

Well Name: RANA SALADA FED COM 0106	Well Location: T23S / R28E / SEC 1 / NWSW /	County or Parish/State:
Well Number: 223H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMNM91078	Unit or CA Name:	Unit or CA Number:
US Well Number: 3001548155	Well Status: Approved Application for Permit to Drill	Operator: NOVO OIL AND GAS NORTHERN DELAWARE LLC

Notice of Intent

Type of Submission: Notice of Intent	Type of Action Other
Date Sundry Submitted: 06/04/2021	Time Sundry Submitted: 11:46
Date proposed operation will begin: 06/11/2021	

Procedure Description: Request to move Bottom Hole Location from 1,254' FSL & 130' FEL, Section 6, T-23-S, R-29-E, NESE to 1,320' FSL & 130' FEL, Section 6, T-23-S, R-29-E, NESE. See attached for detailed changes to BOP/Choke and casing, cement, and mud programs.

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

RS0106_223H_BHL_etc_Sundry_Attachments_20210604114421.pdf

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Well Number: 223H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMNM91078	Unit or CA Name:	Unit or CA Number:
US Well Number: 3001548155	Well Status: Approved Application for Permit to Drill	Operator: NOVO OIL AND GAS NORTHERN DELAWARE LLC

Conditions of Approval

Additional Reviews

RANA_SALADA_FED_COM_0106_223H_SUNDRY_Drilling__COA_20210610131113.pdf
RANA_SALADA_FED_COM_0106_223H_SUNDRY_APD_Calculations_20210610131108.pdf

Operator Certification

I certify that the foregoing is true and correct. 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. Electronic submission of Sundry Notices through this system satisfies regulations requiring a submission of Form 3160-5 or a Sundry Notice.

Operator Electronic Signature: BRIAN WOOD	Signed on: JUN 04, 2021 11:44 AM
Name: NOVO OIL AND GAS NORTHERN DELAWARE LLC	
Title: President	
Street Address: 37 VERANO LOOP	
City: SANTA FE	State: NM
Phone: (505) 466-8120	
Email address: AFMSS@PERMITSWEST.COM	

Field Representative

Representative Name:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

BLM Point of Contact

BLM POC Name: CHRISTOPHER WALLS	BLM POC Title: Petroleum Engineer
BLM POC Phone: 5752342234	BLM POC Email Address: cwalls@blm.gov
Disposition: Approved	Disposition Date: 06/10/2021
Signature: Chris Walls	

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-48155	² Pool Code 98220	³ Pool Name Purple Sage; Wolfcamp Gas Pool
⁴ Property Code	⁵ Property Name RANA SALADA FED COM 0106	⁶ Well Number 223H
⁷ OGRID No. 372920	⁸ Operator Name NOVO OIL & GAS NORTHERN DELAWARE, LLC	⁹ Elevation 3064.8

