O-MWD                                                                     |                     |                     |                     |                 |             |                   |                                  |           |                    |                   |         |                      |                       | Offset Well Error: | 0.00 ft |
| Reference                                                                                 |                     | Offset              |                     | Semi Major Axis |             | Highside Toolface | Distance                         |           | Minimum Separation | Separation Factor | Warning |                      |                       |                    |         |
| Measured Depth (ft)                                                                       | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft)  | Offset (ft) |                   | Offset Wellbore Centre +N-S (ft) | +E-W (ft) |                    |                   |         | Between Centres (ft) | Between Ellipses (ft) |                    |         |
| 5,000.00                                                                                  | 5,000.00            | 5,002.51            | 5,001.00            | 17.70           | 17.70       | 39.65             | 57.55                            | 47.70     | 74.74              | 39.35             | 2.112   |                      |                       |                    |         |
| 5,100.00                                                                                  | 5,100.00            | 5,100.09            | 5,098.56            | 18.06           | 18.05       | 39.17             | 59.17                            | 48.20     | 78.35              | 40.28             | 2.116   |                      |                       |                    |         |
| 5,200.00                                                                                  | 5,200.00            | 5,197.47            | 5,195.81            | 18.42           | 18.40       | 37.84             | 63.95                            | 49.67     | 81.14              | 44.38             | 2.207   |                      |                       |                    |         |
| 5,300.00                                                                                  | 5,300.00            | 5,294.40            | 5,292.38            | 18.77           | 18.75       | 35.95             | 71.84                            | 52.11     | 89.16              | 51.78             | 2.385   |                      |                       |                    |         |
| 5,400.00                                                                                  | 5,400.00            | 5,390.86            | 5,387.96            | 19.13           | 19.11       | 33.83             | 82.76                            | 55.48     | 100.49             | 62.51             | 2.648   |                      |                       |                    |         |
| 5,500.00                                                                                  | 5,500.00            | 5,486.04            | 5,482.23            | 19.49           | 19.46       | 31.73             | 96.81                            | 59.75     | 115.13             | 78.61             | 2.989   |                      |                       |                    |         |
| 5,600.00                                                                                  | 5,600.00            | 5,582.87            | 5,577.28            | 19.85           | 19.82       | 29.81             | 113.22                           | 64.87     | 132.82             | 93.48             | 3.388   |                      |                       |                    |         |
| 5,700.00                                                                                  | 5,700.00            | 5,680.97            | 5,673.92            | 20.21           | 20.19       | 28.28             | 130.43                           | 70.18     | 150.56             | 110.72            | 3.779   |                      |                       |                    |         |
| 5,800.00                                                                                  | 5,800.00            | 5,779.28            | 5,770.56            | 20.57           | 20.56       | 27.08             | 147.64                           | 75.48     | 168.59             | 128.04            | 4.158   |                      |                       |                    |         |
| 5,900.00                                                                                  | 5,900.00            | 5,877.59            | 5,867.21            | 20.93           | 20.93       | 26.11             | 164.85                           | 80.79     | 186.67             | 145.42            | 4.525   |                      |                       |                    |         |
| 6,000.00                                                                                  | 6,000.00            | 5,875.90            | 5,863.65            | 21.28           | 21.31       | 25.31             | 182.08                           | 86.10     | 204.79             | 162.83            | 4.881   |                      |                       |                    |         |
| 6,100.00                                                                                  | 6,100.00            | 6,074.20            | 6,060.49            | 21.64           | 21.69       | 24.64             | 199.27                           | 91.41     | 222.94             | 180.28            | 5.225   |                      |                       |                    |         |
| 6,200.00                                                                                  | 6,200.00            | 6,172.51            | 6,157.14            | 22.00           | 22.08       | 24.07             | 216.48                           | 96.71     | 241.12             | 197.75            | 5.559   |                      |                       |                    |         |
| 6,300.00                                                                                  | 6,299.98            | 6,271.11            | 6,254.07            | 22.36           | 22.46       | 17.61             | 233.74                           | 102.04    | 257.69             | 213.60            | 5.845   |                      |                       |                    |         |
| 6,400.00                                                                                  | 6,399.84            | 6,370.22            | 6,351.50            | 22.72           | 22.85       | 17.43             | 251.09                           | 107.39    | 270.96             | 226.18            | 6.048   |                      |                       |                    |         |
| 6,500.00                                                                                  | 6,499.45            | 6,469.72            | 6,449.31            | 23.07           | 23.25       | 17.49             | 268.51                           | 112.76    | 280.93             | 235.42            | 6.172   |                      |                       |                    |         |
| 6,600.00                                                                                  | 6,598.70            | 6,569.48            | 6,547.38            | 23.43           | 23.85       | 17.77             | 285.98                           | 118.15    | 287.59             | 241.36            | 6.220   |                      |                       |                    |         |
| 6,700.00                                                                                  | 6,697.47            | 6,669.38            | 6,645.80            | 23.78           | 24.05       | 18.27             | 303.47                           | 123.54    | 290.95             | 243.99            | 6.196   |                      |                       |                    |         |
| 6,800.00                                                                                  | 6,795.62            | 6,769.31            | 6,743.63            | 24.14           | 24.45       | 19.01             | 320.96                           | 128.94    | 291.03             | 243.35            | 6.104   |                      |                       |                    |         |
| 6,900.00                                                                                  | 6,893.06            | 6,869.13            | 6,841.97            | 24.50           | 24.85       | 19.99             | 338.44                           | 134.33    | 287.87             | 239.46            | 5.947   |                      |                       |                    |         |
| 7,000.00                                                                                  | 6,889.91            | 6,868.82            | 6,839.97            | 24.86           | 25.26       | 21.16             | 355.89                           | 139.71    | 282.50             | 233.37            | 5.750   |                      |                       |                    |         |
| 7,100.00                                                                                  | 7,086.74            | 7,068.50            | 7,037.98            | 25.23           | 25.67       | 22.38             | 373.34                           | 145.09    | 277.17             | 227.32            | 5.559   |                      |                       |                    |         |
| 7,200.00                                                                                  | 7,183.57            | 7,168.18            | 7,135.95            | 25.61           | 26.07       | 23.64             | 390.79                           | 150.47    | 271.97             | 221.38            | 5.378   |                      |                       |                    |         |
| 7,300.00                                                                                  | 7,280.41            | 7,267.86            | 7,233.95            | 25.99           | 26.48       | 24.95             | 408.24                           | 155.86    | 266.91             | 215.58            | 5.133   |                      |                       |                    |         |
| 7,400.00                                                                                  | 7,377.24            | 7,367.55            | 7,331.95            | 26.37           | 26.90       | 26.30             | 425.69                           | 161.24    | 261.99             | 209.92            | 5.031   |                      |                       |                    |         |
| 7,500.00                                                                                  | 7,474.07            | 7,467.23            | 7,429.94            | 26.76           | 27.31       | 27.71             | 443.14                           | 166.82    | 257.23             | 204.40            | 4.869   |                      |                       |                    |         |
| 7,600.00                                                                                  | 7,570.90            | 7,566.91            | 7,527.93            | 27.16           | 27.72       | 29.18             | 460.60                           | 172.00    | 252.63             | 199.04            | 4.714   |                      |                       |                    |         |
| 7,700.00                                                                                  | 7,667.73            | 7,666.59            | 7,625.93            | 27.56           | 28.14       | 30.69             | 478.05                           | 177.38    | 248.19             | 193.84            | 4.566   |                      |                       |                    |         |
| 7,800.00                                                                                  | 7,764.57            | 7,766.27            | 7,723.92            | 27.96           | 28.55       | 32.26             | 495.50                           | 182.77    | 243.94             | 188.61            | 4.425   |                      |                       |                    |         |
| 7,900.00                                                                                  | 7,861.40            | 7,865.95            | 7,821.92            | 28.37           | 28.97       | 33.88             | 512.95                           | 188.15    | 239.88             | 183.96            | 4.290   |                      |                       |                    |         |
| 8,000.00                                                                                  | 7,958.23            | 7,965.64            | 7,919.91            | 28.78           | 29.39       | 35.56             | 530.40                           | 193.53    | 236.02             | 179.30            | 4.162   |                      |                       |                    |         |
| 8,100.00                                                                                  | 8,055.06            | 8,065.32            | 8,017.91            | 29.20           | 29.81       | 37.29             | 547.85                           | 198.91    | 232.38             | 174.84            | 4.040   |                      |                       |                    |         |
| 8,200.00                                                                                  | 8,151.90            | 8,165.00            | 8,115.90            | 29.62           | 30.23       | 39.08             | 565.30                           | 204.29    | 228.93             | 170.59            | 3.924   |                      |                       |                    |         |
| 8,300.00                                                                                  | 8,248.73            | 8,264.68            | 8,213.89            | 30.04           | 30.65       | 40.91             | 582.75                           | 209.88    | 225.73             | 166.56            | 3.815   |                      |                       |                    |         |
| 8,400.00                                                                                  | 8,345.56            | 8,364.36            | 8,311.89            | 30.47           | 31.08       | 42.80             | 600.21                           | 215.06    | 222.76             | 162.75            | 3.712   |                      |                       |                    |         |
| 8,500.00                                                                                  | 8,442.39            | 8,464.04            | 8,409.88            | 30.89           | 31.50       | 44.73             | 617.66                           | 220.44    | 220.05             | 159.18            | 3.615   |                      |                       |                    |         |
| 8,600.00                                                                                  | 8,539.22            | 8,563.73            | 8,507.88            | 31.33           | 31.92       | 46.72             | 635.11                           | 225.82    | 217.59             | 155.66            | 3.525   |                      |                       |                    |         |
| 8,700.00                                                                                  | 8,636.06            | 8,663.41            | 8,605.87            | 31.76           | 32.35       | 48.74             | 652.56                           | 231.21    | 215.40             | 152.78            | 3.440   |                      |                       |                    |         |
| 8,800.00                                                                                  | 8,732.89            | 8,764.86            | 8,705.64            | 32.20           | 32.78       | 50.87             | 670.16                           | 236.63    | 213.37             | 149.81            | 3.357   |                      |                       |                    |         |
| 8,900.00                                                                                  | 8,829.72            | 8,870.17            | 8,809.68            | 32.64           | 33.22       | 53.05             | 687.70                           | 241.43    | 209.59             | 145.00            | 3.245   |                      |                       |                    |         |
| 9,000.00                                                                                  | 8,926.55            | 8,974.62            | 8,913.39            | 33.08           | 33.63       | 55.27             | 697.50                           | 245.08    | 203.73             | 138.11            | 3.105   |                      |                       |                    |         |
| 9,100.00                                                                                  | 9,023.45            | 9,078.00            | 9,018.42            | 33.53           | 34.02       | 57.56             | 705.60                           | 247.56    | 196.48             | 129.84            | 2.949   |                      |                       |                    |         |
| 9,200.00                                                                                  | 9,121.02            | 9,180.85            | 9,118.95            | 33.96           | 34.39       | 59.66             | 710.14                           | 248.96    | 189.57             | 121.95            | 2.803   |                      |                       |                    |         |
| 9,300.00                                                                                  | 9,219.29            | 9,281.99            | 9,220.29            | 34.38           | 34.74       | 61.54             | 711.23                           | 249.30    | 183.46             | 114.89            | 2.675   |                      |                       |                    |         |
| 9,400.00                                                                                  | 9,318.14            | 9,380.85            | 9,319.14            | 34.79           | 35.07       | 63.98             | 711.23                           | 249.30    | 179.20             | 109.72            | 2.579   |                      |                       |                    |         |
| 9,500.00                                                                                  | 9,417.46            | 9,480.17            | 9,418.46            | 35.19           | 35.41       | 66.56             | 711.23                           | 249.30    | 178.72             | 106.41            | 2.513   |                      |                       |                    |         |
| 9,512.17                                                                                  | 9,429.57            | 9,492.28            | 9,430.57            | 35.23           | 35.45       | 69.92             | 711.23                           | 249.30    | 178.51             | 106.10            | 2.507   |                      |                       |                    |         |
| 9,600.00                                                                                  | 9,517.12            | 9,583.87            | 9,491.71            | 35.56           | 35.66       | 73.65             | 711.23                           | 254.34    | 182.38             | 111.82            | 2.585   |                      |                       |                    |         |
| 9,700.00                                                                                  | 9,617.01            | 9,685.00            | 9,561.28            | 35.93           | 35.90       | 77.59             | 711.23                           | 269.90    | 203.52             | 133.60            | 2.919   |                      |                       |                    |         |
| 9,800.00                                                                                  | 9,717.00            | 9,887.35            | 9,619.57            | 36.27           | 36.13       | 81.00             | 711.23                           | 291.85    | 238.53             | 170.79            | 3.522   |                      |                       |                    |         |
| 9,900.00                                                                                  | 9,817.00            | 9,984.51            | 9,870.10            | 36.61           | 36.33       | 84.00             | 711.23                           | 318.49    | 285.25             | 219.85            | 4.362   |                      |                       |                    |         |

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



# Anticollision Report

Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Reference Site: Section 01-T23S-R28E  
Site Error: 0.00 ft Rana Salada Fed Com 0605 231H  
Reference Well: 0.00 ft  
Well Error: Original Hole  
Reference Wellbore: rev1  
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at 2.00 sigma  
Database: DB\_Aug0116\_LT\_v14  
Offset TVD Reference: Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1 |                     |                     |                     |                 |             |                   |                        |           |                      |                       |                    |                   | Offset Site Error: 0.00 ft |
|-------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|-----------------|-------------|-------------------|------------------------|-----------|----------------------|-----------------------|--------------------|-------------------|----------------------------|
| Survey Program: 0-MWD                                                                     |                     |                     |                     |                 |             |                   |                        |           |                      |                       |                    |                   | Offset Well Error: 0.00 ft |
| Reference                                                                                 |                     | Offset              |                     | Semi Major Axis |             | Highside Toolface | Offset Wellbore Centre |           | Distance             |                       | Minimum Separation | Separation Factor | Warning                    |
| Measured Depth (ft)                                                                       | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft)  | Offset (ft) |                   | +N-S (ft)              | +E-W (ft) | Between Centres (ft) | Between Ellipses (ft) |                    |                   |                            |
| 10,000.00                                                                                 | 9,916.88            | 9,795.53            | 9,712.23            | 36.94           | 36.51       | 0.00              | 711.23                 | 347.22    | 338.94               | 276.10                | 62.84              | 5.394             |                            |
| 10,100.00                                                                                 | 10,014.27           | 9,845.80            | 9,750.52            | 37.27           | 36.70       | 0.00              | 711.23                 | 379.77    | 385.43               | 325.48                | 59.94              | 6.430             |                            |
| 10,200.00                                                                                 | 10,104.99           | 9,900.00            | 9,787.71            | 37.58           | 36.90       | 0.00              | 711.23                 | 419.16    | 422.49               | 365.39                | 57.10              | 7.399             |                            |
| 10,300.00                                                                                 | 10,185.06           | 9,950.00            | 9,817.86            | 37.87           | 37.10       | 0.00              | 711.23                 | 459.01    | 449.66               | 395.95                | 53.71              | 8.372             |                            |
| 10,400.00                                                                                 | 10,251.00           | 10,000.00           | 9,843.89            | 38.14           | 37.32       | 0.00              | 711.23                 | 501.80    | 466.67               | 416.39                | 50.28              | 9.282             |                            |
| 10,500.00                                                                                 | 10,299.92           | 10,050.00           | 9,864.89            | 38.45           | 37.57       | 0.00              | 711.23                 | 547.06    | 473.34               | 426.36                | 46.98              | 10.075            |                            |
| 10,600.00                                                                                 | 10,329.88           | 10,100.00           | 9,881.26            | 38.87           | 37.84       | 0.00              | 711.23                 | 594.28    | 469.59               | 425.55                | 44.05              | 10.662            |                            |
| 10,700.00                                                                                 | 10,339.01           | 10,150.00           | 9,892.59            | 39.43           | 38.14       | 0.00              | 711.23                 | 642.95    | 455.50               | 413.78                | 41.72              | 10.919            |                            |
| 10,800.00                                                                                 | 10,339.01           | 10,200.00           | 9,898.78            | 40.13           | 38.48       | 0.00              | 711.23                 | 692.55    | 442.82               | 402.39                | 40.23              | 11.002            |                            |
| 10,862.71                                                                                 | 10,339.00           | 10,240.80           | 9,900.01            | 40.66           | 38.78       | 0.00              | 711.23                 | 720.22    | 440.00               | 400.12                | 39.88              | 11.033            |                            |
| 10,900.00                                                                                 | 10,339.00           | 10,264.99           | 9,900.01            | 40.99           | 38.96       | 0.00              | 711.23                 | 757.50    | 440.00               | 400.00                | 40.00              | 11.001            |                            |
| 11,000.00                                                                                 | 10,339.00           | 10,364.99           | 9,900.00            | 41.97           | 39.82       | 0.00              | 711.23                 | 857.50    | 440.00               | 399.58                | 40.42              | 10.886            |                            |
| 11,100.00                                                                                 | 10,339.00           | 10,464.99           | 9,900.00            | 43.08           | 40.81       | 0.00              | 711.23                 | 957.50    | 440.00               | 399.11                | 40.89              | 10.760            |                            |
| 11,200.00                                                                                 | 10,339.00           | 10,564.99           | 9,900.00            | 44.30           | 41.92       | 0.00              | 711.23                 | 1,057.50  | 440.00               | 398.58                | 41.42              | 10.623            |                            |
| 11,300.00                                                                                 | 10,339.00           | 10,664.99           | 9,900.00            | 45.61           | 43.14       | 0.00              | 711.23                 | 1,157.50  | 440.00               | 398.00                | 42.00              | 10.476            |                            |
| 11,400.00                                                                                 | 10,339.00           | 10,764.99           | 9,900.00            | 47.02           | 44.47       | 0.00              | 711.23                 | 1,257.50  | 440.00               | 397.37                | 42.83              | 10.321            |                            |
| 11,500.00                                                                                 | 10,339.00           | 10,864.99           | 9,900.00            | 48.52           | 45.89       | 0.00              | 711.23                 | 1,357.50  | 440.00               | 396.69                | 43.31              | 10.159            |                            |
| 11,600.00                                                                                 | 10,339.00           | 10,964.99           | 9,900.00            | 50.08           | 47.39       | 0.00              | 711.23                 | 1,457.50  | 440.00               | 395.97                | 44.03              | 9.992             |                            |
| 11,700.00                                                                                 | 10,339.00           | 11,064.99           | 9,900.00            | 51.72           | 48.97       | 0.00              | 711.23                 | 1,557.50  | 440.00               | 395.20                | 44.80              | 9.821             |                            |
| 11,800.00                                                                                 | 10,339.00           | 11,164.99           | 9,900.00            | 53.42           | 50.63       | 0.00              | 711.23                 | 1,657.50  | 440.00               | 394.36                | 45.81              | 9.647             |                            |
| 11,900.00                                                                                 | 10,339.00           | 11,264.99           | 9,900.00            | 55.17           | 52.34       | 0.00              | 711.23                 | 1,757.50  | 440.00               | 393.54                | 46.46              | 9.471             |                            |
| 12,000.00                                                                                 | 10,339.00           | 11,364.99           | 9,900.00            | 56.98           | 54.11       | 0.00              | 711.23                 | 1,857.50  | 440.00               | 392.66                | 47.34              | 9.294             |                            |
| 12,100.00                                                                                 | 10,339.00           | 11,464.99           | 9,900.00            | 58.83           | 55.93       | 0.00              | 711.23                 | 1,957.50  | 440.00               | 391.74                | 48.26              | 9.117             |                            |
| 12,200.00                                                                                 | 10,339.00           | 11,564.99           | 9,900.00            | 60.72           | 57.79       | 0.00              | 711.23                 | 2,057.50  | 440.00               | 390.78                | 49.22              | 8.940             |                            |
| 12,300.00                                                                                 | 10,339.00           | 11,664.99           | 9,900.00            | 62.65           | 59.70       | 0.00              | 711.23                 | 2,157.50  | 440.00               | 389.80                | 50.20              | 8.765             |                            |
| 12,400.00                                                                                 | 10,339.00           | 11,764.99           | 9,900.00            | 64.61           | 61.65       | 0.00              | 711.23                 | 2,257.50  | 440.00               | 388.79                | 51.21              | 8.591             |                            |
| 12,500.00                                                                                 | 10,339.00           | 11,864.99           | 9,900.00            | 66.61           | 63.63       | 0.00              | 711.23                 | 2,357.50  | 440.00               | 387.75                | 52.25              | 8.420             |                            |
| 12,600.00                                                                                 | 10,339.00           | 11,964.99           | 9,900.00            | 68.64           | 65.64       | 0.00              | 711.23                 | 2,457.50  | 440.00               | 386.68                | 53.32              | 8.252             |                            |
| 12,700.00                                                                                 | 10,339.00           | 12,064.99           | 9,900.00            | 70.69           | 67.68       | 0.00              | 711.23                 | 2,557.50  | 440.00               | 385.59                | 54.41              | 8.086             |                            |
| 12,800.00                                                                                 | 10,339.00           | 12,164.99           | 9,900.00            | 72.76           | 69.74       | 0.00              | 711.23                 | 2,657.50  | 440.00               | 384.47                | 55.53              | 7.924             |                            |
| 12,900.00                                                                                 | 10,339.00           | 12,264.99           | 9,900.00            | 74.86           | 71.83       | 0.00              | 711.23                 | 2,757.50  | 440.00               | 383.34                | 56.66              | 7.765             |                            |
| 13,000.00                                                                                 | 10,339.00           | 12,364.99           | 9,900.00            | 76.98           | 73.94       | 0.00              | 711.23                 | 2,857.50  | 440.00               | 382.18                | 57.82              | 7.610             |                            |
| 13,100.00                                                                                 | 10,339.00           | 12,464.99           | 9,900.00            | 79.11           | 76.07       | 0.00              | 711.23                 | 2,957.50  | 440.00               | 381.01                | 58.99              | 7.459             |                            |
| 13,200.00                                                                                 | 10,339.00           | 12,564.99           | 9,900.00            | 81.27           | 78.22       | 0.00              | 711.23                 | 3,057.50  | 440.00               | 379.81                | 60.19              | 7.311             |                            |
| 13,300.00                                                                                 | 10,339.00           | 12,664.99           | 9,900.00            | 83.44           | 80.39       | 0.00              | 711.23                 | 3,157.50  | 440.00               | 378.60                | 61.40              | 7.167             |                            |
| 13,400.00                                                                                 | 10,339.00           | 12,764.99           | 9,900.00            | 85.62           | 82.57       | 0.00              | 711.23                 | 3,257.50  | 440.00               | 377.38                | 62.62              | 7.026             |                            |
| 13,500.00                                                                                 | 10,339.00           | 12,864.99           | 9,900.00            | 87.82           | 84.76       | 0.00              | 711.23                 | 3,357.50  | 440.00               | 376.14                | 63.86              | 6.890             |                            |
| 13,600.00                                                                                 | 10,339.00           | 12,964.99           | 9,900.00            | 90.03           | 86.97       | 0.00              | 711.23                 | 3,457.50  | 440.00               | 374.88                | 65.12              | 6.757             |                            |
| 13,700.00                                                                                 | 10,339.00           | 13,064.99           | 9,900.00            | 92.25           | 89.19       | 0.00              | 711.23                 | 3,557.50  | 440.00               | 373.61                | 66.39              | 6.628             |                            |
| 13,800.00                                                                                 | 10,339.00           | 13,164.99           | 9,900.00            | 94.48           | 91.42       | 0.00              | 711.23                 | 3,657.50  | 440.00               | 372.33                | 67.67              | 6.502             |                            |
| 13,900.00                                                                                 | 10,339.00           | 13,264.99           | 9,900.00            | 96.72           | 93.66       | 0.00              | 711.23                 | 3,757.50  | 440.00               | 371.04                | 68.96              | 6.380             |                            |
| 14,000.00                                                                                 | 10,339.00           | 13,364.99           | 9,900.00            | 98.97           | 95.91       | 0.00              | 711.23                 | 3,857.50  | 440.00               | 369.73                | 70.27              | 6.262             |                            |
| 14,100.00                                                                                 | 10,339.00           | 13,464.99           | 9,900.00            | 101.23          | 98.17       | 0.00              | 711.23                 | 3,957.50  | 440.00               | 368.42                | 71.58              | 6.147             |                            |
| 14,200.00                                                                                 | 10,339.00           | 13,564.99           | 9,900.00            | 103.50          | 100.44      | 0.00              | 711.23                 | 4,057.50  | 440.00               | 367.09                | 72.91              | 6.035             |                            |
| 14,300.00                                                                                 | 10,339.00           | 13,664.99           | 9,900.00            | 105.78          | 102.72      | 0.00              | 711.23                 | 4,157.50  | 440.00               | 365.76                | 74.24              | 5.927             |                            |
| 14,400.00                                                                                 | 10,339.00           | 13,764.99           | 9,900.00            | 108.06          | 105.00      | 0.00              | 711.23                 | 4,257.50  | 440.00               | 364.41                | 75.59              | 5.821             |                            |
| 14,500.00                                                                                 | 10,339.00           | 13,864.99           | 9,900.00            | 110.35          | 107.29      | 0.00              | 711.23                 | 4,357.50  | 440.00               | 363.06                | 76.94              | 5.719             |                            |
| 14,600.00                                                                                 | 10,339.00           | 13,964.99           | 9,900.00            | 112.65          | 109.59      | 0.00              | 711.23                 | 4,457.50  | 440.00               | 361.70                | 78.30              | 5.619             |                            |
| 14,700.00                                                                                 | 10,339.00           | 14,064.99           | 9,900.00            | 114.95          | 111.89      | 0.00              | 711.23                 | 4,557.50  | 440.00               | 360.33                | 79.67              | 5.523             |                            |
| 14,800.00                                                                                 | 10,339.00           | 14,164.99           | 9,900.00            | 117.25          | 114.20      | 0.00              | 711.23                 | 4,657.50  | 440.00               | 358.96                | 81.04              | 5.429             |                            |
| 14,900.00                                                                                 | 10,339.00           | 14,264.99           | 9,900.00            | 119.57          | 116.52      | 0.00              | 711.23                 | 4,757.50  | 440.00               | 357.57                | 82.43              | 5.338             |                            |

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



# Anticollision Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Reference Site:** Section 01-T23S-R28E  
**Site Error:** 0.00 ft Rana Salada Fed Com 0605 231H  
**Reference Well:** 0.00 ft  
**Well Error:** Original Hole  
**Reference Wellbore:** rev1  
**Reference Design:**

