

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
NMNM61349

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.
RANA SALADA FED COM 0504 214H9. API Well No.
30-015-46087-00-X110. Field and Pool or Exploratory Area
PURPLE SAGE-WOLFCAMP (GAS)11. County or Parish, State
EDDY COUNTY, NM**SUBMIT IN TRIPLICATE - Other instructions on page 2**1. Type of Well
☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator
NOVO OIL AND GAS NORTHERN DELA
Contact: KURT SHIPLEY
Email: kshipley@novooil.com3a. Address
1001 WEST WILSHIRE BOULEVARD SUITE 206
OKLAHOMA CITY, OK 731163b. Phone No. (include area code)
Ph: 405-286-39164. Location of Well (Footage, Sec., T., R., M., or Survey Description)
Sec 6 T23S R29E SESE 1242FSL 639FEL
32.330433 N Lat, 104.017670 W Lon**12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA**

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original APD
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomple horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Request to move Surface Hole LocationFrom:
1242 feet FSL & 639 feet FEL, Section 6, T23S, R29E, SESETo:
1444 feet FSL & 587 feet FEL Section 6, T23S, R29E, NESE
Moved on the same pad site and there will be no new surface disturbance. ✓**Request to move Bottom Hole Location** ✓

From:

RECEIVED**MAR 20 2020****EMNRD-OCDARTESIA**

14. I hereby certify that the foregoing is true and correct.

**Electronic Submission #504954 verified by the BLM Well Information System
For NOVO OIL AND GAS NORTHERN DELA, sent to the Carlsbad
Committed to AFMS for processing by JUANA MEDRANO on 02/28/2020 (20JM0051SE)**

Name (Printed/Typed) BRIAN WOOD

Title CONSULTANT

Signature (Electronic Submission)

Date 02/28/2020

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By JEROMY PORTER

Title PETROLEUM ENGINEER

Date 03/13/2020

Conditions of approval, if any, are attached. Approval of this notice 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.

Office Carlsbad

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.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

RW3-2620

Additional data for EC transaction #504954 that would not fit on the form

32. Additional remarks, continued

330 feet FSL & 330 feet FEL, Section 4, T23S, R29E, SESE

To:

890 feet FSL & 130 feet FEL Section 4, T23S, R29E, SESE

Request to change Producing Formation from Wolfcamp XY Carbonate to Wolfcamp B

See attached for detailed changes from 3-string to 4-string, casing and cementing specs, and mud program. There has been no change to the surface casing.

Revisions to Operator-Submitted EC Data for Sundry Notice #504954

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	NMNM61349	NMNM61349
Agreement:		
Operator:	NOVO OIL & GAS N DELAWARE LLC 1001 W. WILSHIRE BLVD. SUITE 206 OKLAHOMA CITY, OK 73116 Ph: 405-285-3916	NOVO OIL AND GAS NORTHERN DELA 1001 WEST WILSHIRE BOULEVARD SUITE 206 OKLAHOMA CITY, OK 73116 Ph: 4054040414
Admin Contact:	KURT SHIPLEY VP-OPERATIONS E-Mail: kshipley@novoog.com Cell: 405-404-0414 Ph: 405-286-3916	KURT SHIPLEY VP-OPERATIONS E-Mail: kshipley@novoog.com Cell: 405-404-0414 Ph: 405-286-3916
Tech Contact:	BRIAN WOOD CONSULTANT E-Mail: brian@permitswest.com Ph: 505-466-8120	BRIAN WOOD CONSULTANT E-Mail: brian@permitswest.com Ph: 505-466-8120
Location:		
State:	NM	NM
County:	EDDY COUNTY	EDDY
Field/Pool:	PURPLE SAGE WOLFCAMP	PURPLE SAGE-WOLFCAMP (GAS)
Well/Facility:	RANA SALADA FED COM 0504 214H Sec 6 T23S R29E Mer NMP SESE 1242FSL 639FEL	RANA SALADA FED COM 0504 214H Sec 6 T23S R29E SESE 1242FSL 639FEL 32.330433 N Lat, 104.017670 W Lon

CHANGE TO PLANS

Move Surface Hole Location

From: 1242' FSL & 639' FEL, Section 6, T-23-S, R-29-E, SESE

To: 1444' FSL & 587' FEL Section 6, T-23-S, R-29-E., SESE

Moved on the same pad site and there will be no new surface disturbance.

Move Bottom Hole Location

From: 330' FSL & 330' FEL, Section 4, T-23-S, R-29-E, SESE

To: 890' FSL & 130' FEL Section 4, T-23-S, R-29-E, SESE

Producing Formation

From: Wolfcamp XY carbonate

To: Wolfcamp B

Substitution Casing

9-5/8", 40.0 ppf, J-55, BTC to be set at 2,970' TMD

Design Safety Factors: Collapse 1.63, Burst 2.63, Tension 3.15

7-5/8", 29.7 ppf, L-80HC Anaconda-SP SF to be set at 9,780' TMD

Design Safety Factors: Burst 3.20 SF, Collapse 2.8 SF, Tension 1.60 SF (Casing Specification Sheet is attached)

5-1/2" 23# P-110 EYHC Anaconda SP to be set at 21,217' TMD

Design Safety Factors: Burst 1.25 SF, Collapse 2.8SF, Tension 2.41 SF (Casing Specification Sheet is attached)

Single Stage Cement Job for 9-5/8" Intermediate Casing String (TOC = Surface)

Lead: 481 Sacks; 928 cu. ft.; 20% excess; 1.93 cu.ft./sx; 12.80 ppg; Class C + gel + accelerator + LCM; 700 psi 24 hour compressive strength

Tail: 142 Sacks; 188 cu. ft.; 20% excess; 1.32 cu.ft./sx; 14.80 ppg; Class C; 1200 psi 24 hour compressive strength

Single Stage Cement Job for 7-5/8" Intermediate Casing String (TOC = Surface)

Lead: 392 Sacks; 1,059 cu. ft.; 20% excess; 2.70 cu.ft./sx; 10.50 ppg; Class H + gel + extender + retarder + LCM + beads; 500 psi 24 hour compressive strength

Tail: 96 Sacks; 121 cu. ft.; 20% excess; 1.26 cu.ft./sx; 14.50 ppg; Class H + gel + retarder + LCM; 1200 psi 24 hour compressive strength

Single Stage Cement Job for 5-1/2" Production Casing String (TOC = 9,280')

Tail: 695 Sacks; 1196 cu. Ft.; 20% Excess; 1.72 cu.ft./sx; 13.2 ppg; Class H + Fluid Loss + Retarder + LCM; 1200 psi 24 hour compressive strength

7.625 29.7# L-80 HC Anaconda-SP SF (Special Clearance)

Pipe Body Data

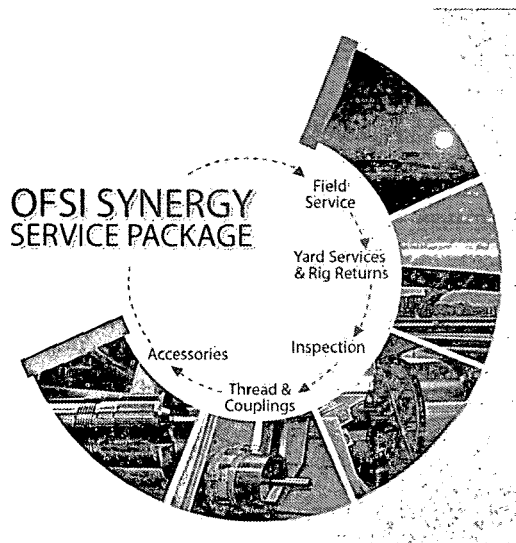
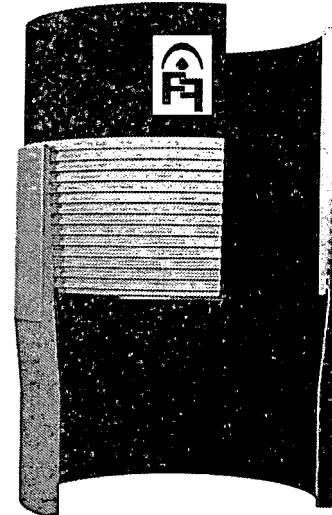
Nominal OD	7.625	Inches
Wall Thickness	0.375	Inches
Weight	29.04	lb/ft
PE Weight	29.7	lb/ft
Nominal ID	6.875	Inches
Drift	6.750	Inches
Minimum Yield Strength	80,000	PSI
Minimum Tensile Strength	95,000	PSI
RBW	87.5%	Rating

Make-Up torques

Yield torque	55,000	FT-LBS.
Max Operating Torque	44,000	FT-LBS.
Max Make-Up	20,000	FT-LBS.
Optimum Make-Up	16,500	FT-LBS.
Minimum Make-Up	13,000	FT-LBS.

Connection Data

Connection OD	7.906	Inches
Connection ID	6.875	Inches
Make-Up loss	4.003	Inches
Tension Efficiency	81.0%	Rating
Compression Efficiency	81.0%	Rating
Yield Strength in Tension	553,000	LBS.
Yield Strength in Compression	553,000	LBS.
MIYP (Burst)	6,890	PSI
Collapse Pressure	5,510	PSI
Uniaxial Bending	39	degrees



Technical Sales Support: Rafael Escamilla Jr., Cell: 281-961-7704, jescamilla@ofsint.com

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5.5 23# P-110 EYHC Anaconda SP

Pipe Body Data

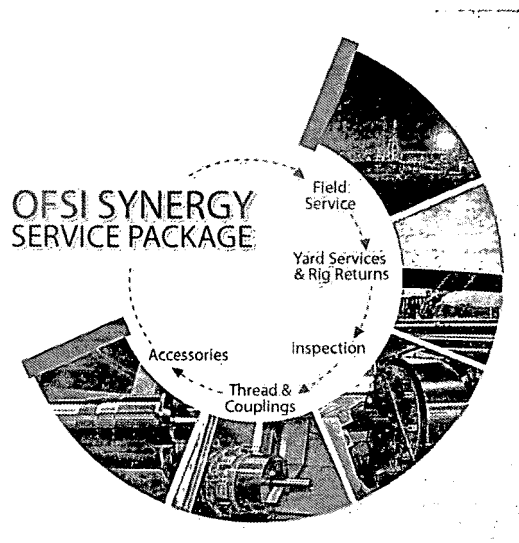
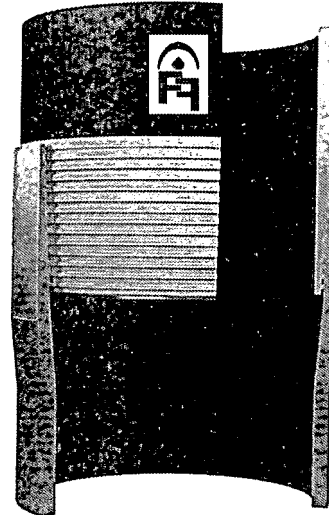
Nominal OD	5.500	Inches
Wall Thickness	0.415	Inches
Weight	23.00	lb/ft
PE Weight	22.56	lb/ft
Nominal ID	4.670	Inches
Drift	4.545	Inches
Minimum Yield Strength	125,000	PSI
Minimum Tensile Strength	130,000	PSI
RBW	87.5%	Rating

Make-Up torques

Yield torque	44,000	FT-LBS.
Max Operating Torque	35,200	FT-LBS.
Max Make-Up	20,000	FT-LBS.
Optimum Make-Up	16,500	FT-LBS.
Minimum Make-Up	13,000	FT-LBS.

Connection Data

Connection OD	5.748	Inches
Connection ID	4.670	Inches
Make-Up loss	4.692	Inches
Tension Efficiency	90%	Rating
Compression Efficiency	90%	Rating
Yield Strength in Tension	746,000	LBS.
Yield Strength in Compression	746,000	LBS.
MIYP (Burst)	16,510	PSI
Collapse Pressure	16,000	PSI
Uniaxial Bending	94	degrees



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NOVO OIL & GAS NORTHERN DELAWARE, LLC

Rana Salada Fed Com 0504 214H
 SHL: 1240' FSL & 709' FEL Section 6, T-23-S, R-29-E
 BHL: 1254' FSL & 130' FEL Section 4, T-23-S, R-29-E
 Eddy County, New Mexico

DRILLING OPERATIONS PLAN SECRETARY POTASH AREA - WOLFCAMP 4-STRING CASING DESIGN

Estimated Drilling Conditions

Target Formation	Wolfcamp B
Target Depth-- TVD (ft)	10,779 ft
Anticipated Bottom-Hole Pressure (psi)	5,768 psi
Anticipated Maximum Surface Pressure (psi)	3,612 psi
Abnormal Pressure (Yes/No)	No
Anticipated Bottom-Hole Temperature (deg F)	165 deg F
H2S Contingency Plan Required (Yes/No)	Yes

Geologic Formations

	GR	KB (25')	
Elevation	3,039	3,064	
Formation Tops	TVDss	TVD - KB	Mineral Resources
Rustler	2,790	274	Water
Salado			Water
Castile			Water
Base of Salt	200	2,864	
Bell Canyon	200	2,864	Oil, Gas, Water
Cherry Canyon	-895	3,959	Oil, Gas, Water
Brushy Canyon	-2,320	5,384	Oil, Gas, Water
Bone Spring Lime	-3,410	6,474	Oil, Gas, Water
1st Bone Spring Sand	-4,495	7,559	Oil, Gas, Water
2nd Bone Spring Carbonate	-4,750	7,814	Oil, Gas, Water
2nd Bone Spring Sand	-5,240	8,304	Oil, Gas, Water
3rd Bone Spring Carbonate	-5,600	8,664	Oil, Gas, Water
3rd Bone Spring Sand	-6,455	9,519	Oil, Gas, Water
Wolfcamp XY	-6,750	9,814	Oil, Gas, Water
Wolfcamp A	-6,905	9,969	Oil, Gas, Water
Wolfcamp B	-7,155	10,219	Oil, Gas, Water
TARGET	-7,715	10,779	
Wolfcamp C	-7,905	10,969	Oil, Gas, Water
Strawn	-8,530	11,594	Water
Atoka			Gas, Water
Morrow			Gas, Water
Mississippian (Chester)			Water

Pressure Control Equipment and Pressure Testing Procedure

A 13-5/8" 5M Blowout Preventer system will be installed on a multi-bowl (speed head) wellhead with a 13-5/8" flanged casing spool. Top flange of casing spool will be set in a cellar below ground level. The blowout preventor system will consist of a single pipe ram on 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 13-3/8" surface casing and will remain installed to total depth of the well. Wellhead, blowout preventer and choke manifold diagrams have been included. The 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. A co-flex line will be used between the BOP system and the choke manifold. A pressure test certification form for the co-flex hose will be available on the location at the time of the BOP testing.

The Surface Casing will be pressure tested to 250 psi low and 1500 psi high. The Salt Protection String will be pressure tested to 250 psi low and 1500 psi high for 30 minutes. The Intermediate Casing will be pressure tested to 250 psi low and 0.22 psi/ft (2,090 psi) high for 30 minutes.

Drilling Fluid Program

Depth Interval (ft)	Hole Size (in.)	Fluid Type	Mud Weight (ppg)	Funnel Viscosity (sec/qt)	API Fluid Loss (ml/30min)	Total Solids (%)
0 - 225	17-1/2	Water Based Spud Mud	8.3	30-60	N/C	2.0-8.0
225 - 2,970	12-1/4	Brine or Cut Brine	9.8-10.2	35-45	N/C	1.0-4.0
2,970 - 9,780	8-3/4	Brine or LSND Water Based Mud	9.8-10.2	35-45	N/C	1.0-4.0
9,780 - 21,217	6-3/4	Oil Based Mud	8.5-12.5	35-65	4-6 cc's	1.0-8.0
Drilling Fluid System		A closed loop drilling system will be used.				

Casing Program

Depth Interval	Length (ft)	Hole Size	Casing Size	Weight (ppf)	Grade	Coupling	Notes
0' - 225'	225	17-1/2"	13-3/8"	54.50	J-55	BTC	
0' - 2,970'	2,970	12-1/4"	9-5/8"	40.00	J-55	BTC	
0' - 9,780'	9,780	8-3/4"	7-5/8"	29.70	L-80 HC	Anaconda-SP SF	Semi-Flush Joint
0' - 21,217'	21,217	6-3/4"	5-1/2"	23.00	P-110 EYHC	Anaconda SP	Semi-Flush Joint

Alternate Production Casing:

0' - 21,217'	21,217	6-3/4"	5-1/2"	23.00	P-110HC	TMK UP Ultra SF	Semi-Flush Joint
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Casing Centralizers

Surface Casing: Centralizers will be run on the bottom 3 joints of casing and then 1 centralizer per joint to surface.

Salt Protection Casing: Centralizers will be run on the bottom 3 joints of casing and then 1 centralizer every 4th joint to surface.

Intermediate Casing: Centralizers will be run on the bottom 3 joints of casing and then 1 centralizer every 4th joint to top of cement.

Casing Performance Properties and Design Criteria

Depth Interval	Collapse (psi)	Burst (psi)	Joint Strength (1000 lbs)	Actual Design Safety Factors			Notes
				Collapse	Burst	Tension	
0' - 225'	1,130	2,740	853	11.60	1.83	7.71	
0' - 2,970'	2,570	3,950	630	1.63	2.63	3.15	
0' - 9,780'	5,510	6,890	553	2.80	3.20	1.60	
0' - 21,217'	16,000	16,510	746	2.80	1.25	2.41	
Design Safety Factors		Design safety factors will meet or exceed as shown.					

Alternate Production Casing:

0' - 21,217'	15,990	14,530	670	2.79	1.25	2.16	
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Surface Casing

Collapse: $DF_C = 1.125$

- 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.
- 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: $DF_B = 1.125$

- 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 percent of the minimum internal yield.

Tensile: $DF_T = 1.60$

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

Salt Protection 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 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 percent of the minimum internal yield.
- b. Gas Kick: Internal burst load of a 50 bbl gas kick at the casing with drillpipe 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 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 percent of the minimum internal yield.
- b. Gas Kick: Internal burst load of a 50 bbl gas kick at the casing with drillpipe in the hole. External force will be 10.2 ppg brine water gradient (0.531 psi/ft) and 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).

Cementing Program**Surface Casing Cement:**

0' - 225'

Top of Cement: Surface

Cement	Amount (sacks)	Slurry Volume (cu. ft.)	Slurry Volume (bbls)	Weight (ppg)	Yield (cu. ft./sx)	Mix Water (gal/sx)	24hr 115deg Strength (psi)	Excess Cement (%)
Lead								
Tail	193	312.6	55.7	13.80	1.62	7.67	1,200	100.0%

Lead:

Tail: Class C Cement with Gel, Accelerator, LCM

Salt Protection Casing Cement:

0' - 2,970'

Top of Cement: Surface

Cement	Amount (sacks)	Slurry Volume (cu. ft.)	Slurry Volume (bbls)	Weight (ppg)	Yield (cu. ft./sx)	Mix Water (gal/sx)	24hr 115deg Strength (psi)	Excess Cement (%)
Lead								
Tail	833	1116.2	198.8	14.80	1.34	6.33	900	20.0%

Lead:

Tail: Class C Cement with Gel, Retarder, LCM

Intermediate Casing Cement:

Stage Tool Set at: 2,770'

Stage 1

2,770' - 9,780'

Top of Cement: 2,770'

Cement	Amount (sacks)	Slurry Volume (cu. ft.)	Slurry Volume (bbls)	Weight (ppg)	Yield (cu. ft./sx)	Mix Water (gal/sx)	24hr 115deg Strength (psi)	Excess Cement (%)
Lead	253	577.4	102.8	11.90	2.28	12.69	900	20.0%
Tail	200	268.0	47.7	14.80	1.34	6.33	1,200	20.0%

Lead: Class C or H Cement with Gel, Extender, LCM

Tail: Class C or H Cement with Fluid Loss, Retarder, LCM

Stage 2

0' - 2,770'

Top of Cement: Surface

Cement	Amount (sacks)	Slurry Volume (cu. ft.)	Slurry Volume (bbls)	Weight (ppg)	Yield (cu. ft./sx)	Mix Water (gal/sx)	24hr 115deg Strength (psi)	Excess Cement (%)
Lead								
Tail	147	334.1	59.5	11.90	2.28	12.69	900	20.0%

Lead:

Tail: Class C or H Cement with Gel, Extender, LCM

Production Casing Cement:

0' - 21,217'

Top of Cement: 9,280'

Cement	Amount (sacks)	Slurry Volume (cu. ft.)	Slurry Volume (bbls)	Weight (ppg)	Yield (cu. ft./sx)	Mix Water (gal/sx)	24hr 115deg Strength (psi)	Excess Cement (%)
Lead								
Tail	695	1196.1	213.0	13.20	1.72	9.44	1,200	20.0%

Lead:

Tail: Class H Cement with Fluid Loss, Retarder, LCM

Logging, Testing & Coring Program

A 2 person mud logging program will be used from 3,000 ft to Total Depth

A gamma ray log will be acquired by directional drilling Measure While Drilling tools from the intermediate casing to Total Depth.



Company: Novo Oil & Gas, LLC
Well: Rana Salada Fed Com 0504 214H
County: Eddy County, New Mexico (NAD 83)
Rig: 25' RKB
Wellbore: Wellbore #1
Design: Design #1
Created By: AAT
Date: 14:33, January 30 2020

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

To convert a Magnetic Direction to a Grid Direction, Add 6.831°
To convert a Magnetic Direction to a True Direction, Add 7.000° East
To convert a True Direction to a Grid Direction, Subtract 0.169°



Azimuths to Grid North
True North: -0.17°
Magnetic North: 6.83°

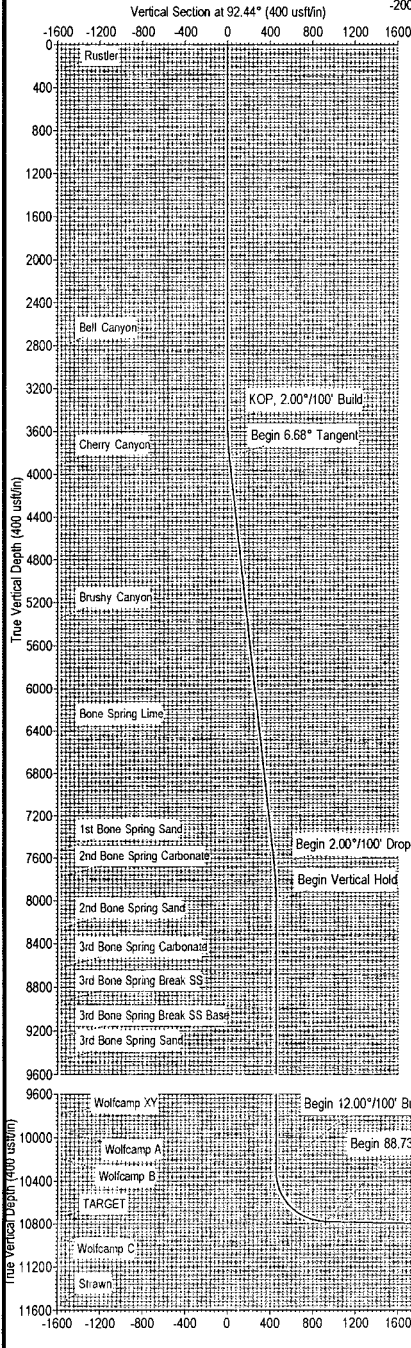
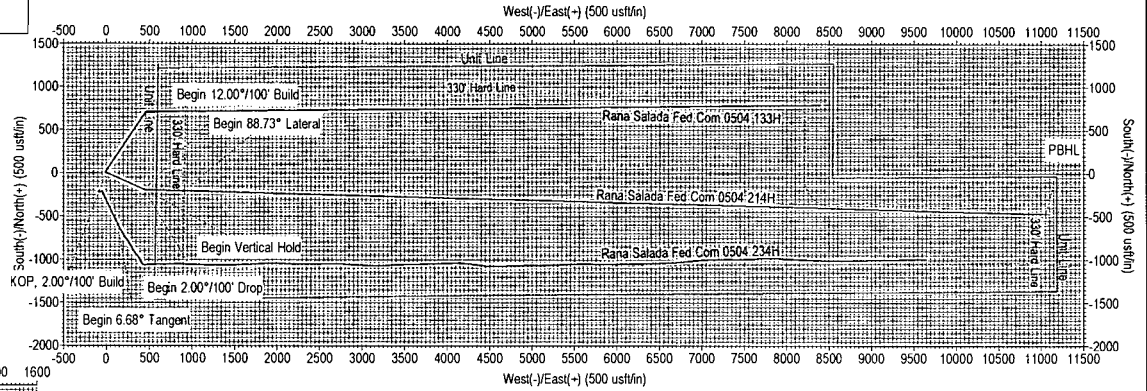
Magnetic Field
Strength: 47851.3nT
Dip Angle: 60.05°
Date: 3/1/2020
Model: HDGM2020

WELL DETAILS: Rana Salada Fed Com 0504 214H

	+N/-S	+E/-W	GL @ 3040.90	WELL @ 3065.90ust (25' RKB)	Longitude
	0.00	0.00	Northings	Eastings	
			484287.32	638890.68	32.330982
					-104.017494

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northings	Eastings	Latitude	Longitude
PBHL	11004.00	-471.99	11055.53	483815.33	649946.21	32.329590	-103.981706
FTP	10779.00	-207.10	913.74	484080.22	639804.42	32.330406	-104.014538

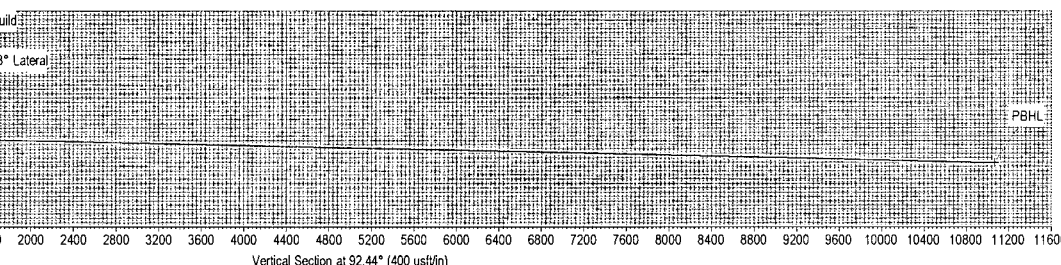
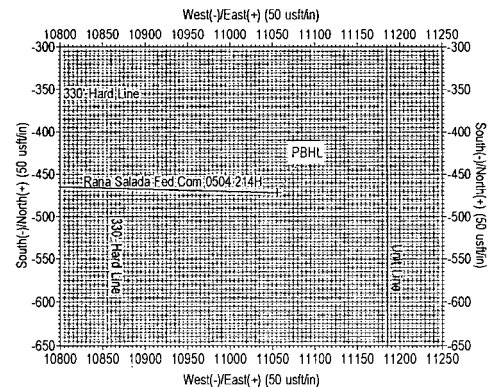
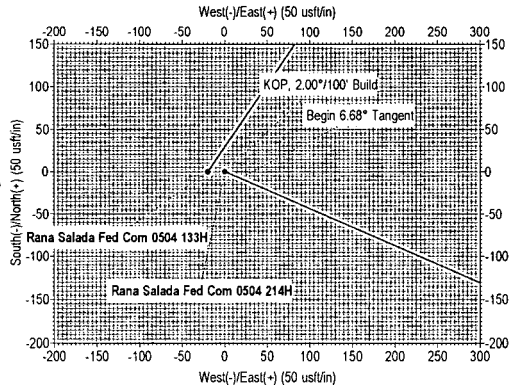


SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSecl	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3500.00	0.00	0.00	3500.00	0.00	0.00	0.00	0.00	0.00	KOP, 2.00°/100' Build
3833.85	6.68	113.56	3833.09	-7.77	17.81	2.00	113.559	18.13	Begin 6.68° Tangent
7693.84	6.68	113.56	7666.91	-187.15	429.21	0.00	0.000	436.80	Begin 2.00°/100' Drop
8027.69	0.00	0.00	8000.00	-194.92	447.02	2.00	180.000	454.93	Begin Vertical Hold
10329.43	0.00	0.00	10301.74	-194.92	447.02	0.00	0.000	454.93	Begin 12.00°/100' Build
11068.85	88.73	91.50	10779.09	-207.11	913.74	12.00	91.496	921.75	Begin 88.73° Lateral
21216.58	88.73	91.50	11004.00	-471.99	11055.53	0.00	0.000	11065.60	PBHL

SURVEY PROGRAM

Depth From	Depth To	Survey/Plan	Tool
0.00	21216.49	Design #1 (Wellbore #1)	MWD+HRGM





Novo Oil & Gas, LLC

Eddy County, New Mexico (NAD 83)

Rana Salada Fed Com 0504

Rana Salada Fed Com 0504 214H

Wellbore #1

Plan: Design #1

Standard Planning Report

30 January, 2020





MS Directional
Planning Report



Database:	EDM 5000.15 Conroe Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Company:	Novo Oil & Gas, LLC	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site:	Rana Salada Fed Com 0504	North Reference:	Grid
Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Eddy County, New Mexico (NAD 83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Rana Salada Fed Com 0504		
Site Position:		Northing:	484,287.33 usft
From:	Map	Easting:	638,890.68 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.330983
		Longitude:	-104.017495
		Grid Convergence:	0.169 °

Well	Rana Salada Fed Com 0504 214H		
Well Position	+N/-S	-0.01 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	
		Latitude:	32.330983
		Longitude:	-104.017495
		Ground Level:	3,040.90 usft

Wellbore	Wellbore #1		
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2020	3/1/2020	7.000	60.050	47,851.30

Design	Design #1		
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Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	92.44

Plan Survey Tool Program	Date	1/22/2020		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	21,216.49	Design #1 (Wellbore #1)	MWD+HRGM
				OWSG MWD + HRGM

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.000	
3,833.85	6.68	113.56	3,833.09	-7.77	17.81	2.00	2.00	0.00	113.559	
7,693.84	6.68	113.56	7,666.91	-187.15	429.21	0.00	0.00	0.00	0.000	
8,027.69	0.00	0.00	8,000.00	-194.92	447.02	2.00	-2.00	0.00	180.000	
10,329.43	0.00	0.00	10,301.74	-194.92	447.02	0.00	0.00	0.00	0.000	
11,068.85	88.73	91.50	10,779.09	-207.11	913.74	12.00	12.00	0.00	91.496	
21,216.59	88.73	91.50	11,004.00	-471.99	11,055.53	0.00	0.00	0.00	0.000	PBHL - Rana Salad



MS Directional
Planning Report



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Company:	Novo Oil & Gas, LLC	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site:	Rana Salada Fed Com 0504	North Reference:	Grid
Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
274.70	0.00	0.00	274.70	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,864.70	0.00	0.00	2,864.70	0.00	0.00	0.00	0.00	0.00	0.00
Base of Salt - Bell Canyon									
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 2.00°/100' Build									
3,600.00	2.00	113.56	3,599.98	-0.70	1.60	1.63	2.00	2.00	0.00
3,700.00	4.00	113.56	3,699.84	-2.79	6.40	6.51	2.00	2.00	0.00
3,800.00	6.00	113.56	3,799.45	-6.27	14.39	14.64	2.00	2.00	0.00
3,833.85	6.68	113.56	3,833.09	-7.77	17.81	18.13	2.00	2.00	0.00
Begin 6.68° Tangent									
3,900.00	6.68	113.56	3,898.80	-10.84	24.86	25.30	0.00	0.00	0.00
3,962.03	6.68	113.56	3,960.41	-13.72	31.47	32.03	0.00	0.00	0.00
Cherry Canyon									
4,000.00	6.68	113.56	3,998.12	-15.49	35.52	36.15	0.00	0.00	0.00
4,100.00	6.68	113.56	4,097.44	-20.14	46.18	46.99	0.00	0.00	0.00
4,200.00	6.68	113.56	4,196.76	-24.78	56.84	57.84	0.00	0.00	0.00
4,300.00	6.68	113.56	4,296.08	-29.43	67.49	68.69	0.00	0.00	0.00



MS Directional Planning Report



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Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site:	Rana Salada Fed Com 0504	North Reference:	Grid
Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
4,400.00	6.68	113.56	4,395.41	-34.08	78.15	79.53	0.00	0.00	0.00	
4,500.00	6.68	113.56	4,494.73	-38.72	88.81	90.38	0.00	0.00	0.00	
4,600.00	6.68	113.56	4,594.05	-43.37	99.47	101.23	0.00	0.00	0.00	
4,700.00	6.68	113.56	4,693.37	-48.02	110.13	112.07	0.00	0.00	0.00	
4,800.00	6.68	113.56	4,792.69	-52.67	120.78	122.92	0.00	0.00	0.00	
4,900.00	6.68	113.56	4,892.01	-57.31	131.44	133.77	0.00	0.00	0.00	
5,000.00	6.68	113.56	4,991.34	-61.96	142.10	144.61	0.00	0.00	0.00	
5,100.00	6.68	113.56	5,090.66	-66.61	152.76	155.46	0.00	0.00	0.00	
5,200.00	6.68	113.56	5,189.98	-71.26	163.42	166.31	0.00	0.00	0.00	
5,300.00	6.68	113.56	5,289.30	-75.90	174.07	177.15	0.00	0.00	0.00	
5,400.00	6.68	113.56	5,388.62	-80.55	184.73	188.00	0.00	0.00	0.00	
5,400.22	6.68	113.56	5,388.84	-80.56	184.75	188.02	0.00	0.00	0.00	
Brushy Canyon										
5,500.00	6.68	113.56	5,487.94	-85.20	195.39	198.85	0.00	0.00	0.00	
5,600.00	6.68	113.56	5,587.27	-89.85	206.05	209.69	0.00	0.00	0.00	
5,700.00	6.68	113.56	5,686.59	-94.49	216.71	220.54	0.00	0.00	0.00	
5,800.00	6.68	113.56	5,785.91	-99.14	227.36	231.39	0.00	0.00	0.00	
5,900.00	6.68	113.56	5,885.23	-103.79	238.02	242.23	0.00	0.00	0.00	
6,000.00	6.68	113.56	5,984.55	-108.43	248.68	253.08	0.00	0.00	0.00	
6,100.00	6.68	113.56	6,083.87	-113.08	259.34	263.92	0.00	0.00	0.00	
6,200.00	6.68	113.56	6,183.20	-117.73	270.00	274.77	0.00	0.00	0.00	
6,300.00	6.68	113.56	6,282.52	-122.38	280.65	285.62	0.00	0.00	0.00	
6,400.00	6.68	113.56	6,381.84	-127.02	291.31	296.46	0.00	0.00	0.00	
6,500.00	6.68	113.56	6,481.16	-131.67	301.97	307.31	0.00	0.00	0.00	
6,500.31	6.68	113.56	6,481.47	-131.69	302.00	307.34	0.00	0.00	0.00	
Bone Spring Lime										
6,600.00	6.68	113.56	6,580.48	-136.32	312.63	318.16	0.00	0.00	0.00	
6,700.00	6.68	113.56	6,679.81	-140.97	323.29	329.00	0.00	0.00	0.00	
6,800.00	6.68	113.56	6,779.13	-145.61	333.94	339.85	0.00	0.00	0.00	
6,900.00	6.68	113.56	6,878.45	-150.26	344.60	350.70	0.00	0.00	0.00	
7,000.00	6.68	113.56	6,977.77	-154.91	355.26	361.54	0.00	0.00	0.00	
7,100.00	6.68	113.56	7,077.09	-159.56	365.92	372.39	0.00	0.00	0.00	
7,200.00	6.68	113.56	7,176.41	-164.20	376.58	383.24	0.00	0.00	0.00	
7,300.00	6.68	113.56	7,275.74	-168.85	387.23	394.08	0.00	0.00	0.00	
7,400.00	6.68	113.56	7,375.06	-173.50	397.89	404.93	0.00	0.00	0.00	
7,500.00	6.68	113.56	7,474.38	-178.15	408.55	415.78	0.00	0.00	0.00	
7,595.35	6.68	113.56	7,569.09	-182.58	418.71	426.12	0.00	0.00	0.00	
1st Bone Spring Sand										
7,600.00	6.68	113.56	7,573.70	-182.79	419.21	426.62	0.00	0.00	0.00	
7,693.84	6.68	113.56	7,666.91	-187.15	429.21	436.80	0.00	0.00	0.00	
Begin 2.00°/100' Drop										
7,700.00	6.55	113.56	7,673.02	-187.44	429.86	437.46	2.00	-2.00	0.00	
7,800.00	4.55	113.56	7,772.55	-191.31	438.73	446.49	2.00	-2.00	0.00	
7,852.19	3.51	113.56	7,824.61	-192.77	442.09	449.91	2.00	-2.00	0.00	
2nd Bone Spring Carbonate										
7,900.00	2.55	113.56	7,872.35	-193.78	444.41	452.27	2.00	-2.00	0.00	
8,000.00	0.55	113.56	7,972.31	-194.87	446.90	454.80	2.00	-2.00	0.00	
8,027.69	0.00	0.00	8,000.00	-194.92	447.02	454.93	2.00	-2.00	-410.10	
Begin Vertical Hold										
8,100.00	0.00	0.00	8,072.31	-194.92	447.02	454.93	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,172.31	-194.92	447.02	454.93	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,272.31	-194.92	447.02	454.93	0.00	0.00	0.00	
8,342.41	0.00	0.00	8,314.72	-194.92	447.02	454.93	0.00	0.00	0.00	