¹⁰ Surface Location

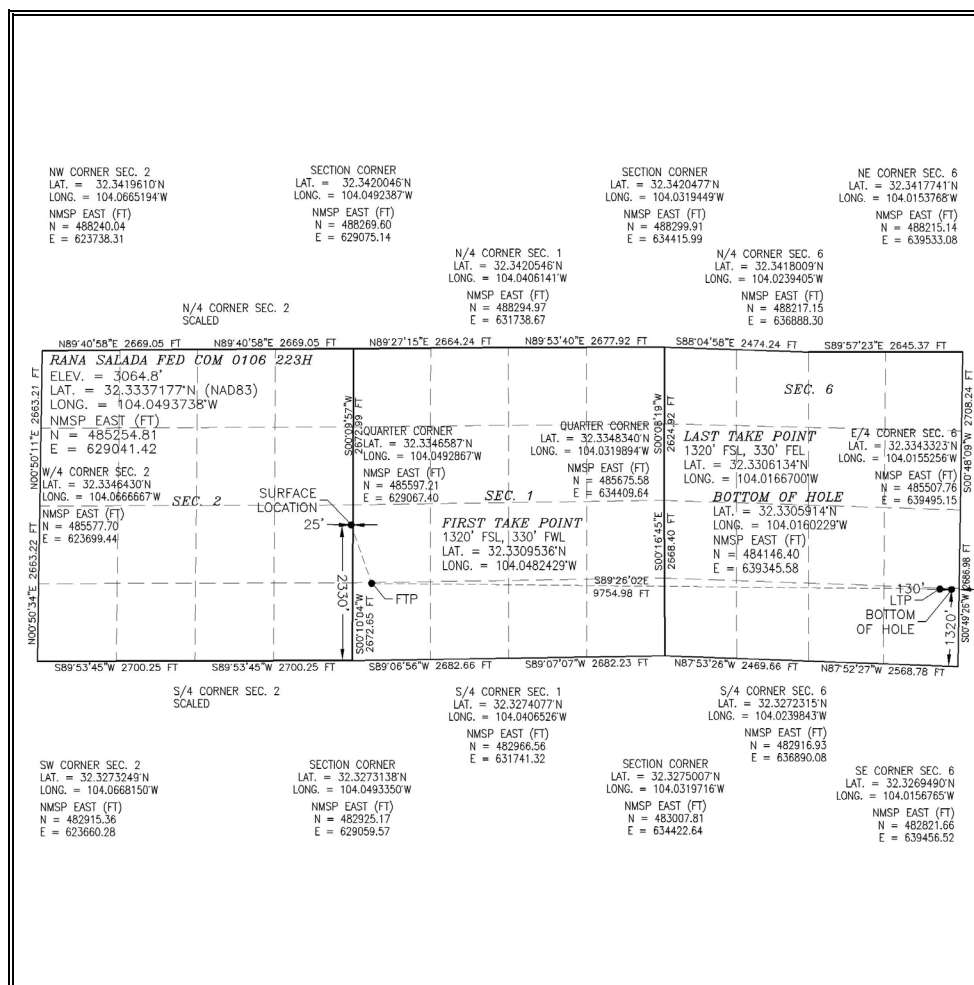
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	2	23 S	28 E		2330	SOUTH	25	EAST	EDDY

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	6	23 S	29 E		1320	SOUTH	130	EAST	EDDY

¹² Dedicated Acres 633.49	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



¹⁷ OPERATOR CERTIFICATION

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

Justin Carter 6/2/2021
Signature Date

Justin Carter

Printed Name

jcarter@novoog.com

E-mail Address

¹⁸ SURVEYOR CERTIFICATION

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

JUNE 1, 2021

Date of Survey

Signature and Seal of Professional Surveyor:

Certificate Number: 12797
Surveyor No. 8109B

Intent ☐ As Drilled ☐

API #		
Operator Name: NOVO OIL & GAS NORTHERN DELAWARE, LLC	Property Name: RANA SALADA FED COM 0106	Well Number 223H

Kick Off Point (KOP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
Latitude					Longitude				NAD

First Take Point (FTP)

UL M	Section 1	Township 23S	Range 28E	Lot	Feet 1320	From N/S SOUTH	Feet 330	From E/W WEST	County EDDY
Latitude 32.3309536					Longitude 104.0482429				NAD 83

Last Take Point (LTP)

UL P	Section 6	Township 23S	Range 29E	Lot	Feet 1320	From N/S SOUTH	Feet 330	From E/W EAST	County EDDY
Latitude 32.3306134					Longitude 104.0166700				NAD 83

Is this well the defining well for the Horizontal Spacing Unit? ☐Is this well an infill well? ☐

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

API #		
Operator Name:	Property Name:	Well Number

KZ 06/29/2018

CHANGE TO PLANS

Move Bottom Hole Location

From: 1,254' FSL & 130' FEL, Section 6, T-23-S, R-29-E, NESE

To: 1,320' FSL & 130' FEL, Section 6, T-23-S, R-29-E, NESE

Producing Formation

From: Wolfcamp A

To: Wolfcamp B

BOP & Choke

From: 10M

To: 5M (see diagrams attached)

Casing Depth Interval Changes (TMD)