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** DB\_Aug0116\_LT\_v14  
**Offset TVD Reference:** Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1 |                           |                           |                           |                   |                |                             |                                        |              |                               |                      |         |                            | Offset Site Error:          | 0.00 ft |
|-------------------------------------------------------------------------------------------|---------------------------|---------------------------|---------------------------|-------------------|----------------|-----------------------------|----------------------------------------|--------------|-------------------------------|----------------------|---------|----------------------------|-----------------------------|---------|
| Survey Program: 0-MWD                                                                     |                           |                           |                           |                   |                |                             |                                        |              |                               |                      |         |                            | Offset Well Error:          | 0.00 ft |
| Reference                                                                                 |                           | Offset                    |                           | Semi Major Axis   |                | Highside<br>Toolface<br>(°) | Distance                               |              | Minimum<br>Separation<br>(ft) | Separation<br>Factor | Warning |                            |                             |         |
| Measured<br>Depth<br>(ft)                                                                 | Vertical<br>Depth<br>(ft) | Measured<br>Depth<br>(ft) | Vertical<br>Depth<br>(ft) | Reference<br>(ft) | Offset<br>(ft) |                             | Offset Wellbore Centre<br>+N-S<br>(ft) | +E-W<br>(ft) |                               |                      |         | Between<br>Centres<br>(ft) | Between<br>Ellipses<br>(ft) |         |
| 15,000.00                                                                                 | 10,339.00                 | 14,364.99                 | 9,900.00                  | 121.88            | 118.84         | 0.00                        | 711.23                                 | 4,857.50     | 440.00                        | 356.19               | 5.250   |                            |                             |         |
| 15,100.00                                                                                 | 10,339.00                 | 14,464.99                 | 9,900.00                  | 124.21            | 121.16         | 0.00                        | 711.23                                 | 4,957.50     | 440.00                        | 354.79               | 5.164   |                            |                             |         |
| 15,200.00                                                                                 | 10,339.00                 | 14,564.99                 | 9,900.00                  | 126.53            | 123.49         | 0.00                        | 711.23                                 | 5,057.50     | 440.00                        | 353.39               | 5.080   |                            |                             |         |
| 15,300.00                                                                                 | 10,339.00                 | 14,664.99                 | 9,900.00                  | 128.86            | 125.82         | 0.00                        | 711.23                                 | 5,157.50     | 440.00                        | 351.98               | 4.999   |                            |                             |         |
| 15,400.00                                                                                 | 10,339.00                 | 14,764.99                 | 9,900.00                  | 131.20            | 128.16         | 0.00                        | 711.23                                 | 5,257.50     | 440.00                        | 350.57               | 4.920   |                            |                             |         |
| 15,500.00                                                                                 | 10,339.00                 | 14,864.99                 | 9,900.00                  | 133.54            | 130.50         | 0.00                        | 711.23                                 | 5,357.50     | 440.00                        | 349.15               | 4.843   |                            |                             |         |
| 15,600.00                                                                                 | 10,339.00                 | 14,964.99                 | 9,900.00                  | 135.88            | 132.84         | 0.00                        | 711.23                                 | 5,457.50     | 440.00                        | 347.73               | 4.769   |                            |                             |         |
| 15,700.00                                                                                 | 10,339.00                 | 15,064.99                 | 9,900.00                  | 138.23            | 135.19         | 0.00                        | 711.23                                 | 5,557.50     | 440.00                        | 346.30               | 4.696   |                            |                             |         |
| 15,800.00                                                                                 | 10,339.00                 | 15,164.99                 | 9,900.00                  | 140.57            | 137.54         | 0.00                        | 711.23                                 | 5,657.50     | 440.00                        | 344.87               | 4.625   |                            |                             |         |
| 15,900.00                                                                                 | 10,339.00                 | 15,264.99                 | 9,900.00                  | 142.93            | 139.89         | 0.00                        | 711.23                                 | 5,757.50     | 440.00                        | 343.44               | 4.557   |                            |                             |         |
| 16,000.00                                                                                 | 10,339.00                 | 15,364.99                 | 9,900.00                  | 145.28            | 142.25         | 0.00                        | 711.23                                 | 5,857.50     | 440.00                        | 342.00               | 4.490   |                            |                             |         |
| 16,100.00                                                                                 | 10,339.00                 | 15,464.99                 | 9,900.00                  | 147.64            | 144.61         | 0.00                        | 711.23                                 | 5,957.50     | 440.00                        | 340.55               | 4.424   |                            |                             |         |
| 16,200.00                                                                                 | 10,339.00                 | 15,564.99                 | 9,900.00                  | 150.00            | 146.97         | 0.00                        | 711.23                                 | 6,057.50     | 440.00                        | 339.10               | 4.361   |                            |                             |         |
| 16,300.00                                                                                 | 10,339.00                 | 15,664.99                 | 9,900.00                  | 152.36            | 149.33         | 0.00                        | 711.23                                 | 6,157.50     | 440.00                        | 337.65               | 4.299   |                            |                             |         |
| 16,400.00                                                                                 | 10,339.00                 | 15,764.99                 | 9,900.00                  | 154.73            | 151.70         | 0.00                        | 711.23                                 | 6,257.50     | 440.00                        | 336.20               | 4.239   |                            |                             |         |
| 16,500.00                                                                                 | 10,339.00                 | 15,864.99                 | 9,900.00                  | 157.09            | 154.07         | 0.00                        | 711.23                                 | 6,357.50     | 440.00                        | 334.74               | 4.180   |                            |                             |         |
| 16,600.00                                                                                 | 10,339.00                 | 15,964.99                 | 9,900.00                  | 159.46            | 156.44         | 0.00                        | 711.23                                 | 6,457.50     | 440.00                        | 333.28               | 4.123   |                            |                             |         |
| 16,700.00                                                                                 | 10,339.00                 | 16,064.99                 | 9,900.00                  | 161.83            | 158.81         | 0.00                        | 711.23                                 | 6,557.50     | 440.00                        | 331.81               | 4.067   |                            |                             |         |
| 16,800.00                                                                                 | 10,339.00                 | 16,164.99                 | 9,900.00                  | 164.21            | 161.19         | 0.00                        | 711.23                                 | 6,657.50     | 440.00                        | 330.35               | 4.013   |                            |                             |         |
| 16,900.00                                                                                 | 10,339.00                 | 16,264.99                 | 9,900.00                  | 166.58            | 163.57         | 0.00                        | 711.23                                 | 6,757.50     | 440.00                        | 328.88               | 3.960   |                            |                             |         |
| 17,000.00                                                                                 | 10,339.00                 | 16,364.99                 | 9,900.00                  | 168.96            | 165.95         | 0.00                        | 711.23                                 | 6,857.50     | 440.00                        | 327.40               | 3.908   |                            |                             |         |
| 17,100.00                                                                                 | 10,339.00                 | 16,464.99                 | 9,900.00                  | 171.34            | 168.33         | 0.00                        | 711.23                                 | 6,957.50     | 440.00                        | 325.93               | 3.857   |                            |                             |         |
| 17,200.00                                                                                 | 10,339.00                 | 16,564.99                 | 9,900.00                  | 173.72            | 170.71         | 0.00                        | 711.23                                 | 7,057.50     | 440.00                        | 324.45               | 3.808   |                            |                             |         |
| 17,300.00                                                                                 | 10,339.00                 | 16,664.99                 | 9,900.00                  | 176.10            | 173.09         | 0.00                        | 711.23                                 | 7,157.50     | 440.00                        | 322.97               | 3.760   |                            |                             |         |
| 17,400.00                                                                                 | 10,339.00                 | 16,764.99                 | 9,900.00                  | 178.48            | 175.48         | 0.00                        | 711.23                                 | 7,257.50     | 440.00                        | 321.49               | 3.713   |                            |                             |         |
| 17,500.00                                                                                 | 10,339.00                 | 16,864.99                 | 9,900.00                  | 180.87            | 177.86         | 0.00                        | 711.23                                 | 7,357.50     | 440.00                        | 320.00               | 3.667   |                            |                             |         |
| 17,600.00                                                                                 | 10,339.00                 | 16,964.99                 | 9,900.00                  | 183.25            | 180.25         | 0.00                        | 711.23                                 | 7,457.50     | 440.00                        | 318.52               | 3.622   |                            |                             |         |
| 17,700.00                                                                                 | 10,339.00                 | 17,064.99                 | 9,900.00                  | 185.64            | 182.64         | 0.00                        | 711.23                                 | 7,557.50     | 440.00                        | 317.03               | 3.578   |                            |                             |         |
| 17,800.00                                                                                 | 10,339.00                 | 17,164.99                 | 9,900.00                  | 188.03            | 185.03         | 0.00                        | 711.23                                 | 7,657.50     | 440.00                        | 315.54               | 3.535   |                            |                             |         |
| 17,900.00                                                                                 | 10,339.00                 | 17,264.99                 | 9,900.00                  | 190.42            | 187.43         | 0.00                        | 711.23                                 | 7,757.50     | 440.00                        | 314.05               | 3.493   |                            |                             |         |
| 18,000.00                                                                                 | 10,339.00                 | 17,364.99                 | 9,900.00                  | 192.82            | 189.82         | 0.00                        | 711.23                                 | 7,857.50     | 440.00                        | 312.55               | 3.452   |                            |                             |         |
| 18,100.00                                                                                 | 10,339.00                 | 17,464.99                 | 9,900.00                  | 195.21            | 192.21         | 0.00                        | 711.23                                 | 7,957.50     | 440.00                        | 311.05               | 3.412   |                            |                             |         |
| 18,200.00                                                                                 | 10,339.00                 | 17,564.99                 | 9,900.00                  | 197.60            | 194.61         | 0.00                        | 711.23                                 | 8,057.50     | 440.00                        | 309.56               | 3.373   |                            |                             |         |
| 18,300.00                                                                                 | 10,339.00                 | 17,664.99                 | 9,900.00                  | 200.00            | 197.01         | 0.00                        | 711.23                                 | 8,157.50     | 440.00                        | 308.06               | 3.335   |                            |                             |         |
| 18,400.00                                                                                 | 10,339.00                 | 17,764.99                 | 9,900.00                  | 202.40            | 199.40         | 0.00                        | 711.23                                 | 8,257.50     | 440.00                        | 306.56               | 3.297   |                            |                             |         |
| 18,500.00                                                                                 | 10,339.00                 | 17,864.99                 | 9,900.00                  | 204.79            | 201.80         | 0.00                        | 711.23                                 | 8,357.50     | 440.00                        | 305.05               | 3.261   |                            |                             |         |
| 18,600.00                                                                                 | 10,339.00                 | 17,964.99                 | 9,900.00                  | 207.19            | 204.20         | 0.00                        | 711.23                                 | 8,457.50     | 440.00                        | 303.55               | 3.225   |                            |                             |         |
| 18,700.00                                                                                 | 10,339.00                 | 18,064.99                 | 9,900.00                  | 209.59            | 206.60         | 0.00                        | 711.23                                 | 8,557.50     | 440.00                        | 302.04               | 3.189   |                            |                             |         |
| 18,800.00                                                                                 | 10,339.00                 | 18,164.99                 | 9,900.00                  | 211.99            | 209.00         | 0.00                        | 711.23                                 | 8,657.50     | 440.00                        | 300.53               | 3.155   |                            |                             |         |
| 18,900.00                                                                                 | 10,339.00                 | 18,264.99                 | 9,900.00                  | 214.39            | 211.41         | 0.00                        | 711.23                                 | 8,757.50     | 440.00                        | 299.03               | 3.121   |                            |                             |         |
| 19,000.00                                                                                 | 10,339.00                 | 18,364.99                 | 9,900.00                  | 216.79            | 213.81         | 0.00                        | 711.23                                 | 8,857.50     | 440.00                        | 297.52               | 3.088   |                            |                             |         |
| 19,100.00                                                                                 | 10,339.00                 | 18,464.99                 | 9,900.00                  | 219.20            | 216.21         | 0.00                        | 711.23                                 | 8,957.50     | 440.00                        | 296.01               | 3.056   |                            |                             |         |
| 19,200.00                                                                                 | 10,339.00                 | 18,564.99                 | 9,900.00                  | 221.60            | 218.62         | 0.00                        | 711.23                                 | 9,057.50     | 440.00                        | 294.49               | 3.024   |                            |                             |         |
| 19,300.00                                                                                 | 10,339.00                 | 18,664.99                 | 9,900.00                  | 224.00            | 221.03         | 0.00                        | 711.23                                 | 9,157.50     | 440.00                        | 292.98               | 2.993   |                            |                             |         |
| 19,400.00                                                                                 | 10,339.00                 | 18,764.99                 | 9,900.00                  | 226.41            | 223.43         | 0.00                        | 711.23                                 | 9,257.50     | 440.00                        | 291.46               | 2.962   |                            |                             |         |
| 19,500.00                                                                                 | 10,339.00                 | 18,864.99                 | 9,900.00                  | 228.82            | 225.84         | 0.00                        | 711.23                                 | 9,357.50     | 440.00                        | 289.95               | 2.932   |                            |                             |         |
| 19,600.00                                                                                 | 10,339.00                 | 18,964.99                 | 9,900.00                  | 231.22            | 228.25         | 0.00                        | 711.23                                 | 9,457.50     | 440.00                        | 288.43               | 2.903   |                            |                             |         |
| 19,700.00                                                                                 | 10,339.00                 | 19,064.99                 | 9,900.00                  | 233.63            | 230.65         | 0.00                        | 711.23                                 | 9,557.50     | 440.00                        | 286.91               | 2.874   |                            |                             |         |
| 19,800.00                                                                                 | 10,339.00                 | 19,164.99                 | 9,900.00                  | 236.04            | 233.06         | 0.00                        | 711.23                                 | 9,657.50     | 440.00                        | 285.39               | 2.846   |                            |                             |         |
| 19,900.00                                                                                 | 10,339.00                 | 19,264.99                 | 9,900.00                  | 238.45            | 235.47         | 0.00                        | 711.23                                 | 9,757.50     | 440.00                        | 283.87               | 2.818   |                            |                             |         |
| 20,000.00                                                                                 | 10,339.00                 | 19,364.99                 | 9,900.00                  | 240.85            | 237.88         | 0.00                        | 711.23                                 | 9,857.50     | 440.00                        | 282.35               | 2.791   |                            |                             |         |

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



# Anticollision Report

**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Reference Site:** Section 01-T23S-R28E  
**Site Error:** 0.00 ft Rana Salada Fed Com 0605 231H  
**Reference Well:** 0.00 ft  
**Well Error:** Original Hole  
**Reference Wellbore:** rev1  
**Reference Design:**

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** DB\_Aug0116\_LT\_v14  
**Offset TVD Reference:** Offset Datum

| Offset Design Section 01-T23S-R28E - Rana Salada Fed Com 0605 211H - Original Hole - rev1 |                     |                     |                     |                 |             |                       |                                  |           |                      |                       |                         |                   | Offset Site Error: | 0.00 ft |
|-------------------------------------------------------------------------------------------|---------------------|---------------------|---------------------|-----------------|-------------|-----------------------|----------------------------------|-----------|----------------------|-----------------------|-------------------------|-------------------|--------------------|---------|
| Survey Program: O-MWD                                                                     |                     |                     |                     |                 |             |                       |                                  |           |                      |                       |                         |                   | Offset Well Error: | 0.00 ft |
| Reference                                                                                 |                     | Offset              |                     | Semi Major Axis |             |                       | Distance                         |           |                      |                       |                         |                   |                    | Warning |
| Measured Depth (ft)                                                                       | Vertical Depth (ft) | Measured Depth (ft) | Vertical Depth (ft) | Reference (ft)  | Offset (ft) | Highside Toolface (°) | Offset Wellbore Centre +N-S (ft) | +E-W (ft) | Between Centres (ft) | Between Ellipses (ft) | Minimum Separation (ft) | Separation Factor |                    |         |
| 20,100.00                                                                                 | 10,339.00           | 19,464.99           | 9,900.00            | 243.26          | 240.29      | 0.00                  | 711.23                           | 9,957.50  | 440.00               | 280.83                | 159.17                  | 2.764             |                    |         |
| 20,200.00                                                                                 | 10,339.00           | 19,564.99           | 9,900.00            | 245.67          | 242.71      | 0.00                  | 711.23                           | 10,057.50 | 440.00               | 279.31                | 160.89                  | 2.738             |                    |         |
| 20,300.00                                                                                 | 10,339.00           | 19,664.99           | 9,900.00            | 248.09          | 245.12      | 0.00                  | 711.23                           | 10,157.50 | 440.00               | 277.78                | 162.22                  | 2.712             |                    |         |
| 20,400.00                                                                                 | 10,339.00           | 19,764.99           | 9,900.00            | 250.50          | 247.53      | 0.00                  | 711.23                           | 10,257.50 | 440.00               | 276.26                | 163.74                  | 2.687             |                    |         |
| 20,500.00                                                                                 | 10,339.00           | 19,864.99           | 9,900.00            | 252.91          | 249.94      | 0.00                  | 711.23                           | 10,357.50 | 440.00               | 274.73                | 165.27                  | 2.662             |                    |         |
| 20,600.00                                                                                 | 10,339.00           | 19,964.99           | 9,900.00            | 255.32          | 252.36      | 0.00                  | 711.23                           | 10,457.50 | 440.00               | 273.21                | 166.79                  | 2.638             |                    |         |
| 20,606.22                                                                                 | 10,339.00           | 19,971.20           | 9,900.00            | 255.47          | 252.51      | 0.00                  | 711.23                           | 10,463.72 | 440.00               | 273.11                | 166.89                  | 2.837             |                    |         |



## Anticollision Report

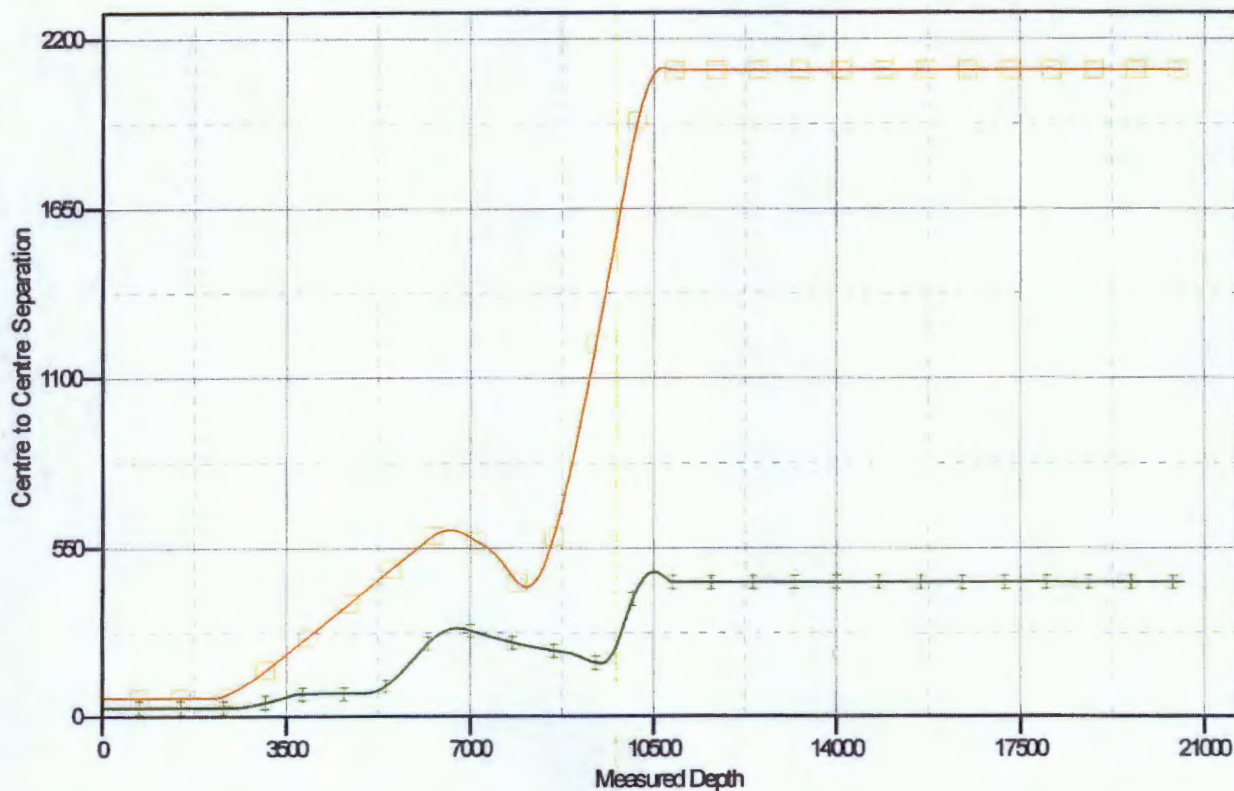
Company: Nova Oil and Gas Northern Delaware LLC  
Project: Eddy County, New Mexico  
Reference Site: Section 01-T23S-R28E  
Site Error: 0.00 ft Rana Salada Fed Com 605 231H  
Reference Well: 0.00 ft  
Well Error: Original Hole  
Reference Wellbore: rev1  
Reference Design:

Local Co-ordinate Reference: Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
TVD Reference: RKB=3089.1+25 @ 3114.10ft  
MD Reference: RKB=3089.1+25 @ 3114.10ft  
North Reference: Grid  
Survey Calculation Method: Minimum Curvature  
Output errors are at: 2.00 sigma  
Database: DB\_Aug0116\_LT\_v14  
Offset TVD Reference: Offset Datum

Reference Depths are relative to RKB=3089.1+25 @ 3114.10ft  
Offset Depths are relative to Offset Datum  
Central Meridian is -104.33333334

Coordinates are relative to: Rana Salada Fed Com 1 5 23S 29E WB 1H  
Coordinate System is US State Plane 1983, New Mexico Eastern Zone  
Grid Convergence at Surface is: 0.16°

### Ladder Plot



#### LEGEND

— Rana Salada Fed Com 1 5 23S 29E WB 1H, Original Hole, rev1 V9

— Rana Salada Fed Com 1 5 23S 29E WB 1H, Original Hole, rev1 V9



## Anticollision Report

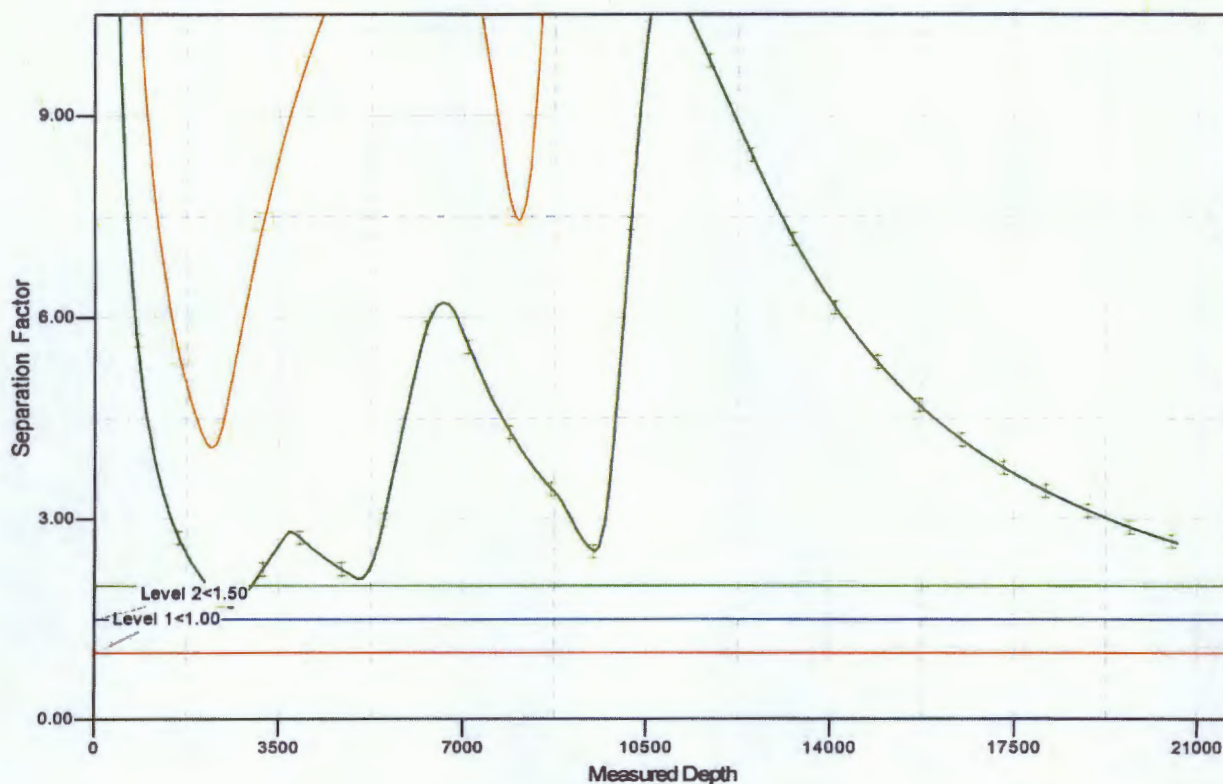
**Company:** Nova Oil and Gas Northern Delaware LLC  
**Project:** Eddy County, New Mexico  
**Reference Site:** Section 01-T23S-R28E  
**Site Error:** 0.00 ft Rana Salada Fed Com 605 0231H  
**Reference Well:** 0.00 ft  
**Well Error:** Original Hole  
**Reference Wellbore:** rev1  
**Reference Design:**

**Local Co-ordinate Reference:** Well Rana Salada Fed Com 1 5 23S 29E WB 1H  
**TVD Reference:** RKB=3089.1+25 @ 3114.10ft  
**MD Reference:** RKB=3089.1+25 @ 3114.10ft  
**North Reference:** Grid  
**Survey Calculation Method:** Minimum Curvature  
**Output errors are at** 2.00 sigma  
**Database:** DB\_Aug0116\_LT\_v14  
**Offset TVD Reference:** Offset Datum

Reference Depths are relative to RKB=3089.1+25 @ 3114.10ft  
Offset Depths are relative to Offset Datum  
Central Meridian is -104.3333334

Coordinates are relative to: Rana Salada Fed Com 605 231H  
Coordinate System is US State Plane 1983, New Mexico Eastern Zone  
Grid Convergence at Surface is: 0.16°

### Separation Factor Plot



#### LEGEND

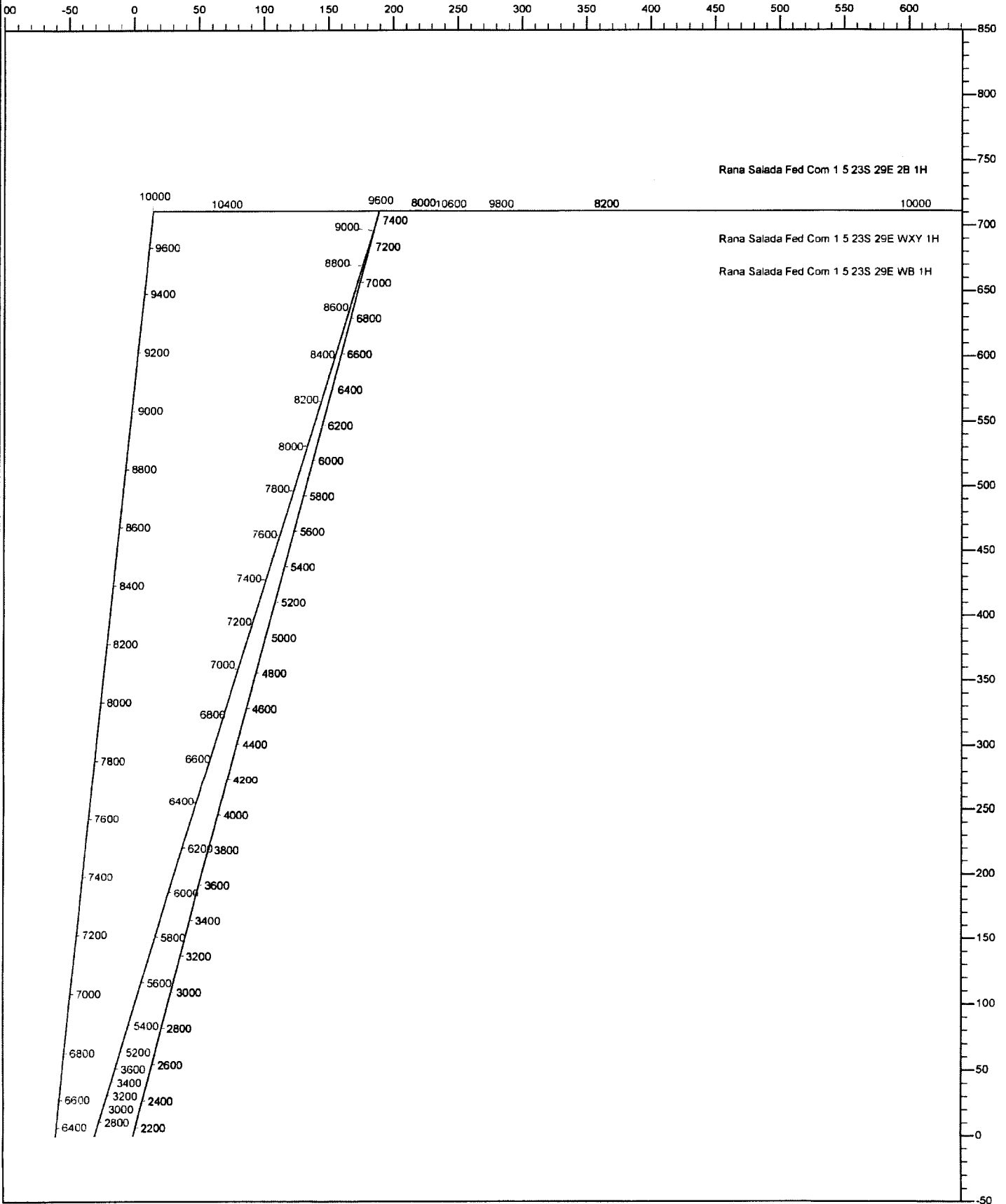
— Rana Salada Fed Com 1 5 23S 29E 1H, Original Hole, rev1 V0

— Rana Salada Fed Com 1 5 23S 29E W X Y 1H, Original Hole, rev1 V0



Well: Rana Salada Fed Com 0605 231H  
Site: Section 01-T23S-R28E  
Project: Eddy County, New Mexico  
Design: rev0

West(-)/East(+) (100 ft/in)





NOVO OIL & GAS, LLC

Date

5/22/2018

105 North Hudson Ave, Suite 500  
Oklahoma City, Oklahoma 73102

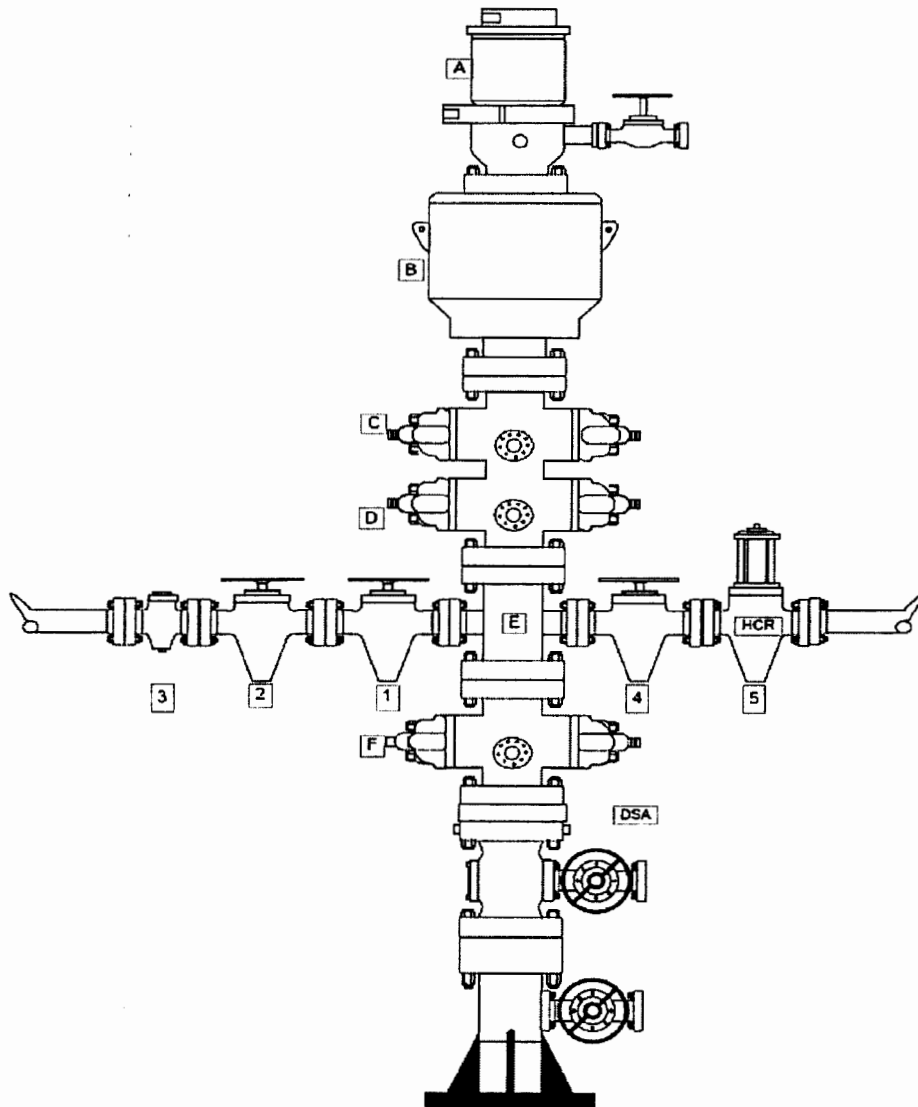
Page No.