MS Directional
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Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
2nd Bone Spring Sand									
8,400.00	0.00	0.00	8,372.31	-194.92	447.02	454.93	0.00	0.00	0.00
8,500.00	0.00	0.00	8,472.31	-194.92	447.02	454.93	0.00	0.00	0.00
8,600.00	0.00	0.00	8,572.31	-194.92	447.02	454.93	0.00	0.00	0.00
8,700.00	0.00	0.00	8,672.31	-194.92	447.02	454.93	0.00	0.00	0.00
8,702.41	0.00	0.00	8,674.72	-194.92	447.02	454.93	0.00	0.00	0.00
3rd Bone Spring Carbonate									
8,800.00	0.00	0.00	8,772.31	-194.92	447.02	454.93	0.00	0.00	0.00
8,900.00	0.00	0.00	8,872.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,000.00	0.00	0.00	8,972.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,017.41	0.00	0.00	8,989.72	-194.92	447.02	454.93	0.00	0.00	0.00
3rd Bone Spring Break SS									
9,100.00	0.00	0.00	9,072.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,200.00	0.00	0.00	9,172.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,300.00	0.00	0.00	9,272.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,332.41	0.00	0.00	9,304.72	-194.92	447.02	454.93	0.00	0.00	0.00
3rd Bone Spring Break SS Base									
9,400.00	0.00	0.00	9,372.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,500.00	0.00	0.00	9,472.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,557.41	0.00	0.00	9,529.72	-194.92	447.02	454.93	0.00	0.00	0.00
3rd Bone Spring Sand									
9,600.00	0.00	0.00	9,572.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,700.00	0.00	0.00	9,672.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,800.00	0.00	0.00	9,772.31	-194.92	447.02	454.93	0.00	0.00	0.00
9,852.41	0.00	0.00	9,824.72	-194.92	447.02	454.93	0.00	0.00	0.00
Wolfcamp XY									
9,900.00	0.00	0.00	9,872.31	-194.92	447.02	454.93	0.00	0.00	0.00
10,000.00	0.00	0.00	9,972.31	-194.92	447.02	454.93	0.00	0.00	0.00
10,007.41	0.00	0.00	9,979.72	-194.92	447.02	454.93	0.00	0.00	0.00
Wolfcamp A									
10,100.00	0.00	0.00	10,072.31	-194.92	447.02	454.93	0.00	0.00	0.00
10,200.00	0.00	0.00	10,172.31	-194.92	447.02	454.93	0.00	0.00	0.00
10,257.41	0.00	0.00	10,229.72	-194.92	447.02	454.93	0.00	0.00	0.00
Wolfcamp B									
10,300.00	0.00	0.00	10,272.31	-194.92	447.02	454.93	0.00	0.00	0.00
10,329.43	0.00	0.00	10,301.74	-194.92	447.02	454.93	0.00	0.00	0.00
Begin 12.00°/100' Build									
10,350.00	2.47	91.50	10,322.30	-194.93	447.46	455.37	12.00	12.00	0.00
10,375.00	5.47	91.50	10,347.24	-194.98	449.19	457.10	12.00	12.00	0.00
10,400.00	8.47	91.50	10,372.05	-195.06	452.22	460.13	12.00	12.00	0.00
10,425.00	11.47	91.50	10,396.67	-195.17	456.55	464.46	12.00	12.00	0.00
10,450.00	14.47	91.50	10,421.03	-195.32	462.16	470.07	12.00	12.00	0.00
10,475.00	17.47	91.50	10,445.06	-195.49	469.03	476.94	12.00	12.00	0.00
10,500.00	20.47	91.50	10,468.70	-195.71	477.15	485.07	12.00	12.00	0.00
10,525.00	23.47	91.50	10,491.89	-195.95	486.50	494.42	12.00	12.00	0.00
10,550.00	26.47	91.50	10,514.55	-196.23	497.05	504.97	12.00	12.00	0.00
10,575.00	29.47	91.50	10,536.63	-196.53	508.77	516.69	12.00	12.00	0.00
10,600.00	32.47	91.50	10,558.06	-196.87	521.63	529.55	12.00	12.00	0.00
10,625.00	35.47	91.50	10,578.79	-197.23	535.59	543.52	12.00	12.00	0.00
10,650.00	38.47	91.50	10,598.76	-197.63	550.62	558.55	12.00	12.00	0.00
10,675.00	41.47	91.50	10,617.92	-198.05	566.67	574.60	12.00	12.00	0.00
10,700.00	44.47	91.50	10,636.21	-198.49	583.70	591.64	12.00	12.00	0.00
10,725.00	47.47	91.50	10,653.59	-198.96	601.67	609.61	12.00	12.00	0.00



MS Directional Planning Report



Database:	EDM 5000.15 Conroe Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Company:	Novo Oil & Gas, LLC	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site:	Rana Salada Fed Com 0504	North Reference:	Grid
Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,750.00	50.47	91.50	10,670.00	-199.45	620.52	628.46	12.00	12.00	0.00
10,775.00	53.47	91.50	10,685.40	-199.97	640.20	648.15	12.00	12.00	0.00
10,800.00	56.47	91.50	10,699.75	-200.50	660.66	668.61	12.00	12.00	0.00
10,825.00	59.47	91.50	10,713.00	-201.05	681.85	689.80	12.00	12.00	0.00
10,850.00	62.47	91.50	10,725.13	-201.62	703.69	711.65	12.00	12.00	0.00
10,875.00	65.47	91.50	10,736.10	-202.21	726.15	734.11	12.00	12.00	0.00
10,900.00	68.47	91.50	10,745.88	-202.81	749.15	757.11	12.00	12.00	0.00
10,925.00	71.47	91.50	10,754.45	-203.42	772.62	780.60	12.00	12.00	0.00
10,950.00	74.47	91.50	10,761.77	-204.05	796.51	804.49	12.00	12.00	0.00
10,975.00	77.47	91.50	10,767.83	-204.68	820.76	828.74	12.00	12.00	0.00
11,000.00	80.47	91.50	10,772.61	-205.32	845.28	853.27	12.00	12.00	0.00
11,025.00	83.47	91.50	10,776.11	-205.97	870.03	878.02	12.00	12.00	0.00
11,050.00	86.47	91.50	10,778.30	-206.62	894.92	902.92	12.00	12.00	0.00
11,068.85	88.73	91.50	10,779.09	-207.11	913.74	921.75	12.00	12.00	0.00
Begin 88.73° Lateral									
11,100.00	88.73	91.50	10,779.78	-207.92	944.88	952.89	0.00	0.00	0.00
11,200.00	88.73	91.50	10,781.99	-210.53	1,044.82	1,052.85	0.00	0.00	0.00
11,300.00	88.73	91.50	10,784.21	-213.14	1,144.76	1,152.81	0.00	0.00	0.00
11,400.00	88.73	91.50	10,786.43	-215.75	1,244.70	1,252.77	0.00	0.00	0.00
11,500.00	88.73	91.50	10,788.64	-218.36	1,344.64	1,352.73	0.00	0.00	0.00
11,600.00	88.73	91.50	10,790.86	-220.97	1,444.58	1,452.70	0.00	0.00	0.00
11,700.00	88.73	91.50	10,793.08	-223.58	1,544.53	1,552.66	0.00	0.00	0.00
11,800.00	88.73	91.50	10,795.29	-226.19	1,644.47	1,652.62	0.00	0.00	0.00
11,900.00	88.73	91.50	10,797.51	-228.81	1,744.41	1,752.58	0.00	0.00	0.00
12,000.00	88.73	91.50	10,799.73	-231.42	1,844.35	1,852.54	0.00	0.00	0.00
12,100.00	88.73	91.50	10,801.94	-234.03	1,944.29	1,952.50	0.00	0.00	0.00
12,200.00	88.73	91.50	10,804.16	-236.64	2,044.23	2,052.47	0.00	0.00	0.00
12,300.00	88.73	91.50	10,806.37	-239.25	2,144.17	2,152.43	0.00	0.00	0.00
12,400.00	88.73	91.50	10,808.59	-241.86	2,244.12	2,252.39	0.00	0.00	0.00
12,500.00	88.73	91.50	10,810.81	-244.47	2,344.06	2,352.35	0.00	0.00	0.00
12,600.00	88.73	91.50	10,813.02	-247.08	2,444.00	2,452.31	0.00	0.00	0.00
12,700.00	88.73	91.50	10,815.24	-249.69	2,543.94	2,552.27	0.00	0.00	0.00
12,800.00	88.73	91.50	10,817.46	-252.30	2,643.88	2,652.24	0.00	0.00	0.00
12,900.00	88.73	91.50	10,819.67	-254.91	2,743.82	2,752.20	0.00	0.00	0.00
13,000.00	88.73	91.50	10,821.89	-257.52	2,843.76	2,852.16	0.00	0.00	0.00
13,100.00	88.73	91.50	10,824.11	-260.13	2,943.71	2,952.12	0.00	0.00	0.00
13,200.00	88.73	91.50	10,826.32	-262.74	3,043.65	3,052.08	0.00	0.00	0.00
13,300.00	88.73	91.50	10,828.54	-265.35	3,143.59	3,152.05	0.00	0.00	0.00
13,400.00	88.73	91.50	10,830.75	-267.96	3,243.53	3,252.01	0.00	0.00	0.00
13,500.00	88.73	91.50	10,832.97	-270.57	3,343.47	3,351.97	0.00	0.00	0.00
13,600.00	88.73	91.50	10,835.19	-273.18	3,443.41	3,451.93	0.00	0.00	0.00
13,700.00	88.73	91.50	10,837.40	-275.79	3,543.35	3,551.89	0.00	0.00	0.00
13,800.00	88.73	91.50	10,839.62	-278.40	3,643.29	3,651.85	0.00	0.00	0.00
13,900.00	88.73	91.50	10,841.84	-281.01	3,743.24	3,751.82	0.00	0.00	0.00
14,000.00	88.73	91.50	10,844.05	-283.62	3,843.18	3,851.78	0.00	0.00	0.00
14,100.00	88.73	91.50	10,846.27	-286.23	3,943.12	3,951.74	0.00	0.00	0.00
14,200.00	88.73	91.50	10,848.49	-288.84	4,043.06	4,051.70	0.00	0.00	0.00
14,300.00	88.73	91.50	10,850.70	-291.45	4,143.00	4,151.66	0.00	0.00	0.00
14,400.00	88.73	91.50	10,852.92	-294.06	4,242.94	4,251.62	0.00	0.00	0.00
14,500.00	88.73	91.50	10,855.13	-296.67	4,342.88	4,351.59	0.00	0.00	0.00
14,600.00	88.73	91.50	10,857.35	-299.28	4,442.83	4,451.55	0.00	0.00	0.00
14,700.00	88.73	91.50	10,859.57	-301.89	4,542.77	4,551.51	0.00	0.00	0.00
14,800.00	88.73	91.50	10,861.78	-304.50	4,642.71	4,651.47	0.00	0.00	0.00



MS Directional Planning Report



Database:	EDM 5000.15 Conroe Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Company:	Novo Oil & Gas, LLC	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site:	Rana Salada Fed Com 0504	North Reference:	Grid
Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,900.00	88.73	91.50	10,864.00	-307.11	4,742.65	4,751.43	0.00	0.00	0.00
15,000.00	88.73	91.50	10,866.22	-309.72	4,842.59	4,851.39	0.00	0.00	0.00
15,100.00	88.73	91.50	10,868.43	-312.33	4,942.53	4,951.36	0.00	0.00	0.00
15,200.00	88.73	91.50	10,870.65	-314.94	5,042.47	5,051.32	0.00	0.00	0.00
15,300.00	88.73	91.50	10,872.87	-317.55	5,142.42	5,151.28	0.00	0.00	0.00
15,400.00	88.73	91.50	10,875.08	-320.16	5,242.36	5,251.24	0.00	0.00	0.00
15,500.00	88.73	91.50	10,877.30	-322.77	5,342.30	5,351.20	0.00	0.00	0.00
15,600.00	88.73	91.50	10,879.52	-325.39	5,442.24	5,451.17	0.00	0.00	0.00
15,700.00	88.73	91.50	10,881.73	-328.00	5,542.18	5,551.13	0.00	0.00	0.00
15,800.00	88.73	91.50	10,883.95	-330.61	5,642.12	5,651.09	0.00	0.00	0.00
15,900.00	88.73	91.50	10,886.16	-333.22	5,742.06	5,751.05	0.00	0.00	0.00
16,000.00	88.73	91.50	10,888.38	-335.83	5,842.00	5,851.01	0.00	0.00	0.00
16,100.00	88.73	91.50	10,890.60	-338.44	5,941.95	5,950.97	0.00	0.00	0.00
16,200.00	88.73	91.50	10,892.81	-341.05	6,041.89	6,050.94	0.00	0.00	0.00
16,300.00	88.73	91.50	10,895.03	-343.66	6,141.83	6,150.90	0.00	0.00	0.00
16,400.00	88.73	91.50	10,897.25	-346.27	6,241.77	6,250.86	0.00	0.00	0.00
16,500.00	88.73	91.50	10,899.46	-348.88	6,341.71	6,350.82	0.00	0.00	0.00
16,600.00	88.73	91.50	10,901.68	-351.49	6,441.65	6,450.78	0.00	0.00	0.00
16,700.00	88.73	91.50	10,903.90	-354.10	6,541.59	6,550.74	0.00	0.00	0.00
16,800.00	88.73	91.50	10,906.11	-356.71	6,641.54	6,650.71	0.00	0.00	0.00
16,900.00	88.73	91.50	10,908.33	-359.32	6,741.48	6,750.67	0.00	0.00	0.00
17,000.00	88.73	91.50	10,910.54	-361.93	6,841.42	6,850.63	0.00	0.00	0.00
17,100.00	88.73	91.50	10,912.76	-364.54	6,941.36	6,950.59	0.00	0.00	0.00
17,200.00	88.73	91.50	10,914.98	-367.15	7,041.30	7,050.55	0.00	0.00	0.00
17,300.00	88.73	91.50	10,917.19	-369.76	7,141.24	7,150.51	0.00	0.00	0.00
17,400.00	88.73	91.50	10,919.41	-372.37	7,241.18	7,250.48	0.00	0.00	0.00
17,500.00	88.73	91.50	10,921.63	-374.98	7,341.12	7,350.44	0.00	0.00	0.00
17,600.00	88.73	91.50	10,923.84	-377.59	7,441.07	7,450.40	0.00	0.00	0.00
17,700.00	88.73	91.50	10,926.06	-380.20	7,541.01	7,550.36	0.00	0.00	0.00
17,800.00	88.73	91.50	10,928.28	-382.81	7,640.95	7,650.32	0.00	0.00	0.00
17,900.00	88.73	91.50	10,930.49	-385.42	7,740.89	7,750.29	0.00	0.00	0.00
18,000.00	88.73	91.50	10,932.71	-388.03	7,840.83	7,850.25	0.00	0.00	0.00
18,100.00	88.73	91.50	10,934.92	-390.64	7,940.77	7,950.21	0.00	0.00	0.00
18,200.00	88.73	91.50	10,937.14	-393.25	8,040.71	8,050.17	0.00	0.00	0.00
18,300.00	88.73	91.50	10,939.36	-395.86	8,140.66	8,150.13	0.00	0.00	0.00
18,400.00	88.73	91.50	10,941.57	-398.47	8,240.60	8,250.09	0.00	0.00	0.00
18,500.00	88.73	91.50	10,943.79	-401.08	8,340.54	8,350.06	0.00	0.00	0.00
18,600.00	88.73	91.50	10,946.01	-403.69	8,440.48	8,450.02	0.00	0.00	0.00
18,700.00	88.73	91.50	10,948.22	-406.30	8,540.42	8,549.98	0.00	0.00	0.00
18,800.00	88.73	91.50	10,950.44	-408.91	8,640.36	8,649.94	0.00	0.00	0.00
18,900.00	88.73	91.50	10,952.66	-411.52	8,740.30	8,749.90	0.00	0.00	0.00
19,000.00	88.73	91.50	10,954.87	-414.13	8,840.25	8,849.86	0.00	0.00	0.00
19,100.00	88.73	91.50	10,957.09	-416.74	8,940.19	8,949.83	0.00	0.00	0.00
19,200.00	88.73	91.50	10,959.30	-419.35	9,040.13	9,049.79	0.00	0.00	0.00
19,300.00	88.73	91.50	10,961.52	-421.97	9,140.07	9,149.75	0.00	0.00	0.00
19,400.00	88.73	91.50	10,963.74	-424.58	9,240.01	9,249.71	0.00	0.00	0.00
19,500.00	88.73	91.50	10,965.95	-427.19	9,339.95	9,349.67	0.00	0.00	0.00
19,600.00	88.73	91.50	10,968.17	-429.80	9,439.89	9,449.63	0.00	0.00	0.00
19,700.00	88.73	91.50	10,970.39	-432.41	9,539.83	9,549.60	0.00	0.00	0.00
19,800.00	88.73	91.50	10,972.60	-435.02	9,639.78	9,649.56	0.00	0.00	0.00
19,900.00	88.73	91.50	10,974.82	-437.63	9,739.72	9,749.52	0.00	0.00	0.00
20,000.00	88.73	91.50	10,977.04	-440.24	9,839.66	9,849.48	0.00	0.00	0.00
20,100.00	88.73	91.50	10,979.25	-442.85	9,939.60	9,949.44	0.00	0.00	0.00
20,200.00	88.73	91.50	10,981.47	-445.46	10,039.54	10,049.41	0.00	0.00	0.00



MS Directional Planning Report



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Company:	Novo Oil & Gas, LLC	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site:	Rana Salada Fed Com 0504	North Reference:	Grid
Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
20,300.00	88.73	91.50	10,983.69	-448.07	10,139.48	10,149.37	0.00	0.00	0.00
20,400.00	88.73	91.50	10,985.90	-450.68	10,239.42	10,249.33	0.00	0.00	0.00
20,500.00	88.73	91.50	10,988.12	-453.29	10,339.37	10,349.29	0.00	0.00	0.00
20,600.00	88.73	91.50	10,990.33	-455.90	10,439.31	10,449.25	0.00	0.00	0.00
20,700.00	88.73	91.50	10,992.55	-458.51	10,539.25	10,549.21	0.00	0.00	0.00
20,800.00	88.73	91.50	10,994.77	-461.12	10,639.19	10,649.18	0.00	0.00	0.00
20,900.00	88.73	91.50	10,996.98	-463.73	10,739.13	10,749.14	0.00	0.00	0.00
21,000.00	88.73	91.50	10,999.20	-466.34	10,839.07	10,849.10	0.00	0.00	0.00
21,100.00	88.73	91.50	11,001.42	-468.95	10,939.01	10,949.06	0.00	0.00	0.00
21,200.00	88.73	91.50	11,003.63	-471.56	11,038.96	11,049.02	0.00	0.00	0.00
21,216.59	88.73	91.50	11,004.00	-471.99	11,055.53	11,065.60	0.00	0.00	0.00
PBHL									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
FTP - Rana Salada Fed Com 0504 214H	0.00	0.00	10,779.00	-207.10	913.74	484,080.22	639,804.42	32.330406	-104.014538
- plan misses target center by 0.09usft at 11068.84usft MD (10779.09 TVD, -207.11 N, 913.74 E)									
- Point									
PBHL - Rana Salada Fed Com 0504 214H	0.00	0.00	11,004.00	-471.99	11,055.53	483,815.33	649,946.21	32.329590	-103.981707
- plan hits target center									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
274.70	274.70	Rustler		1.270	91.50	
2,864.70	2,864.70	Base of Salt		1.270	91.50	
2,864.70	2,864.70	Bell Canyon		1.270	91.50	
3,962.03	3,960.41	Cherry Canyon		1.270	91.50	
5,400.22	5,388.84	Brushy Canyon		1.270	91.50	
6,500.31	6,481.47	Bone Spring Lime		1.270	91.50	
7,595.35	7,569.09	1st Bone Spring Sand		1.270	91.50	
7,852.19	7,824.61	2nd Bone Spring Carbonate		1.270	91.50	
8,342.41	8,314.72	2nd Bone Spring Sand		1.270	91.50	
8,702.41	8,674.72	3rd Bone Spring Carbonate		1.270	91.50	
9,017.41	8,989.72	3rd Bone Spring Break SS		1.270	91.50	
9,332.41	9,304.72	3rd Bone Spring Break SS Base		1.270	91.50	
9,557.41	9,529.72	3rd Bone Spring Sand		1.270	91.50	
9,852.41	9,824.72	Wolfcamp XY		1.270	91.50	
10,007.41	9,979.72	Wolfcamp A		1.270	91.50	
10,257.41	10,229.72	Wolfcamp B		1.270	91.50	



MS Directional
Planning Report



Database:	EDM 5000.15 Conroe Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Company:	Novo Oil & Gas, LLC	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Project:	Eddy County, New Mexico (NAD 83)	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site:	Rana Salada Fed Com 0504	North Reference:	Grid
Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
3,500.00	3,500.00	0.00	0.00	KOP, 2.00°/100' Build
3,833.85	3,833.09	-7.77	17.81	Begin 6.68° Tangent
7,693.84	7,666.91	-187.15	429.21	Begin 2.00°/100' Drop
8,027.69	8,000.00	-194.92	447.02	Begin Vertical Hold
10,329.43	10,301.74	-194.92	447.02	Begin 12.00°/100' Build
11,068.85	10,779.09	-207.11	913.74	Begin 88.73° Lateral
21,216.59	11,004.00	-471.99	11,055.53	PBHL



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Novo Oil & Gas, LLC

Eddy County, New Mexico (NAD 83)

Rana Salada Fed Com 0504

Rana Salada Fed Com 0504 214H

Wellbore #1

Design #1

Anticollision Report

30 January, 2020





MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference	Design #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.00usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum ellipse separation of 1,000.00 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	1/22/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	21,216.49	Design #1 (Wellbore #1)	MWD+HRGM	OWSG MWD + HRGM	

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Rana Salada Fed Com 0504						
Rana Salada Fed Com 0504 133H - Wellbore #1 - Design	3,500.00	3,499.90	19.99	-4.65	0.811	Level 1, CC, ES, SF
Rana Salada Fed Com 0504 234H - Wellbore #1 - Survey	194.15	192.36	216.26	215.45	267.568	CC
Rana Salada Fed Com 0504 234H - Wellbore #1 - Survey	19,812.57	19,892.00	557.16	108.20	1.241	Level 2, ES, SF
Rana Salada Fed Com 0605						
Rana Salada Fed Com 0605 121H - Wellbore #1 - Design	10,826.74	15,910.45	1,988.83	1,821.91	11.915	CC
Rana Salada Fed Com 0605 121H - Wellbore #1 - Design	15,900.00	20,972.56	2,081.96	1,709.97	5.597	ES
Rana Salada Fed Com 0605 121H - Wellbore #1 - Design	16,000.00	20,984.94	2,085.66	1,711.91	5.580	SF
Rana Salada Fed Com 0605 211H - Wellbore #1 - Design	10,820.16	15,864.65	2,915.50	2,748.29	17.436	CC
Rana Salada Fed Com 0605 211H - Wellbore #1 - Design	15,900.00	20,932.54	3,005.98	2,633.54	8.071	ES
Rana Salada Fed Com 0605 211H - Wellbore #1 - Design	16,100.00	20,947.70	3,015.27	2,638.92	8.012	SF
Rana Salada Fed Com 0605 231H - Wellbore #1 - Survey	3,433.46	3,486.00	5,625.21	5,601.10	233.329	CC, ES
Rana Salada Fed Com 0605 231H - Wellbore #1 - Survey	10,500.00	10,281.00	6,293.88	6,219.72	84.861	SF
Rana Salada Fed Com 0605 231H - Wellbore #2 - Survey	11,328.29	16,381.00	3,733.47	3,543.41	19.643	CC
Rana Salada Fed Com 0605 231H - Wellbore #2 - Survey	15,900.00	20,902.00	3,876.89	3,491.42	10.057	ES
Rana Salada Fed Com 0605 231H - Wellbore #2 - Survey	16,300.00	20,902.00	3,903.48	3,510.67	9.937	SF