Surface Casing (13-3/8"): 0' - 401'

Intermediate Casing (8-5/8"): 0' - 9825'

Production Casing (5-1/2"): 0' - 21925'

Single Stage Cement Job for 13-3/8" Surface Casing String (TOC = Surface)

Lead: 344 Sacks; 556.7 cu. ft.; 100% excess; 1.62 cu.ft./sx; 13.8 ppg; Class C + gel + accelerator + LCM; 1200 psi 24 hour compressive strength

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

Lead: 663 Sacks; 2373.5 cu. ft.; 100% excess; 3.58 cu.ft./sx; 10.0 ppg; Class C or H + fluid loss + retarder + LCM + beads; 900 psi 24 hour compressive strength

Tail: 130 Sacks; 180.7 cu. ft.; 50% excess; 1.39 cu.ft./sx; 13.80 ppg; Class C or H + fluid loss + retarder + LCM; 1200 psi 24 hour compressive strength

Single Stage Cement Job for 5-1/2" Production Casing String (TOC = Surface)

Lead: 777 Sacks; 1647.2 cu. ft.; 20% excess; 2.12 cu.ft./sx; 12.0 ppg; Class H + fluid loss + retarder + LCM; 1200 psi 24 hour compressive strength

Tail: 2065 Sacks; 3282.6 cu. ft.; 20% excess; 1.59 cu.ft./sx; 13.20 ppg; Class H + fluid loss + retarder + LCM; 1200 psi 24 hour compressive strength

Drilling Fluid Program Changes

Fresh water spud mud: 0' – 401'; 8.3 ppg

Brine Diesel Emulsion: 401' – 9,825' ; 8.8-9.6 ppg

Oil Based Mud: 9,825' – 21,925'; 12-12.5 ppg



NOVO OIL & GAS NORTHERN DELAWARE, LLC

Rana Salada Fed Com 0106 223H

SHL: 2330' FNL & 25' FEL Section 02-23S-28E

BHL: 1,320' FSL & 130' FEL Section 06-23S-29E

Eddy County, New Mexico

DRILLING OPERATIONS PLAN

Standard Wolfcamp 3-STRING CASING DESIGN (Not Secretary's Potash or R-111-P)

Estimated Drilling Conditions

Target Formation	Wolfcamp B
Target Depth - TVD (ft)	10525
Planned MD (ft)	21925
Anticipated Bottom-Hole Pressure (psi)	6841.25
Anticipated Maximum Surface Pressure (psi)	4525.75
Abnormal Pressure (Yes/No)	No
Anticipated Bottom-Hole Temperature (deg F)	215 deg F
H2S Contingency Plan Required (Yes/No)	Yes

Geologic Formations

	GR	KB (25')	
Elevation	3,065	3,090	
Formation Tops	TVDss	TVD - KB	Mineral Resources
Rustler	2,739	351	Water
Bell Canyon (base of salt)	500	2,590	Water
Cherry Canyon	-575	3,665	Water
Brushy Canyon	-1,588	4,678	Oil, Gas, Water
Bone Spring Lime	-3,031	6,121	Oil, Gas, Water
Lower Avalon	-3,539	6,629	Oil, Gas, Water
1st Bone Spring Sand	-3,998	7,088	Oil, Gas, Water
2nd Bone Spring Carbonate	-4,211	7,301	Oil, Gas, Water
2nd Bone Spring Sand	-4,746	7,836	Oil, Gas, Water
3rd Bone Spring Carbonate	-5,043	8,133	Oil, Gas, Water
3rd Bone Spring Sand	-6,090	9,180	Oil, Gas, Water
Wolfcamp XY	-6,370	9,460	Oil, Gas, Water
Wolfcamp A	-6,575	9,665	Oil, Gas, Water
Wolfcamp B	-6,780	9,870	Oil, Gas, Water
Wolfcamp B Flow Unit	-7,400	10,490	Oil, Gas, Water
Wolfcamp C	-7,633	10,723	Oil, Gas, Water

Pressure Control Equipment and Pressure Testing Procedure

A 13-5/8" 5M Blowout Preventer system will be installed on a multi-bowl wellhead with a 13-5/8 flanged casing spool.