1 of 1

### 5M BLOWOUT PREVENTOR SCHEMATIC

BLOWOUT PREVENTOR COMPONENTS

| ITEM | SIZE    | PRESSURE  | DESCRIPTION                 |
|------|---------|-----------|-----------------------------|
| A    | 13-5/8" | 1,500 psi | Rotating Head + Orbit Valve |
| B    | 13-5/8" | 5,000 psi | Annular Preventer           |
| C    | 13-5/8" | 5,000 psi | Pipe Rams                   |
| D    | 13-5/8" | 5,000 psi | Blind Rams                  |
| E    | 13-5/8" | 5,000 psi | Mud Cross                   |
| F    | 13-5/8" | 5,000 psi | Pipe Rams                   |



KILL LINE

| ITEM | SIZE    | PRESSURE  | DESCRIPTION |
|------|---------|-----------|-------------|
| 1    | 2-1/16" | 5,000 psi | Gate Valve  |
| 2    | 2-1/16" | 5,000 psi | Gate Valve  |
| 3    | 2-1/16" | 5,000 psi | Check Valve |
|      |         |           |             |
|      |         |           |             |

CHOKE LINE

| ITEM | SIZE    | PRESSURE  | DESCRIPTION |
|------|---------|-----------|-------------|
| 4    | 2-1/16" | 5,000 psi | Gate Valve  |
| 5    | 2-1/16" | 5,000 psi | HCR Valve   |
|      |         |           |             |
|      |         |           |             |



NOVO OIL & GAS, LLC

Date

5/22/2018

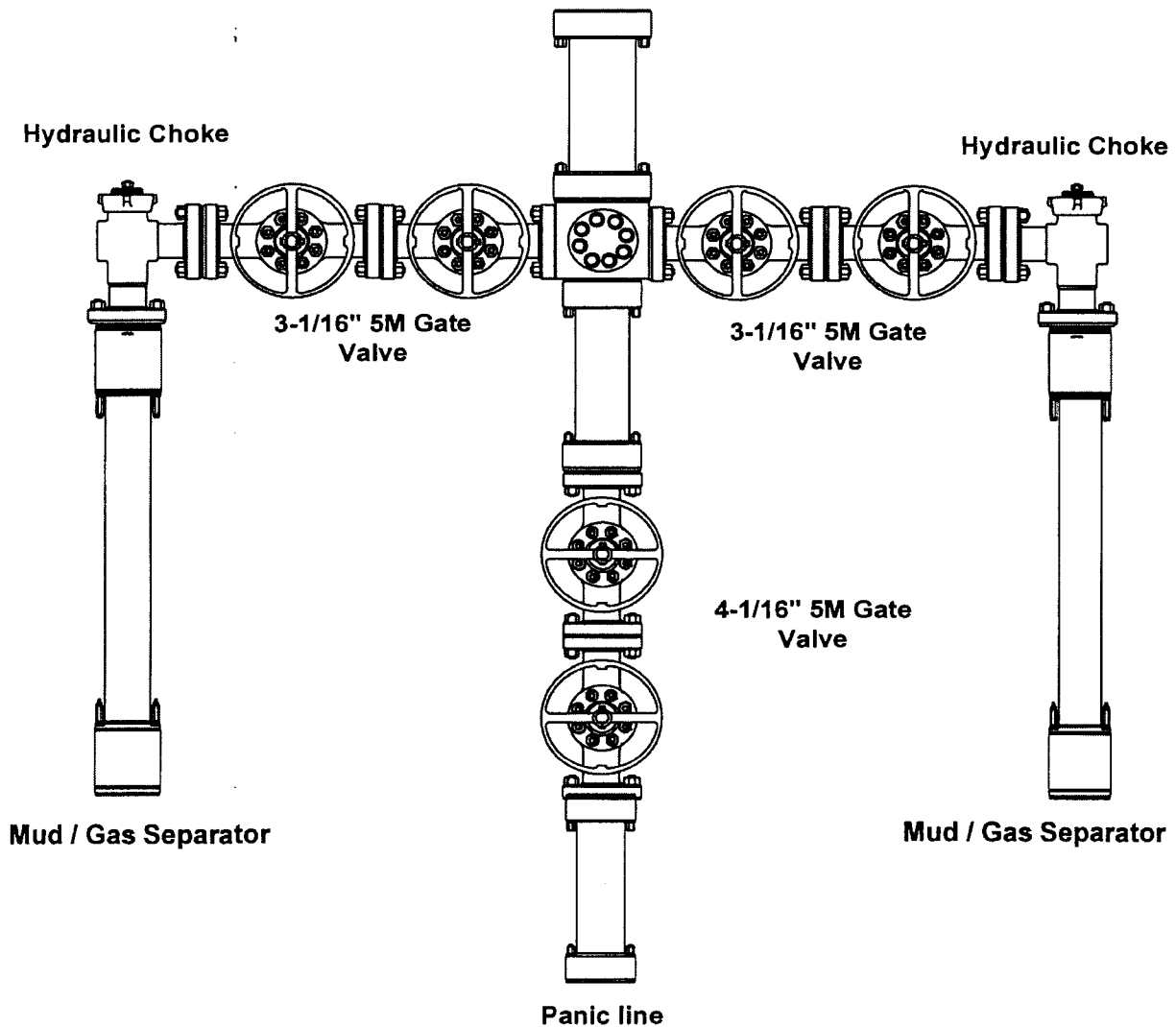
105 North Hudson Ave, Suite 500  
Oklahoma City, Oklahoma 73102

Page No.

1 of 1

### 5M CHOKE MANIFOLD SCHEMATIC

| ITEM | SIZE | PRESSURE | DESCRIPTION |
|------|------|----------|-------------|
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |



| ITEM | SIZE | PRESSURE | DESCRIPTION |
|------|------|----------|-------------|
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |

| ITEM | SIZE | PRESSURE | DESCRIPTION |
|------|------|----------|-------------|
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |
|      |      |          |             |



POWERING PROGRESS™

## MTR DATA BOOK

**CUSTOMER:** AUSTIN DISTRIBUTING

**DATE:** 11/20/2014

**Purchase Order:** PENDING

**Sales Order #:** 205663

**Product Description:** 10K3.566.0CK4.1/1610KFLGE/E L/E

**Hose S/N:** D-112014-10

### CONTENTS INCLUDED

---

**1 GMCO FITTINGS**

|          |             |
|----------|-------------|
| 14-177-1 | INSERT STEM |
| 14-245-1 | INSERT HEAD |
| 14-242-1 | FERRULE     |

---

**2 EDWARDS FABRICATION LIFT EYE CLAMPS**

19351, 19356 Individual Test Certificates for Each Clamp

---

**3 4 1/16 10K FLANGES**

R20834 Heat Numbers

---

**4 WELDING SPECIFICATIONS**

Certification and Procedure for welding

---

**5 NDE RESULTS**

1921 Ultrasonic Test Results and Imaging

---

**6 TEST CHART**

Chart Recording of Hydrostatic Test

---

**7 TEST CERTIFICATE**

Document Product Details & Positive Results of Hydrostatic Testing

---

**8 CERTIFICATE OF CONFORMANCE**

A Declaration of the conformity with the type approval

---

**9 IMAGES**

Images of the product prior to shipping.

---

**10 PACKING LIST**

Details of Shipping Contents, Dimensions and Weights

---



# PLYMOUTH TUBE CO<sup>USA</sup>

672 W State Road 14, Winamac, Indiana 46988  
Phone: (574) 946-3125 Fax-Cold Draw: (574) 946-3850 Fax-Hot Mill: (574) 946-7220

## PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS

119679 - 1 / 1

SOLD TO

J P Steel  
6811 FM 362  
Brookshire, TX 77423  
USA

WORK ORDER 006409

HEAT NUMBER 486597

MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

QJG HXX X +64-15

14-177-1

ISO 9001: 2008  
Registered

| CUSTOMER P.O.                                                                                                                                                                                                                                                                                                                                                                                                      | CUSTOMER PART | QUANTITY    | LADING NO | CERT ID / REV | CERT DATE  |       |     |      |       |     |      |       |      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------|-----------|---------------|------------|-------|-----|------|-------|-----|------|-------|------|
| 17554                                                                                                                                                                                                                                                                                                                                                                                                              | JP 3.562X.531 | 9,736.34 Lb | 00071757  | 01            | 06/18/2014 |       |     |      |       |     |      |       |      |
| <b>PART DESCRIPTION EJ35620531DR1724-00</b><br>Spec: ASTM A-519 Seamless Mech.<br>Alloy Smls Mechanical, HF [D/E] Smls Q&T<br>Grade: 4130<br>OD: 3.5625" Tol+.0360" Tol-.0360"<br>Wall: 0.5310" Tol+.0530" Tol-.0530" AW<br>Lgth Type: Random<br>Lgth: 17.00' / 24.00'<br>End Finish: Debur ID & OD<br>Finish Type: Quench & Temper L80/N80<br>Oil: Light Oil                                                      |               |             |           |               |            |       |     |      |       |     |      |       |      |
| <b>CERTIFICATION REQUIREMENTS</b><br>ASTM A-519-06 / API 5CT<br>Quench & Tempered. Induction heated, water quenched and infrared pyrometer monitored.<br>Tensiles tested were 1" STRIP specimens per A370.<br>Ultrasonic tested and passed.<br>Tubes UT inspected to ASTM E213/API 5CT 10.15 and SR2 requirements w/ 5% notches. Test covered 100% full length of OD & ID surfaces both longitudinal & transverse. |               |             |           |               |            |       |     |      |       |     |      |       |      |
| <b>Chemical Analysis</b>                                                                                                                                                                                                                                                                                                                                                                                           |               |             |           |               |            |       |     |      |       |     |      |       |      |
| C                                                                                                                                                                                                                                                                                                                                                                                                                  | Mn            | P           | S         | Si            | Al         | Cr    | Mo  | Ni   | Pb    | Cu  | V    | Ti    | Sn   |
| .31                                                                                                                                                                                                                                                                                                                                                                                                                | .51           | .011        | .003      | .27           | .015       | .97   | .21 | .13  | ----- | .16 | .006 | ----- | .008 |
| Cb                                                                                                                                                                                                                                                                                                                                                                                                                 | Ca            | N           | As        | Sb            | H          |       |     |      |       |     |      |       |      |
| .001                                                                                                                                                                                                                                                                                                                                                                                                               | .0017         | .0095       | .0039     | .0014         | -----      |       |     |      |       |     |      |       |      |
| <b>Product Checks</b>                                                                                                                                                                                                                                                                                                                                                                                              |               |             |           |               |            |       |     |      |       |     |      |       |      |
| CHK01                                                                                                                                                                                                                                                                                                                                                                                                              | C             | Mn          | P         | S             | Si         | Al    | Cr  | Mo   | Ni    | Pb  | Cu   | V     | Ti   |
| CHK02                                                                                                                                                                                                                                                                                                                                                                                                              | .317          | .52         | .012      | .005          | .275       | .016  | .96 | .211 | .123  |     | .148 | .0034 |      |
| CHK01                                                                                                                                                                                                                                                                                                                                                                                                              | .31           | .52         | .011      | .0043         | .275       | .016  | .96 | .211 | .123  |     | .147 | .0035 |      |
| CHK01                                                                                                                                                                                                                                                                                                                                                                                                              | Sn            | Cb          | Ca        | N             | As         | Sb    | H   |      |       |     |      |       |      |
| CHK02                                                                                                                                                                                                                                                                                                                                                                                                              | .0091         | .000        | .0017     | .0000         | .0095      | .0000 |     |      |       |     |      |       |      |
| CHK02                                                                                                                                                                                                                                                                                                                                                                                                              | .0091         | .000        | .0016     | .0000         | .0099      | .0000 |     |      |       |     |      |       |      |
| <b>Physical Properties</b>                                                                                                                                                                                                                                                                                                                                                                                         |               |             |           |               |            |       |     |      |       |     |      |       |      |
|                                                                                                                                                                                                                                                                                                                                                                                                                    |               |             |           |               |            |       |     |      |       |     |      |       |      |

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

*David Coulter*  
Quality Assurance



**PLYMOUTH TUBE CO. USA**  
 572 W State Road 14, Winamac, Indiana 46996  
 Phone: (574) 946-3125 Fax-Cold Draw: (574) 946-3850 Fax-Hot Mill: (574) 946-7220

# PRODUCT CERTIFICATION

SALES ORDER - LINE / RLS

119679 - 1 / 1

SOLD TO

J P Steel  
 6811 FM 362  
 Brookshire, TX 77423  
 USA

WORK ORDER 006409  
 HEAT NUMBER 486597  
 MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

**ISO 9001: 2008  
 Registered**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       |                                     |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------------|------------------------------|------------------------------------|--------------------------------|---------------------|---------------------|----------------------|-------------------|---------------------|------|-----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|---------|----|----|----|----|----|---------|--|---|----|----|----|----|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|-----|-------|
| CUSTOMER P.O.<br><b>17554</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CUSTOMER PART<br><b>JP 3.562X.531</b> | QUANTITY<br><b>9,736.34 Lb</b>      | LADING NO<br><b>00071757</b> | CERT ID / REV<br><b>01</b>         | CERT DATE<br><b>06/18/2014</b> |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| PART DESCRIPTION <b>EJ35620531DR1724-00</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                       |                                     |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| <table border="0"> <tr> <td>Grain Size</td> <td>J1</td><td>J2</td><td>J3</td><td>J4</td><td>J5</td><td>J6</td><td>J7</td><td>J8</td><td>J9</td><td>J10</td><td>J11</td><td>J12</td> <td>C</td><td>R</td><td>S</td><td>AE</td><td>AT</td><td>BH</td><td>BT</td><td>CH</td><td>CT</td><td>DE</td><td>DT</td> <td>SAM 'B'</td> </tr> <tr> <td></td> <td>7</td><td>50</td><td>49</td><td>48</td><td>45</td><td>42</td><td>38</td><td>35</td><td>33</td><td>33</td><td>33</td><td>32</td> <td>--</td><td>--</td><td>--</td> <td>0.0</td><td>0.5</td><td>1.0</td><td>1.0</td><td>0.0</td><td>0.0</td><td>1.0</td><td>1.5</td> <td>-----</td> </tr> </table> |                                       |                                     |                              |                                    |                                | Grain Size          | J1                  | J2                   | J3                | J4                  | J5   | J6  | J7 | J8 | J9 | J10 | J11 | J12 | C   | R   | S   | AE  | AT  | BH      | BT | CH | CT | DE | DT | SAM 'B' |  | 7 | 50 | 49 | 48 | 45 | 42 | 38 | 35 | 33 | 33 | 33 | 32 | -- | -- | -- | 0.0 | 0.5 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.5 | ----- |
| Grain Size                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | J1                                    | J2                                  | J3                           | J4                                 | J5                             | J6                  | J7                  | J8                   | J9                | J10                 | J11  | J12 | C  | R  | S  | AE  | AT  | BH  | BT  | CH  | CT  | DE  | DT  | SAM 'B' |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 7                                     | 50                                  | 49                           | 48                                 | 45                             | 42                  | 38                  | 35                   | 33                | 33                  | 33   | 32  | -- | -- | -- | 0.0 | 0.5 | 1.0 | 1.0 | 0.0 | 0.0 | 1.0 | 1.5 | -----   |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| <table border="0"> <tr> <td>SAM 'D'</td> <td>Freq.</td> <td>Severity</td> </tr> <tr> <td>-----</td> <td>.000</td> <td>.000</td> </tr> </table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       |                                     |                              |                                    |                                | SAM 'D'             | Freq.               | Severity             | -----             | .000                | .000 |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| SAM 'D'                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Freq.                                 | Severity                            |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| -----                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | .000                                  | .000                                |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| <b>Methods of Manufacturing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                       |                                     |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| Method of Mfg 1<br>Electric Arc Furnace Melted                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                       | Method of Mfg 2<br>Aircraft Quality |                              | Method of Mfg 3<br>Continuous Cast |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| Method of Mfg 4<br>Mfg.Using Clean Steel Practice                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                       | Method of Mfg 5<br>Ladle Refined    |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| <b>Mechanical Properties</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                       |                                     |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Rc-High<br>20                         | Rc-Low<br>19                        | Tensile<br>107000            | Yield .2%<br>91800                 | Yield .5%<br>91800             | Elong%<br>28        | Reduction<br>59     | Aust TempF<br>1640   | Aust Time<br>6.17 | TemperTempF<br>1315 |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | TemperTime<br>79                      |                                     |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| <b>Charpy Impact Tests</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                       |                                     |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Temp 1<br>-30C                        | Size 1<br>10X10                     | Orient 1<br>Long             | FtLb-Tl-Pc 1<br>126                | LExp-Tl-Pc 1<br>.073           | %Shr-Tl-Pc 1<br>100 | FtLb-Tl-Pc 2<br>128 | LExp-Tl-Pc 2<br>.068 |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | %Shr-Tl-Pc 2<br>100                   |                                     | FtLb-Tl-Pc 3<br>125          | LExp-Tl-Pc 3<br>.073               | %Shr-Tl-Pc 3<br>100            |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |
| <p><b>This test report data is for the heat Chemistry Stated above.</b></p> <p>The material in this test report is:</p> <ol style="list-style-type: none"> <li>1) Manufactured in the USA.</li> <li>2) Free from Polybrominated Biphenyls (PBB), Polybrominated Diphenyl Ethers (PBDE), and Mercury contamination.</li> </ol>                                                                                                                                                                                                                                                                                                                         |                                       |                                     |                              |                                    |                                |                     |                     |                      |                   |                     |      |     |    |    |    |     |     |     |     |     |     |     |     |         |    |    |    |    |    |         |  |   |    |    |    |    |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |     |     |     |       |

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

*David Jenkins*  
 Quality Assurance



**PLYMOUTH TUBE CO. USA**

572 W State Road 14, Winamac, Indiana 46986  
Phone: (574) 948-3125 Fax-Cold Draw: (574) 948-3850 Fax-Hot Mill: (574) 948-7220

**PRODUCT CERTIFICATION**

SALES ORDER - LINE / RLS

**119679 - 1 / 1**

SOLD TO

**J P Steel**  
**6811 FM 362**  
**Brookshire, TX 77423**  
**USA**

WORK ORDER 006409

HEAT NUMBER 486597

MELT SOURCE TMK IPSCO Koppel-USA Mfg/Melt

**ISO 9001: 2008**  
**Registered**

| CUSTOMER P.O.                        | CUSTOMER PART | QUANTITY    | LADING NO | CERT ID / REV | CERT DATE  |
|--------------------------------------|---------------|-------------|-----------|---------------|------------|
| 17554                                | JP 3.562X.531 | 9,736.34 Lb | 00071757  | 01            | 06/18/2014 |
| PART DESCRIPTION EJ35620531DR1724-00 |               |             |           |               |            |
| 3) No Repairs by welding             |               |             |           |               |            |
| End of Certification                 |               |             |           |               |            |

I certify that the described material has been manufactured, inspected, and tested in accordance with the above specification(s) and satisfies the requirements.

  
Quality Assurance

Benteler Steel/Tube GmbH  
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33043 Paderborn  
Deutschland  
Tel.: +49.5254.81-0 Fax: +49.5254.13886

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

**BENTELER**

Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1  
EN 10204:2005-01

Benteler Steel/Tube GmbH • Postfach 1340 • 33043 Paderborn • Deutschland

JP Steel  
PO Box 592  
BROOKSHIRE TX 77492  
USA

65-716081/002/P

Prüf-Nr.:  
Inspection No.:  
No. du certificat:

BST 12-12036 / JP 11459

Hersteller:  
Manufacturer:  
Producteur:

Wärmehaushalt Dinslaken  
ISO 9001:2001 CERTIFIED BY TÜV NORD CERT  
ISO 9001:2001 CERTIFIED BY TÜV NORD SYSTEMS

Kunden-Bestell-Nr.:  
Purchase Order No.:  
No. de commande du client:

1578593

Herstellerzeichen:  
Manufacturer's brand:  
Marque du producteur:



Versandanzahlen-Nr.:  
Dispatch Note No.:  
No. d'avis d'expédition:

6571039

Stempel des Abnahmebeauftragten:  
Stamp of the inspection representative:  
Poinçon du contrôleur:

WA

Produkt: NAHTLOSE STAHLROHRE  
Product: SEAMLESS STEEL TUBES  
Produit: TUBES D'ACIER SANS SOUDURE

Stahlschmelzungsverfahren:  
Steelmaking process:  
Procédé d'élaboration de l'acier:

ELEKTROSTAHL  
ELECTRIC FURNACE  
FOUR ELECTRIQUE

Lieferbedingungen: ASTM-A 519-2006

Terms of delivery:  
Conditions de livraison:

Maße - Toleranzen: outside diameter acc. to customer request, wall thickness acc. to customer request, ASTM-A 519-2006

Dimensions-tolerances:  
Dimensions-tolérances:

Stahlsorte: GRADE 4130

Steel grade:  
Nuance d'acier:

Lieferzustand: QT

Delivery condition:  
État de livraison:

Produktkennzeichnung: PKE: BENTELER SIGN BENTELER DIMENSIONS GRADE 4130 BST 12-12036 / JP 11459 ASTM-A 519 WA

Product marking:

Marquage du produit:

ALZ = Anzeichenzeichnung, Etching line marking, Gravis à l'encre, FK = Farbzeichenzeichnung, colour marking, marquage par couleur, PS = Prägestempel, de stempes, marquage par poinçonnage, TS = Temperstempelzeichnung, hot stamp marking, poinçonnage à jet d'encre, LK = Laserstempelzeichnung, Laser marking, Marquage laser, PKE = Produktkennzeichnung, log marking, marquage sur éléments, PS = Prägestempel, de stempes, marquage par poinçonnage, TS = Temperstempelzeichnung, hot stamp marking, poinçonnage à jet d'encre.

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Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

**BENTELER**

Steel/Tube

ABNAHMEPRÜFZEUGNIS EN 10204-3.1  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

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| Pos.  | Stück  | Maße                                   | Länge    | Gewicht | Schmelzen-Nr. | Prüfdruck          | Rohr-Nr.-Gruppe        | Vielfachlängen      |
|-------|--------|----------------------------------------|----------|---------|---------------|--------------------|------------------------|---------------------|
| Item  | Number | Dimensions                             | Length   | Weight  | Heat No.      | Test pressure      | Tube number group      | Multiple lengths    |
| Poste | Nombre | Dimensions                             | Longueur | Poids   | No. de coulée | Pression d'épreuve | Série de no. des tubes | Longueurs multiples |
|       |        | feet                                   | feet     | lbs     |               |                    |                        |                     |
| 0002  | 34     | 4.500" O.D. * 0.625"<br>1.7 FT - 24 FT | 748,36   | 19326   | 573599        |                    |                        |                     |

Schmelzenanalyse [%] / Heat analysis [%] / Analyse sur coulée [%]

| Pos.  | Schmelzen-Nr. | C     | SI    | MIN  | P     | S     | CR   | MO   | NI   |
|-------|---------------|-------|-------|------|-------|-------|------|------|------|
| Item  | Heat No.      |       |       |      |       |       |      |      |      |
| Poste | No. de coulée |       |       |      |       |       |      |      |      |
| 0002  | 573599        | 0,310 | 0,220 | 0,53 | 0,007 | 0,002 | 0,89 | 0,17 | 0,09 |

Prüfergebnisse / Test results / Résultats des essais

|                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                 |        |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Die Rohre wurden zerstörungsfrei geprüft:<br>The tubes are non destructive tested:<br>Les tubes ont passé un essai non destructif: | UT-long imperfections: acc. to API 5CT, SR 2; UT-long, Test method: acc. to ASTM-E 213; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; UT-transv. imperfections: acc. to API 5CT, SR2; acc. to ASTM-E 213; Outside notch depth: 5,0 %; Inside notch depth: 5,0 %; UT-lamination detection: acc. to EN 10246-14, table 1 | PASSED |
|------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|

|                                                              |        |                                                                                          |        |                                                                          |        |
|--------------------------------------------------------------|--------|------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------|--------|
| Augensichtkontrolle:<br>Visual inspection:<br>Examen visuel: | PASSED | Materialverwechslungsprüfung:<br>Material conformity test:<br>Vérification de la nuance: | PASSED | Maßkontrolle:<br>Dimensions examination:<br>Vérification des dimensions: | PASSED |
|--------------------------------------------------------------|--------|------------------------------------------------------------------------------------------|--------|--------------------------------------------------------------------------|--------|

Ergebnisse der mechanischen Prüfung / Results of mechanical testing / Résultats des essais mécaniques

Die Probenahme erfolgte an Vielfachlängen.  
The sampling was carried out on multiple lengths.  
L'échantillonnage était réalisé aux longueurs multiples.