Offset Design:Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 133H- Wellbore #1 - Design #1												Offset Site Error: 0.00 usft	
Survey Program: 0-MWD+HRGM		Offset		Semi Major Axis		Offset Wellbore Centre			Rule Assigned:		Offset Well Error: 0.00 usft		
Reference	Offset	Reference	Offset	Highside	Distance		Between	Between	Minimum	Separation	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)	Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-90.717	-0.25	-19.99	19.99				
100.00	100.00	99.90	99.90	0.13	0.13	-90.717	-0.25	-19.99	19.99	19.72	0.27	74.396	
200.00	200.00	199.90	199.90	0.49	0.49	-90.717	-0.25	-19.99	19.99	19.01	0.99	20.287	
300.00	300.00	299.90	299.90	0.85	0.85	-90.717	-0.25	-19.99	19.99	18.29	1.70	11.743	
400.00	400.00	399.90	399.90	1.21	1.21	-90.717	-0.25	-19.99	19.99	17.57	2.42	8.263	
500.00	500.00	499.90	499.90	1.57	1.57	-90.717	-0.25	-19.99	19.99	16.86	3.14	6.374	
600.00	600.00	599.90	599.90	1.93	1.93	-90.717	-0.25	-19.99	19.99	16.14	3.85	5.188	
700.00	700.00	699.90	699.90	2.29	2.28	-90.717	-0.25	-19.99	19.99	15.42	4.57	4.374	
800.00	800.00	799.90	799.90	2.64	2.64	-90.717	-0.25	-19.99	19.99	14.70	5.29	3.781	
900.00	900.00	899.90	899.90	3.00	3.00	-90.717	-0.25	-19.99	19.99	13.99	6.00	3.330	
1,000.00	1,000.00	999.90	999.90	3.36	3.36	-90.717	-0.25	-19.99	19.99	13.27	6.72	2.974	
1,100.00	1,100.00	1,099.90	1,099.90	3.72	3.72	-90.717	-0.25	-19.99	19.99	12.55	7.44	2.688	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 133H - Wellbore #1 - Design #1												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM												Offset Well Error:	0.00 usft
Reference	Vertical	Measured	Vertical	Semi Major Axis	Offset	Highside	Offset Wellbore Centre		Distance	Between	Minimum	Separation	Warning
Depth	Depth	Depth	Depth	Reference	Offset	Toolface	+N/-S	+E/-W	Between	Ellipses	Separation	Factor	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	Centres	(usft)	(usft)		
1,200.00	1,200.00	1,199.90	1,199.90	4.08	4.08	-90.717	-0.25	-19.99	19.99	11.84	8.15	2.451	
1,300.00	1,300.00	1,299.90	1,299.90	4.44	4.44	-90.717	-0.25	-19.99	19.99	11.12	8.87	2.253	
1,400.00	1,400.00	1,399.90	1,399.90	4.79	4.79	-90.717	-0.25	-19.99	19.99	10.40	9.59	2.085	
1,500.00	1,500.00	1,499.90	1,499.90	5.15	5.15	-90.717	-0.25	-19.99	19.99	9.69	10.31	1.940	
1,600.00	1,600.00	1,599.90	1,599.90	5.51	5.51	-90.717	-0.25	-19.99	19.99	8.97	11.02	1.814	
1,700.00	1,700.00	1,699.90	1,699.90	5.87	5.87	-90.717	-0.25	-19.99	19.99	8.25	11.74	1.703	
1,800.00	1,800.00	1,799.90	1,799.90	6.23	6.23	-90.717	-0.25	-19.99	19.99	7.54	12.46	1.605	
1,900.00	1,900.00	1,899.90	1,899.90	6.59	6.59	-90.717	-0.25	-19.99	19.99	6.82	13.17	1.518	
2,000.00	2,000.00	1,999.90	1,999.90	6.95	6.95	-90.717	-0.25	-19.99	19.99	6.10	13.89	1.439	Level 3
2,100.00	2,100.00	2,099.90	2,099.90	7.30	7.30	-90.717	-0.25	-19.99	19.99	5.38	14.61	1.369	Level 3
2,200.00	2,200.00	2,199.90	2,199.90	7.66	7.66	-90.717	-0.25	-19.99	19.99	4.67	15.32	1.305	Level 3
2,300.00	2,300.00	2,299.90	2,299.90	8.02	8.02	-90.717	-0.25	-19.99	19.99	3.95	16.04	1.246	Level 2
2,400.00	2,400.00	2,399.90	2,399.90	8.38	8.38	-90.717	-0.25	-19.99	19.99	3.23	16.76	1.193	Level 2
2,500.00	2,500.00	2,499.90	2,499.90	8.74	8.74	-90.717	-0.25	-19.99	19.99	2.52	17.48	1.144	Level 2
2,600.00	2,600.00	2,599.90	2,599.90	9.10	9.10	-90.717	-0.25	-19.99	19.99	1.80	18.19	1.099	Level 2
2,700.00	2,700.00	2,699.90	2,699.90	9.45	9.45	-90.717	-0.25	-19.99	19.99	1.08	18.91	1.057	Level 2
2,800.00	2,800.00	2,799.90	2,799.90	9.81	9.81	-90.717	-0.25	-19.99	19.99	0.37	19.63	1.019	Level 2
2,900.00	2,900.00	2,899.90	2,899.90	10.17	10.17	-90.717	-0.25	-19.99	19.99	-0.35	20.34	0.983	Level 1
3,000.00	3,000.00	2,999.90	2,999.90	10.53	10.53	-90.717	-0.25	-19.99	19.99	-1.07	21.06	0.949	Level 1
3,100.00	3,100.00	3,099.90	3,099.90	10.89	10.89	-90.717	-0.25	-19.99	19.99	-1.79	21.78	0.918	Level 1
3,200.00	3,200.00	3,199.90	3,199.90	11.25	11.25	-90.717	-0.25	-19.99	19.99	-2.50	22.49	0.889	Level 1
3,300.00	3,300.00	3,299.90	3,299.90	11.61	11.61	-90.717	-0.25	-19.99	19.99	-3.22	23.21	0.861	Level 1
3,400.00	3,400.00	3,399.90	3,399.90	11.96	11.96	-90.717	-0.25	-19.99	19.99	-3.94	23.93	0.836	Level 1
3,500.00	3,500.00	3,499.90	3,499.90	12.32	12.32	-90.717	-0.25	-19.99	19.99	-4.65	24.64	0.811	Level 1, CC, ES, SF
3,600.00	3,599.98	3,600.25	3,600.23	12.67	12.68	161.704	1.20	-19.00	20.69	-4.65	25.34	0.817	Level 1
3,700.00	3,699.84	3,700.30	3,700.14	13.00	13.04	176.788	5.54	-16.06	23.95	-2.08	26.03	0.920	Level 1
3,800.00	3,799.45	3,799.76	3,799.21	13.34	13.39	-166.894	12.71	-11.18	31.84	5.12	26.72	1.192	Level 2
3,900.00	3,898.80	3,898.41	3,897.13	13.68	13.74	-154.512	22.63	-4.44	44.51	17.11	27.40	1.625	
4,000.00	3,998.12	3,996.25	3,993.77	14.02	14.09	-144.882	35.21	4.11	59.79	31.75	28.04	2.132	
4,100.00	4,097.44	4,093.08	4,088.85	14.37	14.44	-137.138	50.34	14.40	77.78	49.13	28.65	2.715	
4,200.00	4,196.76	4,190.01	4,183.51	14.72	14.79	-131.081	67.58	26.12	98.22	68.95	29.27	3.356	
4,300.00	4,296.08	4,287.43	4,278.61	15.07	15.15	-127.027	85.08	38.01	119.51	89.58	29.93	3.993	
4,400.00	4,395.41	4,384.85	4,373.70	15.42	15.51	-124.204	102.57	49.90	141.20	110.59	30.61	4.613	
4,500.00	4,494.73	4,482.27	4,468.80	15.78	15.88	-122.133	120.06	61.79	163.13	131.83	31.29	5.213	
4,600.00	4,594.05	4,579.69	4,563.89	16.13	16.26	-120.553	137.55	73.68	185.21	153.22	31.98	5.790	
4,700.00	4,693.37	4,677.10	4,658.99	16.49	16.63	-119.310	155.04	85.56	207.40	174.71	32.69	6.345	
4,800.00	4,792.69	4,774.52	4,754.08	16.85	17.01	-118.308	172.54	97.45	229.66	196.27	33.39	6.878	
4,900.00	4,892.01	4,871.94	4,849.18	17.21	17.40	-117.482	190.03	109.34	251.98	217.88	34.10	7.389	
5,000.00	4,991.34	4,969.36	4,944.28	17.57	17.78	-116.791	207.52	121.23	274.34	239.52	34.81	7.880	
5,100.00	5,090.66	5,066.78	5,039.37	17.94	18.17	-116.204	225.01	133.12	296.73	261.20	35.53	8.351	
5,200.00	5,189.98	5,164.20	5,134.47	18.30	18.56	-115.699	242.50	145.01	319.15	282.89	36.25	8.803	
5,300.00	5,289.30	5,261.62	5,229.56	18.67	18.96	-115.261	260.00	156.90	341.58	304.61	36.98	9.238	
5,400.00	5,388.62	5,359.04	5,324.66	19.04	19.36	-114.876	277.49	168.79	364.04	326.33	37.70	9.655	
5,500.00	5,487.94	5,456.46	5,419.75	19.40	19.76	-114.537	294.98	180.68	386.51	348.07	38.43	10.056	
5,600.00	5,587.27	5,553.88	5,514.85	19.77	20.16	-114.234	312.47	192.57	408.99	369.82	39.17	10.443	
5,700.00	5,686.59	5,651.29	5,609.94	20.14	20.56	-113.963	329.96	204.46	431.48	391.58	39.90	10.814	
5,800.00	5,785.91	5,748.71	5,705.04	20.51	20.97	-113.719	347.45	216.35	453.97	413.34	40.63	11.172	
5,900.00	5,885.23	5,846.13	5,800.13	20.89	21.37	-113.498	364.95	228.24	476.48	435.11	41.37	11.517	
6,000.00	5,984.55	5,943.55	5,895.23	21.26	21.78	-113.297	382.44	240.13	498.99	456.88	42.11	11.849	
6,100.00	6,083.87	6,040.97	5,990.33	21.63	22.19	-113.113	399.93	252.02	521.51	478.65	42.85	12.170	
6,200.00	6,183.20	6,138.39	6,085.42	22.01	22.60	-112.945	417.42	263.91	544.03	500.43	43.60	12.479	
6,300.00	6,282.52	6,235.81	6,180.52	22.38	23.01	-112.789	434.91	275.80	566.55	522.21	44.34	12.778	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 133H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM													Offset Well Error:	0.00 usft
Reference	Vertical	Measured	Vertical	Semi	Major	Axis	Offset Wellbore Centre		Distance	Between	Between	Minimum	Separation	Warning
Measured	Depth	Depth	Depth	Reference	Offset	Highside	+N/-S	+E/-W	Centres	Ellipses	Separation	Factor		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
6,400.00	6,381.84	6,333.23	6,275.61	22.76	23.43	-112.646	452.41	287.69	589.08	544.00	45.08	13.066		
6,500.00	6,481.16	6,430.65	6,370.71	23.13	23.84	-112.513	469.90	299.58	611.61	565.78	45.83	13.345		
6,600.00	6,580.48	6,528.07	6,465.80	23.51	24.26	-112.390	487.39	311.46	634.15	587.57	46.58	13.614		
6,700.00	6,679.81	6,625.49	6,560.90	23.89	24.68	-112.275	504.88	323.35	656.69	609.36	47.33	13.875		
6,800.00	6,779.13	6,722.90	6,655.99	24.26	25.10	-112.168	522.37	335.24	679.23	631.15	48.08	14.127		
6,900.00	6,878.45	6,820.32	6,751.09	24.64	25.52	-112.068	539.87	347.13	701.77	652.94	48.83	14.371		
7,000.00	6,977.77	6,917.74	6,846.18	25.02	25.94	-111.974	557.36	359.02	724.31	674.73	49.58	14.608		
7,100.00	7,077.09	7,015.16	6,941.28	25.40	26.36	-111.885	574.85	370.91	746.86	696.52	50.34	14.837		
7,200.00	7,176.41	7,112.58	7,036.38	25.78	26.78	-111.802	592.34	382.80	769.40	718.31	51.09	15.059		
7,300.00	7,275.74	7,210.00	7,131.47	26.16	27.21	-111.724	609.83	394.69	791.95	740.10	51.85	15.274		
7,400.00	7,375.06	7,307.42	7,226.57	26.54	27.63	-111.649	627.33	406.58	814.50	761.90	52.61	15.483		
7,500.00	7,474.38	7,404.84	7,321.66	26.92	28.06	-111.579	644.82	418.47	837.05	783.69	53.36	15.686		
7,600.00	7,573.70	7,515.63	7,429.91	27.30	28.54	-111.522	664.31	431.72	859.30	805.03	54.27	15.835		
7,700.00	7,673.02	7,647.33	7,559.54	27.68	29.09	-111.653	683.53	444.78	878.44	823.10	55.34	15.873		
7,800.00	7,772.55	7,780.89	7,691.94	28.06	29.61	-112.092	697.96	454.59	893.04	836.70	56.35	15.849		
7,900.00	7,872.35	7,915.90	7,826.46	28.42	30.12	-112.366	707.35	460.97	902.45	845.18	57.26	15.760		
8,000.00	7,972.31	8,051.74	7,962.19	28.77	30.59	-112.485	711.49	463.79	906.57	848.49	58.08	15.609		
8,100.00	8,072.31	8,161.76	8,072.21	29.11	30.95	1.069	711.70	463.93	906.78	847.99	58.79	15.425		
8,200.00	8,172.31	8,261.76	8,172.21	29.46	31.28	1.069	711.70	463.93	906.78	847.31	59.47	15.247		
8,300.00	8,272.31	8,361.76	8,272.21	29.80	31.61	1.069	711.70	463.93	906.78	846.62	60.16	15.074		
8,400.00	8,372.31	8,461.76	8,372.21	30.14	31.94	1.069	711.70	463.93	906.78	845.93	60.84	14.904		
8,500.00	8,472.31	8,561.76	8,472.21	30.48	32.27	1.069	711.70	463.93	906.78	845.25	61.53	14.737		
8,600.00	8,572.31	8,661.76	8,572.21	30.82	32.61	1.069	711.70	463.93	906.78	844.56	62.22	14.574		
8,700.00	8,672.31	8,761.76	8,672.21	31.17	32.94	1.069	711.70	463.93	906.78	843.87	62.91	14.415		
8,800.00	8,772.31	8,861.76	8,772.21	31.51	33.27	1.069	711.70	463.93	906.78	843.18	63.59	14.259		
8,900.00	8,872.31	8,961.76	8,872.21	31.85	33.61	1.069	711.70	463.93	906.78	842.49	64.28	14.106		
9,000.00	8,972.31	9,061.76	8,972.21	32.20	33.94	1.069	711.70	463.93	906.78	841.80	64.97	13.956		
9,100.00	9,072.31	9,161.76	9,072.21	32.54	34.28	1.069	711.70	463.93	906.78	841.11	65.66	13.809		
9,200.00	9,172.31	9,261.76	9,172.21	32.89	34.61	1.069	711.70	463.93	906.78	840.42	66.36	13.666		
9,300.00	9,272.31	9,361.76	9,272.21	33.23	34.95	1.069	711.70	463.93	906.78	839.73	67.05	13.525		
9,400.00	9,372.31	9,461.76	9,372.21	33.58	35.28	1.069	711.70	463.93	906.78	839.04	67.74	13.386		
9,500.00	9,472.31	9,561.76	9,472.21	33.92	35.62	1.069	711.70	463.93	906.78	838.35	68.43	13.251		
9,600.00	9,572.31	9,661.76	9,572.21	34.27	35.96	1.069	711.70	463.93	906.78	837.65	69.12	13.118		
9,700.00	9,672.31	9,761.76	9,672.21	34.61	36.29	1.069	711.70	463.93	906.78	836.96	69.82	12.988		
9,800.00	9,772.31	9,861.76	9,772.21	34.96	36.63	1.069	711.70	463.93	906.78	836.26	70.51	12.860		
9,900.00	9,872.31	9,961.76	9,872.21	35.31	36.97	1.069	711.70	463.93	906.78	835.57	71.21	12.734		
10,000.00	9,972.31	10,061.76	9,972.21	35.65	37.31	1.069	711.70	463.93	906.78	834.88	71.90	12.611		
10,100.00	10,072.31	10,161.76	10,072.21	36.00	37.65	1.069	711.70	463.93	906.78	834.18	72.60	12.490		
10,200.00	10,172.31	10,261.76	10,172.21	36.35	37.99	1.069	711.70	463.93	906.78	833.48	73.29	12.372		
10,300.00	10,272.31	10,361.76	10,272.21	36.69	38.33	1.069	711.70	463.93	906.78	832.79	73.99	12.255		
10,400.00	10,372.05	10,458.22	10,368.48	37.05	38.66	-90.446	711.75	468.25	906.95	832.26	74.69	12.142		
10,500.00	10,468.70	10,553.23	10,460.74	37.46	39.01	-90.453	711.98	490.26	907.81	832.34	75.47	12.028		
10,600.00	10,558.08	10,648.64	10,547.18	37.90	39.40	-90.438	712.40	530.27	909.37	833.04	76.33	11.913		
10,700.00	10,636.21	10,744.64	10,624.40	38.38	39.82	-90.402	713.00	587.04	911.57	834.30	77.27	11.797		
10,800.00	10,699.75	10,841.41	10,689.17	38.91	40.28	-90.347	713.76	658.70	914.32	836.00	78.32	11.674		
10,900.00	10,745.88	10,939.08	10,738.57	39.51	40.80	-90.277	714.64	742.76	917.51	838.00	79.51	11.540		
11,000.00	10,772.61	11,037.79	10,770.10	40.19	41.41	-90.194	715.63	836.10	921.00	840.16	80.84	11.393		
11,100.00	10,779.78	11,137.61	10,781.87	40.92	42.11	-90.183	716.68	935.05	924.65	842.35	82.30	11.235		
11,200.00	10,781.99	11,237.54	10,784.87	41.76	42.90	-90.231	717.73	1,034.93	928.32	844.36	83.96	11.056		
11,300.00	10,784.21	11,337.47	10,787.87	42.71	43.79	-90.278	718.79	1,134.81	931.99	846.16	85.83	10.859		
11,400.00	10,786.43	11,437.40	10,790.87	43.75	44.79	-90.325	719.84	1,234.68	935.66	847.76	87.90	10.645		
11,500.00	10,788.64	11,537.33	10,793.87	44.90	45.88	-90.372	720.90	1,334.56	939.33	849.18	90.15	10.420		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 133H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM													Offset Well Error:	0.00 usft
Reference	Vertical	Offset	Vertical	Semi Major	Axis	Highside	Offset Wellbore Centre		Distance	Between	Minimum	Separation	Warning	
Measured	Depth	Measured	Depth	Reference	Offset	Toolface	+N/-S	+E/-W	Between	Centres	Separation	Factor		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)			
11,600.00	10,790.86	11,637.26	10,796.87	46.12	47.06	-90.418	721.95	1,434.44	943.00	850.42	92.58	10.186		
11,700.00	10,793.08	11,737.19	10,799.87	47.43	48.32	-90.464	723.00	1,534.32	946.67	851.50	95.16	9.948		
11,800.00	10,795.29	11,837.12	10,802.87	48.81	49.65	-90.510	724.06	1,634.20	950.34	852.44	97.90	9.707		
11,900.00	10,797.51	11,937.05	10,805.87	50.27	51.06	-90.555	725.11	1,734.08	954.01	853.24	100.77	9.467		
12,000.00	10,799.73	12,036.98	10,808.87	51.78	52.52	-90.600	726.17	1,833.96	957.69	853.92	103.77	9.229		
12,100.00	10,801.94	12,136.91	10,811.87	53.35	54.05	-90.645	727.22	1,933.84	961.36	854.48	106.87	8.995		
12,200.00	10,804.16	12,236.83	10,814.87	54.97	55.63	-90.689	728.28	2,033.72	965.03	854.95	110.09	8.766		
12,300.00	10,806.37	12,336.76	10,817.87	56.64	57.26	-90.733	729.33	2,133.60	968.71	855.31	113.40	8.543		
12,400.00	10,808.59	12,436.69	10,820.86	58.35	58.93	-90.777	730.39	2,233.48	972.38	855.59	116.79	8.326		
12,500.00	10,810.81	12,536.62	10,823.86	60.10	60.65	-90.820	731.44	2,333.35	976.06	855.79	120.26	8.116		
12,600.00	10,813.02	12,636.55	10,826.86	61.88	62.40	-90.863	732.50	2,433.23	979.73	855.92	123.81	7.913		
12,700.00	10,815.24	12,736.48	10,829.86	63.71	64.19	-90.905	733.55	2,533.11	983.41	855.98	127.43	7.717		
12,800.00	10,817.46	12,836.41	10,832.86	65.56	66.00	-90.948	734.61	2,632.99	987.09	855.99	131.10	7.529		
12,900.00	10,819.67	12,936.34	10,835.86	67.43	67.85	-90.990	735.66	2,732.87	990.77	855.93	134.83	7.348		
13,000.00	10,821.89	13,036.27	10,838.86	69.34	69.73	-91.031	736.72	2,832.75	994.44	855.83	138.62	7.174		
13,100.00	10,824.11	13,136.20	10,841.86	71.27	71.63	-91.073	737.77	2,932.63	998.12	855.67	142.45	7.007		
13,200.00	10,826.32	13,236.13	10,844.86	73.22	73.55	-91.114	738.83	3,032.51	1,001.80	855.48	146.33	6.846		
13,300.00	10,828.54	13,336.06	10,847.86	75.19	75.49	-91.155	739.88	3,132.39	1,005.48	855.24	150.24	6.692		
13,400.00	10,830.75	13,435.99	10,850.86	77.18	77.45	-91.195	740.94	3,232.27	1,009.16	854.97	154.19	6.545		
13,500.00	10,832.97	13,535.92	10,853.86	79.18	79.43	-91.235	741.99	3,332.15	1,012.84	854.66	158.18	6.403		
13,600.00	10,835.19	13,635.85	10,856.86	81.20	81.43	-91.275	743.05	3,432.03	1,016.52	854.32	162.20	6.267		
13,700.00	10,837.40	13,735.78	10,859.86	83.24	83.44	-91.315	744.10	3,531.90	1,020.21	853.96	166.25	6.137		
13,800.00	10,839.62	13,835.71	10,862.86	85.29	85.47	-91.354	745.16	3,631.78	1,023.89	853.56	170.33	6.011		
13,900.00	10,841.84	13,935.64	10,865.86	87.35	87.51	-91.393	746.21	3,731.66	1,027.57	853.14	174.43	5.891		
14,000.00	10,844.05	14,035.57	10,868.86	89.42	89.56	-91.432	747.27	3,831.54	1,031.25	852.70	178.55	5.776		
14,100.00	10,846.27	14,135.50	10,871.85	91.51	91.63	-91.470	748.32	3,931.42	1,034.94	852.24	182.70	5.665		
14,200.00	10,848.49	14,235.43	10,874.85	93.60	93.70	-91.508	749.38	4,031.30	1,038.62	851.75	186.87	5.558		
14,300.00	10,850.70	14,335.36	10,877.85	95.71	95.79	-91.546	750.43	4,131.18	1,042.31	851.25	191.06	5.455		
14,400.00	10,852.92	14,435.29	10,880.85	97.82	97.88	-91.584	751.49	4,231.06	1,045.99	850.73	195.26	5.357		
14,500.00	10,855.13	14,535.22	10,883.85	99.94	99.98	-91.621	752.54	4,330.94	1,049.68	850.19	199.49	5.262		
14,600.00	10,857.35	14,635.15	10,886.85	102.07	102.09	-91.659	753.60	4,430.82	1,053.36	849.64	203.72	5.171		
14,700.00	10,859.57	14,735.08	10,889.85	104.21	104.21	-91.696	754.65	4,530.70	1,057.05	849.07	207.98	5.083		
14,800.00	10,861.78	14,835.01	10,892.85	106.36	106.34	-91.732	755.71	4,630.57	1,060.74	848.49	212.25	4.998		
14,900.00	10,864.00	14,934.94	10,895.85	108.51	108.47	-91.769	756.76	4,730.45	1,064.42	847.90	216.53	4.916		
15,000.00	10,866.22	15,034.87	10,898.85	110.66	110.61	-91.805	757.82	4,830.33	1,068.11	847.29	220.82	4.837		
15,100.00	10,868.43	15,134.80	10,901.85	112.83	112.76	-91.841	758.87	4,930.21	1,071.80	846.68	225.12	4.761		
15,200.00	10,870.65	15,234.73	10,904.85	114.99	114.91	-91.876	759.93	5,030.09	1,075.49	846.05	229.44	4.687		
15,300.00	10,872.87	15,334.66	10,907.85	117.17	117.07	-91.912	760.98	5,129.97	1,079.18	845.41	233.76	4.617		
15,400.00	10,875.08	15,434.59	10,910.85	119.35	119.23	-91.947	762.04	5,229.85	1,082.87	844.77	238.10	4.548		
15,500.00	10,877.30	15,534.52	10,913.85	121.53	121.40	-91.982	763.09	5,329.73	1,086.56	844.11	242.44	4.482		
15,600.00	10,879.52	15,634.45	10,916.85	123.72	123.57	-92.016	764.14	5,429.61	1,090.25	843.45	246.80	4.418		
15,700.00	10,881.73	15,734.38	10,919.85	125.91	125.75	-92.051	765.20	5,529.49	1,093.94	842.78	251.16	4.356		
15,800.00	10,883.95	15,834.31	10,922.84	128.10	127.93	-92.085	766.25	5,629.37	1,097.63	842.10	255.53	4.296		
15,900.00	10,886.16	15,934.23	10,925.84	130.30	130.12	-92.119	767.31	5,729.25	1,101.32	841.42	259.90	4.237		
16,000.00	10,888.38	16,034.16	10,928.84	132.51	132.31	-92.153	768.36	5,829.12	1,105.01	840.73	264.28	4.181		
16,100.00	10,890.60	16,134.09	10,931.84	134.71	134.50	-92.186	769.42	5,929.00	1,108.70	840.03	268.67	4.127		
16,200.00	10,892.81	16,234.02	10,934.84	136.92	136.69	-92.219	770.47	6,028.88	1,112.40	839.32	273.07	4.074		
16,300.00	10,895.03	16,333.95	10,937.84	139.13	138.89	-92.252	771.53	6,128.76	1,116.09	838.61	277.47	4.022		
16,400.00	10,897.25	16,433.88	10,940.84	141.35	141.09	-92.285	772.58	6,228.64	1,119.78	837.90	281.88	3.973		
16,500.00	10,899.46	16,533.81	10,943.84	143.57	143.30	-92.318	773.64	6,328.52	1,123.47	837.18	286.29	3.924		
16,600.00	10,901.68	16,633.74	10,946.84	145.79	145.51	-92.350	774.69	6,428.40	1,127.17	836.45	290.71	3.877		
16,700.00	10,903.90	16,733.67	10,949.84	148.01	147.72	-92.383	775.75	6,528.28	1,130.86	835.73	295.14	3.832		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 133H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM													Offset Well Error:	0.00 usft
Reference	Vertical	Offset	Vertical	Semi Major Axis	Offset	Highside	Offset Wellbore Centre		Distance	Between	Minimum	Separation	Warning	
Measured	Depth	Measured	Depth	Reference	Offset	Tooface	+N/-S	+E/-W	Between	Ellipses	Separation	Factor		
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	Centres	(usft)	(usft)	(usft)		
16,800.00	10,906.11	16,833.60	10,952.84	150.24	149.93	-92.415	776.80	6,628.16	1,134.56	834.99	299.57	3.787		
16,900.00	10,908.33	16,933.53	10,955.84	152.46	152.15	-92.446	777.86	6,728.04	1,138.25	834.25	304.00	3.744		
17,000.00	10,910.54	17,033.46	10,958.84	154.69	154.36	-92.478	778.91	6,827.92	1,141.95	833.51	308.44	3.702		
17,100.00	10,912.76	17,133.39	10,961.84	156.93	156.58	-92.509	779.97	6,927.79	1,145.64	832.77	312.88	3.662		
17,200.00	10,914.98	17,233.32	10,964.84	159.16	158.81	-92.541	781.02	7,027.67	1,149.34	832.02	317.32	3.622		
17,300.00	10,917.19	17,333.25	10,967.84	161.40	161.03	-92.572	782.08	7,127.55	1,153.04	831.27	321.77	3.583		
17,400.00	10,919.41	17,433.18	10,970.84	163.63	163.26	-92.602	783.13	7,227.43	1,156.73	830.51	326.22	3.546		
17,500.00	10,921.63	17,533.11	10,973.83	165.87	165.49	-92.633	784.19	7,327.31	1,160.43	829.75	330.68	3.509		
17,600.00	10,923.84	17,633.04	10,976.83	168.12	167.72	-92.663	785.24	7,427.19	1,164.13	828.99	335.14	3.474		
17,700.00	10,926.06	17,732.97	10,979.83	170.36	169.95	-92.694	786.30	7,527.07	1,167.82	828.23	339.60	3.439		
17,800.00	10,928.28	17,832.90	10,982.83	172.60	172.18	-92.724	787.35	7,626.95	1,171.52	827.46	344.06	3.405		
17,900.00	10,930.49	17,932.83	10,985.83	174.85	174.42	-92.753	788.41	7,726.83	1,175.22	826.69	348.53	3.372		
18,000.00	10,932.71	18,032.76	10,988.83	177.10	176.65	-92.783	789.46	7,826.71	1,178.92	825.92	353.00	3.340		
18,100.00	10,934.92	18,132.69	10,991.83	179.35	178.89	-92.813	790.52	7,926.59	1,182.62	825.14	357.48	3.308		
18,200.00	10,937.14	18,232.62	10,994.83	181.60	181.13	-92.842	791.57	8,026.47	1,186.32	824.37	361.95	3.278		
18,300.00	10,939.36	18,332.55	10,997.83	183.85	183.37	-92.871	792.63	8,126.34	1,190.02	823.59	366.43	3.248		
18,400.00	10,941.57	18,432.48	11,000.83	186.10	185.61	-92.900	793.68	8,226.22	1,193.72	822.81	370.91	3.218		
18,500.00	10,943.79	18,532.41	11,003.83	188.36	187.86	-92.929	794.74	8,326.10	1,197.42	822.02	375.39	3.190		
18,600.00	10,946.01	18,604.76	11,006.00	190.61	189.48	-92.949	795.50	8,398.42	1,201.43	822.32	379.11	3.169		
18,700.00	10,948.22	18,604.76	11,006.00	192.87	189.48	-92.949	795.50	8,398.42	1,211.55	832.31	379.23	3.195		
18,800.00	10,950.44	18,604.76	11,006.00	195.13	189.48	-92.949	795.50	8,398.42	1,229.73	852.74	376.99	3.262		
18,900.00	10,952.66	18,604.76	11,006.00	197.39	189.48	-92.949	795.50	8,398.42	1,255.65	883.02	372.63	3.370		
19,000.00	10,954.87	18,604.76	11,006.00	199.65	189.48	-92.949	795.50	8,398.42	1,288.82	922.33	366.48	3.517		
19,100.00	10,957.09	18,604.76	11,006.00	201.91	189.48	-92.949	795.50	8,398.42	1,328.70	969.77	358.93	3.702		
19,200.00	10,959.30	18,604.76	11,006.00	204.17	189.48	-92.949	795.50	8,398.42	1,374.72	1,024.36	350.36	3.924		
19,300.00	10,961.52	18,604.76	11,006.00	206.43	189.48	-92.949	795.50	8,398.42	1,426.27	1,085.17	341.10	4.181		
19,400.00	10,963.74	18,604.76	11,006.00	208.70	189.48	-92.949	795.50	8,398.42	1,482.79	1,151.31	331.48	4.473		
19,500.00	10,965.95	18,604.76	11,006.00	210.96	189.48	-92.949	795.50	8,398.42	1,543.71	1,221.99	321.72	4.798		
19,600.00	10,968.17	18,604.76	11,006.00	213.23	189.48	-92.949	795.50	8,398.42	1,608.56	1,296.53	312.03	5.155		
19,700.00	10,970.39	18,604.76	11,006.00	215.49	189.48	-92.949	795.50	8,398.42	1,676.86	1,374.32	302.54	5.543		
19,800.00	10,972.60	18,604.76	11,006.00	217.76	189.48	-92.949	795.50	8,398.42	1,748.22	1,454.87	293.34	5.960		
19,900.00	10,974.82	18,604.76	11,006.00	220.03	189.48	-92.949	795.50	8,398.42	1,822.27	1,537.75	284.52	6.405		
20,000.00	10,977.04	18,604.76	11,006.00	222.30	189.48	-92.949	795.50	8,398.42	1,898.70	1,622.60	276.10	6.877		
20,100.00	10,979.25	18,604.76	11,006.00	224.57	189.48	-92.949	795.50	8,398.42	1,977.24	1,709.13	268.10	7.375		
20,200.00	10,981.47	18,604.76	11,006.00	226.84	189.48	-92.949	795.50	8,398.42	2,057.63	1,797.10	260.54	7.898		
20,300.00	10,983.69	18,604.76	11,006.00	229.11	189.48	-92.949	795.50	8,398.42	2,139.69	1,886.29	253.40	8.444		
20,400.00	10,985.90	18,604.76	11,006.00	231.38	189.48	-92.949	795.50	8,398.42	2,223.21	1,976.54	246.67	9.013		
20,500.00	10,988.12	18,604.76	11,006.00	233.65	189.48	-92.949	795.50	8,398.42	2,308.04	2,067.70	240.34	9.603		
20,600.00	10,990.33	18,604.76	11,006.00	235.92	189.48	-92.949	795.50	8,398.42	2,394.05	2,159.66	234.39	10.214		
20,700.00	10,992.55	18,604.76	11,006.00	238.19	189.48	-92.949	795.50	8,398.42	2,481.10	2,252.31	228.79	10.844		
20,800.00	10,994.77	18,604.76	11,006.00	240.47	189.48	-92.949	795.50	8,398.42	2,569.10	2,345.57	223.53	11.493		
20,900.00	10,996.98	18,604.76	11,006.00	242.74	189.48	-92.949	795.50	8,398.42	2,657.94	2,439.36	218.58	12.160		
21,000.00	10,999.20	18,604.76	11,006.00	245.02	189.48	-92.949	795.50	8,398.42	2,747.56	2,533.63	213.93	12.843		
21,100.00	11,001.42	18,604.76	11,006.00	247.29	189.48	-92.949	795.50	8,398.42	2,837.86	2,628.31	209.55	13.542		
21,200.00	11,003.63	18,604.76	11,006.00	249.57	189.48	-92.949	795.50	8,398.42	2,928.80	2,723.37	205.43	14.257		
21,216.59	11,004.00	18,604.76	11,006.00	249.95	189.48	-92.949	795.50	8,398.42	2,943.94	2,739.16	204.77	14.377		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 234H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 171-MWD												Offset Well Error:	0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Reference (usft)	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	-157.074	-200.09	-84.63	217.26				
100.00	100.00	99.51	99.51	0.13	0.15	-157.085	-199.83	-84.47	216.96	216.67	0.29	754.452	
194.15	194.15	192.36	192.35	0.47	0.34	-157.123	-199.25	-84.07	216.26	215.45	0.81	267.568	CC
200.00	200.00	197.65	197.64	0.49	0.35	-157.130	-199.26	-84.05	216.26	215.42	0.85	255.158	
300.00	300.00	297.91	297.90	0.85	0.70	-157.276	-200.01	-83.77	216.84	215.29	1.56	139.387	
393.33	393.33	391.53	391.53	1.19	1.03	-157.348	-200.04	-83.48	216.76	214.54	2.22	97.617	
400.00	400.00	398.15	398.14	1.21	1.06	-157.354	-200.04	-83.46	216.76	214.49	2.27	95.578	
500.00	500.00	497.67	497.66	1.57	1.41	-157.430	-200.30	-83.25	216.92	213.94	2.98	72.849	
600.00	600.00	596.65	596.64	1.93	1.76	-157.506	-200.84	-83.16	217.38	213.70	3.68	58.996	
700.00	700.00	696.62	696.61	2.29	2.11	-157.615	-201.67	-83.06	218.11	213.71	4.40	49.609	
800.00	800.00	795.23	795.21	2.64	2.46	-157.718	-202.78	-83.09	219.16	214.06	5.10	42.940	
900.00	900.00	894.31	894.28	3.00	2.81	-157.735	-204.27	-83.63	220.77	214.95	5.81	37.988	
1,000.00	1,000.00	993.69	993.64	3.36	3.16	-157.623	-205.81	-84.73	222.61	216.09	6.52	34.149	
1,100.00	1,100.00	1,092.13	1,092.05	3.72	3.51	-157.383	-207.64	-86.50	225.03	217.80	7.22	31.155	
1,200.00	1,200.00	1,191.02	1,190.88	4.08	3.86	-157.084	-209.92	-88.74	228.02	220.10	7.93	28.758	
1,300.00	1,300.00	1,291.40	1,291.20	4.44	4.22	-156.758	-212.41	-91.23	231.28	222.64	8.64	26.759	
1,400.00	1,400.00	1,392.49	1,392.26	4.79	4.58	-156.619	-214.72	-92.83	234.00	224.64	9.36	24.996	
1,500.00	1,500.00	1,492.67	1,492.40	5.15	4.94	-156.638	-217.02	-93.74	236.47	226.39	10.08	23.465	
1,600.00	1,600.00	1,595.04	1,594.75	5.51	5.31	-156.615	-218.93	-94.67	238.55	227.75	10.80	22.083	
1,700.00	1,700.00	1,696.59	1,696.29	5.87	5.67	-156.652	-219.98	-94.96	239.61	228.09	11.52	20.793	
1,800.00	1,800.00	1,795.93	1,795.63	6.23	6.02	-156.684	-220.87	-95.19	240.52	228.28	12.24	19.655	
1,900.00	1,900.00	1,897.85	1,897.54	6.59	6.39	-156.687	-221.54	-95.47	241.23	228.27	12.96	18.615	
2,000.00	2,000.00	2,001.77	2,001.46	6.95	6.75	-156.845	-221.13	-94.57	240.53	226.86	13.67	17.590	
2,100.00	2,100.00	2,100.32	2,100.00	7.30	7.08	-157.102	-220.62	-93.18	239.50	225.13	14.37	16.669	
2,200.00	2,200.00	2,199.46	2,199.12	7.66	7.42	-157.561	-220.85	-91.20	238.94	223.87	15.07	15.856	
2,300.00	2,300.00	2,299.04	2,298.64	8.02	7.77	-158.370	-221.88	-87.98	238.69	222.91	15.78	15.131	
2,400.00	2,400.00	2,400.83	2,400.36	8.38	8.12	-159.300	-222.96	-84.25	238.36	221.87	16.49	14.456	
2,500.00	2,500.00	2,504.26	2,503.71	8.74	8.48	-160.157	-222.44	-80.27	236.54	219.34	17.20	13.751	
2,600.00	2,600.00	2,603.50	2,602.87	9.10	8.82	-160.920	-221.25	-76.53	234.16	216.26	17.90	13.078	
2,700.00	2,700.00	2,702.29	2,701.59	9.45	9.17	-161.779	-220.95	-72.74	232.64	214.03	18.61	12.501	
2,800.00	2,800.00	2,802.53	2,801.74	9.81	9.52	-162.673	-220.58	-68.81	231.09	211.77	19.32	11.962	
2,900.00	2,900.00	2,903.57	2,902.72	10.17	9.87	-163.515	-219.98	-65.10	229.45	209.42	20.03	11.455	
3,000.00	3,000.00	3,004.14	3,003.21	10.53	10.22	-164.323	-218.76	-61.40	227.27	206.53	20.74	10.958	
3,100.00	3,100.00	3,104.00	3,102.99	10.89	10.57	-165.212	-217.59	-57.44	225.10	203.65	21.45	10.495	
3,200.00	3,200.00	3,201.09	3,200.00	11.25	10.91	-166.092	-216.98	-53.73	223.54	201.39	22.15	10.090	
3,288.56	3,288.56	3,287.88	3,286.76	11.56	11.22	-166.663	-217.20	-51.49	223.22	200.44	22.78	9.798	
3,300.00	3,300.00	3,299.12	3,298.00	11.61	11.26	-166.709	-217.24	-51.32	223.22	200.36	22.86	9.764	
3,400.00	3,400.00	3,398.52	3,397.39	11.96	11.61	-167.037	-217.77	-50.13	223.47	199.90	23.57	9.480	
3,500.00	3,500.00	3,499.50	3,498.36	12.32	11.97	-167.389	-218.23	-48.82	223.62	199.33	24.29	9.206	
3,600.00	3,599.98	3,599.64	3,598.50	12.67	12.33	79.181	-218.38	-47.58	223.17	198.18	24.99	8.929	
3,700.00	3,699.84	3,698.82	3,697.68	13.00	12.68	80.288	-218.59	-46.73	222.24	196.56	25.68	8.654	
3,800.00	3,799.45	3,798.03	3,796.88	13.34	13.03	82.315	-219.09	-46.05	221.23	194.86	26.37	8.389	
3,900.00	3,898.80	3,897.88	3,896.72	13.68	13.39	85.119	-219.40	-45.54	220.12	193.05	27.07	8.132	
3,976.69	3,974.96	3,973.11	3,971.96	13.94	13.66	87.296	-219.77	-45.27	219.79	192.19	27.60	7.964	
4,000.00	3,998.12	3,996.32	3,995.17	14.02	13.74	87.968	-219.92	-45.21	219.80	192.04	27.76	7.917	
4,100.00	4,097.44	4,096.12	4,094.96	14.37	14.09	90.896	-220.49	-45.05	220.15	191.68	28.46	7.735	
4,200.00	4,196.76	4,195.86	4,194.70	14.72	14.45	93.807	-220.75	-44.74	220.73	191.56	29.16	7.569	
4,300.00	4,296.08	4,294.69	4,293.52	15.07	14.80	96.733	-221.10	-44.78	222.13	192.27	29.86	7.439	
4,400.00	4,395.41	4,393.88	4,392.72	15.42	15.15	99.592	-221.47	-44.67	224.06	193.49	30.56	7.331	
4,500.00	4,494.73	4,490.80	4,489.63	15.78	15.49	102.138	-222.70	-44.23	227.06	195.80	31.26	7.264	
4,600.00	4,594.05	4,587.41	4,586.16	16.13	15.84	104.124	-226.18	-43.09	231.90	199.95	31.95	7.258	
4,700.00	4,693.37	4,684.26	4,682.81	16.49	16.19	105.406	-232.02	-40.49	237.95	205.30	32.64	7.289	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 234H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 171-MWD												Offset Well Error:	0.00 usft
Reference	Vertical	Offset	Vertical	Semi Major Axis	Offset	Highside	Offset Wellbore Centre		Distance		Minimum	Separation	Warning
Measured	Depth	Measured	Depth	Reference	Offset	Toolface	+N/-S	+E/-W	Between	Between	Separation	Factor	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	Centres	Ellipses	(usft)		
4,800.00	4,792.69	4,780.07	4,778.19	16.85	16.54	106.083	-240.33	-37.13	245.59	212.27	33.33	7.369	
4,900.00	4,892.01	4,875.54	4,872.95	17.21	16.89	106.219	-251.16	-33.07	254.82	220.82	34.01	7.493	
5,000.00	4,991.34	4,972.41	4,968.68	17.57	17.25	105.765	-264.96	-27.85	265.57	230.87	34.70	7.653	
5,100.00	5,090.66	5,071.22	5,065.97	17.94	17.62	104.843	-280.86	-20.97	276.78	241.36	35.42	7.814	
5,200.00	5,189.98	5,171.99	5,165.18	18.30	18.00	103.963	-297.04	-13.85	287.97	251.80	36.17	7.961	
5,300.00	5,289.30	5,273.89	5,265.67	18.67	18.39	103.289	-312.29	-6.75	298.42	261.48	36.94	8.079	
5,400.00	5,388.62	5,371.98	5,362.45	19.04	18.77	102.685	-326.69	0.29	308.54	270.88	37.66	8.192	
5,500.00	5,487.94	5,468.46	5,457.36	19.40	19.15	101.886	-342.26	7.82	319.52	281.15	38.37	8.327	
5,600.00	5,587.27	5,565.43	5,552.41	19.77	19.54	100.849	-359.48	16.26	331.38	292.30	39.09	8.478	
5,700.00	5,686.59	5,663.41	5,648.29	20.14	19.93	99.755	-377.67	25.09	343.85	304.03	39.82	8.636	
5,800.00	5,785.91	5,761.02	5,743.74	20.51	20.33	98.722	-396.09	33.82	356.74	316.20	40.55	8.798	
5,900.00	5,885.23	5,858.22	5,838.59	20.89	20.73	97.624	-415.25	43.05	370.19	328.91	41.27	8.969	
6,000.00	5,984.55	5,955.27	5,933.15	21.26	21.14	96.544	-434.98	52.36	384.23	342.23	42.00	9.149	
6,100.00	6,083.87	6,062.79	6,038.05	21.63	21.60	95.411	-455.88	63.40	397.29	354.42	42.87	9.267	
6,200.00	6,183.20	6,160.00	6,133.12	22.01	22.01	94.599	-473.83	72.75	409.93	366.32	43.61	9.400	
6,300.00	6,282.52	6,261.66	6,232.83	22.38	22.44	94.008	-491.64	81.34	422.34	377.94	44.40	9.512	
6,400.00	6,381.84	6,360.46	6,329.83	22.76	22.85	93.526	-508.63	89.36	434.66	389.50	45.16	9.624	
6,500.00	6,481.16	6,461.33	6,428.82	23.13	23.28	93.022	-526.04	97.87	446.92	400.97	45.95	9.727	
6,600.00	6,580.48	6,564.87	6,530.73	23.51	23.71	92.712	-542.60	105.66	458.47	411.71	46.76	9.804	
6,700.00	6,679.81	6,672.42	6,636.91	23.89	24.16	92.587	-558.03	113.04	468.86	421.24	47.62	9.846	
6,800.00	6,779.13	6,782.82	6,746.36	24.26	24.60	92.729	-570.75	119.73	477.06	428.58	48.48	9.840	
6,900.00	6,878.45	6,887.25	6,850.26	24.64	25.01	93.145	-580.12	124.71	483.56	434.28	49.28	9.813	
7,000.00	6,977.77	6,990.01	6,952.70	25.02	25.40	93.842	-587.55	127.67	489.41	439.35	50.06	9.777	
7,100.00	7,077.09	7,090.05	7,052.46	25.40	25.78	94.517	-594.38	130.65	494.92	444.10	50.82	9.739	
7,200.00	7,176.41	7,179.00	7,140.90	25.78	26.13	94.790	-602.59	135.25	501.55	450.05	51.51	9.738	
7,300.00	7,275.74	7,268.65	7,229.61	26.16	26.50	94.730	-613.85	141.54	510.25	458.06	52.19	9.777	
7,400.00	7,375.06	7,359.38	7,318.96	26.54	26.88	94.425	-627.77	149.03	520.81	467.93	52.87	9.850	
7,500.00	7,474.38	7,458.09	7,415.85	26.92	27.31	93.955	-644.39	157.95	532.35	478.71	53.64	9.924	
7,600.00	7,573.70	7,559.29	7,515.23	27.30	27.75	93.505	-661.15	167.11	543.69	489.24	54.44	9.986	
7,700.00	7,673.02	7,652.88	7,606.69	27.68	28.16	92.873	-678.02	177.52	555.44	500.27	55.16	10.069	
7,800.00	7,772.55	7,751.37	7,702.65	28.06	28.61	92.148	-696.79	189.28	567.78	511.86	55.92	10.153	
7,900.00	7,872.35	7,856.53	7,805.56	28.42	29.08	91.225	-715.39	200.37	579.53	522.79	56.74	10.214	
8,000.00	7,972.31	7,956.92	7,903.99	28.77	29.52	90.116	-732.24	210.58	590.79	533.31	57.48	10.278	
8,100.00	8,072.31	8,056.02	8,000.93	29.11	29.97	-157.923	-749.21	222.21	602.18	543.99	58.19	10.349	
8,200.00	8,172.31	8,153.22	8,095.85	29.46	30.41	-159.600	-766.12	234.60	613.97	555.10	58.87	10.429	
8,300.00	8,272.31	8,247.22	8,187.47	29.80	30.84	-161.224	-782.99	247.10	626.65	567.13	59.51	10.529	
8,400.00	8,372.31	8,343.90	8,281.91	30.14	31.28	-162.684	-800.41	258.24	640.40	580.21	60.19	10.640	
8,500.00	8,472.31	8,446.35	8,382.33	30.48	31.74	-164.015	-817.82	268.59	653.93	593.00	60.93	10.732	
8,600.00	8,572.31	8,544.83	8,478.86	30.82	32.18	-165.268	-834.41	278.87	667.55	605.93	61.62	10.833	
8,700.00	8,672.31	8,639.72	8,571.80	31.17	32.61	-166.463	-850.51	289.18	681.51	619.23	62.28	10.943	
8,800.00	8,772.31	8,735.33	8,665.38	31.51	33.05	-167.598	-867.38	299.15	696.50	633.57	62.94	11.067	
8,900.00	8,872.31	8,837.00	8,765.17	31.85	33.51	-168.621	-884.68	308.20	711.44	647.77	63.67	11.174	
9,000.00	8,972.31	8,950.86	8,877.20	32.20	34.01	-169.627	-902.77	317.45	725.63	661.11	64.53	11.246	
9,100.00	9,072.31	9,054.76	8,979.48	32.54	34.47	-170.653	-917.51	328.08	737.95	672.68	65.27	11.306	
9,200.00	9,172.31	9,148.71	9,071.53	32.89	34.89	-171.791	-931.42	340.77	750.68	684.76	65.92	11.388	
9,300.00	9,272.31	9,245.59	9,166.54	33.23	35.33	-172.851	-946.05	352.81	764.12	697.53	66.59	11.475	
9,400.00	9,372.31	9,346.80	9,266.01	33.58	35.78	-173.804	-961.04	363.84	777.67	710.36	67.31	11.553	
9,500.00	9,472.31	9,452.33	9,369.97	33.92	36.24	-174.672	-975.91	374.19	790.79	722.72	68.07	11.617	
9,600.00	9,572.31	9,563.41	9,479.70	34.27	36.72	-175.488	-989.94	384.28	802.65	733.78	68.87	11.655	
9,700.00	9,672.31	9,666.43	9,581.67	34.61	37.15	-176.133	-1,002.12	392.45	813.91	744.31	69.60	11.694	
9,800.00	9,772.31	9,777.66	9,692.02	34.96	37.61	-176.700	-1,013.92	399.79	824.11	753.73	70.38	11.709	
9,900.00	9,872.31	9,889.67	9,803.38	35.31	38.06	-177.187	-1,024.14	406.28	832.93	761.77	71.16	11.705	