The 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. 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 BOP system will be isolated with a test plug and tested by an independent tester to 250 psi low and 5,000 psi high for 10 minutes.

The Surface Casing will be pressure tested to 250 psi low and 1500 psi high. Intermediate Casing will be pressure tested to 250 psi low and (.22 psi x Shoe TVD, which is equivalent to 2161.5 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 - 401	17-1/2	Water Based Spud Mud	8.3	30-60	N/C	2.0-8.0
401 - 9,825	9-7/8"	Brine Diesel Emulsion or Brine	8.8-9.6	35-45	N/C	1.0-4.0
9,825 - 21,925	7-7/8"	Oil Based Mud	12-12.5	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' - 401'	401	17-1/2	13-3/8"	54.50	J-55	BTC	
0' - 9,825'	9,825	9-7/8"	8-5/8"	32.00	P-110	TLW	
0' - 21,925'	21,925	7-7/8"	5-1/2"	20.00	P-110	DWC/C IS+	

Note: 8-5/8" 32# P110 USS Talon HTQ has the same specs as the 8-5/8" TLW casing, and may be substituted if inventory issues occur.

Casing Centralizers

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

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' - 401'	1,130	2,730	853	6.51	1.82	7.16	
0' - 9,825'	4,230	8,930	1144	1.34	5.95	3.14	Collapse: 1/3 fluid filled at all times
0' - 21,925'	12,090	14,360	729	2.74	1.25	2.62	
Design Safety Factors Design safety factors will meet or exceed as shown.							

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).

Intermediate Casing

Collapse: $DF_C = 1.125$

- Partial (2/3rd) Internal Evacuation: Casing will remain greater than 1/3 fluid filled at all times with a mud weight greather than 11 ppg**
- Collapse force is equal to mud gradient (0.531 psi/ft) in which the casing will be run.
- 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: $DF_B = 1.125$

- 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.
- 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 intrenal force will be with 10.0 ppg brine water gradient (0.521 psi/ft) with gas kick.

Tensile: $DF_T = 1.60$

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

Production CasingCollapse: $DF_C = 1.125$

- 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 bouyancy factor of 0.8472 in oil-based mud (10.0 ppg).

Cementing Program**Surface Casing Cement:**

0' - 401'

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	344	556.7	99.2	13.80	1.62	7.67	1,200	100.0%

Lead: N/A

Tail: Class C Cement with Gel, Accelerator, LCM

Intermediate Casing Cement:

Top of Lead 0

Top of Tail 8,825

Surface Shoe Depth 401

Intermediate Shoe Depth 9,825

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	663	2373.5	422.7	10.00	3.58	19.15	900	100.0%
Tail	130.0	180.7	32.2	13.80	1.39	6.57	1,200	50.0%

Lead: Class C or H Cement with Fluid Loss, Retarder, LCM, Possibly beaded for desired compressive strength

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

Production Casing Cement:

0' - 21,925'

Top of Cement/Lead: 0'

Top of Tail: 7,825'

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	777	1647.2	293.4	12.00	2.12	11.91	1,200	20.0%
Tail	2065	3282.6	584.6	13.20	1.59	7.98	1,200	20.0%