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Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

**BENTELER**

Steel/Tube

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ABNAHMEPRÜFZEUGNIS EN 10204-3.1  
Inspection No.: 65-716081/002/P  
Document No.:  
No. du document:

Zugversuch längs Streifenprobe / Tensile test longitudinal Strip test specimen / Essai de traction longitudinal Bande découpée sur tube

| Pos.          | Proben-Nr.          | Schmelzen-Nr. | Probenabmessung         | Streckgrenze     | Zugfestigkeit            | Dehnung     | Einschnürung             |
|---------------|---------------------|---------------|-------------------------|------------------|--------------------------|-------------|--------------------------|
| Item          | Specimen No.        | Heat No.      | Specimen dimensions     | Yield strength   | Tensile strength         | Elongation  | Area reduction           |
| Poste         | No. de l'éprouvette | No. de coulée | Dimensions de l'éprouv. | Limite élastique | Résistance à la traction | Allongement | Coefficient de striction |
| Anforderungen |                     |               |                         | RT 0,5 %         | Rm                       | A2°         | 1. Formel                |
| Requirements  |                     |               |                         | MPa              | MPa                      | %           | 1. Formula               |
| Exigences     |                     |               |                         | 552-655          | MIN 655                  | MIN 14      | 1. Formule               |
| 0002          | 000001              | 573599        | 25,40 X 15,40           | 637              | 758                      | 36          |                          |
| 0002          | 000002              | 573599        | 25,40 X 15,70           | 635              | 769                      | 36          |                          |

Härteprüfung / Hardness test / Essai de dureté

| Pos.          | Proben-Nr.       | Schmelzen-Nr. | Härte             |
|---------------|------------------|---------------|-------------------|
| Item          | Specimen No.     | Heat No.      | Hardness          |
| Poste         | No. de l'éprouv. | No. de coulée | Dureté            |
| Anforderungen |                  |               | HRC HB HV HRB HBW |
| Requirements  |                  |               | MAX 22.0          |
| Exigences     |                  |               | 020               |
| 0002          | 000001           | 573599        |                   |

Kerbschlagbiegeversuch Notched bar impact test / Essai de flexion par choc (résistance) [1 CHARPY V]

| Pos.          | Proben-Nr.       | Schmelzen-Nr. | Probenabmessung            | Probenlage               | Prüftemperatur      | Kerbschlagarbeit     | Kerbschlagzähigkeit  | Verf.-Bruchanteil |
|---------------|------------------|---------------|----------------------------|--------------------------|---------------------|----------------------|----------------------|-------------------|
| Item          | Specimen No.     | Heat No.      | Specimen dimensions        | Specimen position        | Test temperature    | Absorbed energy      | Impact strength      | Shear fracture    |
| Poste         | No. de l'éprouv. | No. de coulée | Dimensions de l'éprouvette | Position de l'éprouvette | Température d'essai | Energie absorbée     | Résistance au choc   | Rupture ductile   |
| Anforderungen |                  |               | Länge Breite Höhe          | längs (L)                |                     | einzel mittel        | einzel mittel        |                   |
| Requirements  |                  |               | Length Width Height        | longitudinal (L)         |                     | single average       | single average       |                   |
| Exigences     |                  |               | Longueur Largeur Hauteur   | longitudinal (L)         |                     | individuelle moyenne | individuelle moyenne |                   |
|               |                  |               | quer (Q)                   |                          | GRAD                |                      |                      |                   |
|               |                  |               | transversal (Q)            |                          | °C                  | ft-lbf               | ft-lbf               | J/cm²             |
|               |                  |               | transversal (Q)            |                          | -30                 | MIN 020              |                      |                   |
| 0002          | 000001           | 573599        | 55 10,00 10,00             | L                        | -30                 | 11.6                 |                      |                   |
|               |                  |               | 10,00 10,00                |                          |                     | 11.0                 |                      |                   |
|               |                  |               | 10,00 10,00                |                          |                     | 11.1 11.2            |                      |                   |

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**BENTELER** 

Steel/Tube

Ersetzt / replace

Dok. Nr. / Doc. No. 65-716081/001/E vom / dated 26.09.2012

ABNAHMEPRÜFZEUGNIS EN 10204-3.1  
INSPECTION CERTIFICATE EN 10204-3.1  
CERTIFICAT DE RECEPTION EN 10204-3.1

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Wärmebehandlung / Heat treatment / Traitement thermique

Hardening temperature: 850°C, Holding time: 1 min, Cooling: water / Tempering temperature: 735°C, Holding time: 6 min, Cooling: air

Vermerk / Remark / Remarque

Certificate remarks: Steel is manufactured to fine grain practice, The tubes comply with the requirements of NACE MR0175-03., hardness max. 22 HRC, No mercury, mercury compounds or mercury bearing instruments and / or equipment has been used in any manner which might cause contamination in manufacture assembly, or test of material. No weld repair has been carried out.;  
Certificate-Remark: The steel will be produced by an electric arc furnace, ladle furnace and continuous casting machine, stirring by argon. The mode of operation in this process is commonly referred to as "clean steel process". The products are fully killed.

Verkäufer(in) / Salesman/ woman in charge / Personne chargée : Mr Storm, Tel.: 05254/81-4274, Fax: 4289

Dinslaken, 26.10.2012, TEL.: 02064.623-5370 FAX: 02064.623-5390

Abnahmebeauftragter  
Inspection representative

Contrôleur

DR. BASEL KEITA / Thei

\* Es wird bestätigt, daß die gelösten Erzeugnisse den techn. Lieferbedingungen des Auftrages entsprechen. Dieses Dokument wurde mittels EDV erstellt und ist ohne Unterschrift rechtmäßig.  
We certify that the supplied products comply with the order specification. This document was prepared by means of electronic data processing and is valid without signature.  
Nous attestons que les produits livrés sont conformes aux stipulations de la commande. Ce document a été établi par traitement électronique de l'information et est valide sans signature.

P.O. BOX 924469  
HOUSTON, TX 77292  
PHONE: (713) 290-8490



6645 W. TIDWELL  
HOUSTON, TX 77092  
FAX: (713) 290-8627

To: J.P. STEEL, LLC  
PO BOX 592  
KATY, TX 77492-0592

Report Date: 10/18/13  
Report No: 250944.0  
Rev.: A  
Cust Acct: JPS10050

PO#: 15484  
Material: 4.50" OD X .625" WALL 4130 Q & T ALLOY  
ID/Heat: HT# 573599  
Job Info:

**Tensile Test Results**

| No./Location | Size<br>(in.) | Area<br>(in <sup>2</sup> ) | Ult. Load<br>(lbs.) | Yield<br>(psi) | Tensile<br>(psi) | Elong. (%) | R. of A.<br>(%) | Hardness |
|--------------|---------------|----------------------------|---------------------|----------------|------------------|------------|-----------------|----------|
| 1            | .495          | .1924                      |                     | 90,200         | 112,300          | 26         | 73              |          |

Unless otherwise stated, yield stress is 0.2% offset, gage length is 2 in. for 1/2 in. bars or 1 in. for 1/4 in. bars.

Signed: \_\_\_\_\_

*Mike Mason*

**MIKE MASON**

Our reports are for the exclusive use of our customer and our name may be used only with prior written approval. Our reports apply only to the sample tested or inspected and do not necessarily represent the quality of other apparently similar or identical materials. All test specimens and testing conforms to ASTM A-370 requirements unless otherwise stated. This test report shall not be reproduced, except in full, without the written approval of P&B Testing Inc.



ARCELORMITTAL TUBULAR PRODUCTS  
SHELBY LLC.  
132 WEST MAIN STREET  
SHELBY, OHIO 44875-1471  
Telephone 419/342-1200 FAX: 419/342-1437

**MATERIAL**  
**TEST**  
**REPORT**

ISO/TS 16949:2009 ISO 9001:2008

14-242-1 956444469A-F

SHELBY ORDER NO.  
447180

|                                      |                                                                                           |  |                                                                              |  |                                |  |
|--------------------------------------|-------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------|--|--------------------------------|--|
| C<br>U<br>S<br>T<br>O<br>M<br>E<br>R | MARCON KEYSTONE CORPORATION<br>6441 BINGLE ROAD<br>HOUSTON TX 77092<br>ATTN: EARTHA JILES |  | SPECIFICATION<br>ASTM A513<br>GMCO A513 DOM 1<br>01-10<br>FAX: (713)460-5414 |  | CUSTOMER ORDER<br>35-057810-03 |  |
|--------------------------------------|-------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------|--|--------------------------------|--|

|              |                                               |                      |           |                     |                  |
|--------------|-----------------------------------------------|----------------------|-----------|---------------------|------------------|
| GRADE<br>520 | SIZE(O.D x ID x WALL)<br>7.250 X 6.000 X .625 | QUANTITY<br>17509 LB | 396.00 FT | SHIPPED<br>09/02/14 | DATE<br>09/02/14 |
|--------------|-----------------------------------------------|----------------------|-----------|---------------------|------------------|

|                                                                                              |                  |                        |
|----------------------------------------------------------------------------------------------|------------------|------------------------|
| CONDITION<br>ASTM 513 Type 5 Produced to OD/ID Ref: WALL<br>EW TUFFDOM STRESS RELIEVE ANNEAL | PART NO.<br>REV. | S#00335344<br>50064541 |
|----------------------------------------------------------------------------------------------|------------------|------------------------|

|                     |                   |      |      |      |      |      |      |      |      |      |      |                                           |               |
|---------------------|-------------------|------|------|------|------|------|------|------|------|------|------|-------------------------------------------|---------------|
| HEAT NO.<br>4131797 | CHEMICAL ANALYSIS |      |      |      |      |      |      |      |      |      |      |                                           | GRAIN<br>SIZE |
|                     | C                 | Mn   | P    | S    | Si   | Ni   | Cr   | Mo   | Cu   | V    | Al   | OTHER                                     |               |
|                     | .16               | 1.41 | .012 | .003 | .220 | .010 | .040 | .010 | .040 | .002 | .040 | .0030<br>CA<br>TI<br>.0010<br>Cb<br>.0020 |               |

|                       |                      |                       |                         |                       |               |          |                      |                                                                                                     |       |           |  |
|-----------------------|----------------------|-----------------------|-------------------------|-----------------------|---------------|----------|----------------------|-----------------------------------------------------------------------------------------------------|-------|-----------|--|
| MECHANICAL PROPERTIES |                      |                       |                         |                       |               |          |                      |                                                                                                     |       | MAGNAFLUX |  |
| HEAT NO.<br>4131797   | LOAD NO.<br>T6457128 | YIELD<br>PSI<br>76900 | TENSILE<br>PSI<br>89400 | ELONG %<br>2.0"<br>33 | RED<br>AREA % | HARDNESS |                      | IMPACT<br>FT.-LBS<br>SIZE<br>10.0X10.0<br>TEMP C<br>-20-30<br>RESULTS<br>128 57<br>140 68<br>133 65 | FREQ. | SEVERITY  |  |
|                       |                      |                       |                         |                       |               | BHN      | ROCKWELL<br>RB<br>92 |                                                                                                     |       |           |  |

|                                           |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |  |
|-------------------------------------------|---|---|---|---|---|---|---|---|----|----|----|----|----|----|----|----|--|
| JOMINY HARDENABILITY (EXPRESSED IN 16THS) |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |  |
| HEAT NO.                                  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 12 | 14 | 16 | 20 | 24 | 28 | 32 |  |
|                                           |   |   |   |   |   |   |   |   |    |    |    |    |    |    |    |    |  |

|            |   |   |   |                   |             |       |      |
|------------|---|---|---|-------------------|-------------|-------|------|
| J-K RATING |   |   |   | SLAG-OXIDE RATING |             |       |      |
| HEAT NO.   | A | B | C | D                 | INGOT       | OXIDE | SLAG |
|            |   |   |   |                   |             |       |      |
|            |   |   |   |                   | Q. C. INSPT |       |      |

|              |                                |                                                                                                       |
|--------------|--------------------------------|-------------------------------------------------------------------------------------------------------|
| MELT SOURCE  | OTHER INSPECTION               | THIS TEST REPORT NOTARIZED WHEN REQUIRED<br>SWORN AND SUBSCRIBED BEFORE ME<br>THIS _____ DAY OF _____ |
| EN 10204 3.1 | Melted and Manufactured in USA |                                                                                                       |

Material under this mtr was not exposed to mercury during processing.

NOTARY PUBLIC

*Frank Simeone*



Edwards Fabrication

1385 Hwy. 35 Bypass S. O: (361) 790-7910  
P.O. Box 2350 F: (361) 790-7927  
Rockport, TX 78381

tedwards@edwardsfabrication.com  
www.edwardsfabrication.com

## CERTIFICATE OF TEST

Client:  
Gates E & S North America  
134 44th Street  
Corpus Christi, TX 78405

Purchase Order: 16522

| Certificate Number                                                                                                                    |             |                            |           | Date of Examination |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------|-----------|---------------------|
| 19351                                                                                                                                 |             |                            |           | 09/11/14            |
| ID#                                                                                                                                   | Part Number | Description                | SWL*      | Proofload           |
| 19351                                                                                                                                 | 7361-0864   | 4.0" Lift-Eye Clamp 2 Bolt | 4205 lbs. | 8410 lbs.           |
| DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate. |             |                            |           |                     |
| * Safe Work Load                                                                                                                      |             |                            |           |                     |

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

We hereby verify that the above information is correct  
as contained in the records of Edwards Fabrication L.L.C.

Michael White  
Test Operator



Thomas F. Edwards  
President  
Edwards Fabrication L.L.C.



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P.O. Box 2350 F: (361) 790-7927  
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## CERTIFICATE OF TEST

Client:  
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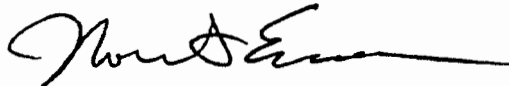
| Certificate Number                                                                                                                    |             |                            | Date of Examination |           |
|---------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------|---------------------|-----------|
| 19356                                                                                                                                 |             |                            | 09/11/14            |           |
| ID#                                                                                                                                   | Part Number | Description                | SWL*                | Proofload |
| 19356                                                                                                                                 | 7361-0864   | 4.0" Lift-Eye Clamp 2 Bolt | 4208 lbs.           | 8416 lbs. |
| DO NOT WELD, CUT, ADD-TO, TAKE AWAY ANY COMPONENTS OR MAKE ANY MODIFICATION TO THIS CLAMP UNIT. Doing so voids this test certificate. |             |                            |                     |           |
| * Safe Work Load                                                                                                                      |             |                            |                     |           |

THIS PRODUCT IS MANUFACTURED IN THE U.S.A.

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Michael White  
Test Operator



  
Thomas F. Edwards  
President  
Edwards Fabrication L.L.C.

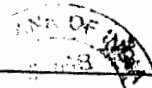
API Monogram Licensee  
ISO 9001-2008 Certified  
PED 97/23/EC  
AD 2000-Merkblatt W0



# MARS FORGE PVT. LTD.

Rajkot Gondal Nh. 8-B, Village : Shapar - 360024 Dist. Rajkot (Guj.) India.  
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 252119  
E-mail : info@marsforge.com, Web. : www.marsforge.com

| MATERIAL TEST REPORT                                                                                      |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       |                          |
|-----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------|------------------------|--------------------------------------|---------------------------------------------|-------|-------|-------|--------------------------|
| The certificate of Material as per EN 10204 3.1                                                           |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       | Doc.No.F-P-21-12/        |
| Customer : R & S OILFIELD INC.USA                                                                         |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       | TC Ref No : 21/K/2014-20 |
| DATE<br>25.08.2014                                                                                        | Purchase Order Ref.No. :<br>520 Dated 31.07.2014                                |                   | Invoice No. :<br>21                                       |                        | MF Drawing No. :<br>MF 0294-01F      |                                             |       |       |       |                          |
| Chemical Analysis Ref:<br>54/270714                                                                       | Physical Analysis Ref<br>MFT-644, MFI-147                                       |                   | Test Certificate Ref<br>025396                            |                        | Mode of Shipping :<br>SEA            |                                             |       |       |       |                          |
| Quantity :<br>27 PCS                                                                                      | Part Description:<br>Weld Neck Flange, 4-1/16" 10M X 4" SCH XXH AISI 4130 N.Q.T |                   |                                                           |                        | PSL LEVEL<br>2                       | Raw Material Spec No<br>MARS 6A -001 REV.03 |       |       |       |                          |
| Heat Code Punch :<br>R 20834                                                                              | R & S Part Number :<br>RSMFW410X...                                             |                   |                                                           |                        | Melting Practice :<br>EAF→LRF→VD→CCM |                                             |       |       |       |                          |
| Heat Number:<br>R 20834                                                                                   | Grade/Condition:<br>SAE4130                                                     |                   | Reduction Ratio:<br>Raw Material Reduction Ratio : 1:3.02 |                        |                                      |                                             |       |       |       |                          |
| CHEMICAL ANALYSIS RESULTS                                                                                 |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       |                          |
| Elements                                                                                                  | C.                                                                              | Mn.               | Si.                                                       | Cr.                    | Ni.                                  | Mo.                                         | S.    | P.    | V.    | Cu.                      |
| Minimum %                                                                                                 | 0.28                                                                            | 0.40              | 0.15                                                      | 0.80                   | ---                                  | 0.15                                        | ---   | ---   | ---   | ---                      |
| Maximum %                                                                                                 | 0.33                                                                            | 0.60              | 0.35                                                      | 1.10                   | 0.25                                 | 0.25                                        | 0.025 | 0.025 | 0.10  | 0.30                     |
| Heat Analysis %                                                                                           | 0.32                                                                            | 0.55              | 0.19                                                      | 1.07                   | 0.21                                 | 0.22                                        | 0.005 | 0.008 | 0.003 | 0.05                     |
| MECHANICAL PROPERTIES(OTC SIZE: 4" x 4")                                                                  |                                                                                 |                   |                                                           |                        | CHARPY IMPACT PROPERTIES             |                                             |       |       |       |                          |
| (ASTM A 370)                                                                                              | Requirement                                                                     | Actual            | Size                                                      | 10 x 10 x 55mm         | DIRN                                 |                                             | L     |       |       |                          |
| 0.2% Yield Strength (PSI)                                                                                 | 75,000 PSI MIN                                                                  | 78798 PSI         | Impact                                                    | 20 Ft-Lbs Min @ -75° F |                                      |                                             |       |       |       |                          |
| Tensile Strength (PSI)                                                                                    | 95,000 PSI MIN                                                                  | 104814 PSI        | Energy (ft-lbs)                                           | 51.63                  | 57.53                                | 50.15                                       |       |       |       |                          |
| % Elongation                                                                                              | 18.0% MIN                                                                       | 25.20%            | Average                                                   | 53.10 Ft Lbs           |                                      |                                             |       |       |       |                          |
| % Reduction Of Area                                                                                       | 35.0% MIN                                                                       | 70.30%            | L.E. (Inch)                                               | 0.026                  | 0.029                                | 0.024                                       |       |       |       |                          |
| Hardness ( HBW)                                                                                           | 207-235 HBW                                                                     | 207 TO 229 HBW    |                                                           |                        |                                      |                                             |       |       |       |                          |
| HEAT TREATMENT                                                                                            |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       |                          |
| CYCLE                                                                                                     | TEMPERATURE(C)                                                                  | TEMPERATURE ( F ) | TIME@TEMP                                                 | QUENCH MEDIA           |                                      |                                             |       |       |       |                          |
| Normalized                                                                                                | 910 °C                                                                          | 1670 °F           | 150 Minutes                                               | AIR COOLED             |                                      |                                             |       |       |       |                          |
| Austenitized                                                                                              | 880 °C                                                                          | 1616 °F           | 150 Minutes                                               | WATER QUENCHED         |                                      |                                             |       |       |       |                          |
| Tempered                                                                                                  | 695 °C                                                                          | 1283 °F           | 150 Minutes                                               | AIR COOLED             |                                      |                                             |       |       |       |                          |
| Water Temperature IN AT 35°C AND OUT AT 45°C                                                              |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       |                          |
| NON DESTRUCTIVE EXAM ( NDE )                                                                              |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       |                          |
|                                                                                                           |                                                                                 | Yes/No            | Spec Number                                               |                        |                                      |                                             |       |       |       |                          |
| Ultrasonic Testing ( UT )                                                                                 |                                                                                 | NO                | ---                                                       |                        |                                      |                                             |       |       |       |                          |
| Magnetic Particle Inspection ( MPI )                                                                      |                                                                                 | YES               | ASME Section-V,Article -7                                 |                        |                                      |                                             |       |       |       |                          |
| *Country of origin - India                                                                                |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       |                          |
| * We hereby declare that the material herein described is in accordance with specifications of the order. |                                                                                 |                   |                                                           |                        |                                      |                                             |       |       |       |                          |



|                         |
|-------------------------|
| API Monogram Licensee   |
| ISO 9001-2008 Certified |
| PED 97/23/EC            |
| AD 2000-Merkblatt W0    |



# MARS FORGE PVT. LTD

Rajkot Gondal Nh. 8-B, Village : Shapar - 360024 Dist. Rajkot (Guj.) India.  
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 252119  
E-mail : info@marsforge.com, Web. : www.marsforge.com

Doc No : F-P-21-17

## MAGNETIC PARTICLE EXAMINATION REPORT

|           |                                                   |                  |              |
|-----------|---------------------------------------------------|------------------|--------------|
| PART No.  | : RSMFW410X                                       | DATE             | : 25.08.2014 |
| PART NAME | : Weld Neck Flange, 4-1/16" 10M X 4" SCH XXH AISI | INSPECTOR/ LEVEL | : ASNT L-II  |
| HEAT NO   | : 4130 N.Q.T                                      | QUANTITY         | : 27 PCS     |
| PROC No   | : R 20834                                         | REJECT           | : None       |
| W/O/PO No | : W-P-21-09                                       |                  |              |
| ACCEPT    | : Acceptable                                      |                  |              |
|           | : R&S PO#520 Dated 31.07.2014                     |                  |              |

## TEST PROCEDURE

|                       |                                                      |
|-----------------------|------------------------------------------------------|
| EQUIPMENT             | : "Magnafield "Make , Electromagnetic Crack Detector |
| DETECTING MEDIA       | : Fluorescent Powder                                 |
| METHOD                | : Wet fluorescent method                             |
| CURRENT APPLY         | : H.W.D.C./A.C. Current used                         |
| LOCATION              | : Cover 100% (Assessable) area of the job            |
| MAGNETIZATION         | : Longitudinal                                       |
| TYPE OF MAGNETIZATION | : Continuous                                         |
| EXAMINATION           | : Surface & sub surface defect.                      |
| REFERENCE STANDARD    | : ASME Section V, Article 7, SE709                   |
| TESTED BY             | : HITESH MAHETA                                      |
| DATE OF TEST          | : 02.08.2014                                         |

OBSERVATION :No relevant indication found

RESULT : Jobs are found satisfactory in MPT.

For,MARS FORGE PVT.LTD.





ISO 9001 : 2008

PED 97/23/EC

AD 2000-Merkblatt WO

**MARS FORGE PVT. LTD.**

"Shraddha House" M-170, Gujarat Housing Board  
Akshar Marg, Rajkot - 360 001. Gujarat (India)  
Tel. No. : 91 - 281 - 244 83 83, 247 90 88, Fax : 91- 281 - 245533

Works : Rajkot Gondal Nh. 8-B, Village : Shapar, Dist. Rajkot (Guj.) Ind  
Tel. No. : 91 - 2827 - 252190, 252191, Fax No. : 91 - 2827 - 2521  
E-mail : info@marsforge.com, Web. : www.marsforge.co

**TEST CERTIFICATE**

TC Ref: 12/A/2011-2012

Date : 27-05-2012

|                        |                |
|------------------------|----------------|
| Our Drawing No.        | : MF 0285 PI   |
| Heat No. Code          | : R 15965      |
| Quantity               | : 159 Nos.     |
| Sample Qty.            | : 01 Nos.      |
| Chemical Analysis Ref. | : 111/07052012 |
| Physical Analysis Ref. | : AI-277       |
| Test Certificate Ref.  | : 1111         |

|                                                  |
|--------------------------------------------------|
| Customer : R & S OILFIELD INC.<br>HOUSTON - USA. |
| Customer's Part No. : 4 - 1500 WN                |
| Purchase Order Ref. : 172 / Dt.19-03-2012        |
| Delivery Challan No. : 12/ DT : 27.05.2011       |
| Vehicle No. : BY SEA                             |

**CHEMICAL ANALYSIS RESULTS :**

| Material              | Heat No. | C.   | Mn.  | Si.  | Cr.   | Ni.   | Mo.   | S.    | P.    | V.    |
|-----------------------|----------|------|------|------|-------|-------|-------|-------|-------|-------|
| Specified<br>A350 LF2 | SPECN.   | ---  | 0.60 | 0.10 | --    | ---   | ---   | ---   | --    | ---   |
|                       |          | 0.35 | 1.05 | 0.35 | 0.30  | 0.40  | 0.12  | 0.050 | 0.040 | 0.08  |
| Actual                | R 15965  | 0.20 | 0.93 | 0.20 | 0.058 | 0.076 | 0.021 | 0.008 | 0.009 | 0.002 |

| Hardness<br>Reqd. Range                                 | Hardness<br>Actual | ASTM<br>Grain Size | Heat Treatment | Jominy<br>Value | INCLUSION RATING  |                   |     |                   |
|---------------------------------------------------------|--------------------|--------------------|----------------|-----------------|-------------------|-------------------|-----|-------------------|
|                                                         |                    |                    |                |                 | A                 | B                 | C   | D                 |
| 187<br>BHN MAX.                                         | 143 - 174<br>BHN   | 6-7                | Normalised     | ---             | <u>1.0</u><br>0.5 | <u>0.5</u><br>--- | --- | <u>1.0</u><br>--- |
| * NORMALISED AT 930° C, SOAK FOR 120 MINUTES, AIR COOL. |                    |                    |                |                 |                   |                   |     |                   |

**PHYSICAL TEST RESULTS :**

| Heat Code<br>On Forgings | Yield<br>PSI. | UTS<br>PSI. | %E    | %RA.  | Impact (dim. - L, Size- 10x10x55 mm)<br>27 Joules min. at -50° F |            |            |          |
|--------------------------|---------------|-------------|-------|-------|------------------------------------------------------------------|------------|------------|----------|
| ---                      | 45000         | 70000       | 22.00 | 30.00 | I                                                                | II         | III        | Avg.     |
| PUNCH<br>R 15965         | 50235         | 76393       | 33.80 | 67.10 | 67<br>1.40                                                       | 65<br>2.30 | 63<br>1.31 | 65.16 J. |



*Signature*  
QUALITY CONTROL





# MORRIS INSPECTIONS

Mailing Address:  
2316 Memorial Pkwy.  
Portland, TX 78374-3206

Business Telephone  
(361) 643-7066  
Cellular Telephone  
(361) 877-0776

QW-484 SUGGESTED FORMAT FOR MANUFACTURER'S RECORD OF WELDER  
OR WELDING OPERATOR QUALIFICATION TESTS  
(See QW-301, Section IX, ASME Boiler and Pressure Vessel Code)

|                                     |                            |         |                  |                     |                  |
|-------------------------------------|----------------------------|---------|------------------|---------------------|------------------|
| Welder's Name                       | JEFFREY CHARLES TOWNSEND   |         | S. S. No.        |                     |                  |
| Welding Process(es)                 | Shielded Metal Arc Welding | Type    | Manual           | Position (QW-405.1) | 6-G              |
| Welding Procedure Specification No. | SM-4130                    | PQR No. | SM-4130          | Backing (QW-402.7)  | None             |
| Material Spec. (QW-403) No.         | HF-4130                    | Grade   | LN80             | P-No                | - -              |
| To                                  |                            |         |                  | Group               | - -              |
| Material Spec (QW-403) No.          | HF-4130                    | Grade   | LN80             | P-No                | - -              |
| Test Thickness                      | .531"                      | Range   | Up to 1.062"     | Test Dia.           | 4.00"            |
| Process(es)                         | SMAW                       |         | SMAW             |                     |                  |
| Filler Metal (QW-404) Spec.         | SFA 5.1                    |         | SFA 5.5          |                     |                  |
|                                     | Class No. E-6010           |         | Class No. E-8018 |                     |                  |
|                                     | F No. 3                    | A No. 1 | F No. 4          | A No. 3             |                  |
| Filler Diameter (QW-404.8)          | 1/8"                       |         | 5/32"            |                     |                  |
| Weld Deposit Thickness              | .125"                      |         | .406"            |                     |                  |
| Consumable Insert (QW-404.22)       | N/A                        |         | N/A              |                     |                  |
| Gas (QW-408) Shielding              | N/A                        |         | N/A              |                     |                  |
| Flow Rate                           | N/A                        |         | N/A              |                     |                  |
| Gas (QW-408) Purge                  | N/A                        |         | N/A              |                     |                  |
| Flow Rate                           | N/A                        |         | N/A              |                     |                  |
| Elec. (QW-409) AC-DC                | Direct                     |         | Direct           |                     |                  |
| Polarity                            | Reverse                    |         | Reverse          |                     |                  |
| Volt Range                          | 22-26                      |         | 23-27            |                     |                  |
| Amp Range                           | 80-120                     |         | 150-210          |                     |                  |
| Progression (QW-405.3)              | Root                       | Up      | Hot Pass         | Up                  | Filler Up Cap Up |
| Transfer Mode (QW-409.2) GMAW       | N/A                        |         |                  |                     |                  |
| Other                               |                            |         | Preheat          | 700 F.              | PWHT. N/A        |

For Information Only  
Material 4130 IS NOT listed in ASME Section IX

Submerged Arc Flux Trade Name but acceptable.