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



MS Directional Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 234H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 171-MWD													Offset Well Error: 0.00 usft
Rule Assigned:													Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Reference (usft)	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
10,000.00	9,972.31	9,995.61	9,908.87	35.65	38.47	-177.576	-1,032.43	411.57	840.53	768.64	71.89	11.692	
10,100.00	10,072.31	10,097.12	10,010.03	36.00	38.86	-177.852	-1,039.91	415.33	847.74	775.14	72.60	11.677	
10,200.00	10,172.31	10,197.57	10,110.15	36.35	39.24	-178.116	-1,047.11	418.99	854.79	781.49	73.30	11.661	
10,300.00	10,272.31	10,291.76	10,203.98	36.69	39.60	-178.403	-1,054.23	423.06	862.21	788.24	73.97	11.656	
10,400.00	10,372.05	10,418.29	10,329.91	37.05	40.09	89.532	-1,063.53	430.71	869.67	794.85	74.82	11.623	
10,500.00	10,468.70	10,606.78	10,512.43	37.46	40.81	89.785	-1,062.96	474.98	868.45	792.79	75.66	11.478	
10,600.00	10,558.06	10,705.00	10,596.55	37.90	41.21	89.999	-1,057.51	524.81	861.59	785.02	76.57	11.252	
10,700.00	10,636.21	10,766.92	10,642.73	38.38	41.49	90.165	-1,056.95	565.99	858.68	781.05	77.63	11.061	
10,800.00	10,699.75	10,920.38	10,729.01	38.91	42.30	89.750	-1,055.91	691.96	856.55	777.75	78.79	10.871	
10,900.00	10,745.88	11,008.32	10,762.41	39.51	42.82	90.007	-1,051.86	773.14	849.59	769.44	80.15	10.600	
11,000.00	10,772.61	11,071.40	10,778.55	40.19	43.25	90.395	-1,050.91	834.03	845.70	764.10	81.60	10.364	
11,027.65	10,776.65	11,087.33	10,780.76	40.39	43.36	90.404	-1,051.21	849.80	845.50	763.49	82.01	10.309	
11,100.00	10,779.78	11,140.02	10,782.95	40.92	43.77	90.367	-1,053.59	902.36	846.75	763.61	83.14	10.184	
11,200.00	10,781.99	11,259.39	10,782.44	41.76	44.82	90.153	-1,057.95	1,021.64	847.74	762.69	85.05	9.968	
11,284.71	10,783.87	11,345.10	10,782.10	42.56	45.68	90.002	-1,060.09	1,107.32	847.64	760.85	86.79	9.767	
11,300.00	10,784.21	11,359.57	10,782.04	42.71	45.83	89.976	-1,060.48	1,121.79	847.64	760.54	87.11	9.731	
11,400.00	10,786.43	11,463.66	10,781.24	43.75	46.99	89.766	-1,063.24	1,225.83	847.70	758.31	89.39	9.483	
11,500.00	10,788.64	11,570.02	10,779.31	44.90	48.29	89.476	-1,065.16	1,332.16	846.92	755.04	91.88	9.217	
11,600.00	10,790.86	11,705.64	10,778.74	46.12	50.09	89.230	-1,064.05	1,467.75	843.46	748.77	94.69	8.907	
11,700.00	10,793.08	11,828.17	10,780.02	47.43	51.83	89.125	-1,059.24	1,590.17	836.97	739.41	97.56	8.579	
11,800.00	10,795.29	11,934.70	10,781.90	48.81	53.41	89.082	-1,052.75	1,696.49	828.27	727.75	100.52	8.240	
11,900.00	10,797.51	12,040.89	10,782.59	50.27	55.06	88.955	-1,045.72	1,802.24	819.07	715.47	103.59	7.906	
12,000.00	10,799.73	12,110.28	10,781.48	51.78	56.19	88.761	-1,042.13	1,871.73	811.34	704.64	106.70	7.604	
12,100.00	10,801.94	12,176.81	10,779.45	53.35	57.32	88.508	-1,041.14	1,938.21	807.40	697.57	109.83	7.351	
12,141.48	10,802.86	12,203.79	10,778.79	54.02	57.78	88.418	-1,041.56	1,965.18	807.02	695.90	111.12	7.262	
12,200.00	10,804.16	12,250.01	10,778.03	54.97	58.60	88.293	-1,043.23	2,011.36	807.63	694.62	113.01	7.146	
12,300.00	10,806.37	12,344.99	10,779.00	56.64	60.30	88.216	-1,047.43	2,106.24	809.48	693.02	116.46	6.951	
12,400.00	10,808.59	12,457.77	10,779.71	58.35	62.39	88.095	-1,052.61	2,218.89	811.59	691.43	120.17	6.754	
12,500.00	10,810.81	12,602.59	10,785.46	60.10	65.11	88.267	-1,053.08	2,363.57	809.19	685.05	124.14	6.518	
12,600.00	10,813.02	12,706.43	10,783.86	61.88	67.10	87.977	-1,050.15	2,467.26	803.88	675.99	127.89	6.286	
12,700.00	10,815.24	12,794.18	10,778.53	63.71	68.80	87.445	-1,048.09	2,554.82	799.24	667.62	131.62	6.072	
12,800.00	10,817.46	12,882.00	10,773.72	65.56	70.53	86.950	-1,047.27	2,642.50	796.08	660.70	135.37	5.881	
12,876.65	10,819.15	12,940.35	10,770.97	67.00	71.71	86.655	-1,047.84	2,700.78	795.14	656.95	138.19	5.754	
12,900.00	10,819.67	12,957.88	10,770.40	67.43	72.06	86.586	-1,048.31	2,718.30	795.23	656.19	139.04	5.720	
13,000.00	10,821.89	13,038.51	10,769.34	69.34	73.71	86.388	-1,051.90	2,798.83	797.27	654.54	142.73	5.586	
13,100.00	10,824.11	13,125.55	10,770.63	71.27	75.51	86.359	-1,057.72	2,885.67	801.36	654.84	146.52	5.469	
13,200.00	10,826.32	13,233.33	10,774.74	73.22	77.77	86.505	-1,065.76	2,993.05	806.15	655.45	150.70	5.349	
13,300.00	10,828.54	13,381.71	10,786.08	75.19	80.90	87.086	-1,071.92	3,140.85	807.60	652.20	155.40	5.197	
13,400.00	10,830.75	13,527.53	10,797.58	77.18	83.98	87.650	-1,067.79	3,286.13	801.58	641.87	159.70	5.019	
13,500.00	10,832.97	13,620.90	10,803.54	79.18	85.96	87.911	-1,063.21	3,379.19	793.93	630.06	163.86	4.845	
13,600.00	10,835.19	13,715.25	10,804.90	81.20	87.98	87.841	-1,059.39	3,473.45	787.30	619.27	168.03	4.685	
13,700.00	10,837.40	13,804.14	10,803.02	83.24	89.89	87.545	-1,056.48	3,562.27	781.60	609.40	172.20	4.539	
13,800.00	10,839.62	13,902.10	10,802.39	85.29	92.02	87.324	-1,054.36	3,660.20	776.95	600.53	176.42	4.404	
13,900.00	10,841.84	14,014.08	10,804.45	87.35	94.46	87.271	-1,051.26	3,772.12	771.61	590.93	180.68	4.271	
14,000.00	10,844.05	14,129.87	10,806.16	89.42	96.99	87.176	-1,045.56	3,887.75	764.10	579.19	184.90	4.132	
14,100.00	10,846.27	14,223.08	10,808.18	91.51	99.04	87.144	-1,040.33	3,980.79	755.91	566.69	189.21	3.995	
14,200.00	10,848.49	14,298.00	10,807.79	93.60	100.70	86.971	-1,037.69	4,055.65	749.96	556.45	193.52	3.875	
14,287.38	10,850.42	14,354.22	10,805.99	95.44	101.96	86.732	-1,037.73	4,111.83	748.06	551.01	197.04	3.796	
14,300.00	10,850.70	14,362.13	10,805.69	95.71	102.13	86.696	-1,037.94	4,119.74	748.10	550.57	197.53	3.787	
14,400.00	10,852.92	14,428.76	10,803.34	97.82	103.64	86.412	-1,041.48	4,186.23	751.09	549.87	201.22	3.733	
14,500.00	10,855.13	14,500.74	10,803.73	99.94	105.27	86.345	-1,048.37	4,257.86	758.11	553.32	204.79	3.702	
14,600.00	10,857.35	14,581.00	10,806.93	102.07	107.09	86.491	-1,058.65	4,337.39	768.19	559.69	208.50	3.684	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 234H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 171-MWVD													Offset Well Error: 0.00 usft
Reference	Vertical	Offset	Vertical	Semi	Major	Axis	Rule Assigned:		Distance	Between	Minimum	Separation	Warning
Measured	Depth	Measured	Depth	Reference	Offset	Highside	Offset Wellbore Centre		Between	Centres	Separation	Factor	
Depth	(usft)	Depth	(usft)	(usft)	(usft)	Toolface	+N/-S	+E/-W	Centres	Ellipses	Separation	Factor	
(usft)		(usft)				(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
14,700.00	10,859.57	14,777.79	10,822.52	104.21	111.57	87.378	-1,076.28	4,532.61	775.26	559.91	215.34	3.600	
14,800.00	10,861.78	14,908.30	10,835.97	106.36	114.53	88.149	-1,075.70	4,662.41	771.83	551.86	219.97	3.509	
14,900.00	10,864.00	15,013.92	10,842.92	108.51	116.93	88.481	-1,072.64	4,767.75	766.18	541.77	224.41	3.414	
15,000.00	10,866.22	15,100.30	10,846.46	110.66	118.90	88.595	-1,070.33	4,854.02	760.90	532.04	228.86	3.325	
15,100.00	10,868.43	15,201.35	10,849.82	112.83	121.21	88.674	-1,069.66	4,955.02	757.61	524.28	233.33	3.247	
15,200.00	10,870.65	15,304.06	10,854.21	114.99	123.57	88.826	-1,067.34	5,057.60	752.69	514.89	237.80	3.165	
15,300.00	10,872.87	15,417.23	10,860.89	117.17	126.17	89.138	-1,064.65	5,170.53	747.69	505.45	242.25	3.087	
15,400.00	10,875.08	15,525.82	10,863.94	119.35	128.66	89.179	-1,059.88	5,278.97	740.68	494.03	246.66	3.003	
15,500.00	10,877.30	15,624.46	10,865.32	121.53	130.92	89.108	-1,055.05	5,377.49	733.19	482.04	251.15	2.919	
15,600.00	10,879.52	15,711.00	10,865.75	123.72	132.91	88.984	-1,051.53	5,463.95	726.56	470.83	255.73	2.841	
15,700.00	10,881.73	15,793.81	10,864.40	125.91	134.83	88.726	-1,049.84	5,546.73	722.03	461.78	260.25	2.774	
15,800.00	10,883.95	15,877.87	10,863.00	128.10	136.79	88.463	-1,050.25	5,630.77	719.99	455.33	264.66	2.720	
15,900.00	10,886.16	15,978.07	10,865.27	130.30	139.13	88.466	-1,052.15	5,730.92	719.28	450.08	269.20	2.672	
16,000.00	10,888.38	16,087.29	10,869.34	132.51	141.68	88.594	-1,053.29	5,840.05	717.67	443.85	273.82	2.621	
16,100.00	10,890.60	16,198.42	10,871.98	134.71	144.28	88.601	-1,052.69	5,951.15	714.51	436.11	278.40	2.566	
16,200.00	10,892.81	16,298.82	10,873.18	136.92	146.62	88.511	-1,051.37	6,051.53	710.62	427.67	282.94	2.512	
16,300.00	10,895.03	16,402.85	10,880.45	139.13	149.06	88.906	-1,050.08	6,155.27	706.66	419.15	287.51	2.458	
16,400.00	10,897.25	16,517.67	10,885.89	141.35	151.74	89.133	-1,046.67	6,269.91	701.03	409.07	291.96	2.401	
16,500.00	10,899.46	16,611.41	10,891.69	143.57	153.93	89.433	-1,042.90	6,363.39	694.38	397.79	296.59	2.341	
16,600.00	10,901.68	16,703.57	10,895.90	145.79	156.09	89.610	-1,040.96	6,455.42	689.63	388.42	301.21	2.290	
16,700.00	10,903.90	16,813.86	10,898.03	148.01	158.68	89.582	-1,038.13	6,565.66	684.47	378.77	305.70	2.239	
16,800.00	10,906.11	16,935.72	10,898.91	150.24	161.53	89.421	-1,032.01	6,687.36	676.88	367.02	309.86	2.184	
16,900.00	10,908.33	17,058.40	10,903.40	152.46	164.37	89.565	-1,020.57	6,809.38	664.73	351.11	313.62	2.120	
17,000.00	10,910.54	17,136.43	10,906.69	154.69	166.19	89.697	-1,014.07	6,887.07	653.74	334.82	318.93	2.050	
17,100.00	10,912.76	17,247.10	10,912.22	156.93	168.77	89.969	-1,004.36	6,997.17	642.25	319.15	323.10	1.988	
17,200.00	10,914.98	17,320.00	10,915.24	159.16	170.47	90.097	-999.80	7,069.85	633.30	304.86	328.44	1.928	
17,300.00	10,917.19	17,415.00	10,918.52	161.40	172.71	90.205	-995.88	7,164.72	626.57	293.46	333.10	1.881	
17,400.00	10,919.41	17,492.28	10,919.49	163.63	174.54	90.139	-994.12	7,241.96	621.76	283.88	337.87	1.840	
17,500.00	10,921.63	17,584.86	10,916.49	165.87	176.73	89.672	-994.93	7,334.48	619.99	277.52	342.47	1.810	
17,600.00	10,923.84	17,699.37	10,911.08	168.12	179.45	88.933	-995.02	7,448.85	617.57	270.48	347.10	1.779	
17,700.00	10,926.06	17,823.44	10,905.99	170.36	182.38	88.184	-990.50	7,572.73	611.39	260.12	351.28	1.740	
17,800.00	10,928.28	17,919.57	10,900.56	172.60	184.64	87.441	-985.15	7,668.55	603.53	247.68	355.85	1.696	
17,900.00	10,930.49	18,001.07	10,894.95	174.85	186.57	86.712	-982.40	7,749.81	598.00	237.44	360.56	1.659	
18,000.00	10,932.71	18,076.00	10,891.60	177.10	188.35	86.218	-982.12	7,824.66	595.60	230.73	364.87	1.632	
18,020.52	10,933.16	18,098.15	10,891.06	177.56	188.88	86.118	-982.49	7,846.80	595.47	229.65	365.81	1.628	
18,100.00	10,934.92	18,158.44	10,890.15	179.35	190.32	85.908	-984.87	7,907.03	596.74	227.83	368.91	1.618	
18,200.00	10,937.14	18,268.70	10,891.98	181.60	192.95	85.870	-990.79	8,017.11	599.57	225.73	373.84	1.604	
18,300.00	10,939.36	18,362.00	10,893.62	183.85	195.18	85.845	-995.46	8,110.26	601.97	223.70	378.27	1.591	
18,400.00	10,941.57	18,460.68	10,893.54	186.10	197.55	85.650	-1,000.84	8,208.79	604.97	222.19	382.78	1.580	
18,500.00	10,943.79	18,551.00	10,892.10	188.36	199.71	85.348	-1,006.22	8,298.93	608.61	221.70	386.91	1.573	
18,600.00	10,946.01	18,687.87	10,893.84	190.61	202.98	85.234	-1,010.56	8,435.66	608.97	216.56	392.42	1.552	
18,700.00	10,948.22	18,789.73	10,895.89	192.87	205.42	85.199	-1,011.29	8,537.49	607.10	210.06	397.04	1.529	
18,800.00	10,950.44	18,893.23	10,896.13	195.13	207.89	84.986	-1,011.65	8,640.99	605.02	203.44	401.58	1.507	
18,900.00	10,952.66	19,007.73	10,898.05	197.39	210.63	84.893	-1,010.52	8,755.47	601.51	195.45	406.07	1.481 Level 3	
19,000.00	10,954.87	19,110.34	10,898.91	199.65	213.08	84.710	-1,007.61	8,858.03	596.20	185.65	410.55	1.452 Level 3	
19,100.00	10,957.09	19,209.39	10,900.69	201.91	215.44	84.623	-1,004.87	8,957.02	590.89	175.75	415.14	1.423 Level 3	
19,200.00	10,959.30	19,304.00	10,904.43	204.17	217.70	84.741	-1,002.70	9,051.53	585.87	165.95	419.92	1.395 Level 3	
19,300.00	10,961.52	19,399.00	10,907.57	206.43	219.97	84.807	-1,001.34	9,146.47	581.75	157.11	424.64	1.370 Level 3	
19,400.00	10,963.74	19,505.11	10,911.59	208.70	222.51	84.936	-999.99	9,252.49	577.75	148.46	429.29	1.346 Level 3	
19,500.00	10,965.95	19,606.90	10,917.08	210.96	224.95	85.216	-997.82	9,354.11	572.75	138.70	434.05	1.320 Level 3	
19,600.00	10,968.17	19,700.52	10,921.21	213.23	227.19	85.394	-996.76	9,447.62	568.81	129.94	438.87	1.296 Level 3	
19,700.00	10,970.39	19,815.98	10,927.68	215.49	229.95	85.742	-993.76	9,562.86	563.31	119.95	443.36	1.271 Level 3	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0504 - Rana Salada Fed Com 0504 234H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 171-MWD														Offset Well Error:	0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Reference (usft)	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)		Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,800.00	10,972.60	19,892.00	10,932.20	217.76	231.77	85.997	-990.98	9,638.69	557.30	108.80	448.50	1.243	Level 2		
19,812.57	10,972.88	19,892.00	10,932.20	218.04	231.77	85.997	-990.98	9,638.69	557.16	108.20	448.96	1.241	Level 2, ES, SF		
19,900.00	10,974.82	19,892.00	10,932.20	220.03	231.77	85.997	-990.98	9,638.69	563.98	117.79	446.19	1.264	Level 3		
20,000.00	10,977.04	19,892.00	10,932.20	222.30	231.77	85.997	-990.98	9,638.69	587.84	156.36	431.47	1.362	Level 3		
20,100.00	10,979.25	19,892.00	10,932.20	224.57	231.77	85.997	-990.98	9,638.69	626.93	218.69	408.23	1.536			
20,200.00	10,981.47	19,892.00	10,932.20	226.84	231.77	85.997	-990.98	9,638.69	678.62	297.67	380.95	1.781			
20,300.00	10,983.69	19,892.00	10,932.20	229.11	231.77	85.997	-990.98	9,638.69	740.28	387.17	353.11	2.096			
20,400.00	10,985.90	19,892.00	10,932.20	231.38	231.77	85.997	-990.98	9,638.69	809.63	482.86	326.76	2.478			
20,500.00	10,988.12	19,892.00	10,932.20	233.65	231.77	85.997	-990.98	9,638.69	884.86	582.01	302.85	2.922			
20,600.00	10,990.33	19,892.00	10,932.20	235.92	231.77	85.997	-990.98	9,638.69	964.61	682.96	281.64	3.425			
20,700.00	10,992.55	19,892.00	10,932.20	238.19	231.77	85.997	-990.98	9,638.69	1,047.83	784.79	263.04	3.984			
20,800.00	10,994.77	19,892.00	10,932.20	240.47	231.77	85.997	-990.98	9,638.69	1,133.77	886.97	246.80	4.594			
20,900.00	10,996.98	19,892.00	10,932.20	242.74	231.77	85.997	-990.98	9,638.69	1,221.85	989.21	232.64	5.252			
21,000.00	10,999.20	19,892.00	10,932.20	245.02	231.77	85.997	-990.98	9,638.69	1,311.64	1,091.37	220.27	5.955			
21,100.00	11,001.42	19,892.00	10,932.20	247.29	231.77	85.997	-990.98	9,638.69	1,402.81	1,193.38	209.44	6.698			
21,200.00	11,003.63	19,892.00	10,932.20	249.57	231.77	85.997	-990.98	9,638.69	1,495.12	1,295.20	199.92	7.479			
21,216.59	11,004.00	19,892.00	10,932.20	249.95	231.77	85.997	-990.98	9,638.69	1,510.52	1,312.07	198.45	7.612			

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 121H - Wellbore #1 - Design #1												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM												Offset Well Error:	0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Reference (usft)	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)					
0.00	0.00	47.60	47.60	0.00	0.06	-61.383	2,612.32	-4,787.99	5,454.27				
100.00	100.00	147.60	147.60	0.13	0.31	-61.383	2,612.32	-4,787.99	5,454.27	5,453.83	0.44	N/A	
200.00	200.00	247.60	247.60	0.49	0.66	-61.383	2,612.32	-4,787.99	5,454.27	5,453.11	1.16	4,716.475	
300.00	300.00	347.60	347.60	0.85	1.02	-61.383	2,612.32	-4,787.99	5,454.27	5,452.40	1.87	2,911.471	
400.00	400.00	447.60	447.60	1.21	1.38	-61.383	2,612.32	-4,787.99	5,454.27	5,451.68	2.59	2,105.639	
500.00	500.00	547.60	547.60	1.57	1.74	-61.383	2,612.32	-4,787.99	5,454.27	5,450.96	3.31	1,649.182	
600.00	600.00	647.60	647.60	1.93	2.10	-61.383	2,612.32	-4,787.99	5,454.27	5,450.25	4.02	1,355.367	
700.00	700.00	747.60	747.60	2.29	2.46	-61.383	2,612.32	-4,787.99	5,454.27	5,449.53	4.74	1,150.412	
800.00	800.00	847.60	847.60	2.64	2.81	-61.383	2,612.32	-4,787.99	5,454.27	5,448.81	5.46	999.301	
900.00	900.00	947.60	947.60	3.00	3.17	-61.383	2,612.32	-4,787.99	5,454.27	5,448.10	6.18	883.278	
1,000.00	1,000.00	1,047.60	1,047.60	3.36	3.53	-61.383	2,612.32	-4,787.99	5,454.27	5,447.38	6.89	791.394	
1,100.00	1,100.00	1,147.60	1,147.60	3.72	3.89	-61.383	2,612.32	-4,787.99	5,454.27	5,446.66	7.61	716.826	
1,200.00	1,200.00	1,247.60	1,247.60	4.08	4.25	-61.383	2,612.32	-4,787.99	5,454.27	5,445.94	8.33	655.100	
1,300.00	1,300.00	1,347.60	1,347.60	4.44	4.61	-61.383	2,612.32	-4,787.99	5,454.27	5,445.23	9.04	603.161	
1,400.00	1,400.00	1,447.60	1,447.60	4.79	4.97	-61.383	2,612.32	-4,787.99	5,454.27	5,444.51	9.76	558.854	
1,500.00	1,500.00	1,547.60	1,547.60	5.15	5.32	-61.383	2,612.32	-4,787.99	5,454.27	5,443.79	10.48	520.610	
1,600.00	1,600.00	1,647.60	1,647.60	5.51	5.68	-61.383	2,612.32	-4,787.99	5,454.27	5,443.08	11.19	487.265	
1,700.00	1,700.00	1,747.60	1,747.60	5.87	6.04	-61.383	2,612.32	-4,787.99	5,454.27	5,442.36	11.91	457.935	
1,800.00	1,800.00	1,847.60	1,847.60	6.23	6.40	-61.383	2,612.32	-4,787.99	5,454.27	5,441.64	12.63	431.935	
1,900.00	1,900.00	1,947.60	1,947.60	6.59	6.76	-61.383	2,612.32	-4,787.99	5,454.27	5,440.93	13.34	408.729	
2,000.00	2,000.00	2,047.60	2,047.60	6.95	7.12	-61.383	2,612.32	-4,787.99	5,454.27	5,440.21	14.06	387.889	
2,100.00	2,100.00	2,147.60	2,147.60	7.30	7.47	-61.383	2,612.32	-4,787.99	5,454.27	5,439.49	14.78	369.072	
2,200.00	2,200.00	2,247.60	2,247.60	7.66	7.83	-61.383	2,612.32	-4,787.99	5,454.27	5,438.78	15.50	351.995	
2,300.00	2,300.00	2,347.60	2,347.60	8.02	8.19	-61.383	2,612.32	-4,787.99	5,454.27	5,438.06	16.21	336.429	
2,400.00	2,400.00	2,447.60	2,447.60	8.38	8.55	-61.383	2,612.32	-4,787.99	5,454.27	5,437.34	16.93	322.182	
2,500.00	2,500.00	2,547.60	2,547.60	8.74	8.91	-61.383	2,612.32	-4,787.99	5,454.27	5,436.62	17.65	309.092	
2,600.00	2,600.00	2,647.60	2,647.60	9.10	9.27	-61.383	2,612.32	-4,787.99	5,454.27	5,435.91	18.36	297.024	
2,700.00	2,700.00	2,747.60	2,747.60	9.45	9.63	-61.383	2,612.32	-4,787.99	5,454.27	5,435.19	19.08	285.863	
2,800.00	2,800.00	2,847.60	2,847.60	9.81	9.98	-61.383	2,612.32	-4,787.99	5,454.27	5,434.47	19.80	275.511	
2,900.00	2,900.00	2,947.60	2,947.60	10.17	10.34	-61.383	2,612.32	-4,787.99	5,454.27	5,433.76	20.51	265.882	
3,000.00	3,000.00	3,047.60	3,047.60	10.53	10.70	-61.383	2,612.32	-4,787.99	5,454.27	5,433.04	21.23	256.903	
3,100.00	3,100.00	3,147.60	3,147.60	10.89	11.06	-61.383	2,612.32	-4,787.99	5,454.27	5,432.32	21.95	248.511	
3,200.00	3,200.00	3,247.60	3,247.60	11.25	11.42	-61.383	2,612.32	-4,787.99	5,454.27	5,431.61	22.66	240.650	
3,300.00	3,300.00	3,347.60	3,347.60	11.61	11.78	-61.383	2,612.32	-4,787.99	5,454.27	5,430.89	23.38	233.271	
3,400.00	3,400.00	4,170.38	4,164.58	11.96	14.54	-61.998	2,537.38	-4,771.70	5,451.75	5,425.44	26.31	207.237	
3,500.00	3,500.00	4,268.34	4,260.54	12.32	14.88	-82.158	2,518.14	-4,767.52	5,438.82	5,411.62	27.00	201.461	
3,600.00	3,599.98	4,366.48	4,356.68	12.67	15.22	-175.895	2,498.85	-4,763.33	5,427.26	5,399.58	27.68	196.092	
3,700.00	3,699.84	4,464.92	4,453.10	13.00	15.57	-176.071	2,479.51	-4,759.12	5,419.41	5,391.05	28.35	191.145	
3,800.00	3,799.45	4,563.52	4,549.69	13.34	15.93	-176.245	2,460.14	-4,754.91	5,415.08	5,386.05	29.03	186.507	
3,900.00	3,898.80	4,662.18	4,646.34	13.68	16.29	-176.415	2,440.75	-4,750.70	5,413.52	5,383.80	29.72	182.142	
4,000.00	3,998.12	4,760.85	4,742.99	14.02	16.66	-176.585	2,421.37	-4,746.49	5,412.21	5,381.80	30.41	177.950	
4,100.00	4,097.44	4,859.51	4,839.63	14.37	17.03	-176.755	2,401.98	-4,742.27	5,410.95	5,379.84	31.11	173.919	
4,200.00	4,196.76	4,958.17	4,936.28	14.72	17.40	-176.925	2,382.59	-4,738.06	5,409.74	5,377.92	31.81	170.041	
4,300.00	4,296.08	5,056.83	5,032.93	15.07	17.78	-177.095	2,363.21	-4,733.85	5,408.57	5,376.05	32.52	166.310	
4,400.00	4,395.41	5,155.49	5,129.57	15.42	18.16	-177.265	2,343.82	-4,729.63	5,407.46	5,374.22	33.23	162.720	
4,500.00	4,494.73	5,254.15	5,228.22	15.78	18.54	-177.435	2,324.44	-4,725.42	5,406.39	5,372.44	33.95	159.262	
4,600.00	4,594.05	5,352.82	5,322.87	16.13	18.93	-177.605	2,305.05	-4,721.21	5,405.37	5,370.71	34.66	155.932	
4,700.00	4,693.37	5,451.48	5,419.51	16.49	19.32	-177.775	2,285.67	-4,716.99	5,404.40	5,369.02	35.39	152.724	
4,800.00	4,792.69	5,550.14	5,516.16	16.85	19.71	-177.946	2,266.28	-4,712.78	5,403.48	5,367.37	36.11	149.631	
4,900.00	4,892.01	5,648.80	5,612.80	17.21	20.11	-178.116	2,246.89	-4,708.57	5,402.61	5,365.77	36.84	146.649	
5,000.00	4,891.34	5,747.46	5,709.45	17.57	20.51	-178.286	2,227.51	-4,704.35	5,401.79	5,364.22	37.57	143.773	
5,100.00	5,090.66	5,846.12	5,806.10	17.94	20.90	-178.457	2,208.12	-4,700.14	5,401.02	5,362.71	38.31	140.997	

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



MS Directional
Anticollision Report



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Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 121H - Wellbore #1 - Design #1													Offset Site Error: 0.00 usft	
Survey Program: 0-MWD+HRGM			Offset					Rule Assigned:			Offset Well Error: 0.00 usft			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,200.00	5,189.98	5,944.78	5,902.74	18.30	21.31	-178.627	2,188.74	-4,695.93	5,400.30	5,361.25	39.04	138.317		
5,300.00	5,289.30	6,043.45	5,999.39	18.67	21.71	-178.798	2,169.35	-4,691.71	5,399.62	5,359.84	39.78	135.729		
5,400.00	5,388.62	6,142.11	6,096.04	19.04	22.11	-178.969	2,149.97	-4,687.50	5,399.00	5,358.47	40.52	133.228		
5,500.00	5,487.94	6,240.77	6,192.68	19.40	22.52	-179.139	2,130.58	-4,683.29	5,398.42	5,357.15	41.27	130.811		
5,600.00	5,587.27	6,339.43	6,289.33	19.77	22.93	-179.310	2,111.19	-4,679.07	5,397.90	5,355.88	42.02	128.474		
5,700.00	5,686.59	6,438.09	6,385.98	20.14	23.34	-179.481	2,091.81	-4,674.86	5,397.42	5,354.66	42.76	126.213		
5,800.00	5,785.91	15,347.18	10,815.00	20.51	115.76	-129.851	1,790.83	133.70	5,328.79	5,258.67	70.11	76.003		
5,900.00	5,885.23	15,360.02	10,815.27	20.89	116.04	-129.534	1,790.73	146.53	5,237.92	5,166.86	71.06	73.709		
6,000.00	5,984.55	15,372.86	10,815.55	21.26	116.32	-129.215	1,790.64	159.37	5,147.36	5,075.32	72.04	71.447		
6,100.00	6,083.87	15,385.70	10,815.83	21.63	116.60	-128.896	1,790.54	172.20	5,057.13	4,984.07	73.06	69.219		
6,200.00	6,183.20	15,398.53	10,816.11	22.01	116.87	-128.576	1,790.44	185.04	4,967.23	4,893.12	74.11	67.024		
6,300.00	6,282.52	15,411.37	10,816.39	22.38	117.15	-128.254	1,790.35	197.88	4,877.70	4,802.50	75.20	64.864		
6,400.00	6,381.84	15,424.21	10,816.66	22.76	117.43	-127.932	1,790.25	210.71	4,788.55	4,712.22	76.33	62.738		
6,500.00	6,481.16	15,437.05	10,816.94	23.13	117.71	-127.609	1,790.15	223.55	4,699.79	4,622.30	77.49	60.647		
6,600.00	6,580.48	15,449.89	10,817.22	23.51	117.99	-127.285	1,790.06	236.39	4,611.46	4,532.76	78.70	58.593		
6,700.00	6,679.81	15,462.73	10,817.50	23.89	118.27	-126.960	1,789.96	249.22	4,523.59	4,443.63	79.96	56.574		
6,800.00	6,779.13	15,475.57	10,817.78	24.26	118.55	-126.634	1,789.87	262.06	4,436.18	4,354.92	81.26	54.593		
6,900.00	6,878.45	15,488.41	10,818.05	24.64	118.83	-126.307	1,789.77	274.89	4,349.28	4,266.67	82.61	52.649		
7,000.00	6,977.77	15,501.25	10,818.33	25.02	119.11	-125.979	1,789.67	287.73	4,262.92	4,178.91	84.01	50.743		
7,100.00	7,077.09	15,514.09	10,818.61	25.40	119.39	-125.651	1,789.58	300.57	4,177.13	4,091.66	85.47	48.875		
7,200.00	7,176.41	15,526.93	10,818.89	25.78	119.67	-125.321	1,789.48	313.40	4,091.94	4,004.96	86.98	47.047		
7,300.00	7,275.74	15,539.77	10,819.16	26.16	119.95	-124.991	1,789.38	326.24	4,007.40	3,918.85	88.55	45.258		
7,400.00	7,375.06	15,552.61	10,819.44	26.54	120.23	-124.660	1,789.29	339.07	3,923.54	3,833.36	90.18	43.510		
7,500.00	7,474.38	15,565.45	10,819.72	26.92	120.51	-124.328	1,789.19	351.91	3,840.41	3,748.54	91.87	41.803		
7,600.00	7,573.70	15,578.29	10,820.00	27.30	120.79	-123.996	1,789.10	364.75	3,758.05	3,664.43	93.63	40.138		
7,700.00	7,673.02	15,591.12	10,820.28	27.68	121.07	-123.520	1,789.00	377.58	3,676.53	3,581.08	95.46	38.516		
7,800.00	7,772.55	15,602.17	10,820.52	28.06	121.31	-120.868	1,788.92	388.62	3,595.27	3,497.96	97.31	36.945		
7,900.00	7,872.35	15,610.03	10,820.69	28.42	121.49	-118.215	1,788.86	396.48	3,513.89	3,414.72	99.17	35.432		
8,000.00	7,972.31	15,614.69	10,820.79	28.77	121.59	-115.585	1,788.82	401.13	3,432.50	3,331.47	101.03	33.976		
8,100.00	8,072.31	15,616.97	10,820.84	29.11	121.64	-1.259	1,788.81	403.42	3,351.43	3,248.54	102.89	32.573		
8,200.00	8,172.31	15,619.14	10,820.88	29.46	121.69	-1.197	1,788.79	405.58	3,271.37	3,166.55	104.82	31.209		
8,300.00	8,272.31	15,621.30	10,820.93	29.80	121.73	-1.134	1,788.77	407.75	3,192.44	3,085.61	106.83	29.883		
8,400.00	8,372.31	15,623.46	10,820.98	30.14	121.78	-1.072	1,788.76	409.91	3,114.72	3,005.81	108.91	28.598		
8,500.00	8,472.31	15,625.63	10,821.02	30.48	121.83	-1.009	1,788.74	412.08	3,038.30	2,927.23	111.07	27.354		
8,600.00	8,572.31	15,627.79	10,821.07	30.82	121.88	-0.947	1,788.73	414.24	2,963.28	2,849.97	113.31	26.152		
8,700.00	8,672.31	15,629.96	10,821.12	31.17	121.92	-0.884	1,788.71	416.40	2,889.77	2,774.15	115.62	24.993		
8,800.00	8,772.31	15,632.12	10,821.16	31.51	121.97	-0.822	1,788.69	418.57	2,817.90	2,699.89	118.01	23.879		
8,900.00	8,872.31	15,634.28	10,821.21	31.85	122.02	-0.759	1,788.68	420.73	2,747.78	2,627.31	120.47	22.809		
9,000.00	8,972.31	15,636.45	10,821.26	32.20	122.06	-0.697	1,788.66	422.89	2,679.56	2,556.56	122.99	21.786		
9,100.00	9,072.31	15,638.61	10,821.30	32.54	122.11	-0.634	1,788.64	425.06	2,613.38	2,487.80	125.58	20.810		
9,200.00	9,172.31	15,640.78	10,821.35	32.89	122.16	-0.572	1,788.63	427.22	2,549.41	2,421.18	128.22	19.883		
9,300.00	9,272.31	15,642.94	10,821.40	33.23	122.21	-0.509	1,788.61	429.38	2,487.81	2,356.90	130.90	19.005		
9,400.00	9,372.31	15,645.10	10,821.44	33.58	122.25	-0.447	1,788.60	431.55	2,428.76	2,295.14	133.62	18.177		
9,500.00	9,472.31	15,647.27	10,821.49	33.92	122.30	-0.384	1,788.58	433.71	2,372.46	2,236.12	136.34	17.401		
9,600.00	9,572.31	15,649.43	10,821.54	34.27	122.35	-0.322	1,788.56	435.87	2,319.10	2,180.04	139.06	16.677		
9,700.00	9,672.31	15,651.60	10,821.58	34.61	122.40	-0.259	1,788.55	438.04	2,268.90	2,127.14	141.76	16.006		
9,800.00	9,772.31	15,653.76	10,821.63	34.96	122.44	-0.197	1,788.53	440.20	2,222.06	2,077.67	144.40	15.389		
9,900.00	9,872.31	15,655.93	10,821.68	35.31	122.49	-0.135	1,788.51	442.36	2,178.81	2,031.85	146.96	14.826		
10,000.00	9,972.31	15,658.09	10,821.73	35.65	122.54	-0.072	1,788.50	444.53	2,139.36	1,989.96	149.40	14.319		
10,100.00	10,072.31	15,660.25	10,821.77	36.00	122.59	-0.010	1,788.48	446.69	2,103.92	1,952.22	151.71	13.868		
10,200.00	10,172.31	15,662.42	10,821.82	36.35	122.63	0.053	1,788.47	448.85	2,072.71	1,918.88	153.83	13.474		
10,300.00	10,272.31	15,664.58	10,821.87	36.69	122.68	0.115	1,788.45	451.02	2,045.91	1,890.16	155.74	13.137		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 121H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM													Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Reference (usft)	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)		Minimum Separation (usft)	Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)						
10,400.00	10,372.05	15,671.94	10,822.02	37.05	122.84	-93.014	1,788.39	458.38	2,023.86	1,866.34	157.53	12.848		
10,500.00	10,468.70	15,698.96	10,822.61	37.46	123.43	-94.265	1,788.19	485.39	2,007.42	1,847.94	159.48	12.587		
10,600.00	10,558.06	15,745.37	10,823.61	37.90	124.45	-94.385	1,787.84	531.78	1,996.67	1,835.09	161.58	12.357		
10,700.00	10,636.21	15,809.13	10,824.99	38.38	125.85	-93.673	1,787.37	595.53	1,990.90	1,827.08	163.82	12.153		
10,800.00	10,699.75	15,887.46	10,826.69	38.91	127.57	-92.522	1,786.78	673.84	1,988.91	1,822.67	166.23	11.964		
10,826.74	10,713.89	15,910.45	10,827.19	39.07	128.07	-92.193	1,786.61	696.82	1,988.83	1,821.91	166.92	11.915 CC		
10,900.00	10,745.88	15,976.93	10,828.63	39.51	129.53	-91.341	1,786.11	763.29	1,989.28	1,820.44	168.84	11.782		
11,000.00	10,772.61	16,073.65	10,830.72	40.19	131.66	-90.476	1,785.38	859.98	1,990.79	1,819.15	171.64	11.599		
11,100.00	10,779.78	16,173.39	10,832.88	40.92	133.86	-90.182	1,784.64	959.69	1,992.62	1,818.05	174.58	11.414		
11,200.00	10,781.99	16,273.37	10,835.04	41.76	136.07	-90.180	1,783.89	1,059.65	1,994.48	1,816.86	177.63	11.228		
11,300.00	10,784.21	16,373.35	10,837.20	42.71	138.28	-90.178	1,783.14	1,159.60	1,996.35	1,815.56	180.79	11.042		
11,400.00	10,786.43	16,473.34	10,839.37	43.75	140.49	-90.177	1,782.39	1,259.56	1,998.21	1,814.15	184.05	10.857		
11,500.00	10,788.64	16,573.32	10,841.53	44.90	142.71	-90.175	1,781.64	1,359.52	2,000.07	1,812.65	187.41	10.672		
11,600.00	10,790.86	16,673.30	10,843.69	46.12	144.93	-90.174	1,780.89	1,459.47	2,001.93	1,811.06	190.87	10.489		
11,700.00	10,793.08	16,773.28	10,845.86	47.43	147.15	-90.172	1,780.14	1,559.43	2,003.79	1,809.39	194.40	10.308		
11,800.00	10,795.29	16,873.27	10,848.02	48.81	149.37	-90.170	1,779.39	1,659.39	2,005.65	1,807.64	198.01	10.129		
11,900.00	10,797.51	16,973.25	10,850.19	50.27	151.60	-90.169	1,778.65	1,759.34	2,007.51	1,805.83	201.69	9.954		
12,000.00	10,799.73	17,073.23	10,852.35	51.78	153.83	-90.167	1,777.90	1,859.30	2,009.37	1,803.94	205.43	9.781		
12,100.00	10,801.94	17,173.21	10,854.51	53.35	156.06	-90.165	1,777.15	1,959.26	2,011.23	1,802.00	209.23	9.612		
12,200.00	10,804.16	17,273.20	10,856.68	54.97	158.29	-90.164	1,776.40	2,059.21	2,013.10	1,800.01	213.09	9.447		
12,300.00	10,806.37	17,373.18	10,858.84	56.64	160.53	-90.162	1,775.65	2,159.17	2,014.96	1,797.96	216.99	9.286		
12,400.00	10,808.59	17,473.16	10,861.00	58.35	162.76	-90.160	1,774.90	2,259.12	2,016.82	1,795.87	220.94	9.128		
12,500.00	10,810.81	17,573.15	10,863.17	60.10	165.00	-90.159	1,774.15	2,359.08	2,018.68	1,793.74	224.93	8.975		
12,600.00	10,813.02	17,673.13	10,865.33	61.88	167.24	-90.157	1,773.40	2,459.04	2,020.54	1,791.58	228.96	8.825		
12,700.00	10,815.24	17,773.11	10,867.50	63.71	169.48	-90.156	1,772.65	2,558.99	2,022.40	1,789.37	233.03	8.679		
12,800.00	10,817.46	17,873.09	10,869.66	65.56	171.73	-90.154	1,771.90	2,658.95	2,024.26	1,787.14	237.12	8.537		
12,900.00	10,819.67	17,973.08	10,871.82	67.43	173.97	-90.152	1,771.15	2,758.91	2,026.12	1,784.87	241.25	8.398		
13,000.00	10,821.89	18,073.06	10,873.99	69.34	176.22	-90.151	1,770.41	2,858.86	2,027.98	1,782.58	245.40	8.264		
13,100.00	10,824.11	18,173.04	10,876.15	71.27	178.47	-90.149	1,769.66	2,958.82	2,029.85	1,780.27	249.58	8.133		
13,200.00	10,826.32	18,273.02	10,878.31	73.22	180.72	-90.148	1,768.91	3,058.78	2,031.71	1,777.93	253.78	8.006		
13,300.00	10,828.54	18,373.01	10,880.48	75.19	182.97	-90.146	1,768.16	3,158.73	2,033.57	1,775.57	258.00	7.882		
13,400.00	10,830.75	18,472.99	10,882.64	77.18	185.22	-90.144	1,767.41	3,258.69	2,035.43	1,773.19	262.24	7.762		
13,500.00	10,832.97	18,572.97	10,884.80	79.18	187.47	-90.143	1,766.66	3,358.65	2,037.29	1,770.79	266.50	7.645		
13,600.00	10,835.19	18,672.95	10,886.97	81.20	189.73	-90.141	1,765.91	3,458.60	2,039.15	1,768.37	270.78	7.531		
13,700.00	10,837.40	18,772.94	10,889.13	83.24	191.98	-90.140	1,765.16	3,558.56	2,041.01	1,765.94	275.07	7.420		
13,800.00	10,839.62	18,872.92	10,891.30	85.29	194.24	-90.138	1,764.41	3,658.52	2,042.87	1,763.50	279.38	7.312		
13,900.00	10,841.84	18,972.90	10,893.46	87.35	196.49	-90.136	1,763.66	3,758.47	2,044.74	1,761.04	283.70	7.207		
14,000.00	10,844.05	19,072.89	10,895.62	89.42	198.75	-90.135	1,762.91	3,858.43	2,046.60	1,758.57	288.03	7.105		
14,100.00	10,846.27	19,172.87	10,897.79	91.51	201.01	-90.133	1,762.17	3,958.38	2,048.46	1,756.08	292.38	7.006		
14,200.00	10,848.49	19,272.85	10,899.95	93.60	203.27	-90.132	1,761.42	4,058.34	2,050.32	1,753.59	296.73	6.910		
14,300.00	10,850.70	19,372.83	10,902.11	95.71	205.53	-90.130	1,760.67	4,158.30	2,052.18	1,751.08	301.10	6.816		
14,400.00	10,852.92	19,472.82	10,904.28	97.82	207.80	-90.129	1,759.92	4,258.25	2,054.04	1,748.57	305.48	6.724		
14,500.00	10,855.13	19,572.80	10,906.44	99.94	210.06	-90.127	1,759.17	4,358.21	2,055.90	1,746.04	309.86	6.635		
14,600.00	10,857.35	19,672.78	10,908.60	102.07	212.32	-90.125	1,758.42	4,458.17	2,057.76	1,743.51	314.26	6.548		
14,700.00	10,859.57	19,772.76	10,910.77	104.21	214.59	-90.124	1,757.67	4,558.12	2,059.62	1,740.97	318.66	6.463		
14,800.00	10,861.78	19,872.75	10,912.93	106.36	216.85	-90.122	1,756.92	4,658.08	2,061.49	1,738.42	323.07	6.381		
14,900.00	10,864.00	19,972.73	10,915.10	108.51	219.12	-90.121	1,756.17	4,758.04	2,063.35	1,735.86	327.49	6.301		
15,000.00	10,866.22	20,072.71	10,917.26	110.66	221.39	-90.119	1,755.42	4,857.99	2,065.21	1,733.30	331.91	6.222		
15,100.00	10,868.43	20,172.69	10,919.42	112.83	223.65	-90.118	1,754.68	4,957.95	2,067.07	1,730.73	336.34	6.146		
15,200.00	10,870.65	20,272.68	10,921.59	114.99	225.92	-90.116	1,753.93	5,057.91	2,068.93	1,728.15	340.78	6.071		
15,300.00	10,872.87	20,372.66	10,923.75	117.17	228.19	-90.115	1,753.18	5,157.86	2,070.79	1,725.57	345.22	5.998		
15,400.00	10,875.08	20,472.64	10,925.91	119.35	230.46	-90.113	1,752.43	5,257.82	2,072.65	1,722.98	349.67	5.927		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 121H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM													Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Reference	Major Axis Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)						
15,500.00	10,877.30	20,572.63	10,928.08	121.53	232.73	-90.111	1,751.68	5,357.77	2,074.51	1,720.39	354.12	5.858		
15,600.00	10,879.52	20,672.61	10,930.24	123.72	235.00	-90.110	1,750.93	5,457.73	2,076.38	1,717.79	358.58	5.791		
15,700.00	10,881.73	20,772.59	10,932.40	125.91	237.27	-90.108	1,750.18	5,557.69	2,078.24	1,715.19	363.05	5.724		
15,800.00	10,883.95	20,872.57	10,934.57	128.10	239.54	-90.107	1,749.43	5,657.64	2,080.10	1,712.58	367.51	5.660		
15,900.00	10,886.16	20,972.56	10,936.73	130.30	241.82	-90.105	1,748.68	5,757.60	2,081.96	1,709.97	371.99	5.597 ES		
16,000.00	10,888.38	20,984.94	10,937.00	132.51	242.10	-90.105	1,748.59	5,769.98	2,085.66	1,711.91	373.75	5.580 SF		
16,100.00	10,890.60	20,984.94	10,937.00	134.71	242.10	-90.105	1,748.59	5,769.98	2,094.10	1,719.74	374.36	5.594		
16,200.00	10,892.81	20,984.94	10,937.00	136.92	242.10	-90.105	1,748.59	5,769.98	2,107.26	1,733.08	374.18	5.632		
16,300.00	10,895.03	20,984.94	10,937.00	139.13	242.10	-90.105	1,748.59	5,769.98	2,125.04	1,751.81	373.23	5.694		
16,400.00	10,897.25	20,984.94	10,937.00	141.35	242.10	-90.105	1,748.59	5,769.98	2,147.34	1,775.79	371.56	5.779		
16,500.00	10,899.46	20,984.94	10,937.00	143.57	242.10	-90.105	1,748.59	5,769.98	2,174.02	1,804.80	369.22	5.888		
16,600.00	10,901.68	20,984.94	10,937.00	145.79	242.10	-90.105	1,748.59	5,769.98	2,204.91	1,838.64	366.27	6.020		
16,700.00	10,903.90	20,984.94	10,937.00	148.01	242.10	-90.105	1,748.59	5,769.98	2,239.84	1,877.05	362.79	6.174		
16,800.00	10,906.11	20,984.94	10,937.00	150.24	242.10	-90.105	1,748.59	5,769.98	2,278.63	1,919.78	358.85	6.350		
16,900.00	10,908.33	20,984.94	10,937.00	152.46	242.10	-90.105	1,748.59	5,769.98	2,321.09	1,966.57	354.52	6.547		
17,000.00	10,910.54	20,984.94	10,937.00	154.69	242.10	-90.105	1,748.59	5,769.98	2,367.01	2,017.14	349.86	6.766		
17,100.00	10,912.76	20,984.94	10,937.00	156.93	242.10	-90.105	1,748.59	5,769.98	2,416.19	2,071.24	344.95	7.004		
17,200.00	10,914.98	20,984.94	10,937.00	159.16	242.10	-90.105	1,748.59	5,769.98	2,468.45	2,128.61	339.84	7.263		
17,300.00	10,917.19	20,984.94	10,937.00	161.40	242.10	-90.105	1,748.59	5,769.98	2,523.60	2,189.00	334.60	7.542		
17,400.00	10,919.41	20,984.94	10,937.00	163.63	242.10	-90.105	1,748.59	5,769.98	2,581.44	2,252.17	329.26	7.840		
17,500.00	10,921.63	20,984.94	10,937.00	165.87	242.10	-90.105	1,748.59	5,769.98	2,641.80	2,317.91	323.88	8.157		
17,600.00	10,923.84	20,984.94	10,937.00	168.12	242.10	-90.105	1,748.59	5,769.98	2,704.51	2,386.01	318.49	8.492		
17,700.00	10,926.06	20,984.94	10,937.00	170.36	242.10	-90.105	1,748.59	5,769.98	2,769.41	2,456.28	313.13	8.844		
17,800.00	10,928.28	20,984.94	10,937.00	172.60	242.10	-90.105	1,748.59	5,769.98	2,836.35	2,528.55	307.81	9.215		
17,900.00	10,930.49	20,984.94	10,937.00	174.85	242.10	-90.105	1,748.59	5,769.98	2,905.20	2,602.63	302.56	9.602		
18,000.00	10,932.71	20,984.94	10,937.00	177.10	242.10	-90.105	1,748.59	5,769.98	2,975.81	2,678.40	297.41	10.006		
18,100.00	10,934.92	20,984.94	10,937.00	179.35	242.10	-90.105	1,748.59	5,769.98	3,048.07	2,755.71	292.36	10.426		
18,200.00	10,937.14	20,984.94	10,937.00	181.60	242.10	-90.105	1,748.59	5,769.98	3,121.86	2,834.43	287.43	10.861		
18,300.00	10,939.36	20,984.94	10,937.00	183.85	242.10	-90.105	1,748.59	5,769.98	3,197.07	2,914.46	282.62	11.312		
18,400.00	10,941.57	20,984.94	10,937.00	186.10	242.10	-90.105	1,748.59	5,769.98	3,273.61	2,995.68	277.93	11.778		
18,500.00	10,943.79	20,984.94	10,937.00	188.36	242.10	-90.105	1,748.59	5,769.98	3,351.39	3,078.01	273.38	12.259		
18,600.00	10,946.01	20,984.94	10,937.00	190.61	242.10	-90.105	1,748.59	5,769.98	3,430.32	3,161.35	268.97	12.753		
18,700.00	10,948.22	20,984.94	10,937.00	192.87	242.10	-90.105	1,748.59	5,769.98	3,510.32	3,245.63	264.70	13.262		
18,800.00	10,950.44	20,984.94	10,937.00	195.13	242.10	-90.105	1,748.59	5,769.98	3,591.33	3,330.77	260.56	13.783		
18,900.00	10,952.66	20,984.94	10,937.00	197.39	242.10	-90.105	1,748.59	5,769.98	3,673.27	3,416.72	256.55	14.318		
19,000.00	10,954.87	20,984.94	10,937.00	199.65	242.10	-90.105	1,748.59	5,769.98	3,756.09	3,503.41	252.68	14.865		
19,100.00	10,957.09	20,984.94	10,937.00	201.91	242.10	-90.105	1,748.59	5,769.98	3,839.72	3,590.79	248.94	15.425		
19,200.00	10,959.30	20,984.94	10,937.00	204.17	242.10	-90.105	1,748.59	5,769.98	3,924.12	3,678.80	245.32	15.996		
19,300.00	10,961.52	20,984.94	10,937.00	206.43	242.10	-90.105	1,748.59	5,769.98	4,009.24	3,767.41	241.83	16.579		
19,400.00	10,963.74	20,984.94	10,937.00	208.70	242.10	-90.105	1,748.59	5,769.98	4,095.03	3,856.57	238.46	17.173		
19,500.00	10,965.95	20,984.94	10,937.00	210.96	242.10	-90.105	1,748.59	5,769.98	4,181.45	3,946.24	235.21	17.777		
19,600.00	10,968.17	20,984.94	10,937.00	213.23	242.10	-90.105	1,748.59	5,769.98	4,268.47	4,036.40	232.07	18.393		
19,700.00	10,970.39	20,984.94	10,937.00	215.49	242.10	-90.105	1,748.59	5,769.98	4,356.04	4,127.00	229.05	19.018		
19,800.00	10,972.60	20,984.94	10,937.00	217.76	242.10	-90.105	1,748.59	5,769.98	4,444.14	4,218.01	226.13	19.653		
19,900.00	10,974.82	20,984.94	10,937.00	220.03	242.10	-90.105	1,748.59	5,769.98	4,532.73	4,309.42	223.31	20.298		
20,000.00	10,977.04	20,984.94	10,937.00	222.30	242.10	-90.105	1,748.59	5,769.98	4,621.79	4,401.20	220.59	20.952		
20,100.00	10,979.25	20,984.94	10,937.00	224.57	242.10	-90.105	1,748.59	5,769.98	4,711.28	4,493.32	217.96	21.615		
20,200.00	10,981.47	20,984.94	10,937.00	226.84	242.10	-90.105	1,748.59	5,769.98	4,801.20	4,585.77	215.43	22.287		
20,300.00	10,983.69	20,984.94	10,937.00	229.11	242.10	-90.105	1,748.59	5,769.98	4,891.50	4,678.52	212.98	22.967		
20,400.00	10,985.90	20,984.94	10,937.00	231.38	242.10	-90.105	1,748.59	5,769.98	4,982.17	4,771.55	210.62	23.655		
20,500.00	10,988.12	20,984.94	10,937.00	233.65	242.10	-90.105	1,748.59	5,769.98	5,073.19	4,864.85	208.34	24.351		
20,600.00	10,990.33	20,984.94	10,937.00	235.92	242.10	-90.105	1,748.59	5,769.98	5,164.55	4,958.41	206.14	25.054		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 121H - Wellbore #1 - Design #1													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	Rule Assigned:		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)		Reference (usft)	Offset (usft)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
20,700.00	10,992.55	20,984.94	10,937.00		238.19	242.10	-90.105	1,748.59	5,769.98	5,256.22	5,052.21	204.01	25.764	
20,800.00	10,994.77	20,984.94	10,937.00		240.47	242.10	-90.105	1,748.59	5,769.98	5,348.19	5,146.23	201.96	26.482	
20,900.00	10,996.98	20,984.94	10,937.00		242.74	242.10	-90.105	1,748.59	5,769.98	5,440.44	5,240.47	199.97	27.206	
21,000.00	10,999.20	20,984.94	10,937.00		245.02	242.10	-90.105	1,748.59	5,769.98	5,532.96	5,334.91	198.05	27.937	
21,100.00	11,001.42	20,984.94	10,937.00		247.29	242.10	-90.105	1,748.59	5,769.98	5,625.74	5,429.54	196.20	28.674	
21,200.00	11,003.63	20,984.94	10,937.00		249.57	242.10	-90.105	1,748.59	5,769.98	5,718.76	5,524.36	194.40	29.417	
21,216.59	11,004.00	20,984.94	10,937.00		249.95	242.10	-90.105	1,748.59	5,769.98	5,734.21	5,540.10	194.11	29.541	