Guided Bend Test Results (QW-482.2(a), QW-482.3(a), QW-482.3(b))

| Specimen No. | Type | Figure No. | Results                                   | Specimen No. | Type | Figure No. | Results |
|--------------|------|------------|-------------------------------------------|--------------|------|------------|---------|
|              |      |            |                                           |              |      |            |         |
|              |      |            | Radiographic Results in lieu of Sidebands |              |      |            |         |
|              |      |            |                                           |              |      |            |         |

Radiographic Test Results (QW-304 & QW-305)

For alternative qualification of groove welds by radiography

Radiographic Results: Satisfactory

Test Conducted by J. Morris - MORRIS INSPECTIONS Laboratory—Test No. 09-019

We certify that the statements in this record are correct and that the test welds prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Date March 23, 2009 Organization DU-TEX, INC.  
By

(Details of record of tests are illustrative only and may be modified to conform to the type and number of test required by the Code.)

NOTE: Any essential variables in addition to those above shall be recorded. This form modified for information and typing purposes. (QW-301.4).



# MORRIS INSPECTIONS

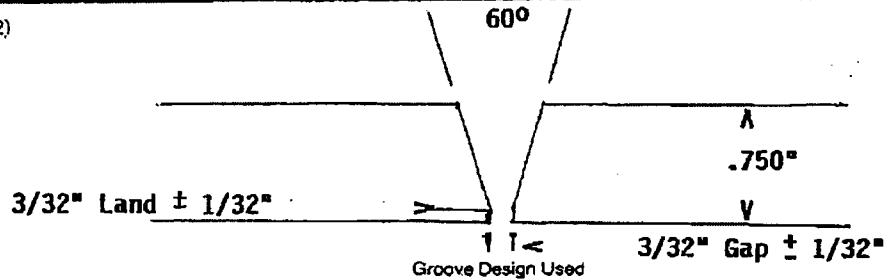
Mailing Address:  
2316 Memorial Pkwy.  
Portland, TX 78374-3206

Business Telephone  
(361) 643-7066  
Cellular Telephone  
(361) 877-0776

## QW-483 SUGGESTED FORMAT FOR PROCEDURE QUALIFICATION RECORD (PQR) (See QW-201.2, Section IX, ASME Boiler and Pressure Vessel Code)

Company Name DU-TEX, INC.  
Procedure Qualification Record No. SM-4130 Date March 24, 2009  
WPS No. SM-4130 Transfer Mode GMAW N/A  
Welding Process(es) Shielded Metal Arc Welding  
Types (Manual, Automatic, Semi-Auto.) Manual

### JOINTS (QW-402)



### BASE METALS (QW-403)

Material Spec. HF-4130 To HF-4130  
Type or Grade LN 80 To LN 80  
P-No. - Grp. - to P-No. - Grp. -  
Thickness Tested .750" Range: .1875" - 1.500"  
Diameter Tested 4.500" Range: Proc. unlimited  
No Pass Greater than 1/2" in thickness No  
Backing: Yes No XX Material Weld Metal only  
Other Material 4130 IS NOT listed in ASME Section IX

### FILLER METALS (QW404)

Process(es) SMAW SMAW  
Weld Metal Analysis A-No. 1 3  
Weld Bead Number 1 & 2 Balance  
Dia of Electrode 1/8" 5/32"  
Filler Metal F-No. 3 4  
SFA Specification 5.1 5.5  
AWS Classification E-6010 E-8018  
Weld Deposit Range .250" 1.250"  
Weld Deposit Thickness .125" .625"  
Tungsten: Size N/A Type:  Class:   
Flux Trade Name: N/A Designation:   
Other

### POSITION (QW-405)

Position of Test Groove 6-G  
Weld Progression (Up, Down, Flat)   
Root Up Hot Pass Up Filler Up Cap Up

### PREHEAT (QW-406)

Preheat Temp. 70° F.  
Interpass Temp. Min.  Max.   
Other

### POSTWELD HEAT TREATMENT (QW-407)

Temperature None applied  
Time   
Other

### GAS (QW-408)

Process(es) SMAW-N/A  
Shielding   
Flow Rate   
Purge   
Flow Rate   
Other

### ELECTRICAL CHARACTERISTICS (QW-409)

| Process(es) | <u>SMAW</u>    | <u>SMAW</u>    |
|-------------|----------------|----------------|
| Current     | <u>Direct</u>  | <u>Direct</u>  |
| Polarity    | <u>Reverse</u> | <u>Reverse</u> |
| Volts Range | <u>22-26</u>   | <u>23-27</u>   |
| AMPS Range  | <u>80-120</u>  | <u>150-210</u> |
| Other       | <u></u>        | <u></u>        |

### TECHNIQUE (QW-410)

| Process(es)                        | <u>SMAW</u>     | <u>SMAW</u>     |
|------------------------------------|-----------------|-----------------|
| Travel Speed                       | <u>Variable</u> | <u>Variable</u> |
| String or Weave Bead               | <u>String</u>   | <u>String</u>   |
| Oscillation                        | <u>None</u>     | <u>None</u>     |
| Multiple or Single Pass (per side) | <u>Multiple</u> | <u>Multiple</u> |
| Single or Multi Electrodes         | <u>Single</u>   | <u>Single</u>   |
| Peening                            | <u>None</u>     | <u>None</u>     |
| Other                              | <u></u>         | <u></u>         |

## Tensile Test (QW-150)

## NOTE: MATERIAL SPECS

Electrode Tensile Strength is 80,000 PSI

| Specimen No. | Width | Thickness | Area  | Ultimate Total Load lbs. | Ultimate Unit Stress psi | Character of Failure & Location |
|--------------|-------|-----------|-------|--------------------------|--------------------------|---------------------------------|
| T - 1        | .751" | .743"     | .558" | 45,000                   | 80,645                   | Satisfactory-Broke in Weld Area |
| T - 2        | .748" | .748"     | .554" | 44,400                   | 80,144                   | Satisfactory-Broke in Weld Area |
|              |       |           |       |                          |                          |                                 |

## Guided Bend Test (QW-180)

| Specimen No. | Type  | Figure No. | Results      | Specimen No. | Type | Figure | Results |
|--------------|-------|------------|--------------|--------------|------|--------|---------|
| 6G - SB1     | SBend | QW462.2    | Satisfactory |              |      |        |         |
| 6G - SB2     | SBend | QW462.2    | Satisfactory |              |      |        |         |
| 6G - SB3     | SBend | QW462.2    | Satisfactory |              |      |        |         |
| 6G - SB4     | SBend | QW462.2    | Satisfactory |              |      |        |         |

## Toughness Tests (QW-170)

| Specimen No. | Notch Location | Specimen Size | Test Temp. | Impact Values | Lateral Exp. |      | Drop Weight |          |
|--------------|----------------|---------------|------------|---------------|--------------|------|-------------|----------|
|              |                |               |            |               | % Shear      | Mils | Break       | No Break |
|              |                |               |            |               |              |      |             |          |
|              |                |               |            |               |              |      |             |          |
|              |                |               |            |               |              |      |             |          |
|              |                |               |            |               |              |      |             |          |
|              |                |               |            |               |              |      |             |          |
|              |                |               |            |               |              |      |             |          |

Average ft/lb for this size \_\_\_\_\_

Minimum ft/lb for this size \_\_\_\_\_

## Fillet Weld Test (QW-180)

| Pos. | Spec. No. | Contour | Leg No. 1 | Leg No. 2 | Throat | Bend Defects | Macro-Pent. | Results |
|------|-----------|---------|-----------|-----------|--------|--------------|-------------|---------|
|      |           |         |           |           |        |              |             |         |
|      |           |         |           |           |        |              |             |         |
|      |           |         |           |           |        |              |             |         |
|      |           |         |           |           |        |              |             |         |

## Other Tests

Type of Test \_\_\_\_\_

Deposit Analysis \_\_\_\_\_

Other \_\_\_\_\_

Welder's Name Jeffrey Charles Townsend S.S.# \_\_\_\_\_ Stamp No. N/ATest conducted by: J. Morris-MORRIS INSPECTIONS Laboratory Test No. 09-022

We certify that the statements in this record are correct and that the test welds were prepared, welded and tested in accordance with the requirements of Section IX of the ASME Code.

Date March 25, 2009 By Joe Morris Manufacturer DU-TEX, INC.

Details of record of tests are illustrative only and may be modified to conform to the type and number of tests required by the Code. This form modified for information and typing purposes (QW200.2(D))

# Non-Destructive Testing Report

Report # \_\_\_\_\_

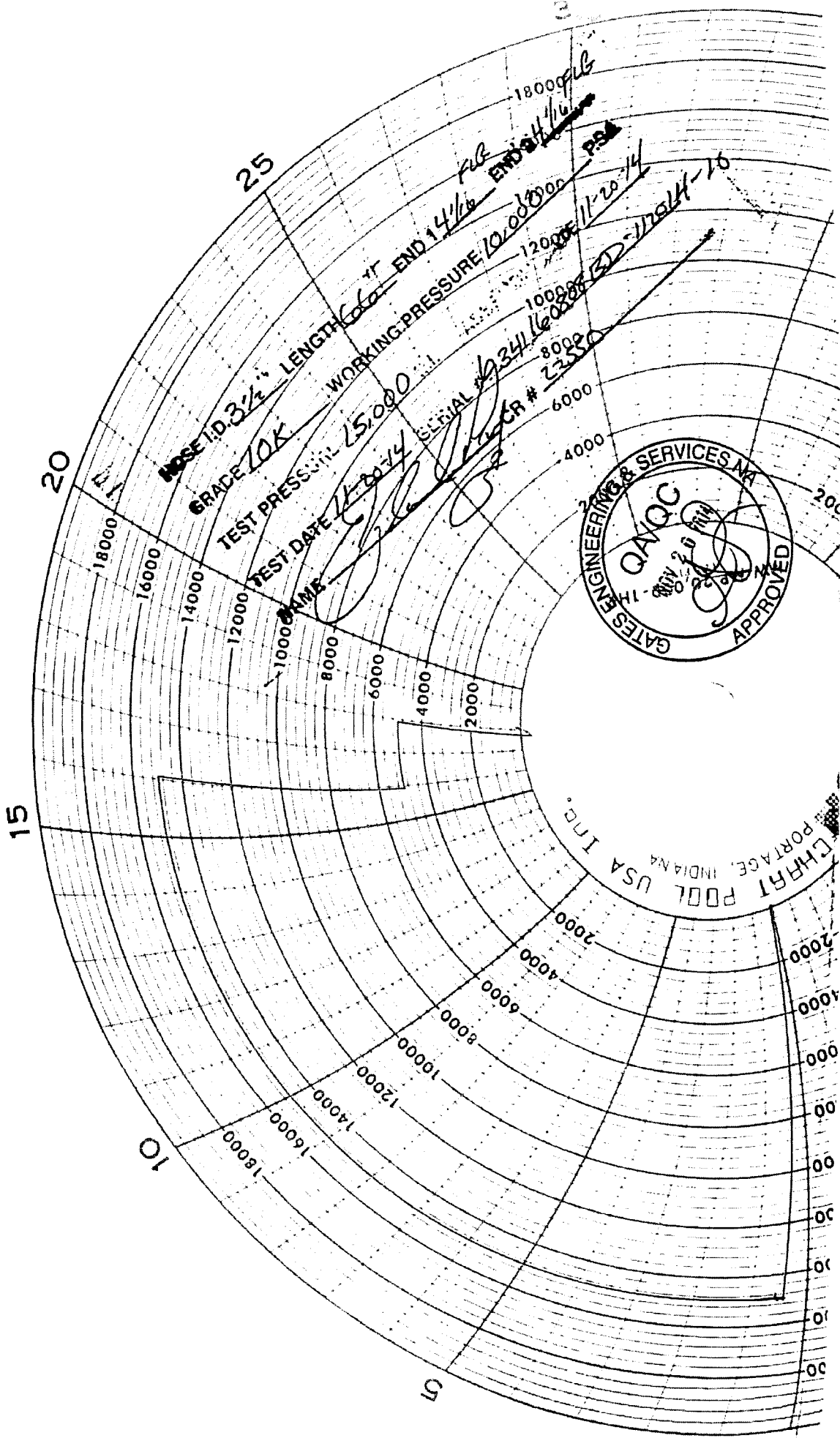
Project: 192114

|                   |               |                 |                             |
|-------------------|---------------|-----------------|-----------------------------|
| Ultrasonic        | <u>✓</u>      | Procedure #     | <u>NRS- PA-VT/2013/R-00</u> |
| Magnetic Particle | <u>      </u> | Standard #      | <u>ASME</u>                 |
| Liquid Penetrant  | <u>      </u> | Section # Level | <u>II</u>                   |

|               |                  |       |            |     |             |
|---------------|------------------|-------|------------|-----|-------------|
| Shear wave    | <u>✓</u>         | Angle | AC         | DC  | Dwell Time  |
| Straight Beam | <u>✓</u>         | 60    | Wet        | Dry | Penetrant # |
| Unit Type     | <u>Dr. Beam</u>  | 70    | Continuous |     | Developer # |
| Ref Standard  | <u>T. D. 100</u> | 45    | Residual   |     | Cleaner #   |
| Range         | <u>5"</u>        | 0     | Background |     |             |

[illegible]

Customer Representative: Don K Hours 2 Mileage



NOSE I.D. 3 1/2" LENGTH 66" END 14 1/16" FIB  
GRADE 10K WORKING PRESSURE 10,000 PSI  
TEST PRESSURE 15,000  
TEST DATE 11-20-14  
SERIAL # 34160000  
CR # 2330  
ED-117914-10

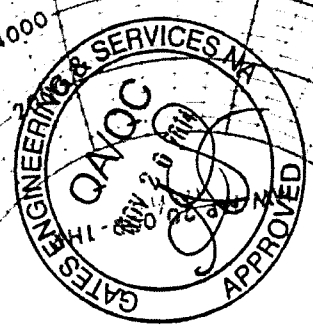


CHART POOL USA, INC.  
PORTAGE, INDIANA



**GATES E & S NORTH AMERICA, INC.**  
**134 44TH STREET**  
**CORPUS CHRISTI, TEXAS 78405**

**PHONE: 361-887-9807**  
**FAX: 361-887-0812**  
**EMAIL: Tim.Cantu@gates.com**  
**WEB: www.gates.com**

### **10K CHOKE AND KILL ASSEMBLY PRESSURE TEST CERTIFICATE**

|                      |                                 |                  |                         |
|----------------------|---------------------------------|------------------|-------------------------|
| Customer :           | AUSTIN DISTRIBUTING             | Test Date:       | 11/20/2014              |
| Customer Ref. :      | PENDING                         | Hose Serial No.: | D-112014-10             |
| Invoice No. :        | 205663                          | Created By:      | NORMA MATA              |
| Product Description: | 10K3.566.0CK4.1/1610KFLGE/E L/E |                  |                         |
| End Fitting 1 :      | 4 1/16 10K FLG                  | End Fitting 2 :  | 4 1/16 10K FLG          |
| Gates Part No. :     | 4773-6291                       | Assembly Code :  | L34116080813D-112014-10 |
| Working Pressure :   | 10,000 PSI                      | Test Pressure :  | 15,000 PSI              |

Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 15,000 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2.5 times the working pressure per Table 9.

Quality Manager :  
Date :  
Signature :

|            |
|------------|
| QUALITY    |
| 11/20/2014 |
|            |

Technical Supervisor :  
Date :  
Signature :

|            |
|------------|
| PRODUCTION |
| 11/20/2014 |
|            |



POWERING PROGRESS™

Gates E&S North America, Inc.  
134 - 44th St.  
CORPUS CHRISTI, TEXAS 78405  
PHONE : (361) 887-9807  
FAX: (361) 887-0812  
[Tim.Cantu@gates.com](mailto:Tim.Cantu@gates.com)

## CERTIFICATE OF CONFORMANCE

This is to verify that all Parts and/or Materials included in this shipment have been manufactured and/or processed in Conformance with applicable drawings and specifications, and that Records of Required Tests are on file and subject to examination. The following items were assembled at Gates E & S, North America Inc., facilities in Corpus Christi, TX, USA. This hose assembly was designed and manufactured to meet all the requirements of API Spec 7K.

CUSTOMER: AUSTIN DISTRIBUTING  
CUSTOMERS P.O.#: PENDING  
PART DESCRIPTION: 10K3.566.0CK4.1/1610KFLGE/E L/E  
SALES ORDER #: 205663  
QUANTITY: 1  
SERIAL #: D-112014-10

SIGNATURE:

TITLE:

DATE:

QUALITY

11/20/2014





| HLL ASSEMBLY PRESSURE TEST CERTIFICATE |  |                  |                         |
|----------------------------------------|--|------------------|-------------------------|
| AUSTIN DISTRIBUTING                    |  | Test Date:       | 11/20/2014              |
| PENDING                                |  | Hose Serial No.: | D-112014-10             |
| 205663                                 |  | Created By:      | NORMA MATA              |
| 10K3.566.0CK4.1/1610KFLGE/E L/E        |  |                  |                         |
| 4 1/16 10K FLG                         |  | End Fitting 2 :  | 4 1/16 10K FLG          |
| 4773-6291                              |  | Assembly Code :  | L34116080813D-112014-10 |
| 10,000 PSI                             |  | Test Pressure :  | 15,000 PSI              |

... has been tested to the

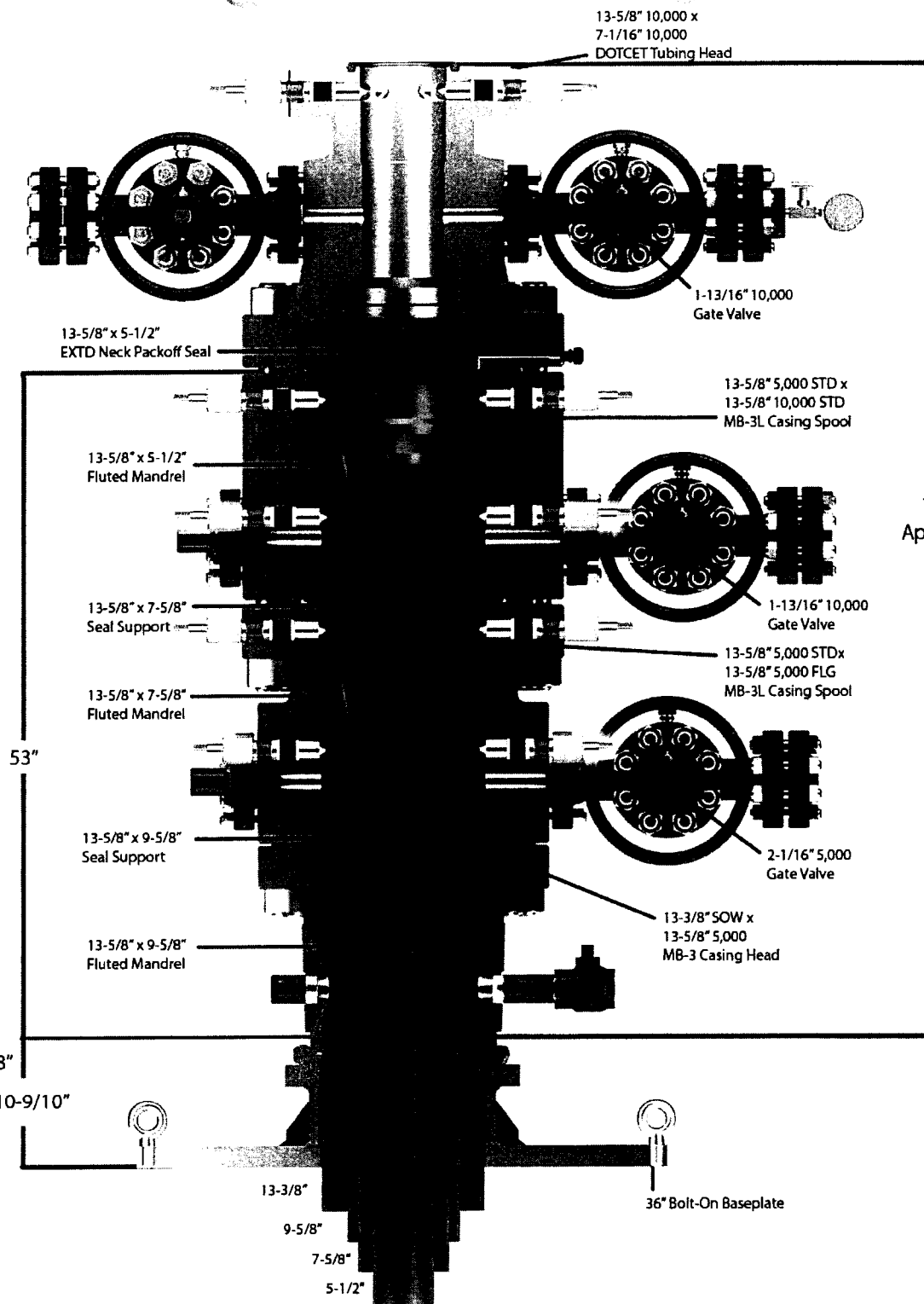




**Gates E&S North America**  
**134 - 44th St.**  
**CORPUS CHRISTI, TEXAS 78405**  
**PHONE : (361) 887-9807**  
**FAX: (361) 887-0812**  
[Tim.Cantu@gates.com](mailto:Tim.Cantu@gates.com)

**PACKAGING: ENCLOSED CRATE**

[illegible]



89-9/10"  
Approx.

79"  
Approx.

## Quotation

## Downing Wellhead Equipment

Oklahoma City,  
Oklahoma - USA

Reference Data:

NOVO

### Proprietary and Confidential

The information contained in this drawing is the sole property of Downing Wellhead Equipment, any reproduction in part or in whole without the written permission of Downing Wellhead Equipment is prohibited.

TITLE:

NOVO OIL & GAS, MB-3 SYSTEM,  
13-3/8" x 9-5/8" x 7-5/8" x 5-1/2"

DRAWN

CHECKED

APPROVED

SIZE

A

Scale:

OWG. NO.

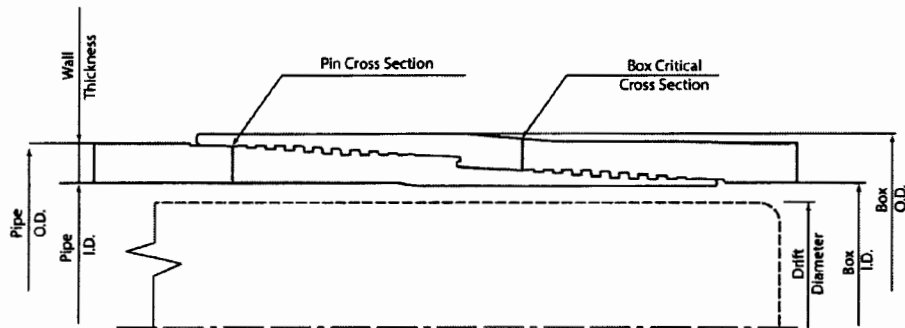
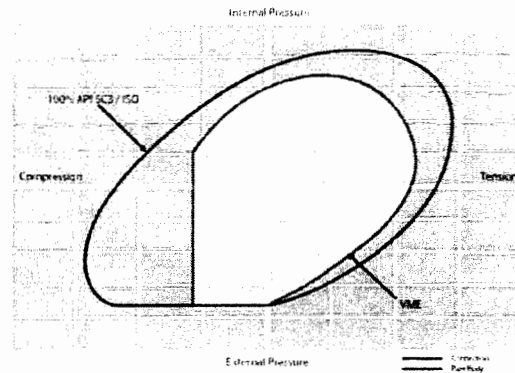
Weight:

REV.

Sheet:

# **TECHNICAL DATA SHEET: TMK UP SF 7.625 X 29.7 L80 HC**

| TUBULAR PARAMETERS                    |         | PIPE BODY PROPERTIES                |       |
|---------------------------------------|---------|-------------------------------------|-------|
| Nominal OD, (inch)                    | 7.625   | PE Weight, (lbs/ft)                 | 29.04 |
| Wall Thickness, (inch)                | 0.375   | Nominal Weight, (lbs/ft)            | 29.70 |
| Pipe Grade                            | L80 HC  | Nominal ID, (inch)                  | 6.875 |
| Drift                                 | Special | Drift Diameter, (inch)              | N/A   |
| CONNECTION PARAMETERS                 |         | Nominal Pipe Body Area, (sq inch)   | 8.541 |
|                                       |         | Yield Strength in Tension, (klbs)   | 683   |
|                                       |         | Min. Internal Yield Pressure, (psi) | 6 890 |
|                                       |         | Collapse Pressure, (psi)            | 5 510 |
|                                       |         |                                     |       |
| Connection OD (inch)                  | 7.79    |                                     |       |
| Connection ID, (inch)                 | 6.844   |                                     |       |
| Make-Up Loss, (inch)                  | 5.640   |                                     |       |
| Connection Critical Area, (sq inch)   | 6.777   |                                     |       |
| Yield Strength in Tension, (klbs)     | 607     |                                     |       |
| Yield Strength in Compression, (klbs) | 607     |                                     |       |
| Tension Efficiency                    | 89%     |                                     |       |
| Compression Efficiency                | 89%     |                                     |       |
| Min. Internal Yield Pressure, (psi)   | 6 890   |                                     |       |
| Collapse Pressure, (psi)              | 5 510   |                                     |       |
| Uniaxial Bending (deg/100ft)          | 42.8    |                                     |       |
| MAKE-UP TORQUES                       |         |                                     |       |
| Yield Torque, (ft-lb)                 | 22 800  |                                     |       |
| Minimum Make-Up Torque, (ft-lb)       | 15 200  |                                     |       |
| Optimum Make-Up Torque, (ft-lb)       | 16 700  |                                     |       |
| Maximum Make-Up Torque, (ft-lb)       | 18 400  |                                     |       |



**NOTE:** The content of this Technical Data Sheet is for general informational use and does not guarantee performance for any, or any particular, purpose, which only a competent design engineer can determine, considering the specific installation and operation parameters. This information is supplemental and is not to be used in conjunction with the information that is printed or downloaded and is not controlled by TMK and might not be the latest information. Anyone using the information herein does so at their own risk. To verify that you have the latest technical information, please contact PAK, TMK Technical Sales in Russia at Tel. +7 (495) 775-75 50. Email: technical@pak-group.com and PAK, PSCC in North America at Tel. +1 (281) 944-1144. Email: sales@tmk-ussa.com.

Print date: 05/18/2018 01:13

# PERFORMANCE DATA

**TMK UP ULTRA™ SF**  
**Technical Data Sheet**

**5.500 in**

**20.00 lbs/ft**

**P110 HC**

## Tubular Parameters

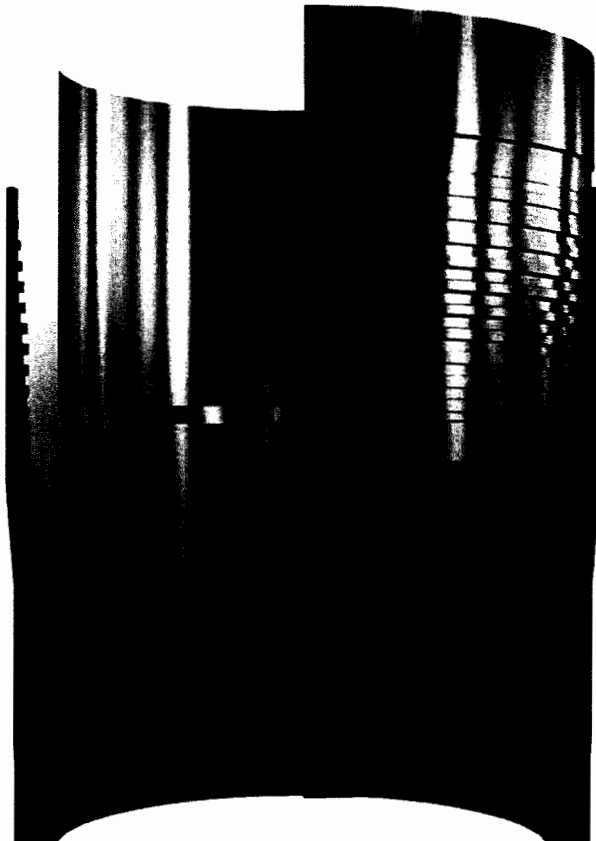
|                     |         |        |                              |         |     |
|---------------------|---------|--------|------------------------------|---------|-----|
| Size                | 5.500   | in     | Minimum Yield                | 110,000 | psi |
| Nominal Weight      | 20.00   | lbs/ft | Minimum Tensile              | 125,000 | psi |
| Grade               | P110 HC |        | Yield Load                   | 641,000 | lbs |
| PE Weight           | 19.81   | lbs/ft | Tensile Load                 | 728,000 | lbs |
| Wall Thickness      | 0.361   | in     | Min. Internal Yield Pressure | 12,640  | psi |
| Nominal ID          | 4.778   | in     | Collapse Pressure            | 12,780  | psi |
| Drift Diameter      | 4.653   | in     |                              |         |     |
| Nom. Pipe Body Area | 5.828   | in²    |                              |         |     |

## Connection Parameters

|                              |         |           |
|------------------------------|---------|-----------|
| Connection OD                | 5.646   | in        |
| Connection ID                | 4.734   | in        |
| Make-Up Loss                 | 5.526   | in        |
| Critical Section Area        | 5.289   | in²       |
| Tension Efficiency           | 90.5    | %         |
| Compression Efficiency       | 90.5    | %         |
| Yield Load In Tension        | 580,000 | lbs       |
| Min. Internal Yield Pressure | 12,640  | psi       |
| Collapse Pressure            | 12,780  | psi       |
| Uniaxial Bending             | 83      | °/ 100 ft |

## Make-Up Torques

|                     |        |        |
|---------------------|--------|--------|
| Min. Make-Up Torque | 10,200 | ft-lbs |
| Opt. Make-Up Torque | 11,200 | ft-lbs |
| Max. Make-Up Torque | 12,300 | ft-lbs |
| Operating Torque    | 13,090 | ft-lbs |
| Yield Torque        | 15,400 | ft-lbs |



Printed on: May-09-2018

### NOTE:

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**IPSCO**

## Rana Salada Fed Com Casing Design Assumptions

### Surface Casing

Collapse:  $DF_C = 1.125$

- a. Full Internal Evacuation: Collapse force is equal to mud gradient (0.433 psi/ft) in which the casing will be run and internal evacuation of casing.
- b. Cementing: Collapse force is equal net force of the planned cement slurry gradient (0.718 psi/ft) in which the casing will be run and internal force equivalent to fresh water displacement gradient (0.433 psi/ft).

Burst:  $DF_B = 1.125$

- a. Casing Pressure Test: According to BLM Onshore Order No. 2 with 0.22 psi/ft or 1500 psi, whichever is greater but not to exceed 70% of the minimum internal yield.

Tensile:  $DF_T = 1.60$

- a. Overpull: A tensile force of 100,000 lbs over string weight with a buoyancy factor of 0.8727 in water (8.33 ppg).

### Intermediate Casing

Collapse:  $DF_C = 1.125$

- a. Full Internal Evacuation: Collapse force is equal to mud gradient (0.531 psi/ft) in which the casing will be run and internal evacuation of casing.
- b. Cementing: Collapse force is equal net force of the planned cement slurry gradient (0.626 psi/ft) in which the casing will be run and internal force equivalent to the displacement of fluid gradient.

Burst:  $DF_B = 1.125$

- a. Casing Pressure Test: According to BLM Onshore Order No. 2 with 0.22 psi/ft or 1500 psi, whichever is greater but to exceed 70% of the minimum internal yield.
- b. Gas Kick: Internal burst load of a 50 bbl gas kick at the casing with drill pipe in the hole. External force will be 10.2 ppg brine water gradient (0.531 psi/ft) and internal force will be with 10.0 ppg brine water gradient (0.521 psi/ft) with gas kick.

Tensile:  $DF_T = 1.60$

- a. Overpull: A tensile force of 100,000 lbs over string weight with a buoyancy factor of 0.8441 in brine water (10.2 ppg).

### Intermediate II Casing

Collapse:  $DF_C = 1.125$

- a. Partial Internal Evacuation: Collapse force is equal to mud gradient (0.531 psi/ft) in which the casing will be run and a 50% internal evacuation of casing with a gas gradient and 10.0 ppg brine water gradient.
- b. Cementing: Collapse force is equal net force of the planned cement slurry gradient (0.6232 psi/ft) in which the casing will be run and internal force equivalent to the displacement fluid gradient.

Burst:  $DF_B = 1.125$

- a. Casing Pressure Test: According to BLM Onshore Order No. 2 with 0.22 psi/ft or 1500 psi, whichever is greater but not to exceed 70% of the minimum internal yield.
- b. Gas Kick: Internal burst load of a 50 bbl gas kick at the casing with drill pipe in the hole. External force will be 10.2 ppg brine water gradient (0.531 psi/ft) and the internal force will be with 8.8 ppg oil-based mud gradient (0.459 psi/ft) with gas kick.

Tensile:  $DF_T = 1.60$

- a. Overpull: A tensile force of 100,000 lbs over string weight with a buoyancy factor of 0.8441 in brine water (10.2 ppg)

### **Production Casing**

Collapse:  $DF_C = 1.125$

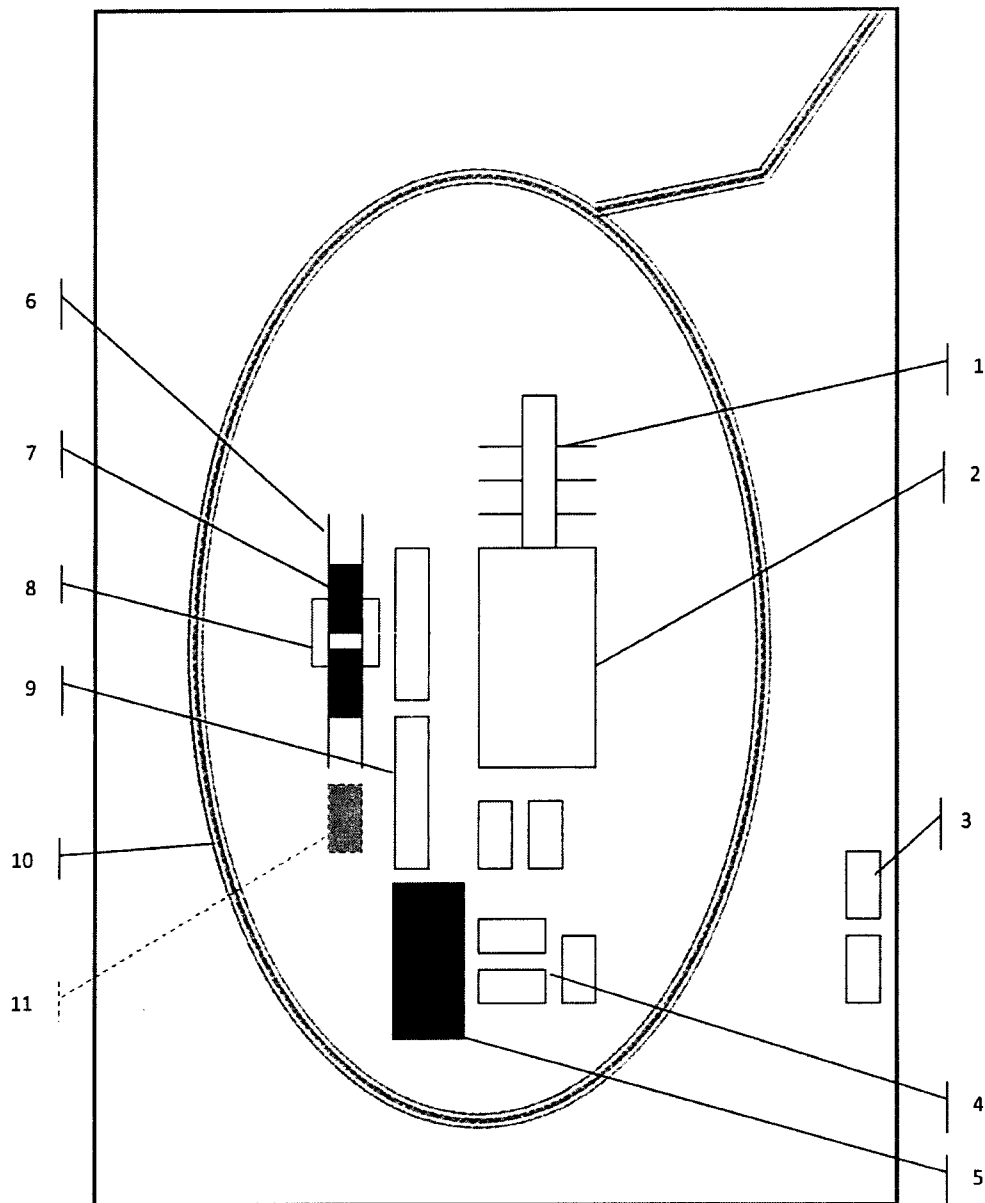
- a. Full Internal Evacuation: Collapse force is equal to mud gradient (0.531 psi/ft) in which the casing will be run and internal evacuation of casing.
- b. Cementing: Collapse force is equal net force of the planned cement slurry gradient (0.688 psi/ft) in which the casing will be run and internal force equivalent to fresh water displacement gradient (0.433 psi/ft).

Burst:  $DF_B = 1.125$

- a. Pressure Test: Pressure test will be to 80% of Internal Yield Pressure of casing intended for fracture stimulation.

Tensile:  $DF_T = 1.60$

- a. Overpull: A tensile force of 100,000 lbs over string weight with a buoyancy factor of 0.8472 in oil-based mud (10.0 ppg).



**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

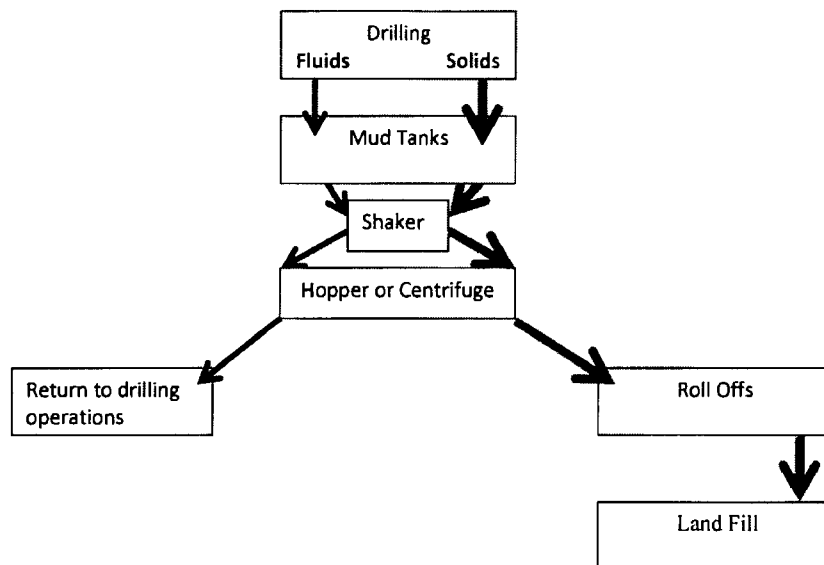


Above: Centrifugal Closed Loop System



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

#### Flow Chart for Drilling Fluids and Solids

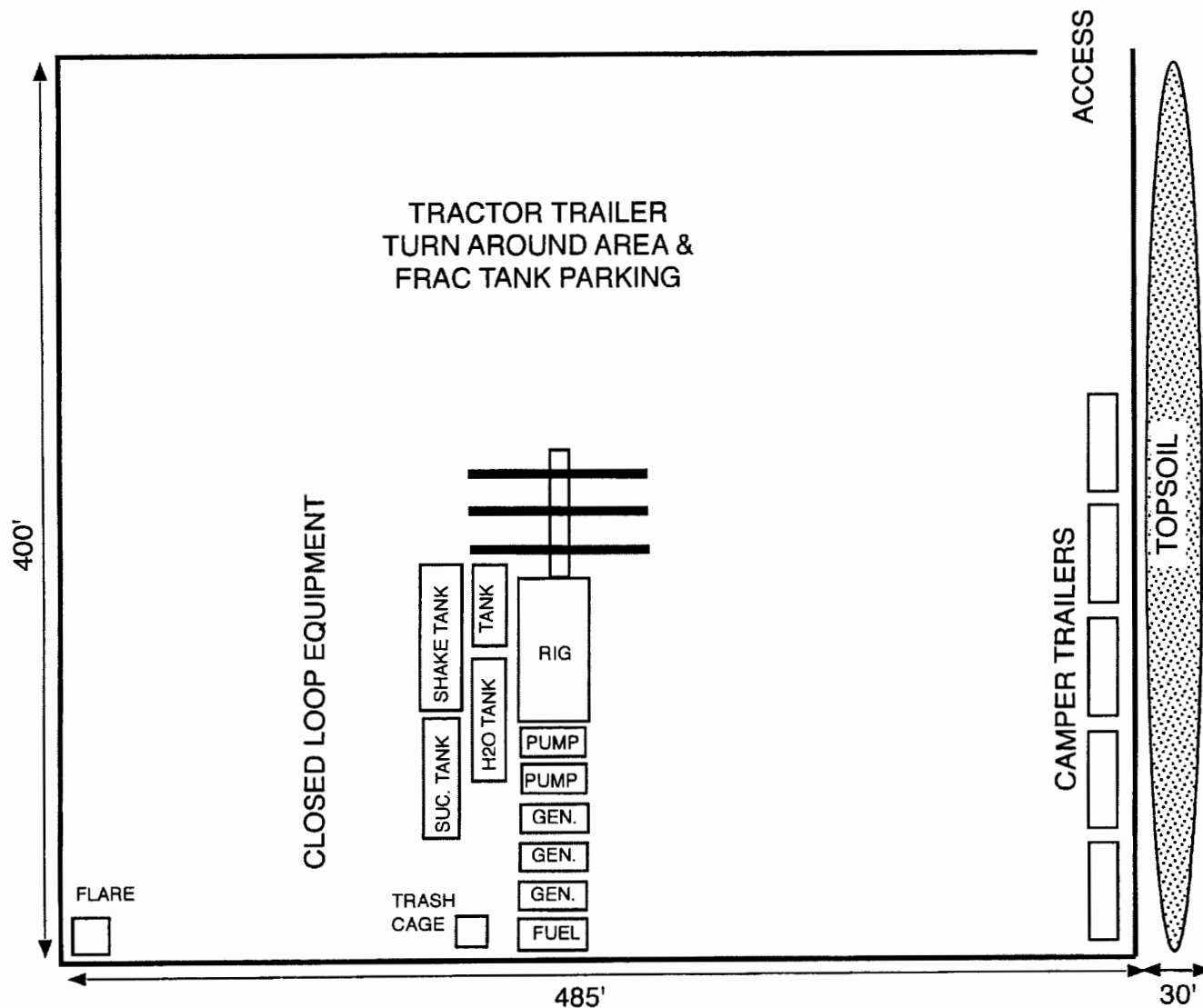


Photos Courtesy of Gandy Corporation Oil  
 Field Service

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

Novo's  
Rana Salada Fed Com 0605 231H  
rig diagram

1" = 75'





### H<sub>2</sub>S Drilling Operations Plan

- a. All personnel will be trained in H<sub>2</sub>S 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<sub>2</sub>S page 5 for more details.
- c. H<sub>2</sub>S Safety Equipment/Systems:
  - i. Well Control Equipment
    - Flare line will be  $\geq 150'$  from the wellhead and ignited by a pilot light.
    - Beware of SO<sub>2</sub> 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<sub>2</sub>S and SO<sub>2</sub> 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 inch OSHA compliant rope
    - One 20-pound ABC fire extinguisher

iii. H<sub>2</sub>S Detection & Monitoring Equipment

- Every person on site will be required to wear a personal H<sub>2</sub>S and SO<sub>2</sub> 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<sub>2</sub>S condition sign will be set at the entrance to the pad.
- Color-coded condition flag will be installed to indicate current H<sub>2</sub>S 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<sub>2</sub>S gas returns to the surface, and minimize sulfide stress cracking and embrittlement.
- Drilling mud containing H<sub>2</sub>S 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<sub>2</sub>S where formation pressures are unknown.

vi. Metallurgy

- All equipment that has the potential to be exposed to H<sub>2</sub>S will be suitable for H<sub>2</sub>S 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<sub>2</sub>S.

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 |
|----------------------------------------|----------------|

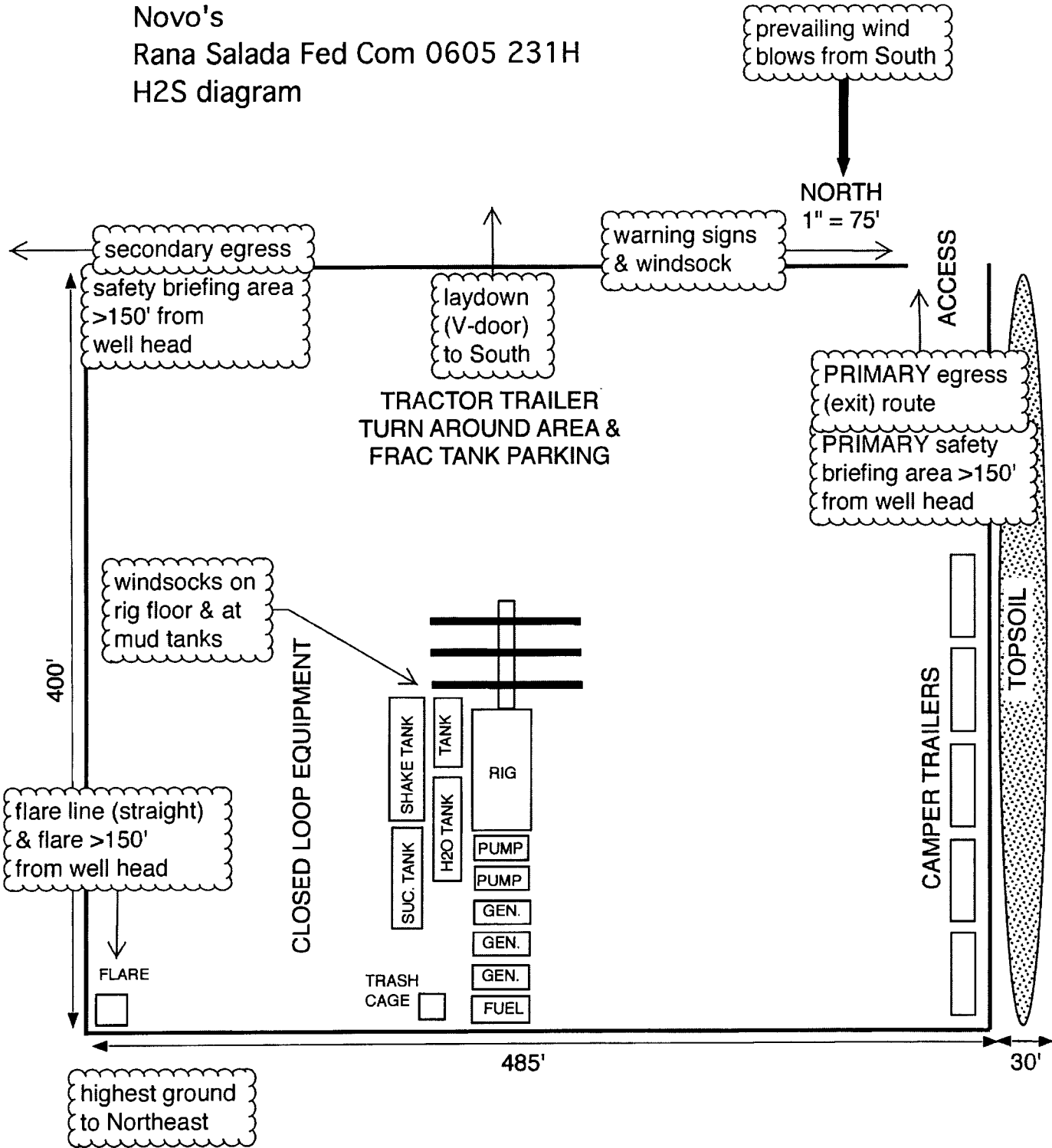
|                         |                |
|-------------------------|----------------|
| Lifeguard (Albuquerque) | (888) 866-7256 |
|-------------------------|----------------|

Veterinarians

|                                              |                |
|----------------------------------------------|----------------|
| Desert Willow Veterinary Services (Carlsbad) | (575) 885-3399 |
|----------------------------------------------|----------------|

|                               |                |
|-------------------------------|----------------|
| Animal Care Center (Carlsbad) | (575) 885-5352 |
|-------------------------------|----------------|

Novo's  
Rana Salada Fed Com 0605 231H  
H2S diagram



# **Novo Oil & Gas Northern Delaware**

Rana Salada Fed Com 6-3 23S 28E WB 1H  
H2S Contingency Plan:  
2 Mile Radius Map

Section 6, T.23S R.29E  
Eddy County, New Mexico



MAD 1983 NAD 83 Mainline State Plane East  
FIPS 3001 Foot

**PERKINS WEST**  
Geospatial Solutions

Prepared by Perkins West, Inc., May 23, 2018  
for Novo Oil & Gas Northern Delaware, LLC



Novo Oil & Gas Northern Delaware, LLC  
Rana Salada Fed Com 0605 231H  
SHL 1127' FNL & 395' FEL 1-23S-28E  
BHL 330' FNL & 330' FEL 5-23S-29e  
Eddy County, NM

SURFACE PLAN PAGE 1

Surface Use Plan

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

From the junction of US 285 and US 62/180 in Carlsbad...  
Go SE 9.9 miles on US 285 to the equivalent of Mile Post 23.4  
Then turn left and go East 5-1/4 miles on paved NM 31  
Turn left and go NW 1.6 miles on paved County Road 605 (Refinery Road)  
Then turn right and go N 0.15 mile on a caliche road  
Then bear right and go East 3/4 mile on a caliche road  
Then turn right and go S 0.2 mile on a caliche road\*  
Then turn left and go East 221' cross-country to the pad

\*For access to the central tank battery  
Go South 75' on the same caliche road  
Then turn left and go SE 331' cross-country to the CTB

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

2. ROAD TO BE BUILT OR UPGRADED (See MAPS 3 - 5)

The 552' of new local roads will be crowned and ditched, have a  $\leq 24'$  wide driving surface, and be surfaced with caliche. Pipelines that are crossed will be padded. Maximum disturbed width = 30'. Maximum grade = 5%. Maximum cut or fill = 3'. No culvert, cattle guard, or vehicle turn out is needed. Upgrading will consist of filling potholes with caliche as needed.

Novo Oil & Gas Northern Delaware, LLC  
Rana Salada Fed Com 0605 231H  
SHL 1127' FNL & 395' FEL 1-23S-28E  
BHL 330' FNL & 330' FEL 5-23S-29e  
Eddy County, NM

SURFACE PLAN PAGE 2

3. EXISTING WELLS (See MAP 6)

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

4. PROPOSED PRODUCTION FACILITIES (See MAP 7)

A central tank battery (CTB) will be built immediately north of the well pad. Flare and/or CBU will be set on the northeast corner of the CTB. Process equipment (e. g., separators, heater-treaters) will be placed on the east side of the CTB. Tank battery will be on the north side of the CTB. No power line is planned at this time. Novo is not planning any off-pad pipelines at this time. Lucid may run a gas line to the CTB, but this has not been finalized.

5. WATER SUPPLY (See MAP 8)

Water will be trucked from an existing water well (C 03607) on private (Branson) land in NENE 24-21s-27e.

6. CONSTRUCTION MATERIALS & METHODS (See MAPS 9 - 15)

NM One Call (811) will be notified before construction starts. Top ≈6" of soil and brush will be stockpiled west of the well pad and CTB. V-door will face south. Closed loop mud system will be used. Caliche will be hauled from an existing caliche pit on private (McDonald) land in SESE 16-23s-28e.

Entire 600' x 600' well pad will be graded. However, only a 400' x 485' sub-pad will initially be surfaced with caliche to accommodate the first three wells. As more wells are added, then more of the pad will be surfaced with more caliche. In the interim, the unsurfaced area will be ripped, harrowed, seeded, and revegetated.

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Eddy County, NM

SURFACE PLAN PAGE 3

## 7. WASTE DISPOSAL

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

## 8. ANCILLARY FACILITIES

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

## 9. WELL SITE LAYOUT (See MAPS 9-15)

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

## 10. RECLAMATION (See MAPS 16-19)

A 240' x 300' (= 1.65 acres) working area centered on the wells will remain after interim reclamation. Once the last well is plugged, then the pad, CTB, and new roads will be reclaimed within 6 months of plugging. Disturbed areas will be contoured to match pre-construction grades. Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM requirements. Roads will be blocked. Noxious weeds will be controlled.

Novo Oil & Gas Northern Delaware, LLC  
Rana Salada Fed Com 0605 231H  
SHL 1127' FNL & 395' FEL 1-23S-28E  
BHL 330' FNL & 330' FEL 5-23S-29e  
Eddy County, NM

SURFACE PLAN PAGE 4

Land use:

221' x 30' road to pad = 0.15 acre  
331' x 30' road to CTB = 0.23 acre  
300' x 520' CTB = 3.58 acres  
+ 600' x 600' pad = 8.26 acres  
12.22 acres short term  
- 6.36 acres interim reclamation  
5.86 acres long term

#### 11. SURFACE OWNER

All construction will be on BLM. BLM office is the Carlsbad Field Office, 620 E. Greene, Carlsbad NM 88220. Phone is 575 234-5972.

#### 12. OTHER INFORMATION

On-site inspection was held with Colleen Cepero Rios and Jim Rutley (both BLM) on March 21, 2018. Lone Mountain Archaeological Services will inspect and report on the project.

Novo Oil & Gas Northern Delaware, LLC  
Rana Salada Fed Com 0605 231H  
SHL 1127' FNL & 395' FEL 1-23S-28E  
BHL 330' FNL & 330' FEL 5-23S-29e  
Eddy County, NM

SURFACE PLAN PAGE 5

CERTIFICATION

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U. S. C. 1001 for the filing of false statements. Executed this 2nd day of July, 2018.



---

Brian Wood, Consultant

Permits West, Inc.