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 211H - Wellbore #1 - Design #2												Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM												Offset Well Error:	0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Reference Offset	Major Axis Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Minimum Separation (usft)	Separation Factor	Warning	
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Ellipses (usft)				
0.00	0.00	47.70	47.70	0.00	0.06	-61.484	2,612.28	-4,808.01	5,471.83				
100.00	100.00	147.70	147.70	0.13	0.31	-61.484	2,612.28	-4,808.01	5,471.83	5,471.39	0.44	N/A	
200.00	200.00	247.70	247.70	0.49	0.66	-61.484	2,612.28	-4,808.01	5,471.83	5,470.68	1.16	4,730.196	
300.00	300.00	347.70	347.70	0.85	1.02	-61.484	2,612.28	-4,808.01	5,471.83	5,469.96	1.87	2,920.288	
400.00	400.00	447.70	447.70	1.21	1.38	-61.484	2,612.28	-4,808.01	5,471.83	5,469.24	2.59	2,112.127	
500.00	500.00	547.70	547.70	1.57	1.74	-61.484	2,612.28	-4,808.01	5,471.83	5,468.53	3.31	1,654.313	
600.00	600.00	647.70	647.70	1.93	2.10	-61.484	2,612.28	-4,808.01	5,471.83	5,467.81	4.02	1,359.610	
700.00	700.00	747.70	747.70	2.29	2.46	-61.484	2,612.28	-4,808.01	5,471.83	5,467.09	4.74	1,154.029	
800.00	800.00	847.70	847.70	2.64	2.81	-61.484	2,612.28	-4,808.01	5,471.83	5,466.38	5.46	1,002.453	
900.00	900.00	947.70	947.70	3.00	3.17	-61.484	2,612.28	-4,808.01	5,471.83	5,465.66	6.18	886.071	
1,000.00	1,000.00	1,047.70	1,047.70	3.36	3.53	-61.484	2,612.28	-4,808.01	5,471.83	5,464.94	6.89	793.902	
1,100.00	1,100.00	1,147.70	1,147.70	3.72	3.89	-61.484	2,612.28	-4,808.01	5,471.83	5,464.22	7.61	719.101	
1,200.00	1,200.00	1,247.70	1,247.70	4.08	4.25	-61.484	2,612.28	-4,808.01	5,471.83	5,463.51	8.33	657.181	
1,300.00	1,300.00	1,347.70	1,347.70	4.44	4.61	-61.484	2,612.28	-4,808.01	5,471.83	5,462.79	9.04	605.080	
1,400.00	1,400.00	1,447.70	1,447.70	4.79	4.97	-61.484	2,612.28	-4,808.01	5,471.83	5,462.07	9.76	560.633	
1,500.00	1,500.00	1,547.70	1,547.70	5.15	5.32	-61.484	2,612.28	-4,808.01	5,471.83	5,461.36	10.48	522.269	
1,600.00	1,600.00	1,647.70	1,647.70	5.51	5.68	-61.484	2,612.28	-4,808.01	5,471.83	5,460.64	11.19	488.819	
1,700.00	1,700.00	1,747.70	1,747.70	5.87	6.04	-61.484	2,612.28	-4,808.01	5,471.83	5,459.92	11.91	459.396	
1,800.00	1,800.00	1,847.70	1,847.70	6.23	6.40	-61.484	2,612.28	-4,808.01	5,471.83	5,459.21	12.63	433.314	
1,900.00	1,900.00	1,947.70	1,947.70	6.59	6.76	-61.484	2,612.28	-4,808.01	5,471.83	5,458.49	13.34	410.034	
2,000.00	2,000.00	2,047.70	2,047.70	6.95	7.12	-61.484	2,612.28	-4,808.01	5,471.83	5,457.77	14.06	389.129	
2,100.00	2,100.00	2,147.70	2,147.70	7.30	7.47	-61.484	2,612.28	-4,808.01	5,471.83	5,457.06	14.78	370.251	
2,200.00	2,200.00	2,247.70	2,247.70	7.66	7.83	-61.484	2,612.28	-4,808.01	5,471.83	5,456.34	15.50	353.121	
2,300.00	2,300.00	2,347.70	2,347.70	8.02	8.19	-61.484	2,612.28	-4,808.01	5,471.83	5,455.62	16.21	337.505	
2,400.00	2,400.00	2,447.70	2,447.70	8.38	8.55	-61.484	2,612.28	-4,808.01	5,471.83	5,454.90	16.93	323.212	
2,500.00	2,500.00	2,547.70	2,547.70	8.74	8.91	-61.484	2,612.28	-4,808.01	5,471.83	5,454.19	17.65	310.081	
2,600.00	2,600.00	2,647.70	2,647.70	9.10	9.27	-61.484	2,612.28	-4,808.01	5,471.83	5,453.47	18.36	297.975	
2,700.00	2,700.00	2,747.70	2,747.70	9.45	9.63	-61.484	2,612.28	-4,808.01	5,471.83	5,452.75	19.08	286.778	
2,800.00	2,800.00	2,847.70	2,847.70	9.81	9.98	-61.484	2,612.28	-4,808.01	5,471.83	5,452.04	19.80	276.393	
2,900.00	2,900.00	2,947.70	2,947.70	10.17	10.34	-61.484	2,612.28	-4,808.01	5,471.83	5,451.32	20.51	266.733	
3,000.00	3,000.00	3,047.70	3,047.70	10.53	10.70	-61.484	2,612.28	-4,808.01	5,471.83	5,450.60	21.23	257.726	
3,100.00	3,100.00	3,147.70	3,147.70	10.89	11.06	-61.484	2,612.28	-4,808.01	5,471.83	5,449.89	21.95	249.307	
3,200.00	3,200.00	3,247.70	3,247.70	11.25	11.42	-61.484	2,612.28	-4,808.01	5,471.83	5,449.17	22.67	241.421	
3,300.00	3,300.00	3,347.70	3,347.70	11.61	11.78	-61.484	2,612.28	-4,808.01	5,471.83	5,448.45	23.38	234.019	
3,400.00	3,400.00	3,447.70	3,447.70	11.96	12.13	-61.484	2,612.28	-4,808.01	5,471.83	5,447.74	24.10	227.057	
3,500.00	3,500.00	3,743.18	3,742.89	12.32	13.18	-61.386	2,618.43	-4,799.73	5,470.98	5,445.49	25.49	214.649	
3,600.00	3,599.98	3,848.15	3,847.46	12.67	13.55	-174.863	2,623.87	-4,792.39	5,469.06	5,442.86	26.20	208.730	
3,605.08	3,605.06	3,853.22	3,852.51	12.69	13.57	-174.859	2,624.13	-4,792.04	5,469.06	5,442.82	26.24	208.453	
3,700.00	3,699.84	3,947.86	3,946.79	13.00	13.91	-174.783	2,629.04	-4,785.42	5,470.63	5,443.74	26.89	203.468	
3,800.00	3,799.45	4,047.47	4,046.02	13.34	14.26	-174.699	2,634.21	-4,778.46	5,475.68	5,448.10	27.57	198.583	
3,900.00	3,898.80	4,146.93	4,145.11	13.68	14.61	-174.623	2,639.37	-4,771.50	5,483.45	5,455.18	28.26	194.024	
4,000.00	3,998.12	4,246.38	4,244.18	14.02	14.97	-174.552	2,644.53	-4,764.55	5,491.42	5,462.47	28.95	189.680	
4,100.00	4,097.44	4,345.83	4,343.25	14.37	15.33	-174.481	2,649.70	-4,757.59	5,499.40	5,469.76	29.64	185.523	
4,200.00	4,196.76	4,445.28	4,442.32	14.72	15.68	-174.410	2,654.86	-4,750.64	5,507.40	5,477.06	30.34	181.543	
4,300.00	4,296.08	4,544.73	4,541.39	15.07	16.04	-174.340	2,660.02	-4,743.69	5,515.40	5,484.36	31.03	177.729	
4,400.00	4,395.41	4,644.18	4,640.46	15.42	16.40	-174.269	2,665.18	-4,736.73	5,523.41	5,491.68	31.73	174.073	
4,500.00	4,494.73	4,743.63	4,739.53	15.78	16.76	-174.199	2,670.34	-4,729.78	5,531.42	5,498.99	32.43	170.564	
4,600.00	4,494.05	4,843.07	4,838.60	16.13	17.12	-174.129	2,675.50	-4,722.82	5,539.45	5,506.32	33.13	167.196	
4,700.00	4,493.37	4,942.52	4,937.68	16.49	17.48	-174.059	2,680.66	-4,715.87	5,547.48	5,513.65	33.83	163.959	
4,800.00	4,492.69	5,041.97	5,036.75	16.85	17.84	-173.990	2,685.82	-4,708.92	5,555.52	5,520.99	34.54	160.848	
4,900.00	4,492.01	5,141.42	5,135.82	17.21	18.20	-173.920	2,690.98	-4,701.96	5,563.57	5,528.33	35.24	157.855	
5,000.00	4,491.34	5,240.87	5,234.89	17.57	18.56	-173.851	2,696.14	-4,695.01	5,571.63	5,535.68	35.95	154.974	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 211H - Wellbore #1 - Design #2													Offset Site Error:	0.00 usft
Survey Program: O-MWD+HRGM													Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Reference	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)						
5,100.00	5,090.66	5,340.32	5,333.96	17.94	18.93	-173.782	2,701.30	-4,688.05	5,579.70	5,543.04	36.66	152.200		
5,200.00	5,189.98	5,439.77	5,433.03	18.30	19.29	-173.714	2,706.46	-4,681.10	5,587.77	5,550.40	37.37	149.526		
5,300.00	5,289.30	5,539.21	5,532.10	18.67	19.65	-173.645	2,711.62	-4,674.15	5,595.86	5,557.77	38.08	146.948		
5,400.00	5,388.62	5,638.66	5,631.17	19.04	20.01	-173.577	2,716.78	-4,667.19	5,603.95	5,565.15	38.79	144.460		
5,500.00	5,487.94	5,738.11	5,730.24	19.40	20.38	-173.509	2,721.94	-4,660.24	5,612.04	5,572.54	39.51	142.059		
5,600.00	5,587.27	5,837.56	5,829.31	19.77	20.74	-173.441	2,727.10	-4,653.28	5,620.15	5,579.93	40.22	139.739		
5,700.00	5,686.59	5,937.01	5,928.38	20.14	21.11	-173.373	2,732.26	-4,646.33	5,628.26	5,587.33	40.93	137.498		
5,800.00	5,785.91	6,036.46	6,027.45	20.51	21.47	-173.305	2,737.42	-4,639.38	5,636.39	5,594.74	41.65	135.331		
5,900.00	5,885.23	6,135.91	6,126.53	20.89	21.84	-173.238	2,742.59	-4,632.42	5,644.51	5,602.15	42.37	133.235		
6,000.00	5,984.55	6,235.36	6,226.15	21.26	22.21	-173.170	2,747.75	-4,625.47	5,652.62	5,610.29	43.08	131.140		
6,100.00	6,083.87	6,334.81	6,325.60	21.63	22.58	-173.102	2,752.91	-4,618.51	5,660.73	5,618.40	43.79	129.045		
6,200.00	6,183.20	6,434.26	6,425.05	22.01	22.95	-173.034	2,758.07	-4,611.55	5,668.84	5,626.51	44.50	126.950		
6,300.00	6,282.52	6,533.71	6,524.50	22.38	23.32	-172.966	2,763.23	-4,604.60	5,676.95	5,634.62	45.21	124.855		
6,400.00	6,381.84	6,633.16	6,623.95	22.76	23.69	-172.898	2,768.39	-4,597.64	5,685.06	5,642.73	45.92	122.760		
6,500.00	6,481.16	6,732.61	6,723.40	23.13	24.06	-172.830	2,773.55	-4,590.69	5,693.17	5,650.84	46.63	120.665		
6,600.00	6,580.48	6,832.06	6,822.85	23.51	24.43	-172.762	2,778.71	-4,583.73	5,701.28	5,658.95	47.34	118.570		
6,700.00	6,679.81	6,931.51	6,922.30	23.89	24.80	-172.694	2,783.87	-4,576.78	5,709.39	5,667.06	48.05	116.475		
6,800.00	6,779.13	7,030.96	7,021.75	24.26	25.17	-172.626	2,789.03	-4,569.82	5,717.50	5,675.17	48.76	114.380		
6,900.00	6,878.45	7,130.41	7,121.20	24.64	25.54	-172.558	2,794.19	-4,562.87	5,725.61	5,683.28	49.47	112.285		
7,000.00	6,977.77	7,229.86	7,220.65	25.02	25.91	-172.490	2,799.35	-4,555.91	5,733.72	5,691.39	50.18	110.190		
7,100.00	7,077.09	7,329.31	7,320.10	25.40	26.28	-172.422	2,804.51	-4,548.96	5,741.83	5,699.50	50.89	108.095		
7,200.00	7,176.41	7,428.76	7,419.55	25.78	26.65	-172.354	2,809.67	-4,542.00	5,749.94	5,707.61	51.60	106.000		
7,300.00	7,275.74	7,528.21	7,519.00	26.16	27.02	-172.286	2,814.83	-4,535.05	5,758.05	5,715.72	52.31	103.905		
7,400.00	7,375.06	7,627.66	7,618.45	26.54	27.39	-172.218	2,819.99	-4,528.09	5,766.16	5,723.83	53.02	101.810		
7,500.00	7,474.38	7,727.11	7,717.90	26.92	27.76	-172.150	2,825.15	-4,521.14	5,774.27	5,731.94	53.73	99.715		
7,600.00	7,573.70	7,826.56	7,817.35	27.30	28.13	-172.082	2,830.31	-4,514.18	5,782.38	5,740.05	54.44	97.620		
7,700.00	7,673.02	7,926.01	7,916.80	27.68	28.50	-172.014	2,835.47	-4,507.23	5,790.49	5,748.16	55.15	95.525		
7,800.00	7,772.35	8,025.46	8,016.25	28.06	28.87	-171.946	2,840.63	-4,500.27	5,798.60	5,756.27	55.86	93.430		
7,900.00	7,871.67	8,124.91	8,115.70	28.44	29.24	-171.878	2,845.79	-4,493.32	5,806.71	5,764.38	56.57	91.335		
8,000.00	7,971.00	8,224.36	8,215.15	28.82	29.61	-171.810	2,850.95	-4,486.36	5,814.82	5,772.49	57.28	89.240		
8,100.00	8,070.32	8,323.81	8,314.60	29.20	30.00	-171.742	2,856.11	-4,479.41	5,822.93	5,780.60	57.99	87.145		
8,200.00	8,169.65	8,423.26	8,414.05	29.58	30.37	-171.674	2,861.27	-4,472.45	5,831.04	5,788.71	58.70	85.050		
8,300.00	8,268.97	8,522.71	8,513.50	30.00	30.75	-171.606	2,866.43	-4,465.50	5,839.15	5,796.82	59.41	82.955		
8,400.00	8,368.30	8,622.16	8,613.00	30.38	31.12	-171.538	2,871.59	-4,458.54	5,847.26	5,804.93	60.12	80.860		
8,500.00	8,467.62	8,721.61	8,712.40	30.76	31.50	-171.470	2,876.75	-4,451.59	5,855.37	5,813.04	60.83	78.765		
8,600.00	8,566.95	8,821.06	8,811.85	31.14	31.87	-171.402	2,881.91	-4,444.63	5,863.48	5,821.15	61.54	76.670		
8,700.00	8,666.27	8,920.51	8,911.30	31.52	32.25	-171.334	2,887.07	-4,437.68	5,871.59	5,829.26	62.25	74.575		
8,800.00	8,765.60	9,019.96	9,010.75	31.90	32.62	-171.266	2,892.23	-4,430.72	5,879.70	5,837.37	62.96	72.480		
8,900.00	8,864.92	9,119.41	9,110.20	32.28	33.00	-171.198	2,897.39	-4,423.77	5,887.81	5,845.48	63.67	70.385		
9,000.00	8,964.25	9,218.86	9,209.65	32.66	33.37	-171.130	2,902.55	-4,416.81	5,895.92	5,853.59	64.38	68.290		
9,100.00	9,063.57	9,318.31	9,309.10	33.04	33.75	-171.062	2,907.71	-4,409.86	5,904.03	5,861.70	65.09	66.195		
9,200.00	9,162.90	9,417.76	9,408.55	33.42	34.12	-171.000	2,912.87	-4,402.90	5,912.14	5,869.81	65.80	64.100		
9,300.00	9,262.22	9,517.21	9,508.00	33.80	34.50	-170.932	2,918.03	-4,395.95	5,920.25	5,877.92	66.51	62.005		
9,400.00	9,361.55	9,616.66	9,607.45	34.18	34.87	-170.864	2,923.19	-4,389.00	5,928.36	5,886.03	67.22	59.910		
9,500.00	9,460.87	9,716.11	9,706.90	34.56	35.25	-170.796	2,928.35	-4,382.04	5,936.47	5,894.14	67.93	57.815		
9,600.00	9,560.20	9,815.56	9,806.35	34.94	35.62	-170.728	2,933.51	-4,375.09	5,944.58	5,902.25	68.64	55.720		
9,700.00	9,659.52	9,915.01	9,905.80	35.32	36.00	-170.660	2,938.67	-4,368.13	5,952.69	5,910.36	69.35	53.625		
9,800.00	9,758.85	10,014.46	10,005.25	35.70	36.37	-170.592	2,943.83	-4,361.18	5,960.80	5,918.47	70.06	51.530		
9,900.00	9,858.17	10,113.91	10,104.70	36.08	36.75	-170.524	2,948.99	-4,354.22	5,968.91	5,926.58	70.77	49.435		
10,000.00	9,957.50	10,213.36	10,204.15	36.46	37.12	-170.456	2,954.15	-4,347.27	5,977.02	5,934.69	71.48	47.340		
10,100.00	10,056.82	10,312.81	10,303.60	36.84	37.50	-170.388	2,959.31	-4,340.31	5,985.13	5,942.80	72.19	45.245		
10,200.00	10,156.15	10,412.26	10,403.05	37.22	37.87	-170.320	2,964.47	-4,333.36	5,993.24	5,950.91	72.90	43.150		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 211H - Wellbore #1 - Design #2														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM														Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Reference (usft)	Major Axis Offset (usft)	Highside Toothface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
							+N/-S (usft)	+E/-W (usft)							
10,300.00	10,272.31	15,624.51	10,843.76	36.69	123.08	0.235	2,714.98	458.93	2,956.68	2,799.16	157.52	18.770			
10,400.00	10,372.05	15,631.87	10,843.92	37.05	123.25	-92.435	2,714.92	466.29	2,940.76	2,782.00	158.76	18.523			
10,500.00	10,468.70	15,658.90	10,844.51	37.46	123.84	-93.359	2,714.71	493.31	2,928.89	2,768.58	160.31	18.270			
10,600.00	10,558.06	15,705.30	10,845.51	37.90	124.85	-93.491	2,714.34	539.70	2,921.12	2,758.95	162.17	18.013			
10,700.00	10,636.21	15,769.06	10,846.89	38.38	126.25	-93.034	2,713.83	603.45	2,916.94	2,752.64	164.30	17.754			
10,800.00	10,699.75	15,847.39	10,848.59	38.91	127.97	-92.254	2,713.20	681.76	2,915.53	2,748.84	166.69	17.491			
10,820.16	10,710.52	15,864.65	10,848.96	39.03	128.35	-92.083	2,713.06	699.01	2,915.50	2,748.29	167.21	17.436	CC		
10,900.00	10,745.88	15,936.87	10,850.52	39.51	129.94	-91.431	2,712.48	771.21	2,915.94	2,746.61	169.33	17.221			
11,000.00	10,772.61	16,033.58	10,852.62	40.19	132.07	-90.800	2,711.71	867.90	2,917.30	2,745.14	172.16	16.946			
11,100.00	10,779.78	16,133.33	10,854.78	40.92	134.26	-90.559	2,710.92	967.61	2,919.05	2,743.96	175.10	16.671			
11,200.00	10,781.99	16,233.31	10,856.94	41.76	136.47	-90.558	2,710.12	1,067.57	2,920.87	2,742.72	178.15	16.396			
11,300.00	10,784.21	16,333.29	10,859.11	42.71	138.68	-90.556	2,709.32	1,167.53	2,922.68	2,741.37	181.31	16.120			
11,400.00	10,786.43	16,433.28	10,861.27	43.75	140.90	-90.555	2,708.52	1,267.48	2,924.49	2,739.92	184.57	15.845			
11,500.00	10,788.64	16,533.26	10,863.43	44.90	143.11	-90.554	2,707.72	1,367.44	2,926.30	2,738.37	187.93	15.572			
11,600.00	10,790.86	16,633.24	10,865.60	46.12	145.33	-90.552	2,706.92	1,467.40	2,928.11	2,736.73	191.38	15.300			
11,700.00	10,793.08	16,733.23	10,867.76	47.43	147.55	-90.551	2,706.12	1,567.36	2,929.92	2,735.01	194.91	15.032			
11,800.00	10,795.29	16,833.21	10,869.93	48.81	149.78	-90.550	2,705.32	1,667.31	2,931.73	2,733.22	198.51	14.768			
11,900.00	10,797.51	16,933.20	10,872.09	50.27	152.00	-90.548	2,704.52	1,767.27	2,933.54	2,731.35	202.19	14.509			
12,000.00	10,799.73	17,033.18	10,874.26	51.78	154.23	-90.547	2,703.73	1,867.23	2,935.35	2,729.42	205.93	14.254			
12,100.00	10,801.94	17,133.16	10,876.42	53.35	156.46	-90.546	2,702.93	1,967.18	2,937.16	2,727.43	209.73	14.004			
12,200.00	10,804.16	17,233.15	10,878.59	54.97	158.69	-90.544	2,702.13	2,067.14	2,938.97	2,725.39	213.59	13.760			
12,300.00	10,806.37	17,333.13	10,880.75	56.64	160.93	-90.543	2,701.33	2,167.10	2,940.79	2,723.30	217.49	13.522			
12,400.00	10,808.59	17,433.11	10,882.91	58.35	163.17	-90.542	2,700.53	2,267.05	2,942.60	2,721.16	221.44	13.289			
12,500.00	10,810.81	17,533.10	10,885.08	60.10	165.40	-90.540	2,699.73	2,367.01	2,944.41	2,718.98	225.43	13.061			
12,600.00	10,813.02	17,633.08	10,887.24	61.88	167.64	-90.539	2,698.93	2,466.97	2,946.22	2,716.76	229.45	12.840			
12,700.00	10,815.24	17,733.06	10,889.41	63.71	169.89	-90.538	2,698.13	2,566.92	2,948.03	2,714.51	233.52	12.624			
12,800.00	10,817.46	17,833.05	10,891.57	65.56	172.13	-90.536	2,697.34	2,666.88	2,949.84	2,712.23	237.61	12.415			
12,900.00	10,819.67	17,933.03	10,893.74	67.43	174.37	-90.535	2,696.54	2,766.84	2,951.65	2,709.92	241.73	12.210			
13,000.00	10,821.89	18,033.01	10,895.90	69.34	176.62	-90.534	2,695.74	2,866.80	2,953.46	2,707.58	245.89	12.012			
13,100.00	10,824.11	18,133.00	10,898.07	71.27	178.87	-90.532	2,694.94	2,966.75	2,955.27	2,705.21	250.06	11.818			
13,200.00	10,826.32	18,232.98	10,900.23	73.22	181.12	-90.531	2,694.14	3,066.71	2,957.08	2,702.82	254.26	11.630			
13,300.00	10,828.54	18,332.97	10,902.40	75.19	183.37	-90.530	2,693.34	3,166.67	2,958.90	2,700.42	258.48	11.447			
13,400.00	10,830.75	18,432.95	10,904.56	77.18	185.62	-90.528	2,692.54	3,266.62	2,960.71	2,697.99	262.72	11.269			
13,500.00	10,832.97	18,532.93	10,906.72	79.18	187.87	-90.527	2,691.74	3,366.58	2,962.52	2,695.54	266.98	11.096			
13,600.00	10,835.19	18,632.92	10,908.89	81.20	190.12	-90.526	2,690.94	3,466.54	2,964.33	2,693.08	271.25	10.928			
13,700.00	10,837.40	18,732.90	10,911.05	83.24	192.38	-90.524	2,690.15	3,566.49	2,966.14	2,690.60	275.54	10.765			
13,800.00	10,839.62	18,832.88	10,913.22	85.29	194.64	-90.523	2,689.35	3,666.45	2,967.95	2,688.10	279.85	10.606			
13,900.00	10,841.84	18,932.87	10,915.38	87.35	196.89	-90.522	2,688.55	3,766.41	2,969.76	2,685.59	284.17	10.451			
14,000.00	10,844.05	19,032.85	10,917.55	89.42	199.15	-90.521	2,687.75	3,866.37	2,971.57	2,683.07	288.50	10.300			
14,100.00	10,846.27	19,132.83	10,919.71	91.51	201.41	-90.519	2,686.95	3,966.32	2,973.38	2,680.54	292.84	10.153			
14,200.00	10,848.49	19,232.82	10,921.88	93.60	203.67	-90.518	2,686.15	4,066.28	2,975.19	2,677.99	297.20	10.011			
14,300.00	10,850.70	19,332.80	10,924.04	95.71	205.93	-90.517	2,685.35	4,166.24	2,977.01	2,675.44	301.57	9.872			
14,400.00	10,852.92	19,432.78	10,926.20	97.82	208.19	-90.515	2,684.55	4,266.19	2,978.82	2,672.88	305.94	9.737			
14,500.00	10,855.13	19,532.77	10,928.37	99.94	210.46	-90.514	2,683.75	4,366.15	2,980.63	2,670.30	310.33	9.605			
14,600.00	10,857.35	19,632.75	10,930.53	102.07	212.72	-90.513	2,682.96	4,466.11	2,982.44	2,667.72	314.72	9.477			
14,700.00	10,859.57	19,732.74	10,932.70	104.21	214.98	-90.511	2,682.16	4,566.06	2,984.25	2,665.13	319.12	9.351			
14,800.00	10,861.78	19,832.72	10,934.86	106.36	217.25	-90.510	2,681.36	4,666.02	2,986.06	2,662.53	323.53	9.230			
14,900.00	10,864.00	19,932.70	10,937.03	108.51	219.52	-90.509	2,680.56	4,765.98	2,987.87	2,659.92	327.95	9.111			
15,000.00	10,866.22	20,032.69	10,939.19	110.66	221.78	-90.508	2,679.76	4,865.93	2,989.68	2,657.31	332.37	8.995			
15,100.00	10,868.43	20,132.67	10,941.36	112.83	224.05	-90.506	2,678.96	4,965.89	2,991.49	2,654.69	336.80	8.882			
15,200.00	10,870.65	20,232.65	10,943.52	114.99	226.32	-90.505	2,678.16	5,065.85	2,993.30	2,652.07	341.24	8.772			
15,300.00	10,872.87	20,332.64	10,945.68	117.17	228.59	-90.504	2,677.36	5,165.81	2,995.12	2,649.44	345.68	8.664			

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 211H - Wellbore #1 - Design #2												Offset Site Error:	0.00 usft
Survey Program: C-MWD+HRGM												Offset Well Error:	0.00 usft
Reference	Vertical	Measured	Offset	Semi	Major	Highside	Offset Wellbore Centre		Distance	Between	Minimum	Separation	Warning
Depth	Depth	Depth	Depth	Reference	Axis	Toolface	+N/-S	+E/-W	Between	Ellipses	Separation	Factor	
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	(usft)	(usft)	Centres	(usft)	(usft)		
15,400.00	10,875.08	20,432.62	10,947.85	119.35	230.86	-90.502	2,676.57	5,265.76	2,996.93	2,646.80	350.13	8.560	
15,500.00	10,877.30	20,532.60	10,950.01	121.53	233.13	-90.501	2,675.77	5,365.72	2,998.74	2,644.16	354.58	8.457	
15,600.00	10,879.52	20,632.59	10,952.18	123.72	235.40	-90.500	2,674.97	5,465.68	3,000.55	2,641.51	359.04	8.357	
15,700.00	10,881.73	20,732.57	10,954.34	125.91	237.67	-90.499	2,674.17	5,565.63	3,002.36	2,638.86	363.50	8.260	
15,800.00	10,883.95	20,832.55	10,956.51	128.10	239.94	-90.497	2,673.37	5,665.59	3,004.17	2,636.20	367.97	8.164	
15,900.00	10,886.16	20,932.54	10,958.67	130.30	242.21	-90.496	2,672.57	5,765.55	3,005.98	2,633.54	372.44	8.071	ES
16,000.00	10,888.38	20,947.70	10,959.00	132.51	242.56	-90.496	2,672.45	5,780.71	3,008.99	2,634.22	374.77	8.029	
16,100.00	10,890.60	20,947.70	10,959.00	134.71	242.56	-90.496	2,672.45	5,780.71	3,015.27	2,638.92	376.35	8.012	SF
16,200.00	10,892.81	20,947.70	10,959.00	136.92	242.56	-90.496	2,672.45	5,780.71	3,024.85	2,647.32	377.53	8.012	
16,300.00	10,895.03	20,947.70	10,959.00	139.13	242.56	-90.496	2,672.45	5,780.71	3,037.69	2,659.36	378.33	8.029	
16,400.00	10,897.25	20,947.70	10,959.00	141.35	242.56	-90.496	2,672.45	5,780.71	3,053.76	2,675.01	378.74	8.063	
16,500.00	10,899.46	20,947.70	10,959.00	143.57	242.56	-90.496	2,672.45	5,780.71	3,072.99	2,694.21	378.78	8.113	
16,600.00	10,901.68	20,947.70	10,959.00	145.79	242.56	-90.496	2,672.45	5,780.71	3,095.34	2,716.88	378.46	8.179	
16,700.00	10,903.90	20,947.70	10,959.00	148.01	242.56	-90.496	2,672.45	5,780.71	3,120.74	2,742.94	377.80	8.260	
16,800.00	10,906.11	20,947.70	10,959.00	150.24	242.56	-90.496	2,672.45	5,780.71	3,149.10	2,772.30	376.81	8.357	
16,900.00	10,908.33	20,947.70	10,959.00	152.46	242.56	-90.496	2,672.45	5,780.71	3,180.36	2,804.85	375.51	8.469	
17,000.00	10,910.54	20,947.70	10,959.00	154.69	242.56	-90.496	2,672.45	5,780.71	3,214.43	2,840.50	373.93	8.596	
17,100.00	10,912.76	20,947.70	10,959.00	156.93	242.56	-90.496	2,672.45	5,780.71	3,251.22	2,879.12	372.09	8.738	
17,200.00	10,914.98	20,947.70	10,959.00	159.16	242.56	-90.496	2,672.45	5,780.71	3,290.63	2,920.61	370.02	8.893	
17,300.00	10,917.19	20,947.70	10,959.00	161.40	242.56	-90.496	2,672.45	5,780.71	3,332.58	2,964.85	367.73	9.063	
17,400.00	10,919.41	20,947.70	10,959.00	163.63	242.56	-90.496	2,672.45	5,780.71	3,376.98	3,011.73	365.25	9.246	
17,500.00	10,921.63	20,947.70	10,959.00	165.87	242.56	-90.496	2,672.45	5,780.71	3,423.72	3,061.11	362.60	9.442	
17,600.00	10,923.84	20,947.70	10,959.00	168.12	242.56	-90.496	2,672.45	5,780.71	3,472.71	3,112.90	359.81	9.651	
17,700.00	10,926.06	20,947.70	10,959.00	170.36	242.56	-90.496	2,672.45	5,780.71	3,523.85	3,166.96	356.89	9.874	
17,800.00	10,928.28	20,947.70	10,959.00	172.60	242.56	-90.496	2,672.45	5,780.71	3,577.07	3,223.20	353.87	10.109	
17,900.00	10,930.49	20,947.70	10,959.00	174.85	242.56	-90.496	2,672.45	5,780.71	3,632.25	3,281.50	350.75	10.356	
18,000.00	10,932.71	20,947.70	10,959.00	177.10	242.56	-90.496	2,672.45	5,780.71	3,689.32	3,341.75	347.57	10.615	
18,100.00	10,934.92	20,947.70	10,959.00	179.35	242.56	-90.496	2,672.45	5,780.71	3,748.19	3,403.86	344.33	10.885	
18,200.00	10,937.14	20,947.70	10,959.00	181.60	242.56	-90.496	2,672.45	5,780.71	3,808.78	3,467.73	341.05	11.168	
18,300.00	10,939.36	20,947.70	10,959.00	183.85	242.56	-90.496	2,672.45	5,780.71	3,871.00	3,533.26	337.74	11.461	
18,400.00	10,941.57	20,947.70	10,959.00	186.10	242.56	-90.496	2,672.45	5,780.71	3,934.78	3,600.36	334.42	11.766	
18,500.00	10,943.79	20,947.70	10,959.00	188.36	242.56	-90.496	2,672.45	5,780.71	4,000.05	3,668.95	331.10	12.081	
18,600.00	10,946.01	20,947.70	10,959.00	190.61	242.56	-90.496	2,672.45	5,780.71	4,066.72	3,738.95	327.77	12.407	
18,700.00	10,948.22	20,947.70	10,959.00	192.87	242.56	-90.496	2,672.45	5,780.71	4,134.74	3,810.28	324.47	12.743	
18,800.00	10,950.44	20,947.70	10,959.00	195.13	242.56	-90.496	2,672.45	5,780.71	4,204.04	3,882.86	321.18	13.089	
18,900.00	10,952.66	20,947.70	10,959.00	197.39	242.56	-90.496	2,672.45	5,780.71	4,274.55	3,956.64	317.92	13.446	
19,000.00	10,954.87	20,947.70	10,959.00	199.65	242.56	-90.496	2,672.45	5,780.71	4,346.22	4,031.54	314.69	13.811	
19,100.00	10,957.09	20,947.70	10,959.00	201.91	242.56	-90.496	2,672.45	5,780.71	4,418.99	4,107.50	311.50	14.186	
19,200.00	10,959.30	20,947.70	10,959.00	204.17	242.56	-90.496	2,672.45	5,780.71	4,492.81	4,184.47	308.35	14.571	
19,300.00	10,961.52	20,947.70	10,959.00	206.43	242.56	-90.496	2,672.45	5,780.71	4,567.63	4,262.39	305.24	14.964	
19,400.00	10,963.74	20,947.70	10,959.00	208.70	242.56	-90.496	2,672.45	5,780.71	4,643.39	4,341.20	302.19	15.366	
19,500.00	10,965.95	20,947.70	10,959.00	210.96	242.56	-90.496	2,672.45	5,780.71	4,720.06	4,420.88	299.18	15.777	
19,600.00	10,968.17	20,947.70	10,959.00	213.23	242.56	-90.496	2,672.45	5,780.71	4,797.58	4,501.36	296.22	16.196	
19,700.00	10,970.39	20,947.70	10,959.00	215.49	242.56	-90.496	2,672.45	5,780.71	4,875.92	4,582.60	293.32	16.623	
19,800.00	10,972.60	20,947.70	10,959.00	217.76	242.56	-90.496	2,672.45	5,780.71	4,955.05	4,664.57	290.48	17.058	
19,900.00	10,974.82	20,947.70	10,959.00	220.03	242.56	-90.496	2,672.45	5,780.71	5,034.91	4,747.23	287.69	17.501	
20,000.00	10,977.04	20,947.70	10,959.00	222.30	242.56	-90.496	2,672.45	5,780.71	5,115.49	4,830.53	284.95	17.952	
20,100.00	10,979.25	20,947.70	10,959.00	224.57	242.56	-90.496	2,672.45	5,780.71	5,196.74	4,914.46	282.27	18.410	
20,200.00	10,981.47	20,947.70	10,959.00	226.84	242.56	-90.496	2,672.45	5,780.71	5,278.63	4,998.98	279.65	18.876	
20,300.00	10,983.69	20,947.70	10,959.00	229.11	242.56	-90.496	2,672.45	5,780.71	5,361.14	5,084.05	277.09	19.348	
20,400.00	10,985.90	20,947.70	10,959.00	231.38	242.56	-90.496	2,672.45	5,780.71	5,444.23	5,169.65	274.58	19.828	
20,500.00	10,988.12	20,947.70	10,959.00	233.65	242.56	-90.496	2,672.45	5,780.71	5,527.88	5,255.76	272.12	20.314	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 211H - Wellbore #1 - Design #2													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HRGM													Offset Well Error:	0.00 usft
Rule Assigned:														
Measured Depth (usft)	Reference Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Reference (usft)	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)		Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
20,600.00	10,990.33	20,947.70	10,959.00	235.92	242.56	-90.496	2,672.45	5,780.71	5,612.07	5,342.35	269.72	20.807		
20,700.00	10,992.55	20,947.70	10,959.00	238.19	242.56	-90.496	2,672.45	5,780.71	5,696.77	5,429.39	267.38	21.306		
20,800.00	10,994.77	20,947.70	10,959.00	240.47	242.56	-90.496	2,672.45	5,780.71	5,781.96	5,516.87	265.08	21.812		
20,900.00	10,996.98	20,947.70	10,959.00	242.74	242.56	-90.496	2,672.45	5,780.71	5,867.61	5,604.77	262.84	22.324		
21,000.00	10,999.20	20,947.70	10,959.00	245.02	242.56	-90.496	2,672.45	5,780.71	5,953.72	5,693.06	260.66	22.841		
21,100.00	11,001.42	20,947.70	10,959.00	247.29	242.56	-90.496	2,672.45	5,780.71	6,040.25	5,781.73	258.52	23.365		
21,200.00	11,003.63	20,947.70	10,959.00	249.57	242.56	-90.496	2,672.45	5,780.71	6,127.19	5,870.76	256.43	23.894		
21,216.59	11,004.00	20,947.70	10,959.00	249.95	242.56	-90.496	2,672.45	5,780.71	6,141.65	5,885.56	256.09	23.983		



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 231H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 62-MWD													Offset Well Error:	0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Reference (usft)	Major Offset (usft)	Axis Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)						
0.00	0.00	39.21	39.21	0.00	0.04	-59.368	2,885.20	-4,872.31	5,662.50					
100.00	100.00	126.01	126.01	0.13	0.30	-59.364	2,885.61	-4,872.36	5,662.78	5,662.35	0.43	N/A		
200.00	200.00	242.30	242.29	0.49	0.71	-59.356	2,886.51	-4,872.31	5,663.17	5,661.96	1.20	4,712.192		
300.00	300.00	348.58	348.56	0.85	1.09	-59.343	2,887.56	-4,871.56	5,663.05	5,661.11	1.94	2,924.036		
301.04	301.04	349.26	349.24	0.86	1.09	-59.343	2,887.56	-4,871.56	5,663.05	5,661.10	1.94	2,914.796		
400.00	400.00	416.00	415.98	1.21	1.32	-59.339	2,887.98	-4,871.55	5,663.35	5,660.81	2.53	2,234.702		
500.00	500.00	509.00	508.98	1.57	1.66	-59.334	2,888.64	-4,871.71	5,663.86	5,660.63	3.22	1,756.469		
600.00	600.00	600.00	599.98	1.93	1.98	-59.329	2,889.40	-4,871.99	5,664.56	5,660.66	3.91	1,449.638		
700.00	700.00	688.12	688.09	2.29	2.29	-59.327	2,890.07	-4,872.66	5,665.59	5,661.01	4.58	1,237.407		
800.00	800.00	802.44	802.40	2.64	2.70	-59.327	2,890.62	-4,873.64	5,666.58	5,661.24	5.34	1,061.110		
900.00	900.00	880.64	880.60	3.00	2.97	-59.331	2,890.69	-4,874.46	5,667.54	5,661.57	5.97	948.907		
1,000.00	1,000.00	973.51	973.46	3.36	3.30	-59.338	2,890.74	-4,875.86	5,668.86	5,662.20	6.66	851.567		
1,100.00	1,100.00	1,063.22	1,063.16	3.72	3.61	-59.346	2,890.69	-4,877.32	5,670.24	5,662.91	7.33	773.481		
1,200.00	1,200.00	1,146.24	1,146.16	4.08	3.91	-59.355	2,890.55	-4,878.99	5,671.88	5,663.90	7.98	710.623		
1,300.00	1,300.00	1,239.41	1,239.30	4.44	4.24	-59.370	2,890.25	-4,881.23	5,673.78	5,665.11	8.67	654.506		
1,400.00	1,400.00	1,355.59	1,355.46	4.79	4.65	-59.388	2,889.74	-4,883.98	5,675.60	5,666.16	9.44	601.342		
1,500.00	1,500.00	1,444.01	1,443.85	5.15	4.96	-59.403	2,889.28	-4,886.01	5,677.32	5,667.21	10.11	561.571		
1,600.00	1,600.00	1,534.11	1,533.92	5.51	5.28	-59.418	2,888.85	-4,888.29	5,679.25	5,668.46	10.79	526.442		
1,700.00	1,700.00	1,665.44	1,665.20	5.87	5.75	-59.440	2,888.28	-4,891.58	5,681.25	5,669.63	11.61	489.141		
1,800.00	1,800.00	1,830.33	1,830.08	6.23	6.34	-59.443	2,888.69	-4,892.96	5,682.07	5,669.51	12.56	452.401		
1,900.00	1,900.00	2,000.12	1,999.86	6.59	6.92	-59.422	2,890.19	-4,891.40	5,681.70	5,668.20	13.50	420.904		
2,000.00	2,000.00	2,314.40	2,313.92	6.95	7.98	-59.381	2,888.52	-4,880.61	5,677.54	5,662.64	14.90	381.003		
2,100.00	2,100.00	2,481.85	2,481.11	7.30	8.55	-59.368	2,884.97	-4,872.07	5,671.94	5,656.13	15.82	358.541		
2,200.00	2,200.00	2,551.00	2,550.17	7.66	8.78	-59.368	2,883.06	-4,868.88	5,666.50	5,650.08	16.42	345.156		
2,300.00	2,300.00	2,612.75	2,611.84	8.02	8.99	-59.373	2,881.21	-4,866.55	5,661.65	5,644.65	16.99	333.211		
2,400.00	2,400.00	2,699.48	2,698.48	8.38	9.29	-59.382	2,878.39	-4,863.67	5,657.12	5,639.47	17.65	320.546		
2,500.00	2,500.00	2,788.33	2,787.24	8.74	9.60	-59.394	2,875.45	-4,860.93	5,652.79	5,634.48	18.31	308.671		
2,600.00	2,600.00	2,873.97	2,872.80	9.10	9.89	-59.406	2,872.60	-4,858.52	5,648.67	5,629.71	18.97	297.791		
2,700.00	2,700.00	2,964.08	2,962.83	9.45	10.21	-59.419	2,869.77	-4,856.18	5,644.83	5,625.19	19.64	287.421		
2,800.00	2,800.00	3,067.79	3,066.47	9.81	10.57	-59.427	2,867.01	-4,853.16	5,640.97	5,620.61	20.36	277.098		
2,900.00	2,900.00	3,163.49	3,162.04	10.17	10.90	-59.400	2,867.43	-4,848.64	5,637.13	5,616.08	21.05	267.814		
3,000.00	3,000.00	3,238.31	3,236.46	10.53	11.17	-59.327	2,872.23	-4,842.64	5,633.49	5,611.82	21.67	259.962		
3,100.00	3,100.00	3,296.00	3,293.64	10.89	11.37	-59.252	2,877.72	-4,837.37	5,630.50	5,608.27	22.23	253.238		
3,200.00	3,200.00	3,392.00	3,388.67	11.25	11.71	-59.116	2,887.97	-4,828.46	5,627.98	5,605.05	22.93	245.419		
3,300.00	3,300.00	3,428.77	3,425.07	11.61	11.84	-59.063	2,892.07	-4,825.22	5,626.08	5,602.65	23.42	240.190		
3,400.00	3,400.00	3,486.00	3,481.66	11.96	12.04	-58.977	2,899.17	-4,820.56	5,625.31	5,601.32	23.99	234.497		
3,433.46	3,433.46	3,486.00	3,481.66	12.08	12.04	-58.977	2,899.17	-4,820.56	5,625.21	5,601.10	24.11	233.329 CC, ES		
3,500.00	3,500.00	3,486.00	3,481.66	12.32	12.04	-58.977	2,899.17	-4,820.56	5,625.60	5,601.26	24.34	231.084		
3,600.00	3,599.98	3,542.10	3,537.05	12.67	12.24	-172.438	2,907.06	-4,816.50	5,628.63	5,603.74	24.89	226.148		
3,700.00	3,699.84	3,581.00	3,575.40	13.00	12.38	-172.354	2,913.13	-4,814.00	5,636.36	5,611.01	25.36	222.280		
3,800.00	3,799.45	3,663.19	3,656.44	13.34	12.68	-172.195	2,925.96	-4,809.36	5,648.28	5,622.29	25.99	217.334		
3,900.00	3,898.80	3,751.84	3,744.04	13.68	13.00	-172.059	2,938.92	-4,805.03	5,663.05	5,636.41	26.65	212.520		
4,000.00	3,998.12	3,830.98	3,822.22	14.02	13.29	-171.951	2,950.61	-4,801.31	5,678.28	5,651.01	27.27	208.217		
4,100.00	4,097.44	3,919.61	3,909.45	14.37	13.63	-171.810	2,965.49	-4,796.36	5,693.85	5,665.91	27.94	203.803		
4,200.00	4,196.76	4,013.64	4,001.56	14.72	13.99	-171.637	2,983.26	-4,789.92	5,709.52	5,680.88	28.63	199.394		
4,300.00	4,296.08	4,103.76	4,089.82	15.07	14.34	-171.471	3,000.42	-4,783.76	5,725.33	5,696.01	29.32	195.266		
4,400.00	4,395.41	4,194.28	4,178.58	15.42	14.69	-171.312	3,017.22	-4,777.99	5,741.32	5,711.31	30.01	191.298		
4,500.00	4,494.73	4,294.67	4,277.13	15.78	15.09	-171.142	3,035.37	-4,771.98	5,757.43	5,726.68	30.75	187.242		
4,600.00	4,494.05	4,402.93	4,383.60	16.13	15.52	-170.971	3,053.99	-4,765.90	5,773.42	5,741.90	31.52	183.164		
4,700.00	4,693.37	4,494.78	4,473.90	16.49	15.88	-170.824	3,069.91	-4,760.58	5,789.37	5,757.15	32.23	179.638		
4,800.00	4,792.69	4,577.69	4,555.10	16.85	16.22	-170.676	3,085.70	-4,755.04	5,805.57	5,772.67	32.90	176.439		
4,900.00	4,892.01	4,666.69	4,641.99	17.21	16.59	-170.505	3,103.86	-4,748.56	5,822.06	5,788.44	33.61	173.206		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 231H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 62-MWD													Offset Well Error: 0.00 usft
Reference Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Reference (usft)	Major Offset (usft)	Axis Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)					
5,000.00	4,991.34	4,763.97	4,736.82	17.57	17.00	-170.313	3,124.22	-4,741.16	5,838.63	5,804.26	34.37	169.896	
5,100.00	5,090.66	4,874.20	4,844.33	17.94	17.47	-170.099	3,147.11	-4,732.79	5,855.20	5,820.02	35.18	166.430	
5,200.00	5,189.98	5,041.44	5,007.96	18.30	18.18	-169.798	3,179.26	-4,720.30	5,871.07	5,834.82	36.25	161.945	
5,300.00	5,289.30	5,141.25	5,106.04	18.67	18.60	-169.639	3,196.46	-4,713.33	5,886.31	5,849.29	37.02	159.008	
5,400.00	5,388.62	5,212.60	5,176.16	19.04	18.90	-169.527	3,208.76	-4,708.56	5,901.85	5,864.19	37.66	156.717	
5,500.00	5,487.94	5,284.00	5,246.00	19.40	19.21	-169.400	3,222.61	-4,703.30	5,918.02	5,879.72	38.30	154.503	
5,600.00	5,587.27	5,372.66	5,332.26	19.77	19.60	-169.222	3,241.66	-4,695.80	5,934.56	5,895.52	39.04	152.012	
5,700.00	5,686.59	5,465.86	5,422.71	20.14	20.02	-169.027	3,262.48	-4,687.27	5,951.11	5,911.30	39.81	149.506	
5,800.00	5,785.91	5,560.43	5,553.43	20.51	20.63	-168.751	3,291.90	-4,674.95	5,967.46	5,926.69	40.77	146.359	
5,900.00	5,885.23	5,721.91	5,671.78	20.89	21.18	-168.516	3,317.05	-4,663.97	5,983.32	5,941.65	41.68	143.570	
6,000.00	5,984.55	5,853.02	5,799.74	21.26	21.77	-168.274	3,343.06	-4,652.26	5,998.86	5,956.23	42.62	140.745	
6,100.00	6,083.87	5,977.25	5,921.27	21.63	22.33	-168.057	3,366.40	-4,641.26	6,013.91	5,970.37	43.53	138.147	
6,200.00	6,183.20	6,093.37	6,035.09	22.01	22.84	-167.866	3,387.07	-4,631.21	6,028.59	5,984.19	44.40	135.775	
6,300.00	6,282.52	6,201.68	6,141.39	22.38	23.32	-167.694	3,405.68	-4,622.05	6,043.14	5,997.91	45.23	133.608	
6,400.00	6,381.84	6,305.37	6,243.41	22.76	23.77	-167.544	3,422.34	-4,613.92	6,057.57	6,011.53	46.03	131.591	
6,500.00	6,481.16	6,420.25	6,356.54	23.13	24.26	-167.384	3,440.24	-4,605.10	6,071.88	6,025.00	46.88	129.506	
6,600.00	6,580.48	6,529.10	6,463.91	23.51	24.73	-167.241	3,456.30	-4,597.08	6,085.99	6,038.29	47.70	127.579	
6,700.00	6,679.81	6,646.22	6,579.71	23.89	25.22	-167.107	3,471.91	-4,589.33	6,099.90	6,051.35	48.55	125.644	
6,800.00	6,779.13	7,078.00	7,009.61	24.26	26.83	-166.864	3,499.49	-4,564.40	6,108.50	6,057.95	50.55	120.836	
6,900.00	6,878.45	7,174.00	7,105.45	24.64	27.17	-166.844	3,501.48	-4,559.41	6,116.90	6,065.66	51.25	119.365	
7,000.00	6,977.77	7,174.00	7,105.45	25.02	27.17	-166.844	3,501.48	-4,559.41	6,126.13	6,074.52	51.61	118.708	
7,100.00	7,077.09	7,212.07	7,143.48	25.40	27.30	-166.837	3,502.72	-4,558.11	6,136.67	6,084.57	52.10	117.797	
7,200.00	7,176.41	7,267.00	7,198.35	25.78	27.49	-166.826	3,504.97	-4,556.72	6,148.25	6,095.60	52.64	116.794	
7,300.00	7,275.74	7,328.42	7,259.69	26.16	27.71	-166.813	3,507.83	-4,555.42	6,160.52	6,107.30	53.21	115.772	
7,400.00	7,375.06	7,443.04	7,374.14	26.54	28.13	-166.783	3,513.44	-4,552.58	6,172.77	6,118.78	53.98	114.343	
7,500.00	7,474.38	7,534.01	7,464.96	26.92	28.45	-166.758	3,517.98	-4,550.14	6,184.92	6,130.25	54.67	113.134	
7,600.00	7,573.70	7,626.14	7,556.96	27.30	28.78	-166.736	3,522.36	-4,548.02	6,197.24	6,141.88	55.36	111.952	
7,700.00	7,673.02	7,725.67	7,656.37	27.68	29.14	-166.721	3,526.72	-4,546.08	6,209.60	6,153.53	56.07	110.751	
7,800.00	7,772.55	7,827.68	7,758.31	28.06	29.49	-166.756	3,530.36	-4,544.67	6,220.04	6,163.26	56.78	109.541	
7,900.00	7,872.35	7,965.58	7,896.17	28.42	29.96	-166.779	3,533.06	-4,543.72	6,226.66	6,169.05	57.61	108.081	
8,000.00	7,972.31	8,059.60	7,990.19	28.77	30.26	-166.800	3,533.25	-4,544.10	6,229.75	6,171.49	58.26	106.923	
8,100.00	8,072.31	8,157.10	8,087.69	29.11	30.56	-53.252	3,532.69	-4,545.13	6,230.39	6,171.47	58.91	105.753	
8,200.00	8,172.31	8,243.45	8,174.02	29.46	30.83	-53.264	3,531.93	-4,546.32	6,230.98	6,171.45	59.53	104.675	
8,300.00	8,272.31	8,318.62	8,249.19	29.80	31.07	-53.271	3,531.75	-4,547.37	6,231.94	6,171.84	60.11	103.684	
8,400.00	8,372.31	8,424.69	8,355.25	30.14	31.40	-53.278	3,531.90	-4,548.82	6,233.13	6,172.34	60.79	102.532	
8,500.00	8,472.31	8,615.72	8,546.26	30.48	32.00	-53.301	3,530.23	-4,550.76	6,233.39	6,171.64	61.75	100.941	
8,600.00	8,572.31	8,762.86	8,693.38	30.82	32.46	-53.322	3,527.61	-4,551.19	6,232.55	6,169.99	62.56	99.623	
8,700.00	8,672.31	8,816.74	8,747.24	31.17	32.63	-53.331	3,526.51	-4,551.38	6,231.67	6,168.59	63.08	98.792	
8,746.76	8,719.07	8,836.77	8,767.27	31.33	32.70	-53.332	3,526.43	-4,551.38	6,231.57	6,168.27	63.30	98.439	
8,800.00	8,772.31	8,873.00	8,803.50	31.51	32.81	-53.329	3,526.79	-4,551.29	6,231.74	6,168.13	63.60	97.976	
8,900.00	8,872.31	8,905.12	8,835.61	31.85	32.92	-53.323	3,527.52	-4,551.18	6,232.63	6,168.58	64.05	97.307	
9,000.00	8,972.31	8,967.00	8,897.45	32.20	33.14	-53.307	3,529.66	-4,551.07	6,234.46	6,169.86	64.60	96.502	
9,100.00	9,072.31	9,011.36	8,941.77	32.54	33.30	-53.292	3,531.61	-4,551.09	6,237.00	6,171.91	65.09	95.818	
9,200.00	9,172.31	9,102.39	9,032.70	32.89	33.62	-53.262	3,535.92	-4,551.42	6,240.10	6,174.34	65.76	94.896	
9,300.00	9,272.31	9,217.91	9,148.15	33.23	34.01	-53.244	3,539.42	-4,552.75	6,242.82	6,176.31	66.51	93.867	
9,400.00	9,372.31	9,348.98	9,279.17	33.58	34.45	-53.245	3,541.42	-4,555.55	6,245.47	6,178.16	67.30	92.798	
9,500.00	9,472.31	9,449.33	9,379.50	33.92	34.78	-53.249	3,542.36	-4,557.69	6,247.74	6,179.76	67.98	91.904	
9,600.00	9,572.31	9,563.43	9,493.58	34.27	35.15	-53.256	3,543.23	-4,560.12	6,249.90	6,181.19	68.71	90.961	
9,700.00	9,672.31	9,678.21	9,608.33	34.61	35.53	-53.264	3,543.82	-4,562.37	6,251.78	6,182.34	69.44	90.031	
9,800.00	9,772.31	9,772.65	9,702.75	34.96	35.84	-53.271	3,544.26	-4,564.16	6,253.58	6,183.48	70.10	89.211	
9,900.00	9,872.31	9,912.27	9,842.34	35.31	36.29	-53.283	3,544.60	-4,566.91	6,255.37	6,184.45	70.92	88.209	
10,000.00	9,972.31	10,025.38	9,955.43	35.65	36.66	-53.299	3,544.03	-4,569.00	6,256.56	6,184.92	71.63	87.340	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 231H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 62-MWD						Rule Assigned:						Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Reference (usft)	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)					
10,100.00	10,072.31	10,110.12	10,040.15	36.00	36.93	-53.313	3,543.39	-4,570.64	6,257.66	6,185.41	72.26	86.604	
10,200.00	10,172.31	10,187.00	10,117.01	36.35	37.18	-53.324	3,543.09	-4,572.27	6,259.13	6,186.28	72.85	85.918	
10,300.00	10,272.31	10,187.00	10,117.01	36.69	37.18	-53.324	3,543.09	-4,572.27	6,261.58	6,188.41	73.17	85.576	
10,400.00	10,372.05	10,239.85	10,169.84	37.05	37.36	-144.351	3,544.17	-4,573.33	6,269.02	6,195.34	73.69	85.074	
10,500.00	10,468.70	10,281.00	10,210.91	37.46	37.51	-142.568	3,546.64	-4,574.00	6,293.88	6,219.72	74.17	84.861 SF	
10,600.00	10,558.06	10,281.00	10,210.91	37.90	37.51	-139.109	3,546.64	-4,574.00	6,335.27	6,260.80	74.46	85.078	
10,700.00	10,636.21	10,281.00	10,210.91	38.38	37.51	-133.438	3,546.64	-4,574.00	6,391.57	6,316.84	74.73	85.531	
10,800.00	10,699.75	10,281.00	10,210.91	38.91	37.51	-124.677	3,546.64	-4,574.00	6,459.97	6,385.01	74.96	86.182	
10,900.00	10,745.88	10,281.00	10,210.91	39.51	37.51	-111.839	3,546.64	-4,574.00	6,537.15	6,461.99	75.16	86.976	
11,000.00	10,772.61	10,281.00	10,210.91	40.19	37.51	-94.938	3,546.64	-4,574.00	6,619.51	6,544.16	75.35	87.851	
11,100.00	10,779.78	10,281.00	10,210.91	40.92	37.51	-82.230	3,546.64	-4,574.00	6,703.40	6,627.86	75.54	88.744	
11,200.00	10,781.99	10,281.00	10,210.91	41.76	37.51	-82.230	3,546.64	-4,574.00	6,787.56	6,711.82	75.75	89.607	
11,300.00	10,784.21	10,281.00	10,210.91	42.71	37.51	-82.230	3,546.64	-4,574.00	6,872.15	6,796.17	75.99	90.440	
11,400.00	10,786.43	10,281.00	10,210.91	43.75	37.51	-82.230	3,546.64	-4,574.00	6,957.15	6,880.90	76.25	91.244	
11,500.00	10,788.64	10,281.00	10,210.91	44.90	37.51	-82.230	3,546.64	-4,574.00	7,042.54	6,966.01	76.53	92.022	
11,600.00	10,790.86	10,281.00	10,210.91	46.12	37.51	-82.230	3,546.64	-4,574.00	7,128.32	7,051.48	76.83	92.777	
11,700.00	10,793.08	10,281.00	10,210.91	47.43	37.51	-82.230	3,546.64	-4,574.00	7,214.45	7,137.30	77.15	93.510	
11,800.00	10,795.29	10,911.00	10,728.60	48.81	40.76	-90.335	3,790.07	-4,450.89	7,300.48	7,219.11	81.37	89.716	
11,900.00	10,797.51	10,911.00	10,728.60	50.27	40.76	-90.335	3,790.07	-4,450.89	7,385.58	7,303.82	81.76	90.328	
12,000.00	10,799.73	10,911.00	10,728.60	51.78	40.76	-90.335	3,790.07	-4,450.89	7,471.06	7,388.89	82.17	90.926	
12,100.00	10,801.94	10,911.00	10,728.60	53.35	40.76	-90.335	3,790.07	-4,450.89	7,556.89	7,474.30	82.58	91.510	
12,200.00	10,804.16	10,911.00	10,728.60	54.97	40.76	-90.335	3,790.07	-4,450.89	7,643.06	7,560.06	83.00	92.082	
12,300.00	10,806.37	10,911.00	10,728.60	56.64	40.76	-90.335	3,790.07	-4,450.89	7,729.57	7,646.13	83.43	92.644	
12,400.00	10,808.59	10,911.00	10,728.60	58.35	40.76	-90.335	3,790.07	-4,450.89	7,816.39	7,732.52	83.87	93.198	
12,500.00	10,810.81	10,911.00	10,728.60	60.10	40.76	-90.335	3,790.07	-4,450.89	7,903.53	7,819.22	84.31	93.743	
12,600.00	10,813.02	10,911.00	10,728.60	61.88	40.76	-90.335	3,790.07	-4,450.89	7,990.97	7,906.22	84.76	94.283	
12,700.00	10,815.24	10,911.00	10,728.60	63.71	40.76	-90.335	3,790.07	-4,450.89	8,078.71	7,993.50	85.20	94.816	
12,800.00	10,817.46	10,911.00	10,728.60	65.56	40.76	-90.335	3,790.07	-4,450.89	8,166.72	8,081.07	85.65	95.345	
12,900.00	10,819.67	10,911.00	10,728.60	67.43	40.76	-90.335	3,790.07	-4,450.89	8,255.01	8,168.90	86.11	95.870	
13,000.00	10,821.89	10,911.00	10,728.60	69.34	40.76	-90.335	3,790.07	-4,450.89	8,343.56	8,257.00	86.56	96.392	
13,100.00	10,824.11	10,911.00	10,728.60	71.27	40.76	-90.335	3,790.07	-4,450.89	8,432.37	8,345.36	87.01	96.912	
13,200.00	10,826.32	10,911.00	10,728.60	73.22	40.76	-90.335	3,790.07	-4,450.89	8,521.42	8,433.96	87.46	97.429	
13,300.00	10,828.54	10,911.00	10,728.60	75.19	40.76	-90.335	3,790.07	-4,450.89	8,610.72	8,522.81	87.91	97.945	
13,400.00	10,830.75	10,911.00	10,728.60	77.18	40.76	-90.335	3,790.07	-4,450.89	8,700.25	8,611.89	88.36	98.460	
13,500.00	10,832.97	10,911.00	10,728.60	79.18	40.76	-90.335	3,790.07	-4,450.89	8,790.00	8,701.19	88.81	98.975	
13,600.00	10,835.19	10,911.00	10,728.60	81.20	40.76	-90.335	3,790.07	-4,450.89	8,879.98	8,790.72	89.26	99.490	
13,700.00	10,837.40	10,911.00	10,728.60	83.24	40.76	-90.335	3,790.07	-4,450.89	8,970.16	8,880.47	89.70	100.004	
13,800.00	10,839.62	10,911.00	10,728.60	85.29	40.76	-90.335	3,790.07	-4,450.89	9,060.56	8,970.42	90.14	100.519	
13,900.00	10,841.84	10,911.00	10,728.60	87.35	40.76	-90.335	3,790.07	-4,450.89	9,151.15	9,060.57	90.57	101.035	
14,000.00	10,844.05	10,911.00	10,728.60	89.42	40.76	-90.335	3,790.07	-4,450.89	9,241.93	9,150.93	91.01	101.551	
14,100.00	10,846.27	10,911.00	10,728.60	91.51	40.76	-90.335	3,790.07	-4,450.89	9,332.91	9,241.47	91.44	102.068	
14,200.00	10,848.49	10,911.00	10,728.60	93.60	40.76	-90.335	3,790.07	-4,450.89	9,424.07	9,332.20	91.86	102.587	
14,300.00	10,850.70	10,911.00	10,728.60	95.71	40.76	-90.335	3,790.07	-4,450.89	9,515.40	9,423.11	92.29	103.107	
14,400.00	10,852.92	10,911.00	10,728.60	97.82	40.76	-90.335	3,790.07	-4,450.89	9,606.91	9,514.20	92.71	103.628	
14,500.00	10,855.13	10,911.00	10,728.60	99.94	40.76	-90.335	3,790.07	-4,450.89	9,698.58	9,605.46	93.12	104.150	
14,600.00	10,857.35	10,911.00	10,728.60	102.07	40.76	-90.335	3,790.07	-4,450.89	9,790.42	9,696.89	93.53	104.675	
14,700.00	10,859.57	10,911.00	10,728.60	104.21	40.76	-90.335	3,790.07	-4,450.89	9,882.42	9,788.48	93.94	105.200	
14,800.00	10,861.78	10,911.00	10,728.60	106.36	40.76	-90.335	3,790.07	-4,450.89	9,974.57	9,880.23	94.34	105.728	