37 Verano Loop, Santa Fe, NM 87508

(505) 466-8120

FAX: (505) 466-9682

Cellular: (505) 699-2276

Field representative will be:

Kurt Shipley

Vice President, Operations

Novo Oil & Gas Northern Delaware, LLC

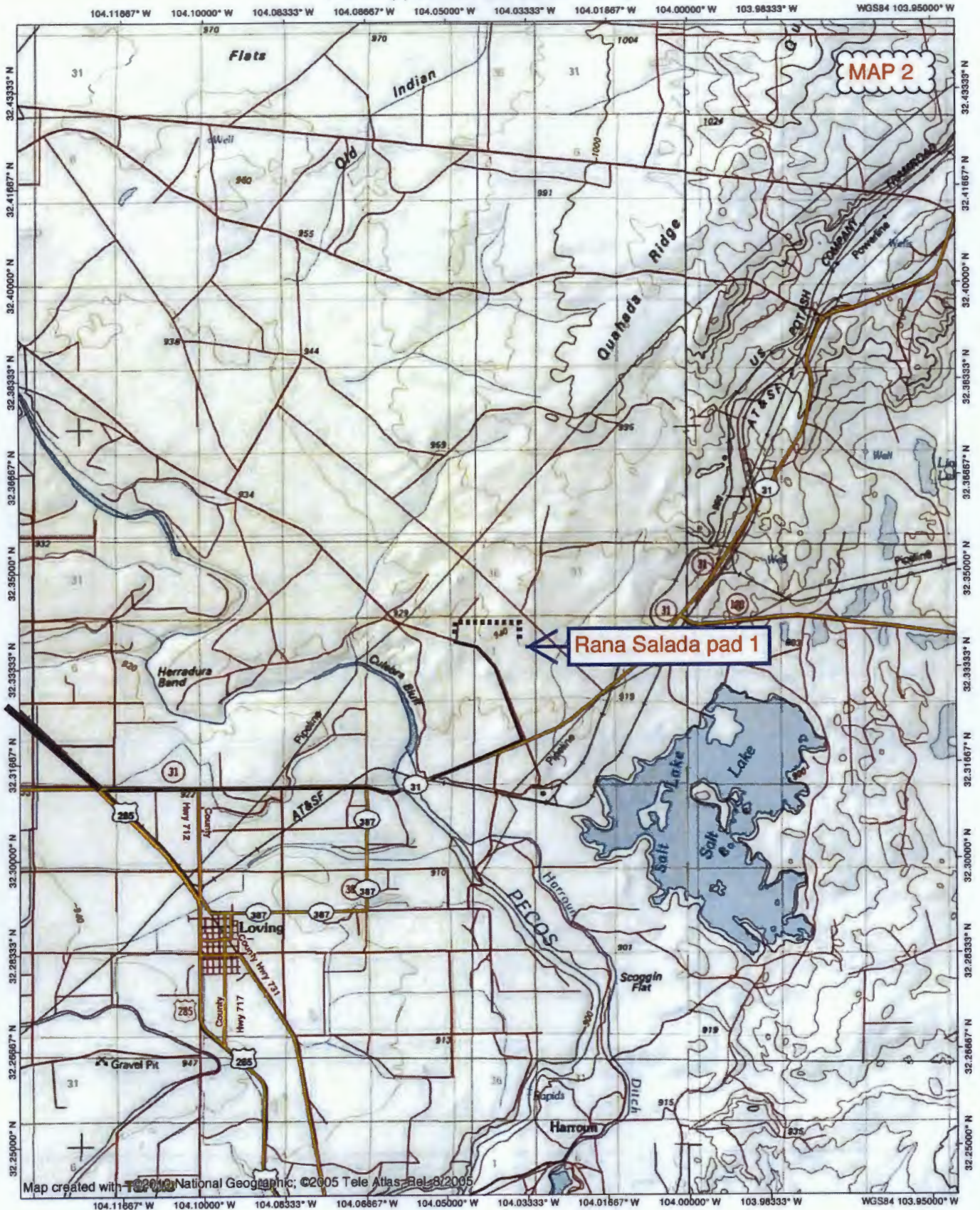
105 North Hudson Ave., Suite 500

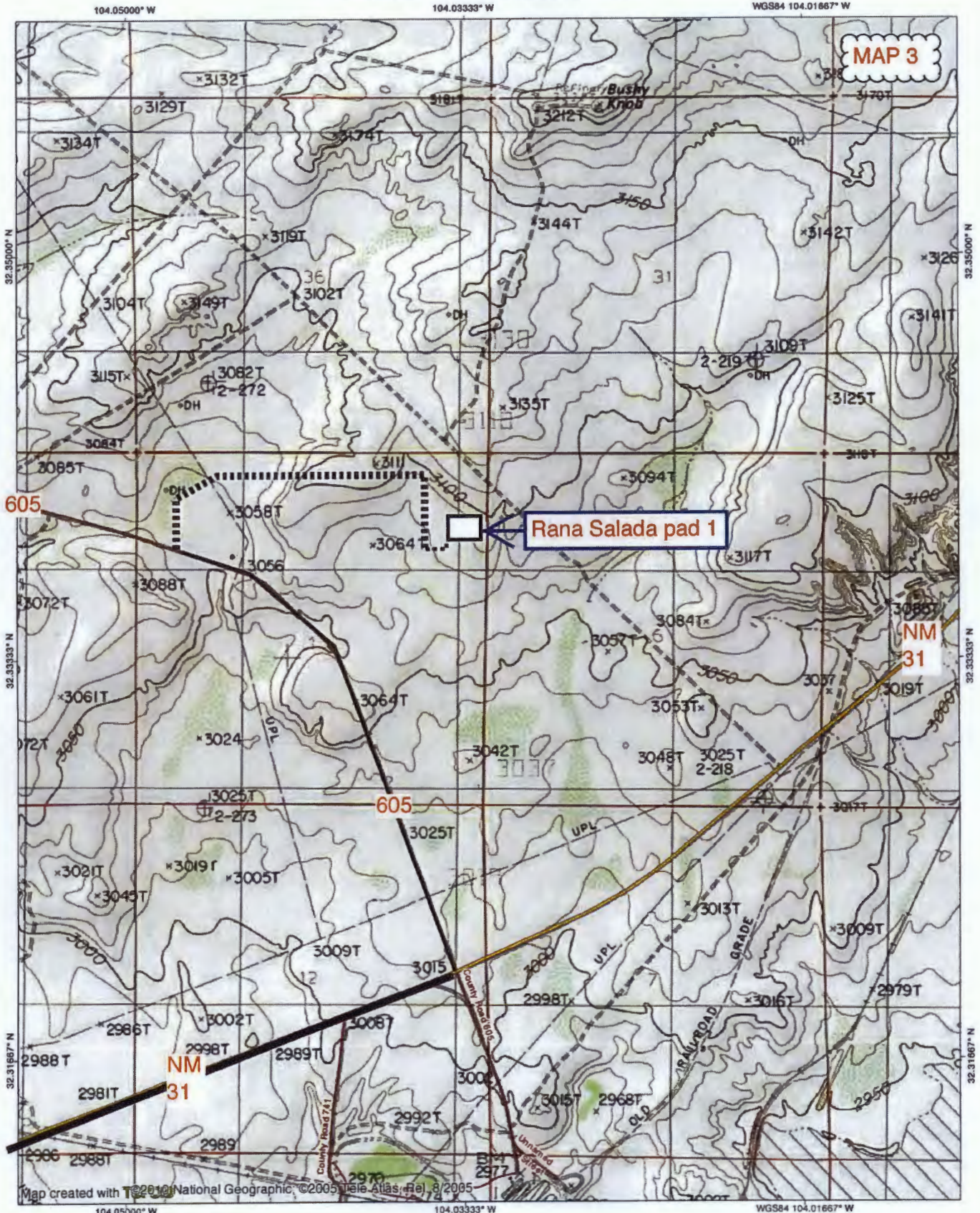
Oklahoma City OK 73102

Office: (405) 609-1596

Cell: (405) 404-0414









331' new road

CTB

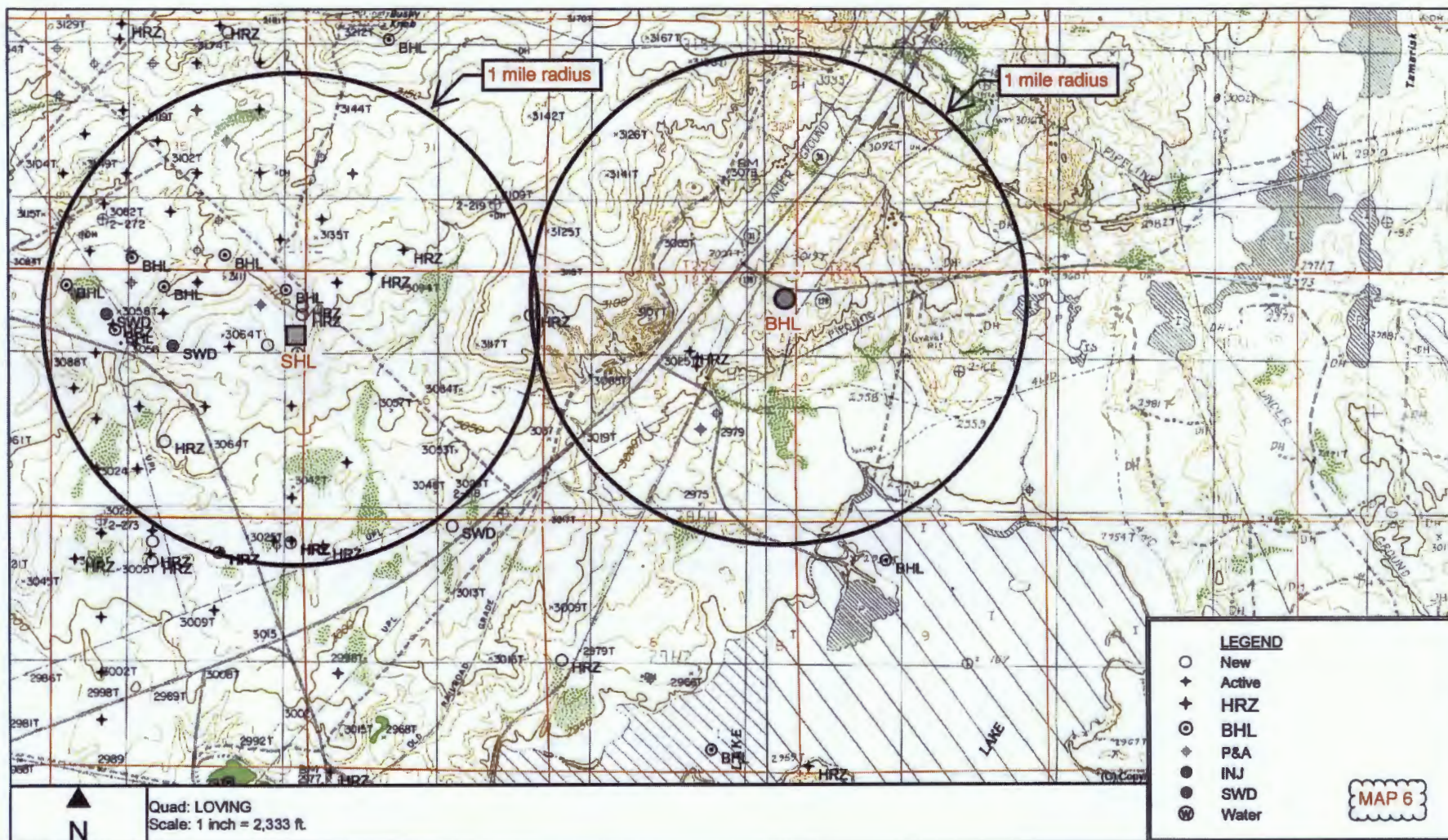
well pad

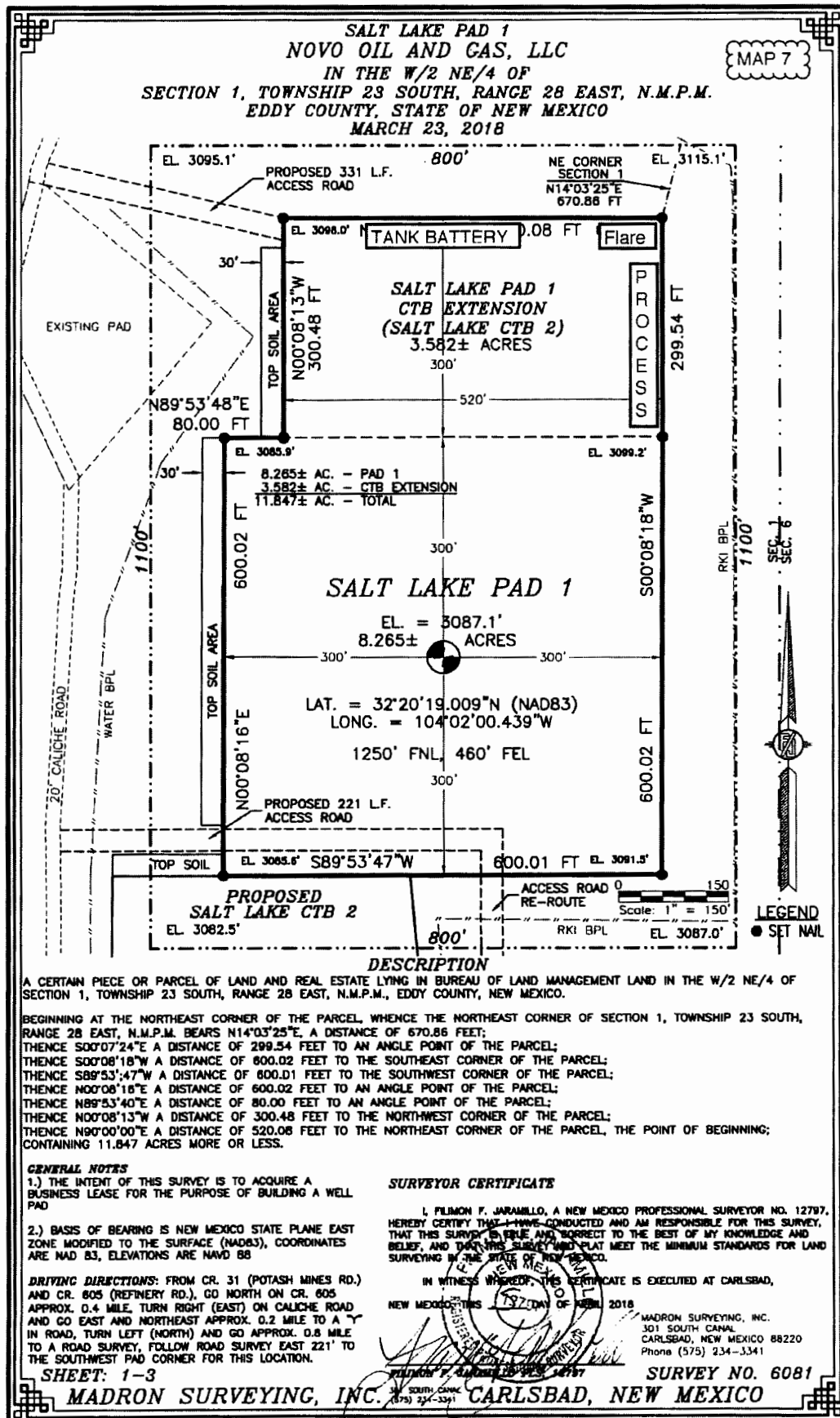
221' new road

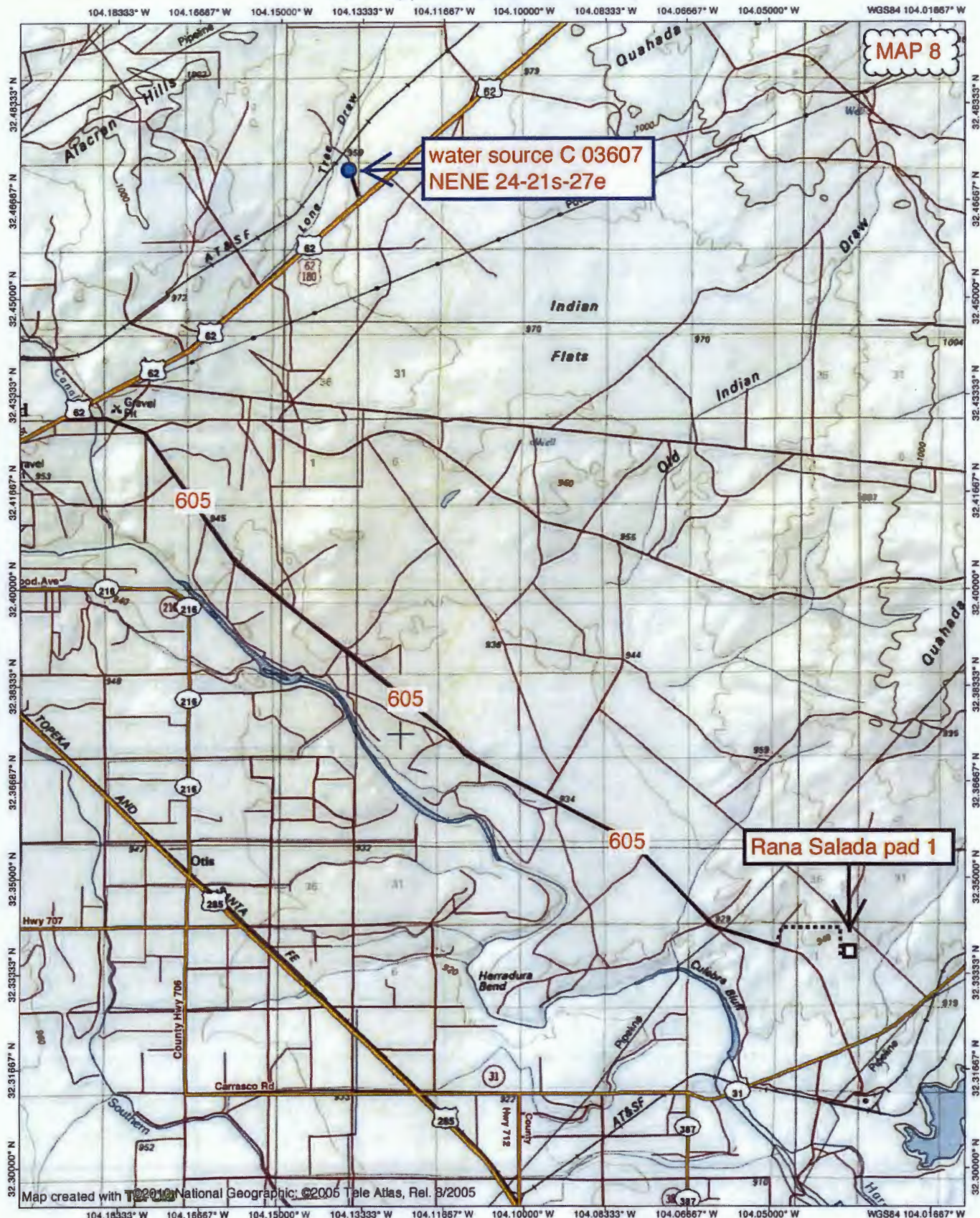
MAP 5

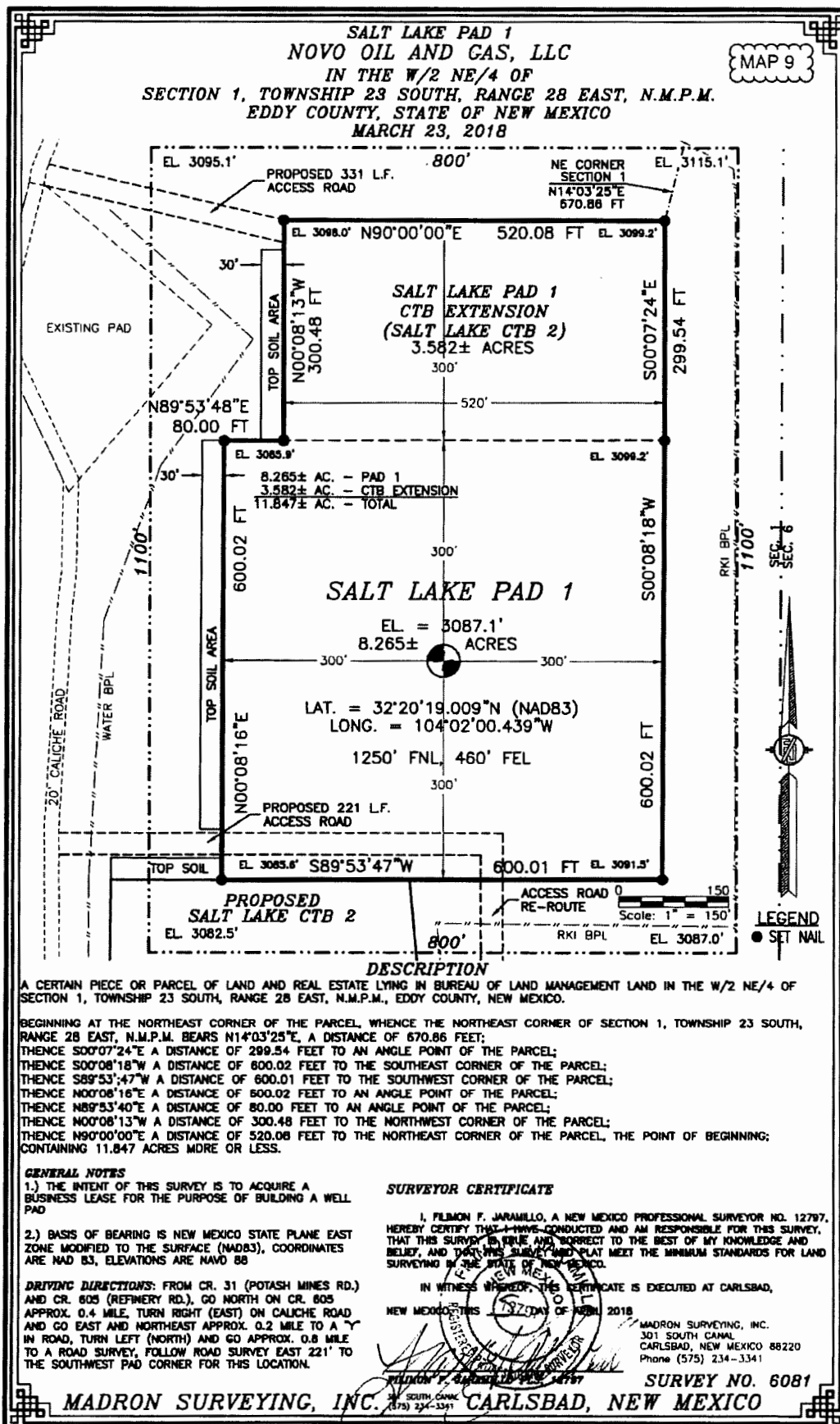
Google Earth

300 ft



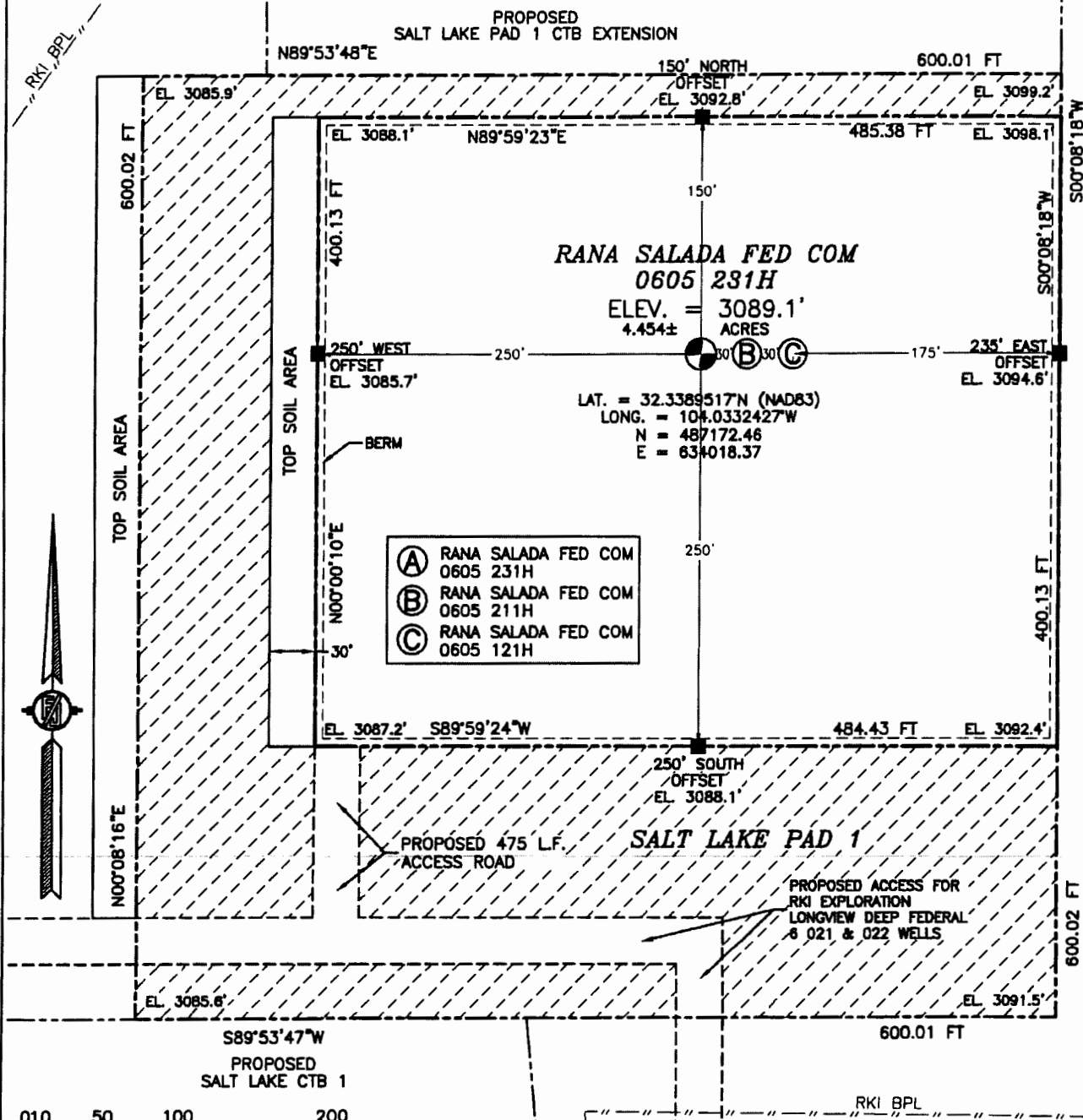






SECTION 1, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO  
SITE MAP

MAP 10



010 50 100 200  
SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM CR. 31 (POTASH MINES RD.) AND CR. 805 (REFINERY RD.), GO NORTH ON CR. 805 APPROX. 0.4 MILE, TURN RIGHT (EAST) ON CALICHE ROAD AND GO EAST AND NORTHEAST APPROX. 0.2 MILE TO A "Y" IN ROAD, TURN LEFT (NORTH) AND GO APPROX. 0.8 MILE TO A ROAD SURVEY, FOLLOW ROAD SURVEY EAST 351' AND NORTH 124' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

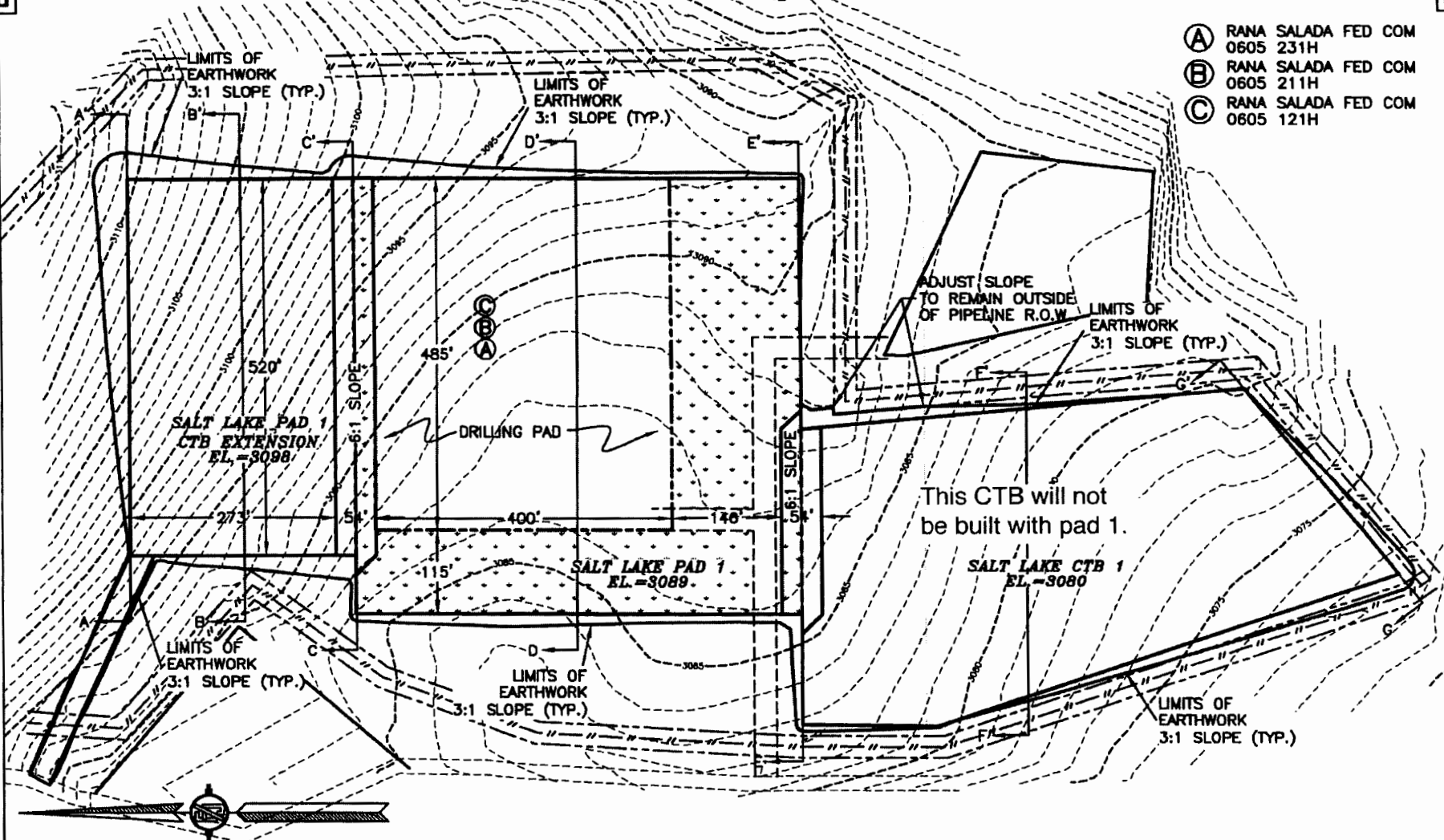
NOVO OIL AND GAS NORTHERN DELAWARE, LLC  
RANA SALADA FED COM 0605 231H  
LOCATED 1127 FT. FROM THE NORTH LINE  
AND 395 FT. FROM THE EAST LINE OF  
SECTION 1, TOWNSHIP 23 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