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 231H - Wellbore #2 - Surveys													Offset Site Error: 0.00 usft	
Survey Program: 62-MWD, 10173-MWD				Offset				Rule Assigned:				Offset Well Error: 0.00 usft		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	39.21	39.21	0.00	0.04	-59.368	2,885.20	-4,872.31	5,662.50					
100.00	100.00	126.01	126.01	0.13	0.30	-59.364	2,885.61	-4,872.36	5,662.78	5,662.35	0.43	N/A		
200.00	200.00	242.30	242.29	0.49	0.71	-59.356	2,886.51	-4,872.31	5,663.17	5,661.96	1.20	4,712.192		
300.00	300.00	348.58	348.56	0.85	1.09	-59.343	2,887.56	-4,871.56	5,663.05	5,661.11	1.94	2,924.036		
301.04	301.04	349.26	349.24	0.86	1.09	-59.343	2,887.56	-4,871.56	5,663.05	5,661.10	1.94	2,914.796		
400.00	400.00	416.00	415.98	1.21	1.32	-59.339	2,887.98	-4,871.55	5,663.35	5,660.81	2.53	2,234.702		
500.00	500.00	509.00	508.98	1.57	1.66	-59.334	2,888.64	-4,871.71	5,663.86	5,660.63	3.22	1,756.469		
600.00	600.00	600.00	599.98	1.93	1.98	-59.329	2,889.40	-4,871.99	5,664.56	5,660.66	3.91	1,449.638		
700.00	700.00	688.12	688.09	2.29	2.29	-59.327	2,890.07	-4,872.66	5,665.59	5,661.01	4.58	1,237.407		
800.00	800.00	802.44	802.40	2.64	2.70	-59.327	2,890.62	-4,873.64	5,666.58	5,661.24	5.34	1,061.110		
900.00	900.00	880.64	880.60	3.00	2.97	-59.331	2,890.69	-4,874.46	5,667.54	5,661.57	5.97	948.907		
1,000.00	1,000.00	973.51	973.46	3.36	3.30	-59.338	2,890.74	-4,875.86	5,668.86	5,662.20	6.66	851.567		
1,100.00	1,100.00	1,063.22	1,063.16	3.72	3.61	-59.346	2,890.69	-4,877.32	5,670.24	5,662.91	7.33	773.481		
1,200.00	1,200.00	1,146.24	1,146.16	4.08	3.91	-59.355	2,890.55	-4,878.99	5,671.88	5,663.90	7.98	710.623		
1,300.00	1,300.00	1,239.41	1,239.30	4.44	4.24	-59.370	2,890.25	-4,881.23	5,673.78	5,665.11	8.67	654.506		
1,400.00	1,400.00	1,355.59	1,355.46	4.79	4.65	-59.388	2,889.74	-4,883.98	5,675.60	5,666.16	9.44	601.342		
1,500.00	1,500.00	1,444.01	1,443.85	5.15	4.96	-59.403	2,889.28	-4,886.01	5,677.32	5,667.21	10.11	561.571		
1,600.00	1,600.00	1,534.11	1,533.92	5.51	5.28	-59.418	2,888.85	-4,888.29	5,679.25	5,668.46	10.79	526.442		
1,700.00	1,700.00	1,665.44	1,665.20	5.87	5.75	-59.440	2,888.28	-4,891.58	5,681.25	5,669.63	11.61	489.141		
1,800.00	1,800.00	1,830.33	1,830.08	6.23	6.34	-59.443	2,888.69	-4,892.96	5,682.07	5,669.51	12.56	452.401		
1,900.00	1,900.00	2,000.12	1,999.86	6.59	6.92	-59.422	2,890.19	-4,891.40	5,681.70	5,668.20	13.50	420.904		
2,000.00	2,000.00	2,314.40	2,313.92	6.95	7.98	-59.381	2,888.52	-4,880.61	5,677.54	5,662.64	14.90	381.003		
2,100.00	2,100.00	2,481.85	2,481.11	7.30	8.55	-59.368	2,884.97	-4,872.07	5,671.94	5,656.13	15.82	358.541		
2,200.00	2,200.00	2,551.00	2,550.17	7.66	8.78	-59.368	2,883.06	-4,868.88	5,666.50	5,650.08	16.42	345.156		
2,300.00	2,300.00	2,612.75	2,611.84	8.02	8.99	-59.373	2,881.21	-4,866.55	5,661.65	5,644.65	16.99	333.211		
2,400.00	2,400.00	2,699.48	2,698.48	8.38	9.29	-59.382	2,878.39	-4,863.67	5,657.12	5,639.47	17.65	320.546		
2,500.00	2,500.00	2,788.33	2,787.24	8.74	9.60	-59.394	2,875.45	-4,860.93	5,652.79	5,634.48	18.31	308.671		
2,600.00	2,600.00	2,873.97	2,872.80	9.10	9.89	-59.406	2,872.60	-4,858.52	5,648.67	5,629.71	18.97	297.791		
2,700.00	2,700.00	2,964.08	2,962.83	9.45	10.21	-59.419	2,869.77	-4,856.18	5,644.83	5,625.19	19.64	287.421		
2,800.00	2,800.00	3,067.79	3,066.47	9.81	10.57	-59.427	2,867.01	-4,853.16	5,640.97	5,620.61	20.36	277.098		
2,900.00	2,900.00	3,163.49	3,162.04	10.17	10.90	-59.400	2,867.43	-4,848.64	5,637.13	5,616.08	21.05	267.814		
3,000.00	3,000.00	3,238.31	3,236.46	10.53	11.17	-59.327	2,872.23	-4,842.64	5,633.49	5,611.82	21.67	259.962		
3,100.00	3,100.00	3,296.00	3,293.64	10.89	11.37	-59.252	2,877.72	-4,837.37	5,630.50	5,608.27	22.23	253.238		
3,200.00	3,200.00	3,392.00	3,388.67	11.25	11.71	-59.116	2,887.97	-4,828.46	5,627.98	5,605.05	22.93	245.419		
3,300.00	3,300.00	3,428.77	3,425.07	11.61	11.84	-59.063	2,892.07	-4,825.22	5,626.08	5,602.65	23.42	240.190		
3,400.00	3,400.00	3,486.00	3,481.66	11.96	12.04	-58.977	2,899.17	-4,820.56	5,625.31	5,601.32	23.99	234.497		
3,433.46	3,433.46	3,486.00	3,481.66	12.08	12.04	-58.977	2,899.17	-4,820.56	5,625.21	5,601.10	24.11	233.329		
3,500.00	3,500.00	3,486.00	3,481.66	12.32	12.04	-58.977	2,899.17	-4,820.56	5,625.60	5,601.26	24.34	231.084		
3,600.00	3,599.98	3,542.10	3,537.05	12.67	12.24	-172.438	2,907.06	-4,816.50	5,628.63	5,603.74	24.89	226.148		
3,700.00	3,699.84	3,581.00	3,575.40	13.00	12.38	-172.354	2,913.13	-4,814.00	5,636.36	5,611.01	25.36	222.280		
3,800.00	3,799.45	3,663.19	3,656.44	13.34	12.68	-172.195	2,925.96	-4,809.36	5,648.28	5,622.29	25.99	217.334		
3,900.00	3,898.80	3,751.84	3,744.04	13.68	13.00	-172.059	2,938.92	-4,805.03	5,663.05	5,636.41	26.65	212.520		
4,000.00	3,998.12	3,830.98	3,822.22	14.02	13.29	-171.951	2,950.61	-4,801.31	5,678.28	5,651.01	27.27	208.217		
4,100.00	4,097.44	3,919.61	3,909.45	14.37	13.63	-171.810	2,965.49	-4,796.36	5,693.85	5,665.91	27.94	203.803		
4,200.00	4,196.76	4,013.64	4,001.56	14.72	13.99	-171.637	2,983.26	-4,789.92	5,709.52	5,680.88	28.63	199.394		
4,300.00	4,296.08	4,103.76	4,089.82	15.07	14.34	-171.471	3,000.42	-4,783.76	5,725.33	5,696.01	29.32	195.266		
4,400.00	4,395.41	4,194.28	4,178.58	15.42	14.69	-171.312	3,017.22	-4,777.99	5,741.32	5,711.31	30.01	191.298		
4,500.00	4,494.73	4,294.67	4,277.13	15.78	15.09	-171.142	3,035.37	-4,771.98	5,757.43	5,726.68	30.75	187.242		
4,600.00	4,594.05	4,402.93	4,383.60	16.13	15.52	-170.971	3,053.99	-4,765.90	5,773.42	5,741.90	31.52	183.164		
4,700.00	4,693.37	4,494.78	4,473.90	16.49	15.88	-170.824	3,069.91	-4,760.58	5,789.37	5,757.15	32.23	179.638		
4,800.00	4,792.69	4,577.69	4,555.10	16.85	16.22	-170.676	3,085.70	-4,755.04	5,805.57	5,772.67	32.90	176.439		
4,900.00	4,892.01	4,666.69	4,641.99	17.21	16.59	-170.505	3,103.86	-4,748.56	5,822.06	5,788.44	33.61	173.206		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 231H - Wellbore #2 - Surveys												Offset Site Error: 0.00 usft			
Survey Program: 62-MWD, 10173-MWD				Reference Offset				Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
5,000.00	4,991.34	4,763.97	4,736.82	17.57	17.00	-170.313	3,124.22	-4,741.16	5,838.63	5,804.26	34.37	169.896			
5,100.00	5,090.66	4,874.20	4,844.33	17.94	17.47	-170.099	3,147.11	-4,732.79	5,855.20	5,820.02	35.18	166.430			
5,200.00	5,189.98	5,041.44	5,007.96	18.30	18.18	-169.798	3,179.26	-4,720.30	5,871.07	5,834.82	36.25	161.945			
5,300.00	5,289.30	5,141.25	5,106.04	18.67	18.60	-169.639	3,196.46	-4,713.33	5,886.31	5,849.29	37.02	159.008			
5,400.00	5,388.62	5,212.60	5,176.16	19.04	18.90	-169.527	3,208.76	-4,708.56	5,901.85	5,864.19	37.66	156.717			
5,500.00	5,487.94	5,284.00	5,246.00	19.40	19.21	-169.400	3,222.61	-4,703.30	5,918.02	5,879.72	38.30	154.503			
5,600.00	5,587.27	5,372.66	5,332.26	19.77	19.60	-169.222	3,241.66	-4,695.80	5,934.56	5,895.52	39.04	152.012			
5,700.00	5,686.59	5,465.86	5,422.71	20.14	20.02	-169.027	3,262.48	-4,687.27	5,951.11	5,911.30	39.81	149.506			
5,800.00	5,785.91	5,600.43	5,553.43	20.51	20.63	-168.751	3,291.90	-4,674.95	5,967.46	5,926.69	40.77	146.359			
5,900.00	5,885.23	5,721.91	5,671.78	20.89	21.18	-168.516	3,317.05	-4,663.97	5,983.32	5,941.65	41.68	143.570			
6,000.00	5,984.55	5,837.00	5,785.46	21.26	21.57	-168.265	3,348.37	-4,653.29	6,000.00	5,950.00	42.63	140.717			
6,100.00	6,083.87	5,937.00	5,885.46	21.63	21.94	-168.009	3,384.85	-4,643.39	6,021.11	5,960.11	43.61	137.800			
6,200.00	6,183.20	6,040.00	5,988.46	22.01	22.32	-167.748	3,427.49	-4,633.91	6,046.61	5,985.61	44.61	134.817			
6,300.00	6,282.52	6,143.00	6,091.46	22.38	22.69	-167.482	3,476.29	-4,624.91	6,077.61	6,016.61	45.63	131.767			
6,400.00	6,381.84	6,246.00	6,194.46	22.76	22.57	-167.211	3,531.35	-4,616.39	6,113.61	6,052.61	46.67	128.659			
6,500.00	6,481.16	6,349.00	6,297.46	23.13	22.57	-166.935	3,560.57	-4,608.39	6,155.61	6,094.61	47.73	125.491			
6,600.00	6,580.48	6,452.00	6,400.46	23.51	22.57	-166.654	3,560.57	-4,608.39	6,155.61	6,094.61	47.73	125.491			
6,700.00	6,679.81	6,555.00	6,503.46	23.89	22.57	-166.368	3,560.57	-4,608.39	6,155.61	6,094.61	47.73	125.491			
6,800.00	6,779.13	6,658.00	6,606.46	24.26	22.57	-166.077	3,560.57	-4,608.39	6,155.61	6,094.61	47.73	125.491			
6,900.00	6,878.45	6,761.00	6,709.46	24.64	22.57	-165.781	3,560.57	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,000.00	6,977.77	6,864.00	6,812.46	25.02	22.57	-165.480	3,560.57	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,100.00	7,077.09	6,967.00	6,915.46	25.40	22.57	-165.174	3,560.57	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,200.00	7,176.41	7,067.25	7,066.75	25.78	22.57	-164.863	3,559.33	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,300.00	7,275.74	7,167.37	7,167.10	26.16	22.57	-164.547	3,559.04	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,400.00	7,375.06	7,268.47	7,267.47	26.54	22.57	-164.226	3,558.74	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,500.00	7,474.38	7,368.87	7,367.87	26.92	22.57	-163.900	3,558.44	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,600.00	7,573.70	7,468.29	7,468.29	27.30	22.57	-163.569	3,558.14	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,700.00	7,673.02	7,568.75	7,568.75	27.68	22.57	-163.233	3,557.82	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,800.00	7,772.35	7,669.46	7,669.46	28.06	22.57	-162.892	3,556.77	-4,608.39	6,155.61	6,094.61	47.73	125.491			
7,900.00	7,871.67	7,770.46	7,770.46	28.42	22.57	-162.546	3,556.77	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,000.00	7,970.99	7,870.46	7,870.46	28.77	22.57	-162.195	3,556.77	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,100.00	8,070.31	7,970.46	7,970.46	29.11	22.57	-161.839	3,556.77	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,200.00	8,169.63	8,070.46	8,070.46	29.46	22.57	-161.478	3,556.77	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,300.00	8,268.95	8,170.46	8,170.46	29.80	22.57	-161.112	3,556.77	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,400.00	8,368.27	8,270.46	8,270.46	30.14	22.57	-160.741	3,556.77	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,500.00	8,467.59	8,371.26	8,371.26	30.48	22.57	-160.365	3,556.32	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,600.00	8,566.91	8,471.61	8,471.61	30.82	22.57	-160.000	3,556.13	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,700.00	8,666.23	8,572.96	8,572.96	31.17	22.57	-159.624	3,555.94	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,800.00	8,765.55	8,673.61	8,673.61	31.51	22.57	-159.248	3,555.75	-4,608.39	6,155.61	6,094.61	47.73	125.491			
8,900.00	8,864.87	8,773.61	8,773.61	31.85	22.57	-158.862	3,555.57	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,000.00	8,964.19	8,873.97	8,873.97	32.20	22.57	-158.476	3,555.39	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,100.00	9,063.51	8,973.31	8,973.31	32.54	22.57	-158.090	3,555.22	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,200.00	9,162.83	9,073.63	9,073.63	32.89	22.57	-157.704	3,555.05	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,300.00	9,262.15	9,173.96	9,173.96	33.23	22.57	-157.318	3,554.88	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,400.00	9,361.47	9,274.28	9,274.28	33.58	22.57	-156.932	3,554.72	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,500.00	9,460.79	9,374.60	9,374.60	33.92	22.57	-156.546	3,554.55	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,600.00	9,560.11	9,474.92	9,474.92	34.27	22.57	-156.160	3,554.40	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,700.00	9,659.43	9,574.73	9,574.73	34.61	22.57	-155.774	3,554.24	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,800.00	9,758.75	9,674.55	9,674.55	34.96	22.57	-155.388	3,554.09	-4,608.39	6,155.61	6,094.61	47.73	125.491			
9,900.00	9,858.07	9,774.41	9,774.41	35.31	22.57	-155.002	3,553.94	-4,608.39	6,155.61	6,094.61	47.73	125.491			
10,000.00	9,957.39	9,874.59	9,874.59	35.65	22.57	-154.616	3,553.80	-4,608.39	6,155.61	6,094.61	47.73	125.491			
10,100.00	10,056.71	9,974.59	9,974.59	36.00	22.57	-154.230	3,553.60	-4,608.39	6,155.61	6,094.61	47.73	125.491			



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 231H - Wellbore #2 - Surveys														Offset Site Error: 0.00 usft	
Survey Program: 62-MWD, 10173-MWD				Offset				Rule Assigned:				Offset Well Error: 0.00 usft			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Tooface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
10,200.00	10,172.31	15,626.00	10,776.59	36.35	129.67	1.085	3,553.60	518.03	3,790.21	3,626.12	164.09	23.099			
10,300.00	10,272.31	15,626.00	10,776.59	36.69	129.67	1.085	3,553.60	518.03	3,776.83	3,611.90	164.93	22.899			
10,400.00	10,372.05	15,626.00	10,776.59	37.05	129.67	-91.287	3,553.60	518.03	3,766.13	3,600.42	165.71	22.728			
10,500.00	10,468.70	15,658.96	10,778.64	37.46	130.44	-91.744	3,552.72	550.92	3,758.28	3,591.12	167.16	22.483			
10,600.00	10,558.06	15,941.52	10,784.94	37.90	137.05	-88.710	3,536.63	832.72	3,750.69	3,576.99	173.70	21.593			
10,700.00	10,636.21	15,960.76	10,785.73	38.38	137.50	-89.222	3,535.11	851.89	3,744.59	3,569.66	174.93	21.406			
10,800.00	10,699.75	16,002.00	10,788.26	38.91	138.46	-89.374	3,532.63	892.97	3,740.57	3,563.95	176.62	21.179			
10,900.00	10,745.88	16,022.69	10,789.79	39.51	138.95	-89.563	3,531.69	913.59	3,738.12	3,560.18	177.94	21.008			
11,000.00	10,772.61	16,096.00	10,795.03	40.19	140.67	-89.499	3,528.96	986.65	3,737.04	3,556.64	180.40	20.715			
11,100.00	10,779.78	16,218.73	10,801.83	40.92	143.55	-89.576	3,523.98	1,109.09	3,735.60	3,551.62	183.98	20.304			
11,200.00	10,781.99	16,286.00	10,805.53	41.76	145.14	-89.610	3,521.38	1,176.21	3,734.30	3,547.81	186.50	20.023			
11,300.00	10,784.21	16,376.69	10,810.66	42.71	147.28	-89.658	3,518.38	1,266.71	3,733.58	3,543.97	189.61	19.690			
11,328.29	10,784.84	16,381.00	10,810.89	43.00	147.38	-89.660	3,518.24	1,271.00	3,733.47	3,543.41	190.06	19.643 CC			
11,400.00	10,786.43	16,413.79	10,812.53	43.75	148.15	-89.674	3,517.46	1,303.74	3,733.74	3,542.08	191.66	19.481			
11,500.00	10,788.64	16,477.00	10,815.27	44.90	149.64	-89.695	3,517.50	1,366.89	3,735.99	3,541.64	194.35	19.223			
11,600.00	10,790.86	16,477.00	10,815.27	46.12	149.64	-89.695	3,517.50	1,366.89	3,739.35	3,543.72	195.64	19.114			
11,700.00	10,793.08	16,539.32	10,817.32	47.43	151.12	-89.705	3,518.98	1,429.16	3,744.42	3,546.01	198.41	18.872			
11,800.00	10,795.29	16,594.61	10,818.64	48.81	152.42	-89.707	3,521.04	1,484.39	3,750.73	3,549.67	201.06	18.655			
11,900.00	10,797.51	16,665.00	10,821.00	50.27	154.08	-89.720	3,524.54	1,554.66	3,758.22	3,554.08	204.13	18.411			
12,000.00	10,799.73	16,796.43	10,822.97	51.78	157.19	-89.706	3,530.11	1,685.94	3,764.94	3,556.15	208.78	18.033			
12,100.00	10,801.94	16,855.00	10,822.92	53.35	158.58	-89.686	3,533.04	1,744.43	3,772.46	3,560.78	211.68	17.822			
12,200.00	10,804.16	16,886.89	10,823.06	54.97	159.33	-89.678	3,535.10	1,776.25	3,781.35	3,567.45	213.90	17.678			
12,300.00	10,806.37	17,315.08	10,818.71	56.64	169.48	-89.471	3,548.24	2,203.79	3,788.12	3,562.27	225.85	16.773			
12,400.00	10,808.59	17,380.44	10,819.88	58.35	171.03	-89.467	3,547.48	2,269.13	3,789.60	3,560.43	229.17	16.536			
12,500.00	10,810.81	17,465.78	10,822.91	60.10	173.07	-89.484	3,547.30	2,354.41	3,791.95	3,558.98	232.97	16.276			
12,600.00	10,813.02	17,555.71	10,824.73	61.88	175.21	-89.482	3,547.03	2,444.33	3,794.29	3,557.37	236.91	16.015			
12,700.00	10,815.24	17,607.00	10,827.38	63.71	176.43	-89.505	3,547.20	2,495.54	3,797.36	3,557.38	239.98	15.824			
12,800.00	10,817.46	17,674.91	10,831.88	65.56	178.05	-89.551	3,548.14	2,563.29	3,801.44	3,558.00	243.44	15.615			
12,900.00	10,819.67	17,920.92	10,837.66	67.43	183.91	-89.557	3,549.54	2,809.09	3,805.13	3,554.04	251.09	15.154			
13,000.00	10,821.89	17,983.00	10,836.29	69.34	185.40	-89.515	3,548.91	2,871.15	3,806.68	3,552.14	254.53	14.955			
13,100.00	10,824.11	18,185.04	10,832.42	71.27	190.23	-89.390	3,544.90	3,073.10	3,807.44	3,546.34	261.10	14.583			
13,142.59	10,825.05	18,196.14	10,832.45	72.10	190.49	-89.387	3,544.63	3,084.20	3,807.35	3,545.08	262.27	14.517			
13,200.00	10,826.32	18,224.39	10,832.66	73.22	191.17	-89.380	3,544.02	3,112.43	3,807.61	3,543.48	264.13	14.416			
13,300.00	10,828.54	18,278.11	10,833.52	75.19	192.46	-89.376	3,543.43	3,166.14	3,809.09	3,541.64	267.45	14.242			
13,400.00	10,830.75	18,414.58	10,834.02	77.18	195.73	-89.338	3,542.67	3,302.60	3,811.35	3,538.69	272.66	13.978			
13,500.00	10,832.97	18,591.26	10,836.93	79.18	199.96	-89.323	3,537.34	3,479.15	3,810.58	3,531.85	278.73	13.671			
13,584.94	10,834.85	18,641.00	10,837.01	80.90	201.15	-89.307	3,535.61	3,528.86	3,810.00	3,528.27	281.73	13.523			
13,600.00	10,835.19	18,641.00	10,837.01	81.20	201.15	-89.307	3,535.61	3,528.86	3,810.03	3,527.96	282.07	13.507			
13,700.00	10,837.40	18,696.27	10,836.81	83.24	202.48	-89.286	3,534.38	3,584.11	3,810.70	3,525.20	285.51	13.347			
13,800.00	10,839.62	18,736.00	10,837.38	85.29	203.43	-89.282	3,534.30	3,623.84	3,813.08	3,524.53	288.55	13.215			
13,900.00	10,841.84	18,799.12	10,839.50	87.35	204.94	-89.293	3,534.97	3,686.91	3,816.73	3,524.61	292.12	13.066			
14,000.00	10,844.05	18,830.00	10,841.09	89.42	205.68	-89.307	3,535.52	3,717.75	3,821.54	3,526.69	294.85	12.961			
14,100.00	10,846.27	18,894.80	10,843.07	91.51	207.23	-89.316	3,537.52	3,782.48	3,827.47	3,529.07	298.40	12.827			
14,200.00	10,848.49	18,943.96	10,842.51	93.60	208.41	-89.291	3,539.96	3,831.57	3,835.02	3,533.51	301.51	12.719			
14,300.00	10,850.70	19,017.00	10,842.06	95.71	210.15	-89.262	3,544.37	3,904.48	3,843.65	3,538.40	305.25	12.592			
14,400.00	10,852.92	19,134.93	10,839.77	97.82	212.97	-89.191	3,551.56	4,022.16	3,852.45	3,542.21	310.24	12.418			
14,500.00	10,855.13	19,615.27	10,826.73	99.94	224.48	-88.842	3,554.14	4,501.65	3,854.85	3,530.97	323.87	11.902			
14,600.00	10,857.35	19,680.00	10,825.45	102.07	226.03	-88.802	3,551.45	4,566.31	3,853.55	3,525.87	327.68	11.760			
14,654.52	10,858.56	19,713.40	10,825.56	103.24	226.83	-88.792	3,550.33	4,599.69	3,853.25	3,523.55	329.70	11.687			
14,700.00	10,859.57	19,730.42	10,826.29	104.21	227.24	-88.797	3,549.95	4,616.69	3,853.42	3,522.27	331.14	11.637			
14,800.00	10,861.78	19,775.00	10,830.32	106.36	228.31	-88.843	3,549.62	4,661.07	3,854.99	3,520.55	334.44	11.527			
14,900.00	10,864.00	19,826.89	10,835.94	108.51	229.55	-88.910	3,549.94	4,712.66	3,857.93	3,520.08	337.85	11.419			

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 231H - Wellbore #2 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 62-MWD, 10173-MWD													Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)		Minimum Separation (usft)	Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)						
15,000.00	10,866.22	19,897.12	10,840.84	110.66	231.23	-88.961	3,550.90	4,782.70	3,861.79	3,520.12	341.67	11.303		
15,100.00	10,868.43	19,963.00	10,843.56	112.83	232.81	-88.980	3,552.10	4,848.51	3,866.27	3,520.89	345.37	11.194		
15,200.00	10,870.65	20,025.18	10,844.55	114.99	234.31	-88.975	3,553.78	4,910.66	3,871.68	3,522.73	348.95	11.095		
15,300.00	10,872.87	20,095.91	10,843.97	117.17	236.01	-88.945	3,556.59	4,981.33	3,878.25	3,525.52	352.73	10.995		
15,400.00	10,875.08	20,505.98	10,843.86	119.35	245.88	-88.813	3,560.45	5,391.22	3,884.28	3,519.58	364.69	10.651		
15,500.00	10,877.30	20,597.43	10,846.94	121.53	248.08	-88.828	3,556.92	5,482.55	3,883.02	3,513.90	369.12	10.520		
15,600.00	10,879.52	20,757.39	10,856.30	123.72	251.94	-88.914	3,550.66	5,642.10	3,881.85	3,506.93	374.92	10.354		
15,700.00	10,881.73	20,865.09	10,855.84	125.91	254.53	-88.871	3,544.60	5,749.61	3,878.86	3,499.19	379.67	10.216		
15,800.00	10,883.95	20,902.00	10,855.37	128.10	255.42	-88.851	3,542.62	5,786.47	3,876.67	3,493.64	383.03	10.121		
15,841.46	10,884.87	20,902.00	10,855.37	129.02	255.42	-88.851	3,542.62	5,786.47	3,876.45	3,492.38	384.08	10.093		
15,900.00	10,886.16	20,902.00	10,855.37	130.30	255.42	-88.851	3,542.62	5,786.47	3,876.89	3,491.42	385.48	10.057 ES		
16,000.00	10,888.38	20,902.00	10,855.37	132.51	255.42	-88.851	3,542.62	5,786.47	3,879.69	3,492.01	387.68	10.007		
16,100.00	10,890.60	20,902.00	10,855.37	134.71	255.42	-88.851	3,542.62	5,786.47	3,885.06	3,495.43	389.64	9.971		
16,200.00	10,892.81	20,902.00	10,855.37	136.92	255.42	-88.851	3,542.62	5,786.47	3,893.00	3,501.65	391.35	9.948		
16,300.00	10,895.03	20,902.00	10,855.37	139.13	255.42	-88.851	3,542.62	5,786.47	3,903.48	3,510.67	392.81	9.937 SF		
16,400.00	10,897.25	20,902.00	10,855.37	141.35	255.42	-88.851	3,542.62	5,786.47	3,916.48	3,522.46	394.02	9.940		
16,500.00	10,899.46	20,902.00	10,855.37	143.57	255.42	-88.851	3,542.62	5,786.47	3,931.99	3,537.00	394.99	9.955		
16,600.00	10,901.68	20,902.00	10,855.37	145.79	255.42	-88.851	3,542.62	5,786.47	3,949.97	3,554.26	395.71	9.982		
16,700.00	10,903.90	20,902.00	10,855.37	148.01	255.42	-88.851	3,542.62	5,786.47	3,970.39	3,574.18	396.20	10.021		
16,800.00	10,906.11	20,902.00	10,855.37	150.24	255.42	-88.851	3,542.62	5,786.47	3,993.20	3,596.74	396.46	10.072		
16,900.00	10,908.33	20,902.00	10,855.37	152.46	255.42	-88.851	3,542.62	5,786.47	4,018.38	3,621.89	396.49	10.135		
17,000.00	10,910.54	20,902.00	10,855.37	154.69	255.42	-88.851	3,542.62	5,786.47	4,045.87	3,649.56	396.31	10.209		
17,100.00	10,912.76	20,902.00	10,855.37	156.93	255.42	-88.851	3,542.62	5,786.47	4,075.63	3,679.71	395.92	10.294		
17,200.00	10,914.98	20,902.00	10,855.37	159.16	255.42	-88.851	3,542.62	5,786.47	4,107.62	3,712.28	395.34	10.390		
17,300.00	10,917.19	20,902.00	10,855.37	161.40	255.42	-88.851	3,542.62	5,786.47	4,141.76	3,747.20	394.57	10.497		
17,400.00	10,919.41	20,902.00	10,855.37	163.63	255.42	-88.851	3,542.62	5,786.47	4,178.03	3,784.41	393.62	10.614		
17,500.00	10,921.63	20,902.00	10,855.37	165.87	255.42	-88.851	3,542.62	5,786.47	4,216.35	3,823.85	392.50	10.742		
17,600.00	10,923.84	20,902.00	10,855.37	168.12	255.42	-88.851	3,542.62	5,786.47	4,256.68	3,865.44	391.24	10.880		
17,700.00	10,926.06	20,902.00	10,855.37	170.36	255.42	-88.851	3,542.62	5,786.47	4,298.96	3,909.13	389.83	11.028		
17,800.00	10,928.28	20,902.00	10,855.37	172.60	255.42	-88.851	3,542.62	5,786.47	4,343.13	3,954.84	388.28	11.185		
17,900.00	10,930.49	20,902.00	10,855.37	174.85	255.42	-88.851	3,542.62	5,786.47	4,389.13	4,002.51	386.62	11.353		
18,000.00	10,932.71	20,902.00	10,855.37	177.10	255.42	-88.851	3,542.62	5,786.47	4,436.91	4,052.07	384.84	11.529		
18,100.00	10,934.92	20,902.00	10,855.37	179.35	255.42	-88.851	3,542.62	5,786.47	4,486.41	4,103.44	382.97	11.715		
18,200.00	10,937.14	20,902.00	10,855.37	181.60	255.42	-88.851	3,542.62	5,786.47	4,537.57	4,156.57	381.00	11.910		
18,300.00	10,939.36	20,902.00	10,855.37	183.85	255.42	-88.851	3,542.62	5,786.47	4,590.35	4,211.39	378.96	12.113		
18,400.00	10,941.57	20,902.00	10,855.37	186.10	255.42	-88.851	3,542.62	5,786.47	4,644.67	4,267.84	376.84	12.325		
18,500.00	10,943.79	20,902.00	10,855.37	188.36	255.42	-88.851	3,542.62	5,786.47	4,700.50	4,325.84	374.66	12.546		
18,600.00	10,946.01	20,902.00	10,855.37	190.61	255.42	-88.851	3,542.62	5,786.47	4,757.77	4,385.35	372.42	12.775		
18,700.00	10,948.22	20,902.00	10,855.37	192.87	255.42	-88.851	3,542.62	5,786.47	4,816.44	4,446.30	370.14	13.012		
18,800.00	10,950.44	20,902.00	10,855.37	195.13	255.42	-88.851	3,542.62	5,786.47	4,876.46	4,508.64	367.82	13.258		
18,900.00	10,952.66	20,902.00	10,855.37	197.39	255.42	-88.851	3,542.62	5,786.47	4,937.77	4,572.30	365.47	13.511		
19,000.00	10,954.87	20,902.00	10,855.37	199.65	255.42	-88.851	3,542.62	5,786.47	5,000.32	4,637.24	363.09	13.772		
19,100.00	10,957.09	20,902.00	10,855.37	201.91	255.42	-88.851	3,542.62	5,786.47	5,064.08	4,703.40	360.69	14.040		
19,200.00	10,959.30	20,902.00	10,855.37	204.17	255.42	-88.851	3,542.62	5,786.47	5,129.00	4,770.73	358.28	14.316		
19,300.00	10,961.52	20,902.00	10,855.37	206.43	255.42	-88.851	3,542.62	5,786.47	5,195.03	4,839.18	355.85	14.599		
19,400.00	10,963.74	20,902.00	10,855.37	208.70	255.42	-88.851	3,542.62	5,786.47	5,262.14	4,908.71	353.43	14.889		
19,500.00	10,965.95	20,902.00	10,855.37	210.96	255.42	-88.851	3,542.62	5,786.47	5,330.27	4,979.27	351.00	15.186		
19,600.00	10,968.17	20,902.00	10,855.37	213.23	255.42	-88.851	3,542.62	5,786.47	5,399.40	5,050.82	348.57	15.490		
19,700.00	10,970.39	20,902.00	10,855.37	215.49	255.42	-88.851	3,542.62	5,786.47	5,469.48	5,123.32	346.15	15.801		
19,800.00	10,972.60	20,902.00	10,855.37	217.76	255.42	-88.851	3,542.62	5,786.47	5,540.48	5,196.73	343.75	16.118		
19,900.00	10,974.82	20,902.00	10,855.37	220.03	255.42	-88.851	3,542.62	5,786.47	5,612.36	5,271.01	341.35	16.442		
20,000.00	10,977.04	20,902.00	10,855.37	222.30	255.42	-88.851	3,542.62	5,786.47	5,685.10	5,346.12	338.97	16.772		

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



MS Directional
Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Rana Salada Fed Com 0605 - Rana Salada Fed Com 0605 231H - Wellbore #2 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 62-MWD, 10173-MWD													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Rule Assigned:		Distance		Minimum Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor		
20,100.00	10,979.25	20,902.00	10,855.37	224.57	255.42	-88.851	3,542.62	5,786.47	5,758.65	5,422.04	336.61	17.108		
20,200.00	10,981.47	20,902.00	10,855.37	226.84	255.42	-88.851	3,542.62	5,786.47	5,832.99	5,498.72	334.27	17.450		
20,300.00	10,983.69	20,902.00	10,855.37	229.11	255.42	-88.851	3,542.62	5,786.47	5,908.08	5,576.13	331.95	17.798		
20,400.00	10,985.90	20,902.00	10,855.37	231.38	255.42	-88.851	3,542.62	5,786.47	5,983.91	5,654.25	329.65	18.152		
20,500.00	10,988.12	20,902.00	10,855.37	233.65	255.42	-88.851	3,542.62	5,786.47	6,060.43	5,733.05	327.38	18.512		
20,600.00	10,990.33	20,902.00	10,855.37	235.92	255.42	-88.851	3,542.62	5,786.47	6,137.64	5,812.50	325.14	18.877		
20,700.00	10,992.55	20,902.00	10,855.37	238.19	255.42	-88.851	3,542.62	5,786.47	6,215.49	5,892.57	322.92	19.248		
20,800.00	10,994.77	20,902.00	10,855.37	240.47	255.42	-88.851	3,542.62	5,786.47	6,293.96	5,973.24	320.73	19.624		
20,900.00	10,996.98	20,902.00	10,855.37	242.74	255.42	-88.851	3,542.62	5,786.47	6,373.04	6,054.48	318.57	20.005		
21,000.00	10,999.20	20,902.00	10,855.37	245.02	255.42	-88.851	3,542.62	5,786.47	6,452.71	6,136.27	316.43	20.392		
21,100.00	11,001.42	20,902.00	10,855.37	247.29	255.42	-88.851	3,542.62	5,786.47	6,532.93	6,218.60	314.33	20.784		
21,200.00	11,003.63	20,902.00	10,855.37	249.57	255.42	-88.851	3,542.62	5,786.47	6,613.68	6,301.43	312.26	21.180		
21,216.59	11,004.00	20,902.00	10,855.37	249.95	255.42	-88.851	3,542.62	5,786.47	6,627.13	6,315.21	311.92	21.247		



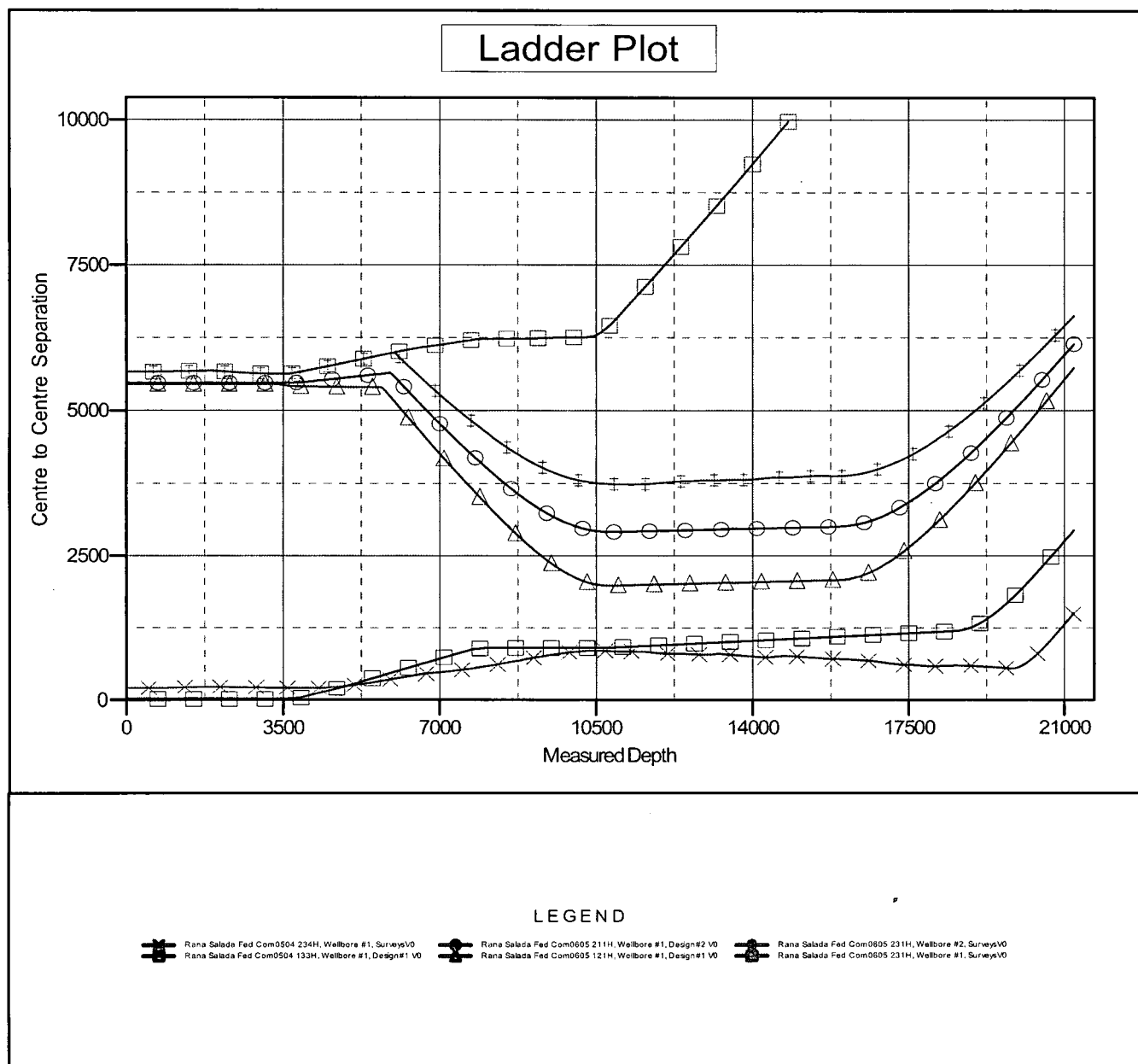
MS Directional Anticollision Report



Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 3065.90usft (25' RKB)
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

Coordinates are relative to: Rana Salada Fed Com 0504 214H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.169°



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



MS Directional
Anticollision Report

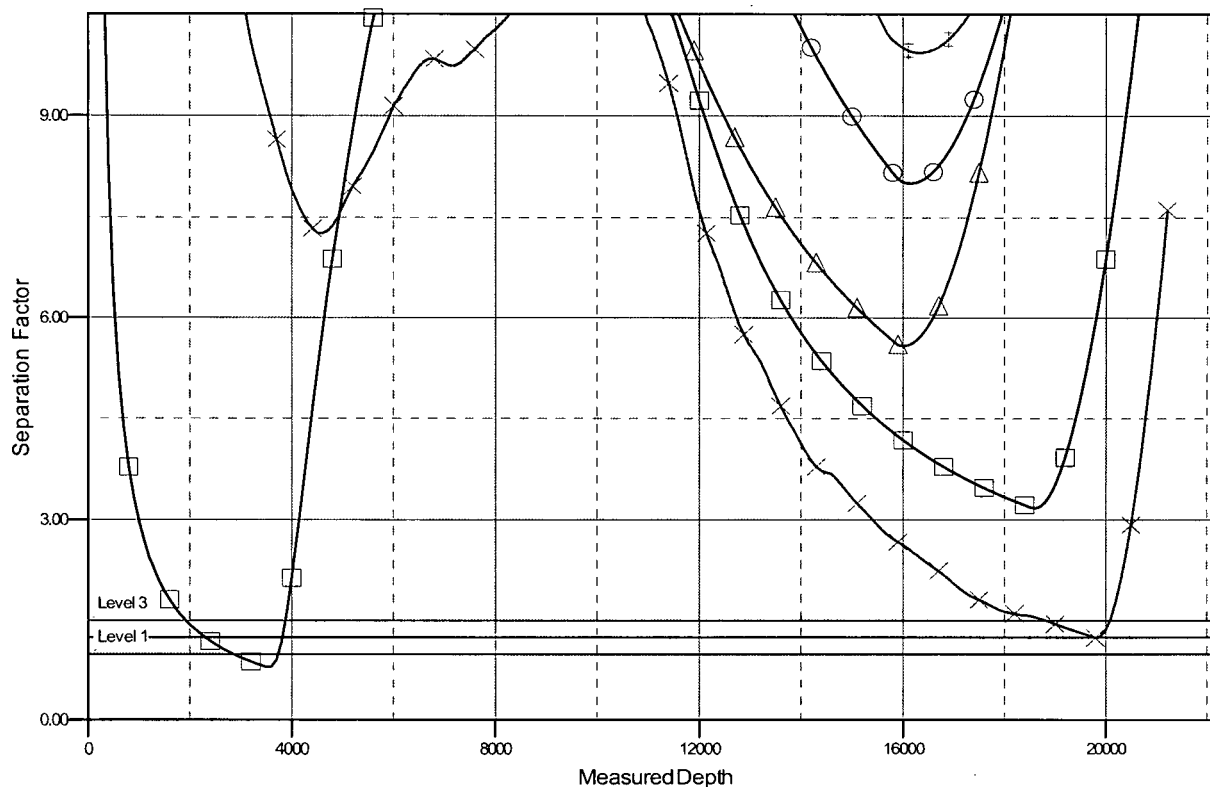


Company:	Novo Oil & Gas, LLC	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0504 214H
Project:	Eddy County, New Mexico (NAD 83)	TVD Reference:	WELL @ 3065.90usft (25' RKB)
Reference Site:	Rana Salada Fed Com 0504	MD Reference:	WELL @ 3065.90usft (25' RKB)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0504 214H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM 5000.15 Conroe Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to WELL @ 3065.90usft (25' RKB)
Offset Depths are relative to Offset Datum
Central Meridian is -104.333334

Coordinates are relative to: Rana Salada Fed Com 0504 214H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.169°

Separation Factor Plot



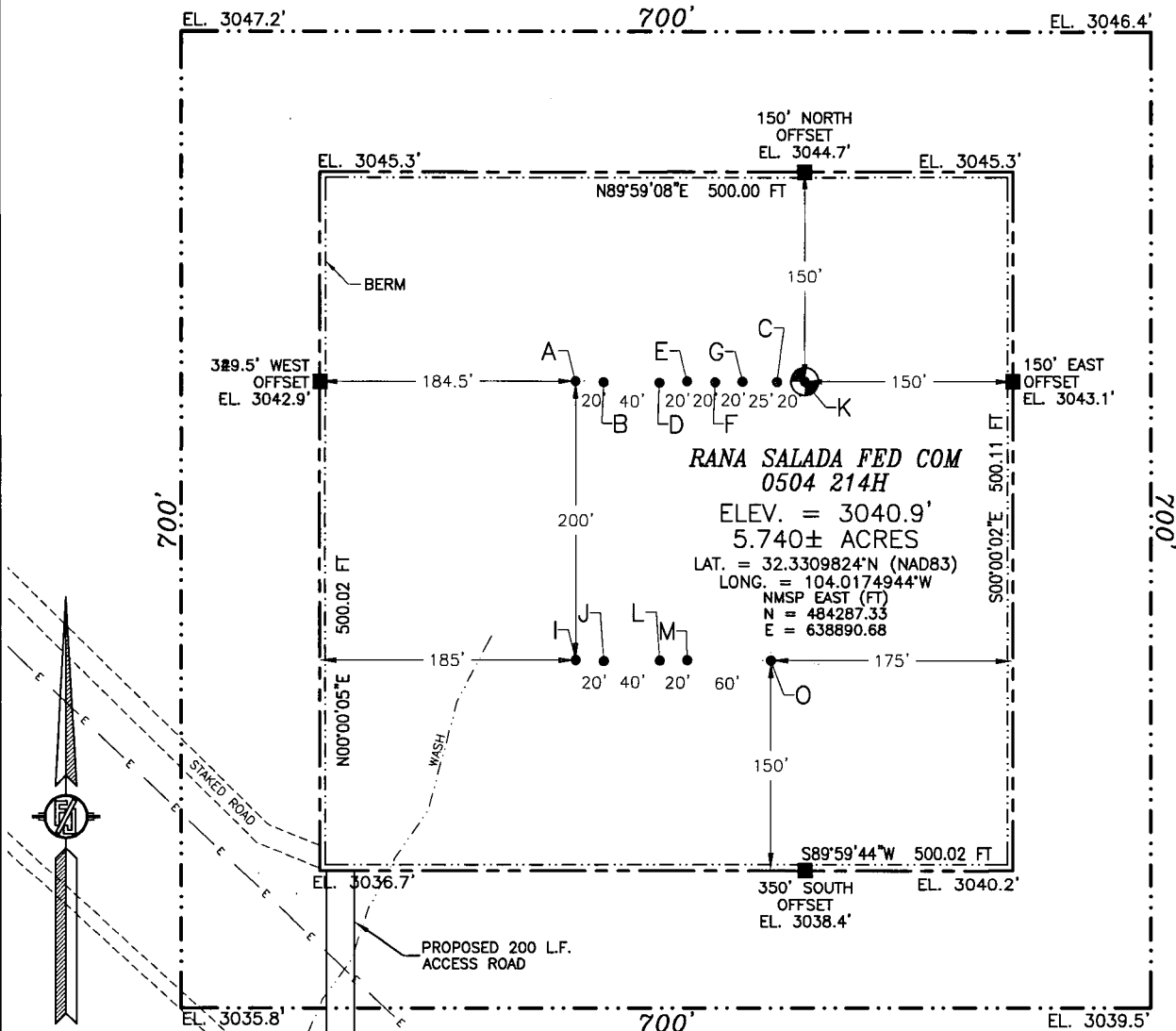
LEGEND

Rana Salada Fed Com0504 234H, Wellbore #1, SurveysV0
 Rana Salada Fed Com0504 133H, Wellbore #1, Design#1 V0
 Rana Salada Fed Com0605 211H, Wellbore #1, Design#2 V0
 Rana Salada Fed Com0605 121H, Wellbore #1, Design#1 V0
 Rana Salada Fed Com0605 231H, Wellbore #2, SurveysV0
 Rana Salada Fed Com0605 231H, Wellbore #1, SurveysV0

SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
SITE MAP

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

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



012 60 120 240
SCALE 1" = 120'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF CR 605 (REFINERY ROAD) AND SR 31 (POTASH MINES ROAD) GO NORTHEAST ON SR 31 APPROX. 1.1 MILES, TURN LEFT ON PIPELINE ROAD AND GO NORTHWEST 311' THROUGH GATE TO A ROAD SURVEY, FOLLOW ROAD SURVEY NORTH 200' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

I, FILIMON F. JARAMILLA, a duly Licensed Professional Surveyor in the State of New Mexico, do hereby certify that this is a true and correct copy of the original survey as shown to me by the owner of the land, and that the same is in accordance with the minimum standards for the profession.

FILIMON F. JARAMILLA (12787)

MADONNA SURVEYING, INC.

301 SOUTH CANAL
(575) 234-3341

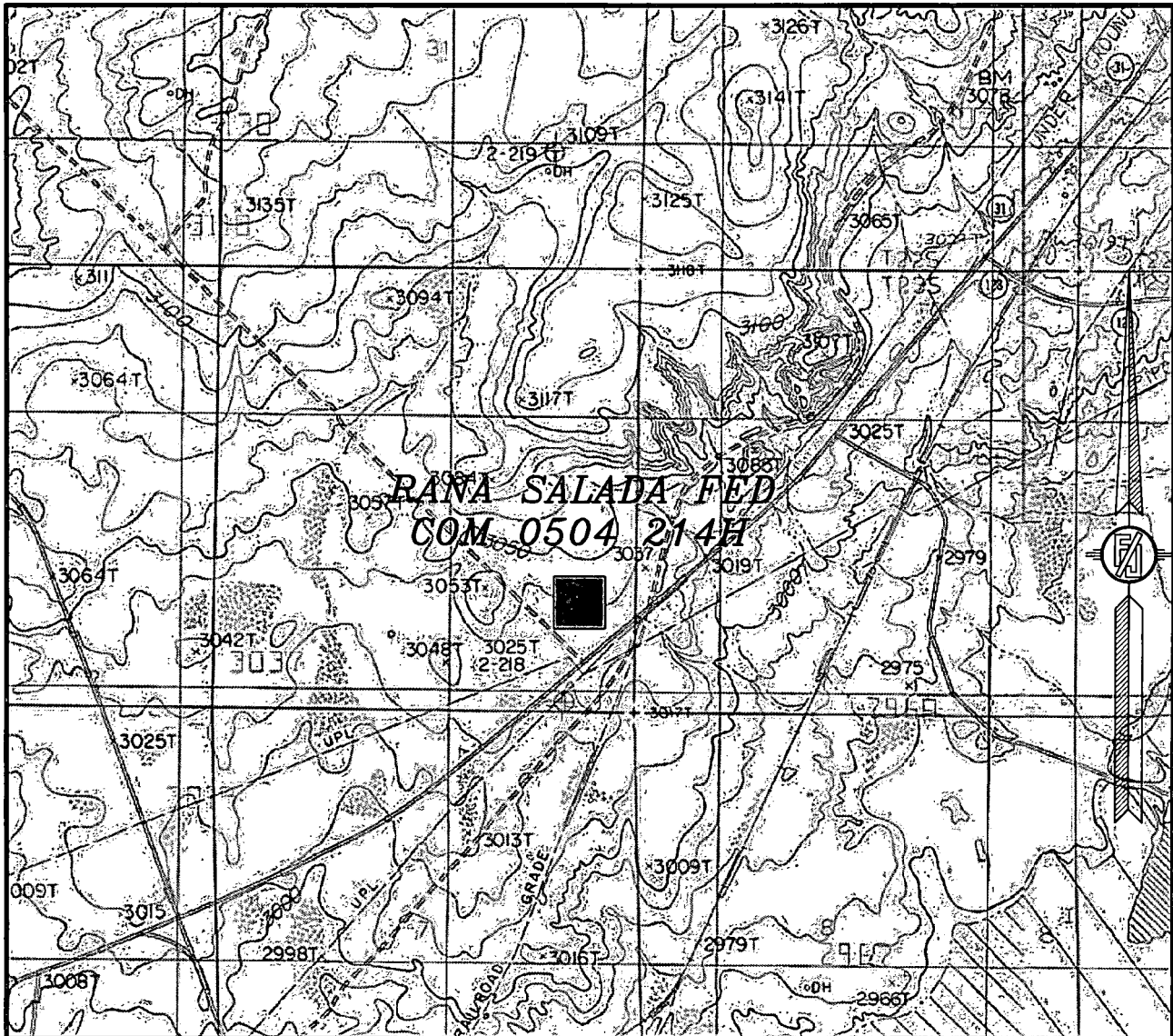
NOVO OIL & GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0504 214H
LOCATED 1240 FT. FROM THE SOUTH LINE
AND 709 FT. FROM THE EAST LINE OF
SECTION 6, TOWNSHIP 23 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 30, 2020

SURVEY NO. 7195C

CARLSBAD, NEW MEXICO

SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
LOCATION VERIFICATION MAP



USGS QUAD MAP:
LOVING

NOT TO SCALE

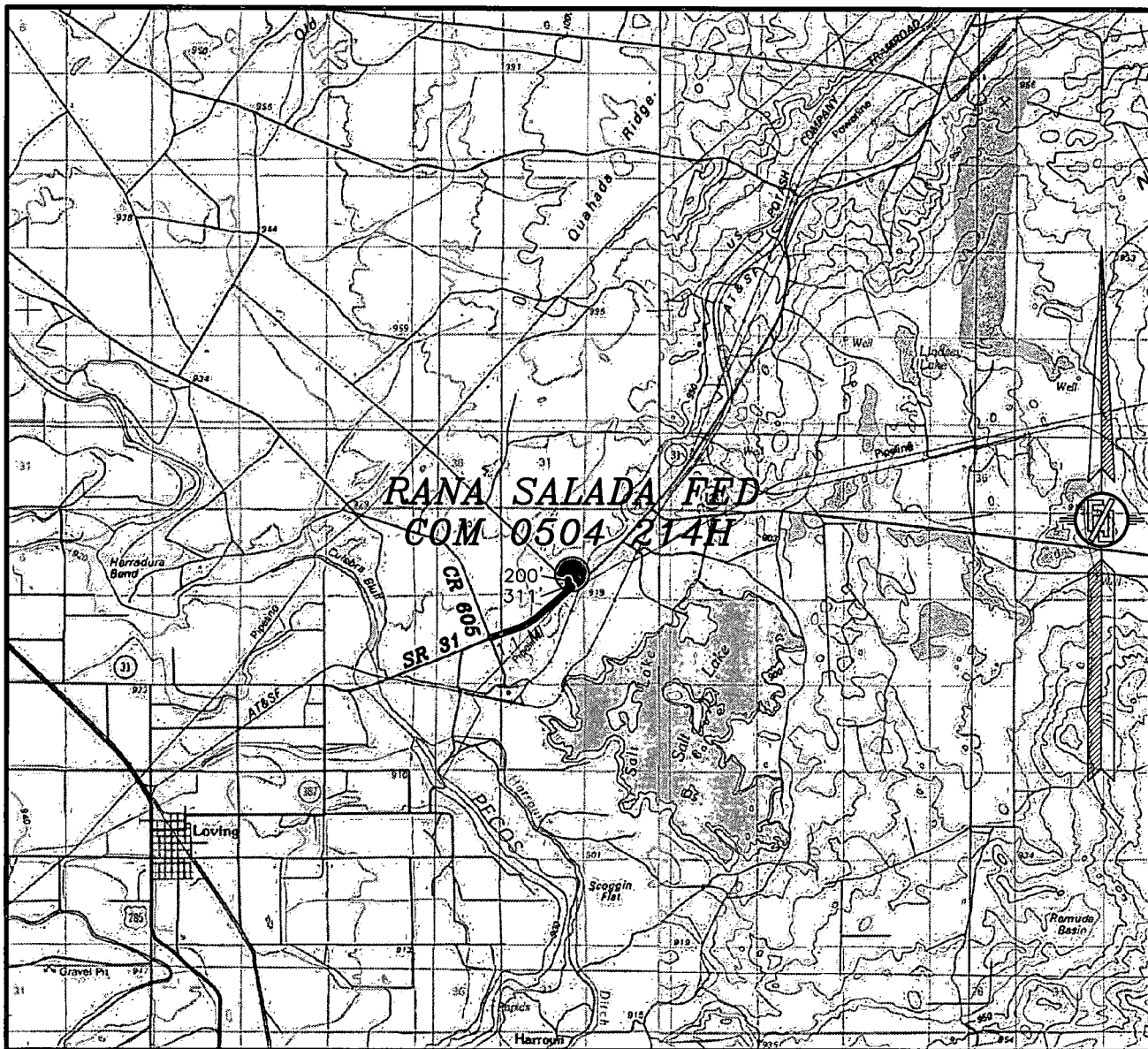
NOVO OIL & GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0504 214H
LOCATED 1240 FT. FROM THE SOUTH LINE
AND 709 FT. FROM THE EAST LINE OF
SECTION 6, TOWNSHIP 23 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 30, 2020

SURVEY NO. 7195C

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

SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

NOVO OIL & GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0504 214H
LOCATED 1240 FT. FROM THE SOUTH LINE
AND 709 FT. FROM THE EAST LINE OF
SECTION 6, TOWNSHIP 23 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF CR 605 (REFINERY ROAD) AND SR 31 (POTASH MINES ROAD) GO NORTHEAST ON SR 31 APPROX. 1.1 MILES, TURN LEFT ON PIPELINE ROAD AND GO NORTHWEST 311' THROUGH GATE TO A ROAD SURVEY, FOLLOW ROAD SURVEY NORTH 200' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

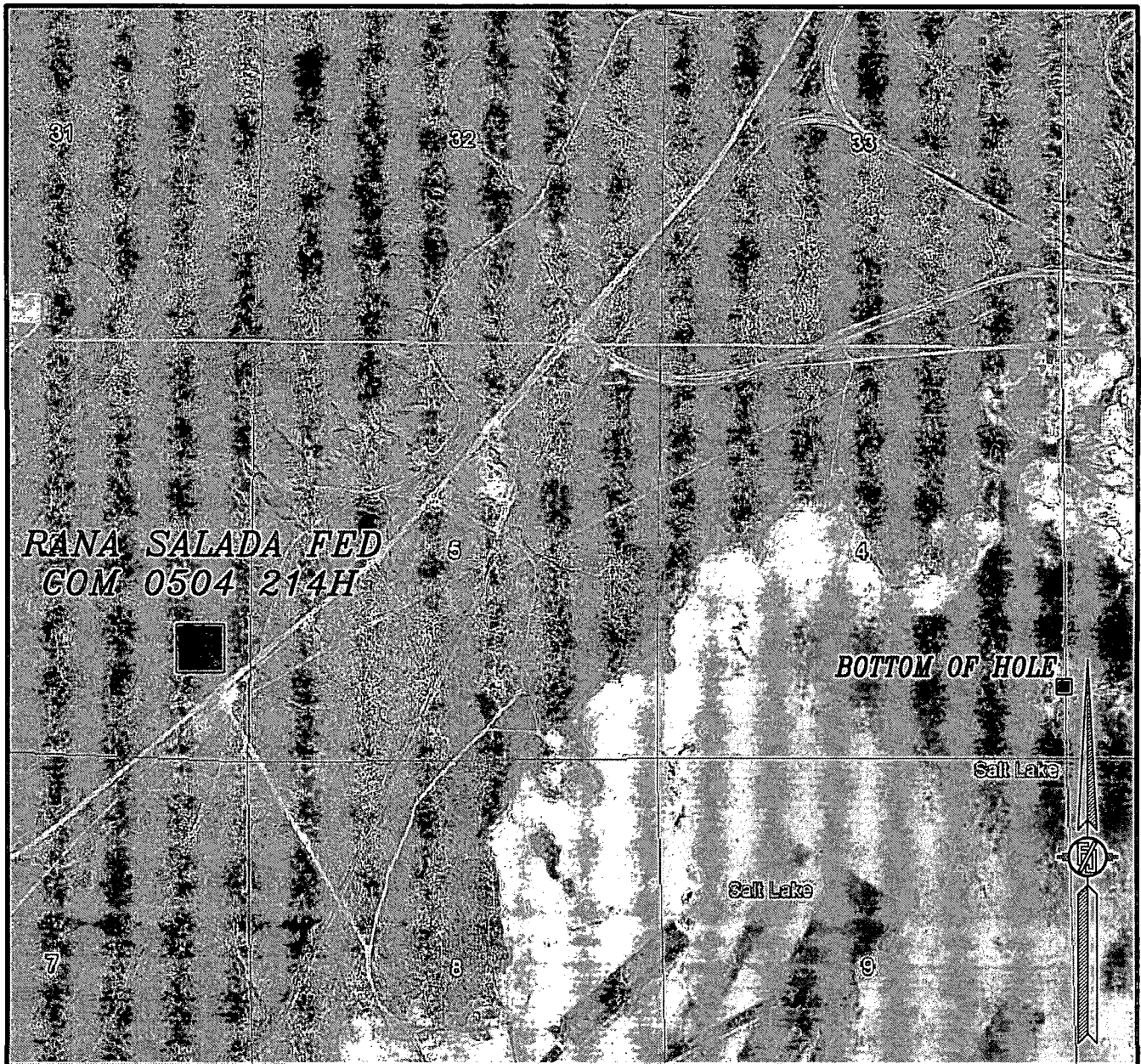
JANUARY 30, 2020

SURVEY NO. 7195C

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

CARLSBAD, NEW MEXICO

SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
NOVEMBER 2017

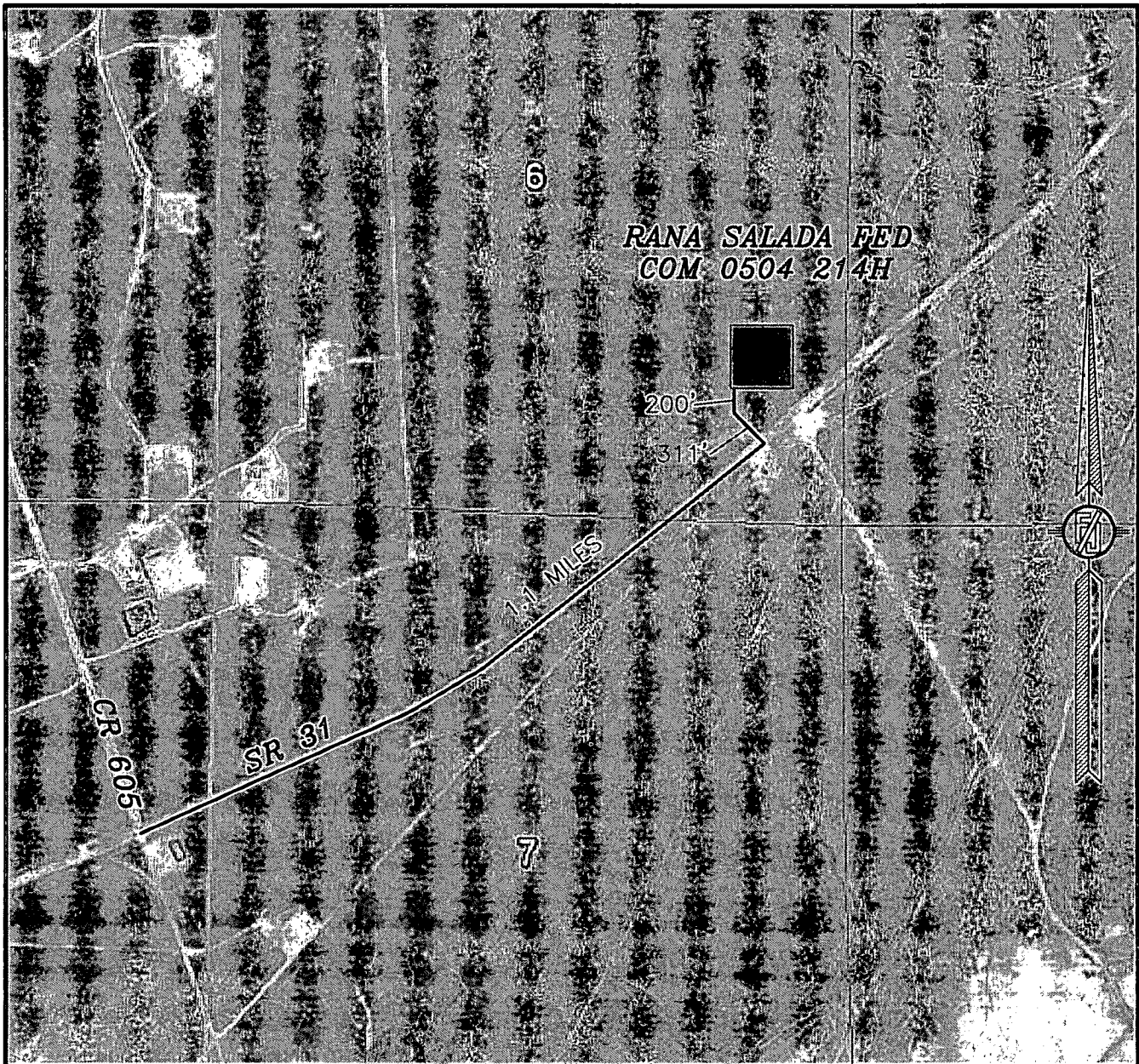
NOVO OIL & GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0504 214H
LOCATED 1240 FT. FROM THE SOUTH LINE
AND 709 FT. FROM THE EAST LINE OF
SECTION 6, TOWNSHIP 23 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 30, 2020

SURVEY NO. 7195C

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

SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
ACCESS AERIAL ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
NOVEMBER 2017

NOVO OIL & GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0504 214H
LOCATED 1240 FT. FROM THE SOUTH LINE
AND 709 FT. FROM THE EAST LINE OF
SECTION 6, TOWNSHIP 23 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 30, 2020

SURVEY NO. 7195C

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

1-MILE MAP

NOT TO SCALE

[SH] SURFACE LOCATION
[BH] BOTTOM OF HOLE
(XX) WELLS WITHIN 1 MILE

NOVO OIL & GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0504 214H
LOCATED 1240 FT. FROM THE SOUTH LINE
AND 709 FT. FROM THE EAST LINE OF
SECTION 6, TOWNSHIP 23 SOUTH,
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EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 30, 2020
SURVEY NO. 7195C

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

☐ SURFACE LOCATION
☐ BOTTOM OF HOLE
☒ WELLS WITHIN 1 MILE

NOVO OIL & GAS NORTHERN DELAWARE, LLC
RANA SALADA FED COM 0504 214H
 LOCATED 1240 FT. FROM THE SOUTH LINE
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 EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 30, 2020

SURVEY NO. 7195C

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

CARLSBAD, NEW MEXICO

PLAN VIEW

LIMITS OF
EARTHWORK
3:1 SLOPE (TYP.)

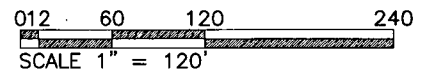
LIMITS OF
EARTHWORK
3:1 SLOPE (TYP.)

PROPOSED PAD
EL. = 3040.0'

PROPOSED 200 L.F.
ACCESS ROAD

PAD
CENTER POINT

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



I, FILIMON F. JARAMILLO, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.



NOVO OIL & GAS NORTHERN DELAWARE, LLC
PAD GRADING AND CROSS SECTIONS
FOR RANA SALADA FED COM 0504 214H
 SECTION 6, TOWNSHIP 23 SOUTH,
 RANGE 29 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO

JANUARY 17, 2020

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

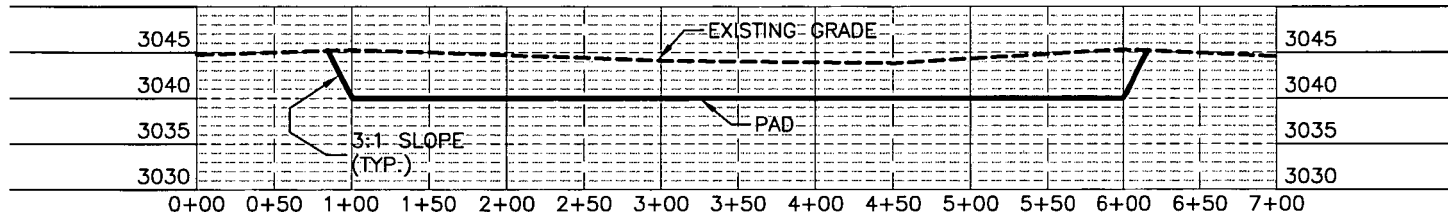
CUT	FILL	NET
12106 CU. YD	5117 CU. YD	6989 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

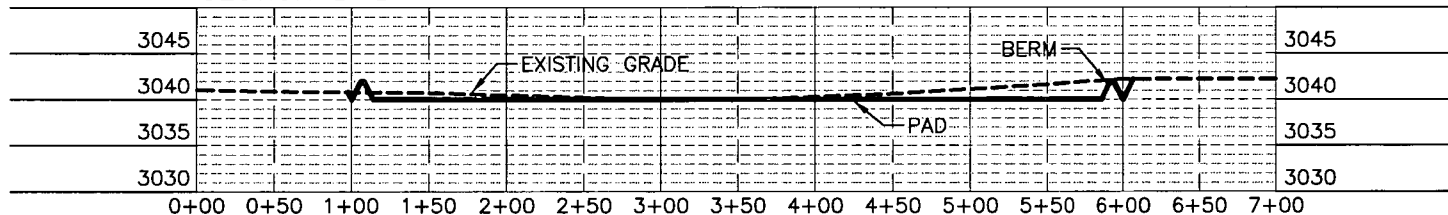
SHEET 1-2
SURVEY NO. 7195C

CROSS-SECTIONS

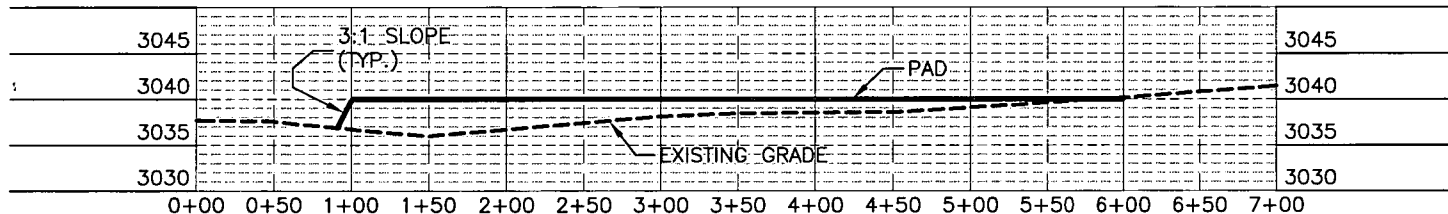
SECTION A-A'



SECTION B-B'



SECTION C-C'



I, FILIMON F. JARAMILLO, A NEW MEXICO REGISTERED PROFESSIONAL SURVEYOR CERTIFY THAT I DIRECTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO.

NOVO OIL & GAS NORTHERN DELAWARE, LLC
PAD GRADING AND CROSS SECTIONS
FOR RANA SALADA FED COM 0504 214H
SECTION 6, TOWNSHIP 23 SOUTH,
RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

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

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

EARTHWORK QUANTITIES ARE ESTIMATED

JANUARY 17, 2020

301 SOUTH CANAL
(575) 234-3341

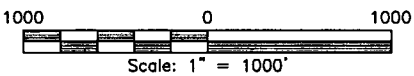
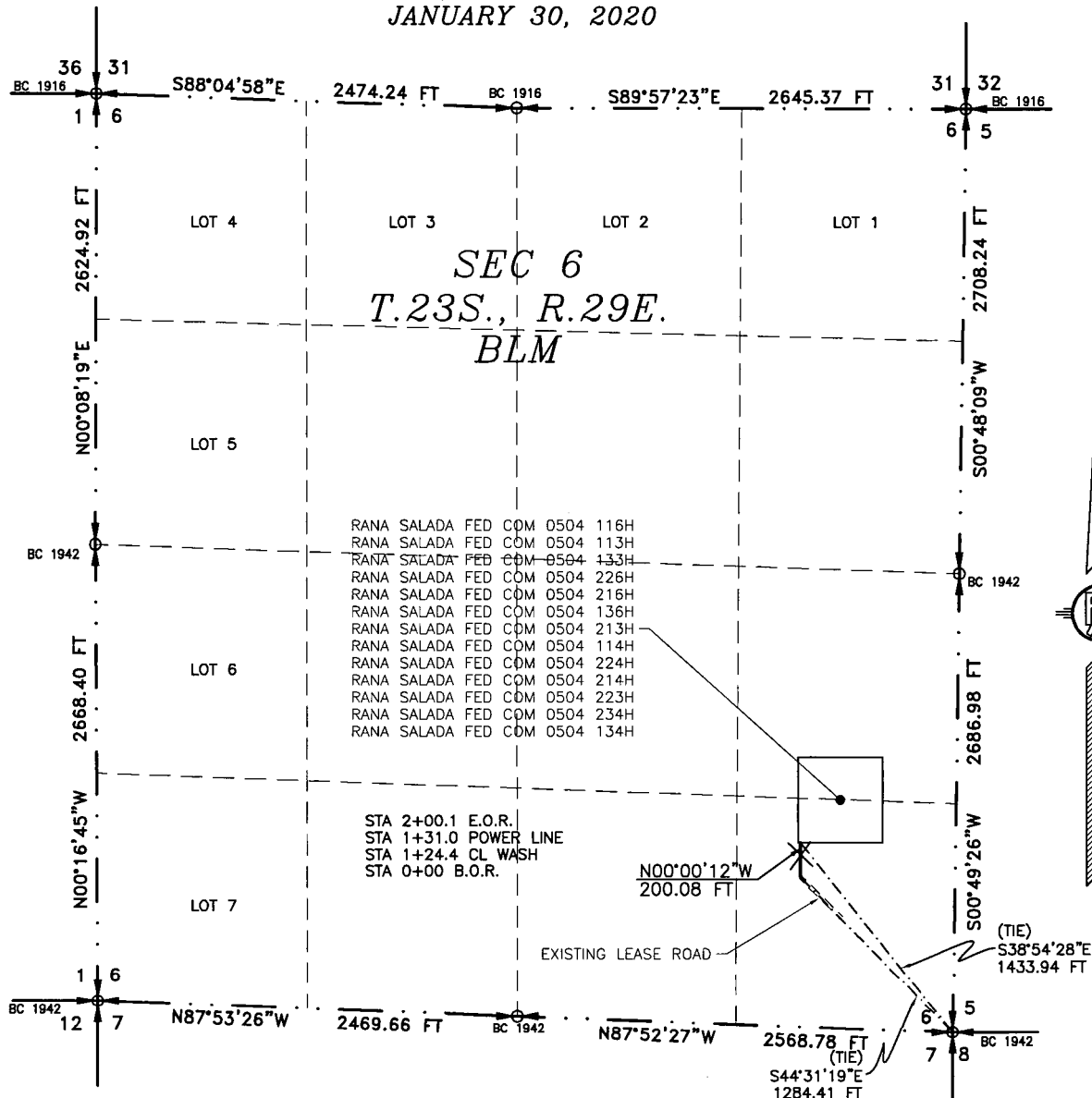
MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

SHEET 2-2
SURVEY NO. 7195C

ACCESS ROAD PLAT

ACCESS ROAD TO THE RANA SALADA FED COM 0504 116H, 113H, 133H, 226H, 216H, 136H, 213H, 114H, 224H, 214H, 223H, 234H, 134H

NOVO OIL & GAS NORTHERN DELAWARE, LLC
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JANUARY 30, 2020



GENERAL NOTES

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SHEET: 1-2

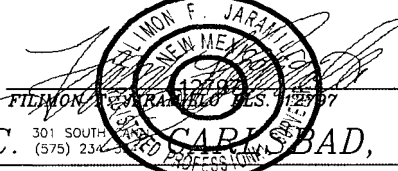
MADRON SURVEYING, INC.

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD,

NEW MEXICO, THIS 30 DAY OF JANUARY 2020



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

SURVEY NO. 7195C

CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD TO THE RANA SALADA FED COM 0504 116H, 113H, 133H, 226H, 216H, 136H, 213H, 114H, 224H, 214H, 223H, 234H, 134H

NOVO OIL & GAS NORTHERN DELAWARE, LLC
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JANUARY 30, 2020

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SE/4 SE/4 OF SAID SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M., WHENCE THE SOUTHEAST CORNER OF SAID SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS S44°31'19"E, A DISTANCE OF 1284.41 FEET;

THENCE N00°00'12"W A DISTANCE OF 200.08 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE SOUTHEAST CORNER OF SAID SECTION 6, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS S38°54'28"E, A DISTANCE OF 1433.94 FEET;

SAID STRIP OF LAND BEING 200.08 FEET OR 12.13 RODS IN LENGTH, CONTAINING 0.138 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SE/4 SE/4 200.08 L.F. 12.13 RODS 0.138 ACRES

GENERAL NOTES

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

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

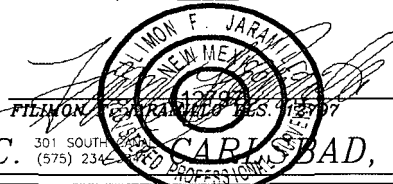
SHEET: 2-2

MADRON SURVEYING, INC.

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 30 DAY OF JANUARY 2020



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

SURVEY NO. 7195C

301 SOUTH CANAL CARLSBAD, NEW MEXICO (575) 234-3341