JUNE 26, 2018

SURVEY NO. 6144B

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

(A) RANA SALADA FED COM  
 0605 231H  
 (B) RANA SALADA FED COM  
 0605 211H  
 (C) RANA SALADA FED COM  
 0605 121H



**NOVO OIL AND GAS NORTHERN DELAWARE, LLC  
PAD GRADING AND CROSS SECTIONS  
FOR RANA SALADA FED COM 0605 231H  
SECTION 1, TOWNSHIP 23 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO**

| CUT          | FILL         | NET               |
|--------------|--------------|-------------------|
| 46251 CU. YD | 41381 CU. YD | 4871 CU. YD (CUT) |

EARTHWORK QUANTITIES ARE ESTIMATED

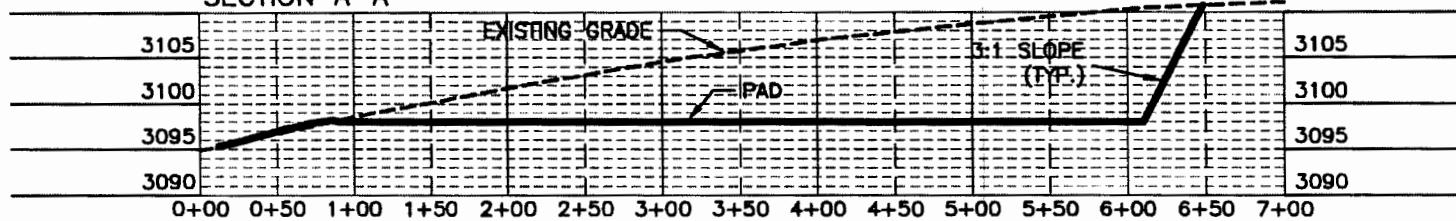
MAP 12

**JUNE 26, 2018**  
**MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO**  
**(575) 234-3341**

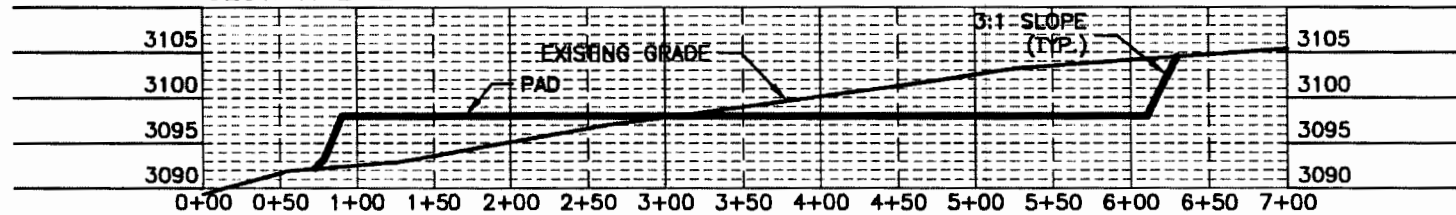
**SURVEY NO. 6144B**

# CROSS-SECTIONS

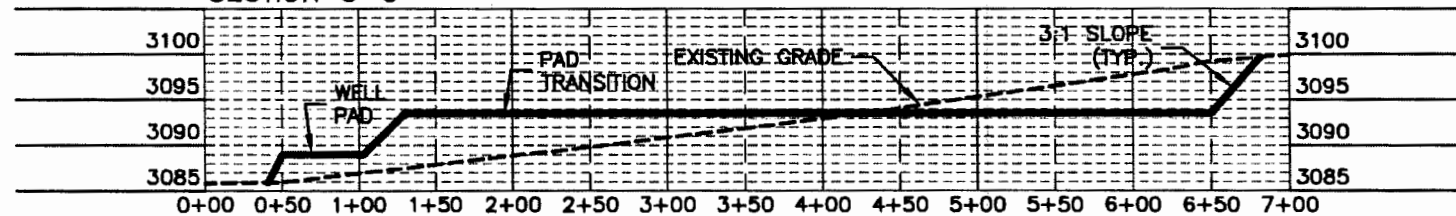
SECTION A-A'



SECTION B-B'



SECTION C-C'



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

NOVO OIL AND GAS NORTHERN DELAWARE, LLC  
PAD GRADING AND CROSS SECTIONS  
FOR RANA SALADA FED COM 0605 231H  
SECTION 1, TOWNSHIP 23 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

| CUT          | FILL         | NET               |
|--------------|--------------|-------------------|
| 46251 CU. YD | 41381 CU. YD | 4871 CU. YD (CUT) |

EARTHWORK QUANTITIES ARE ESTIMATED

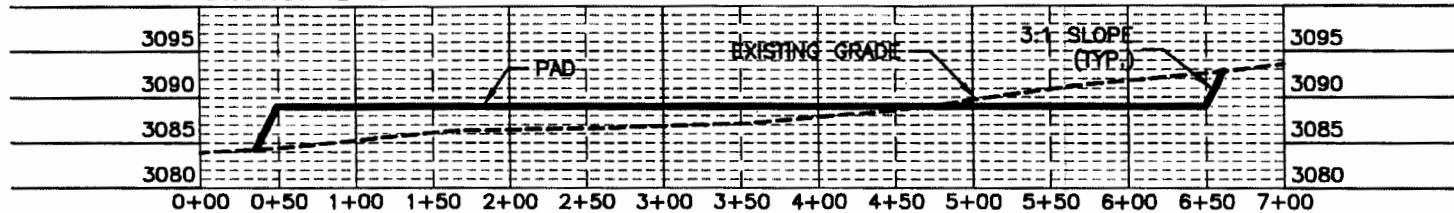
MAP 13

JUNE 26, 2018  
MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO  
(575) 234-3341

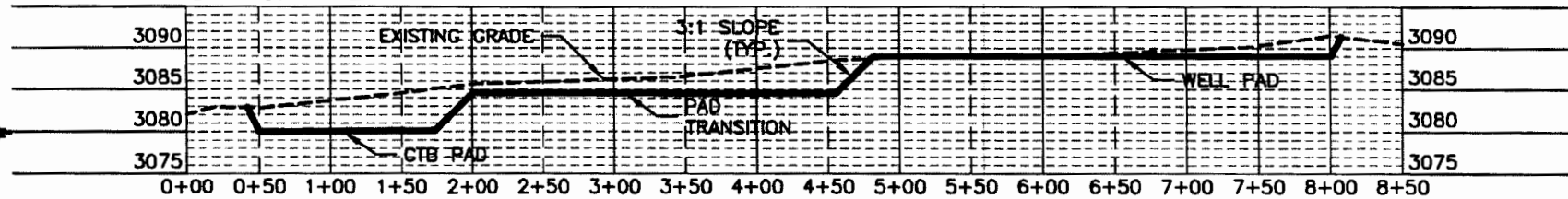
SURVEY NO. 6144B

# CROSS-SECTIONS

SECTION D-D'



SECTION E-E'



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SCALE 1" = 120' - 1" = 20' VER

NOVO OIL AND GAS NORTHERN DELAWARE, LLC  
PAD GRADING AND CROSS SECTIONS  
FOR RANA SALADA FED COM 0605 231H  
SECTION 1, TOWNSHIP 23 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

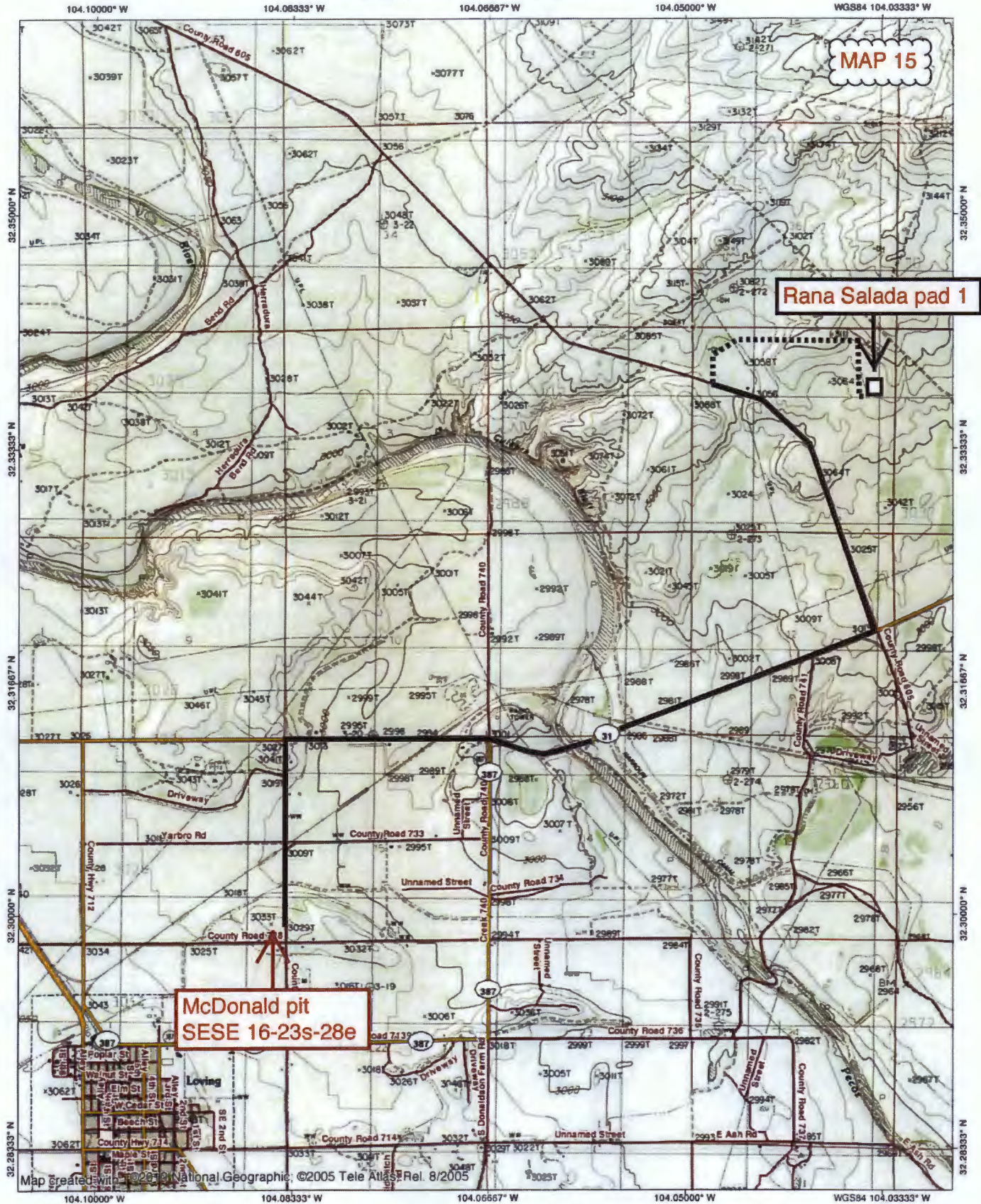
| CUT          | FILL         | NET               |
|--------------|--------------|-------------------|
| 46251 CU. YD | 41381 CU. YD | 4871 CU. YD (CUT) |

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 14

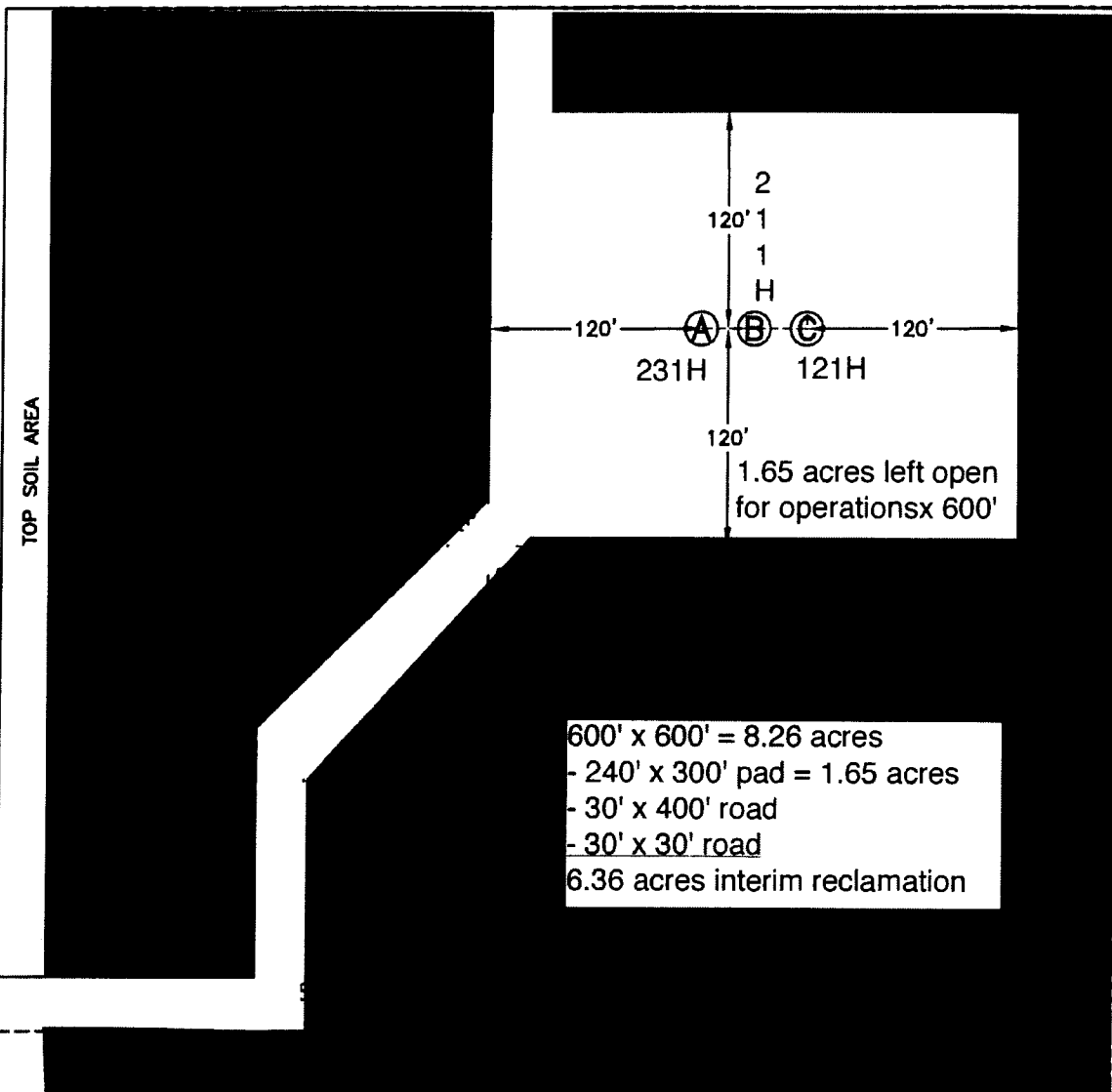
JUNE 26, 2018  
MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO  
(375) 234-3341

SURVEY NO. 6144B



SECTION 1, TOWNSHIP 23 SOUTH, RANGE 28 EAST, N.M.P.M.  
 EDDY COUNTY, STATE OF NEW MEXICO  
 INTERIM SITE BUILD PLAN

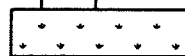
MAP 16



600' x 600' = 8.26 acres  
 - 240' x 300' pad = 1.65 acres  
 - 30' x 400' road  
 - 30' x 30' road  
 6.36 acres interim reclamation



DENOTES INTERIM PAD  
 RECLAMATION AREA



DENOTES GRADING SITE  
 RECLAMATION AREA

0 10 50 100 200  
 SCALE 1" = 100'

NOVO OIL AND GAS NORTHERN DELAWARE, LLC  
**RANA SALADA FED COM 0605 231H**  
 LOCATED 1127 FT. FROM THE NORTH LINE  
 AND 395 FT. FROM THE EAST LINE OF  
 SECTION 1, TOWNSHIP 23 SOUTH,  
 RANGE 28 EAST, N.M.P.M.  
 EDDY COUNTY, STATE OF NEW MEXICO

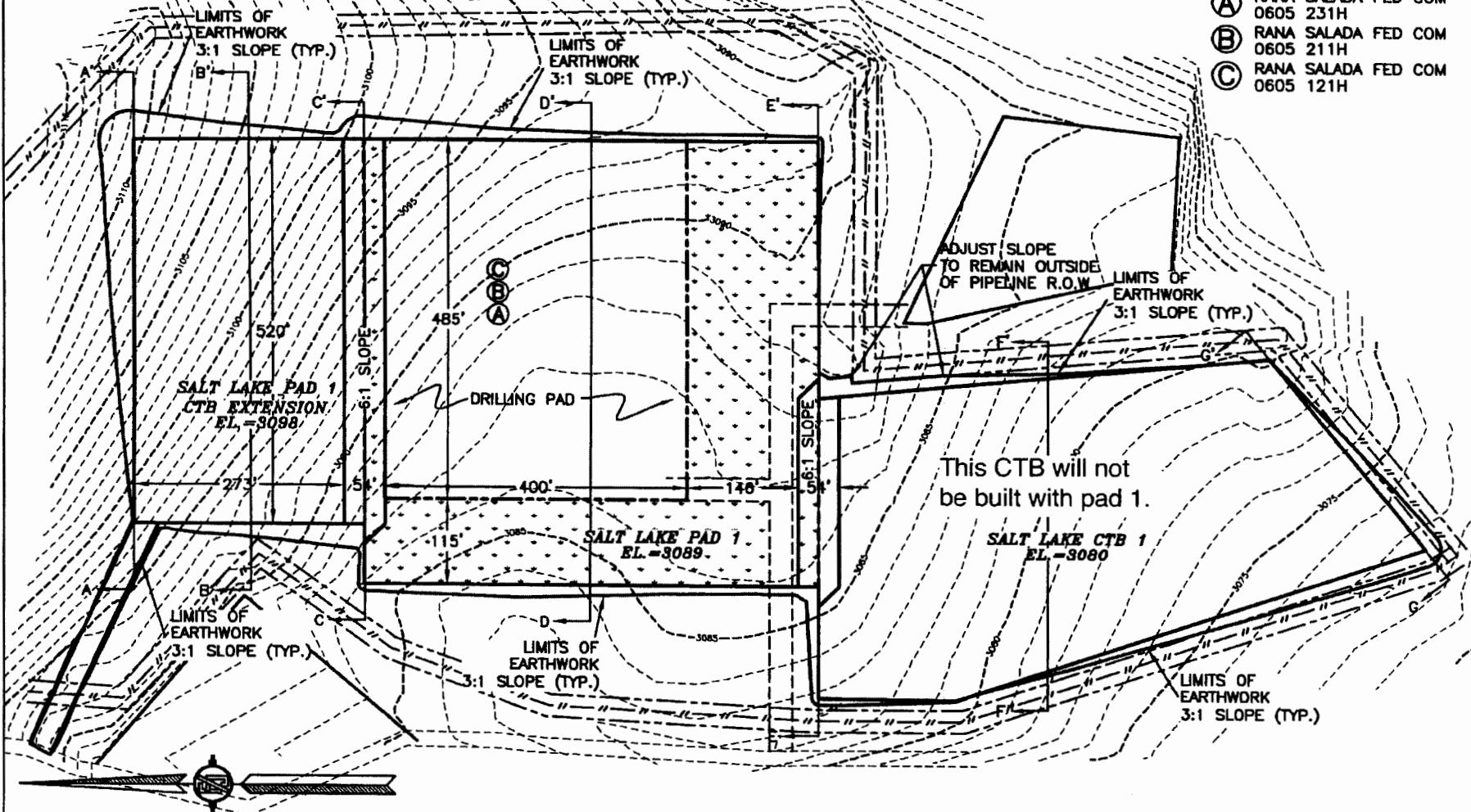
JUNE 26, 2018

SURVEY NO. 6144B

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

# PLAN VIEW

- Ⓐ RANA SALADA FED COM 0605 231H
- Ⓑ RANA SALADA FED COM 0605 211H
- Ⓒ RANA SALADA FED COM 0605 121H



0 20 100 200 400  
SCALE 1" = 200'

**NOVO OIL AND GAS NORTHERN DELAWARE, LLC  
PAD GRADING AND CROSS SECTIONS  
FOR RANA SALADA FED COM 0605 231H  
SECTION 1, TOWNSHIP 23 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO**

| CUT          | FILL         | NET               |
|--------------|--------------|-------------------|
| 46251 CU. YD | 41381 CU. YD | 4871 CU. YD (CUT) |

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 17

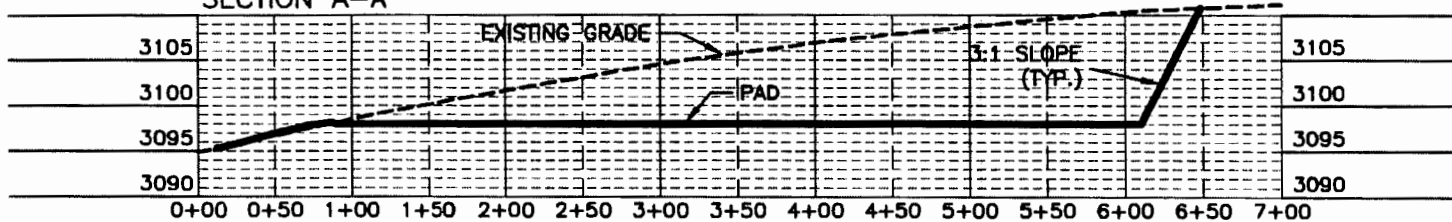
**MADRON SURVEYING, INC.** 301 SOUTH CANAL CARLSBAD, NEW MEXICO  
(575) 234-3341

JUNE 26, 2018

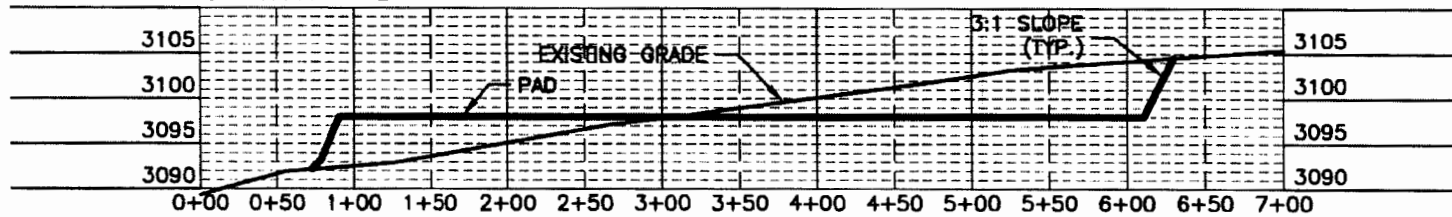
SURVEY NO. 6144B

# CROSS-SECTIONS

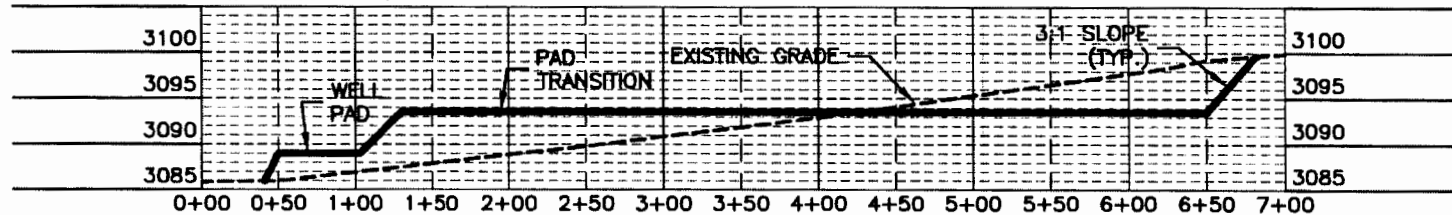
SECTION A-A'



SECTION B-B'



SECTION C-C'



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SCALE 1" = 120' - 1" = 20' VER

NOVO OIL AND GAS NORTHERN DELAWARE, LLC  
PAD GRADING AND CROSS SECTIONS  
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SECTION 1, TOWNSHIP 23 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

| CUT          | FILL         | NET               |
|--------------|--------------|-------------------|
| 46251 CU. YD | 41381 CU. YD | 4871 CU. YD (CUT) |

EARTHWORK QUANTITIES ARE ESTIMATED

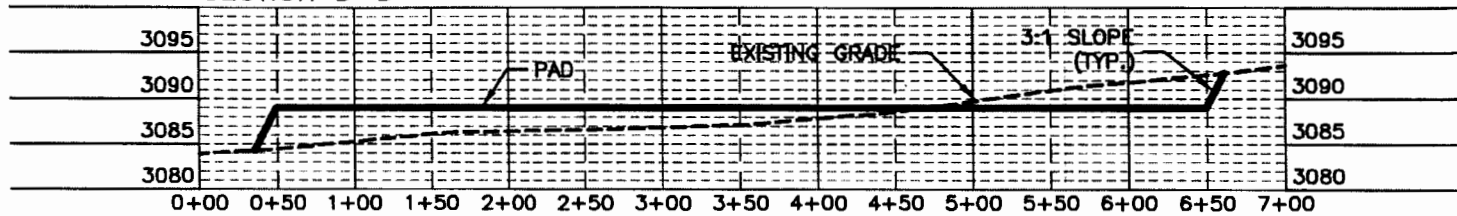
MAP 18

JUNE 26, 2018  
MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO  
(575) 234-3341

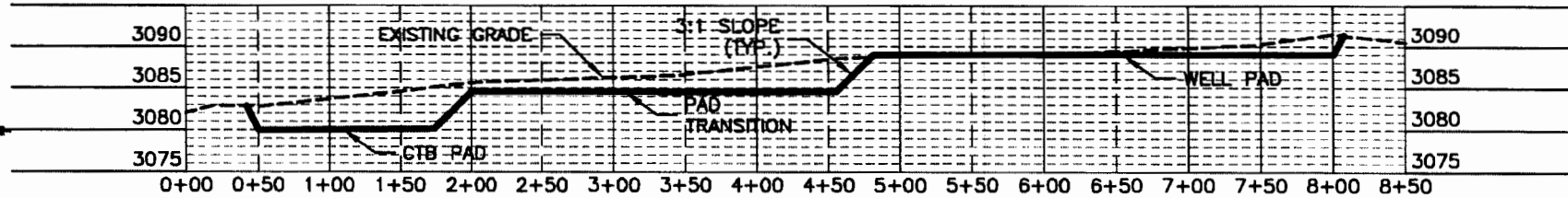
SURVEY NO. 6144B

# CROSS-SECTIONS

SECTION D-D'



SECTION E-E'



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

NOVO OIL AND GAS NORTHERN DELAWARE, LLC  
PAD GRADING AND CROSS SECTIONS  
FOR RANA SALADA FED COM 0605 231H  
SECTION 1, TOWNSHIP 23 SOUTH,  
RANGE 28 EAST, N.M.P.M.  
EDDY COUNTY, STATE OF NEW MEXICO

| CUT          | FILL         | NET               |
|--------------|--------------|-------------------|
| 46251 CU. YD | 41381 CU. YD | 4871 CU. YD (CUT) |

EARTHWORK QUANTITIES ARE ESTIMATED

MAP 19

JUNE 26, 2018  
MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SURVEY NO. 6144B