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

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

Logging, Testing & Coring Program

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



NOVO OIL & GAS, LLC

Date

2/21/2019

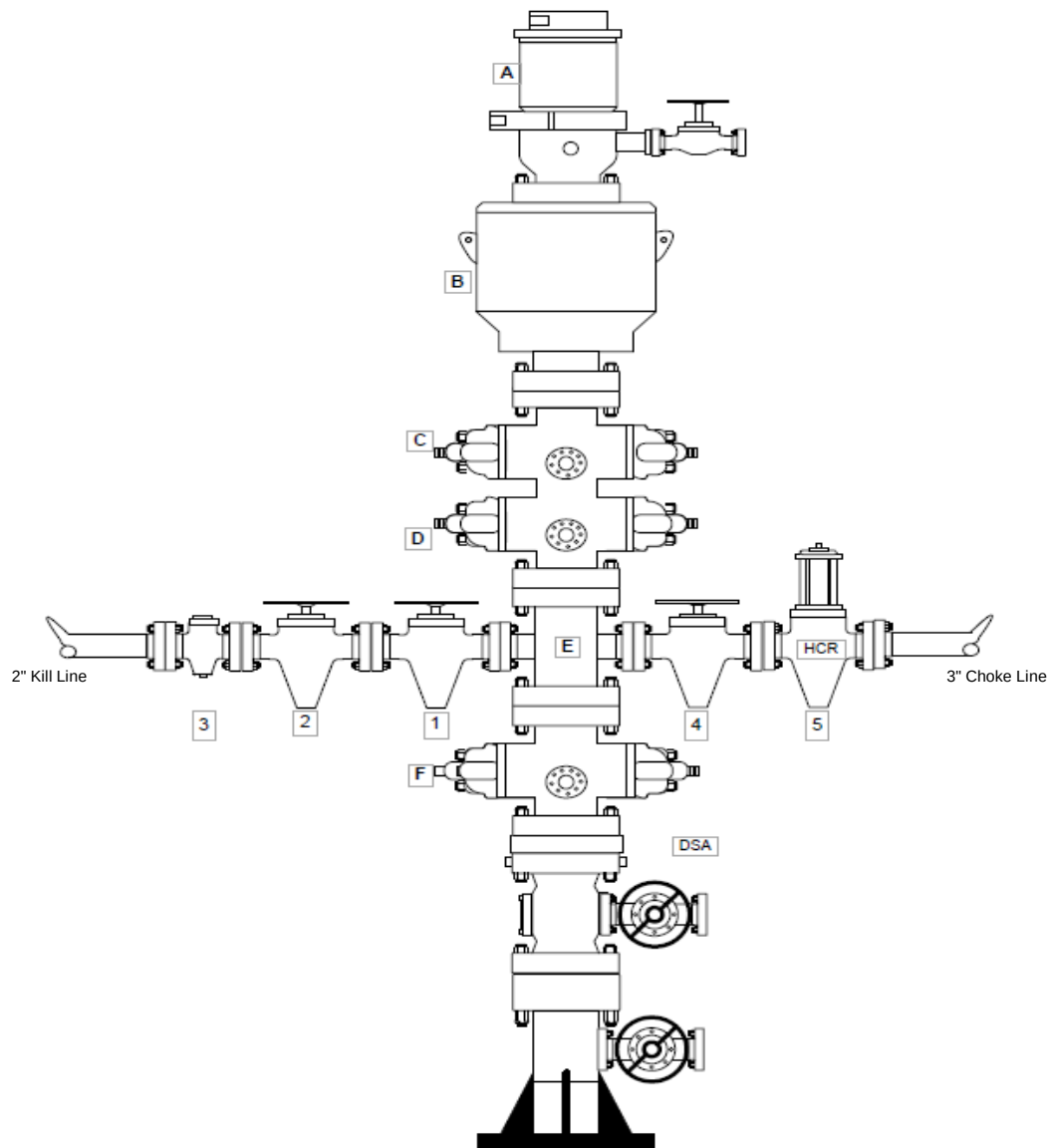
 1001 West Wilshire Boulevard, Suite 206
 Oklahoma City, Oklahoma 73116

Page No.

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5M BLOWOUT PREVENTER SCHEMATIC

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



KILL LINE			
ITEM	SIZE	PRESSURE	DESCRIPTION
1	2"	5,000 psi	Gate Valve
2	2"	5,000 psi	Gate Valve
3	2"	5,000 psi	Check Valve

CHOKE LINE			
ITEM	SIZE	PRESSURE	DESCRIPTION
4	3"	5,000 psi	Gate Valve
5	3"	5,000 psi	HCR Valve



NOVO OIL & GAS, LLC

Date

7/15/2019

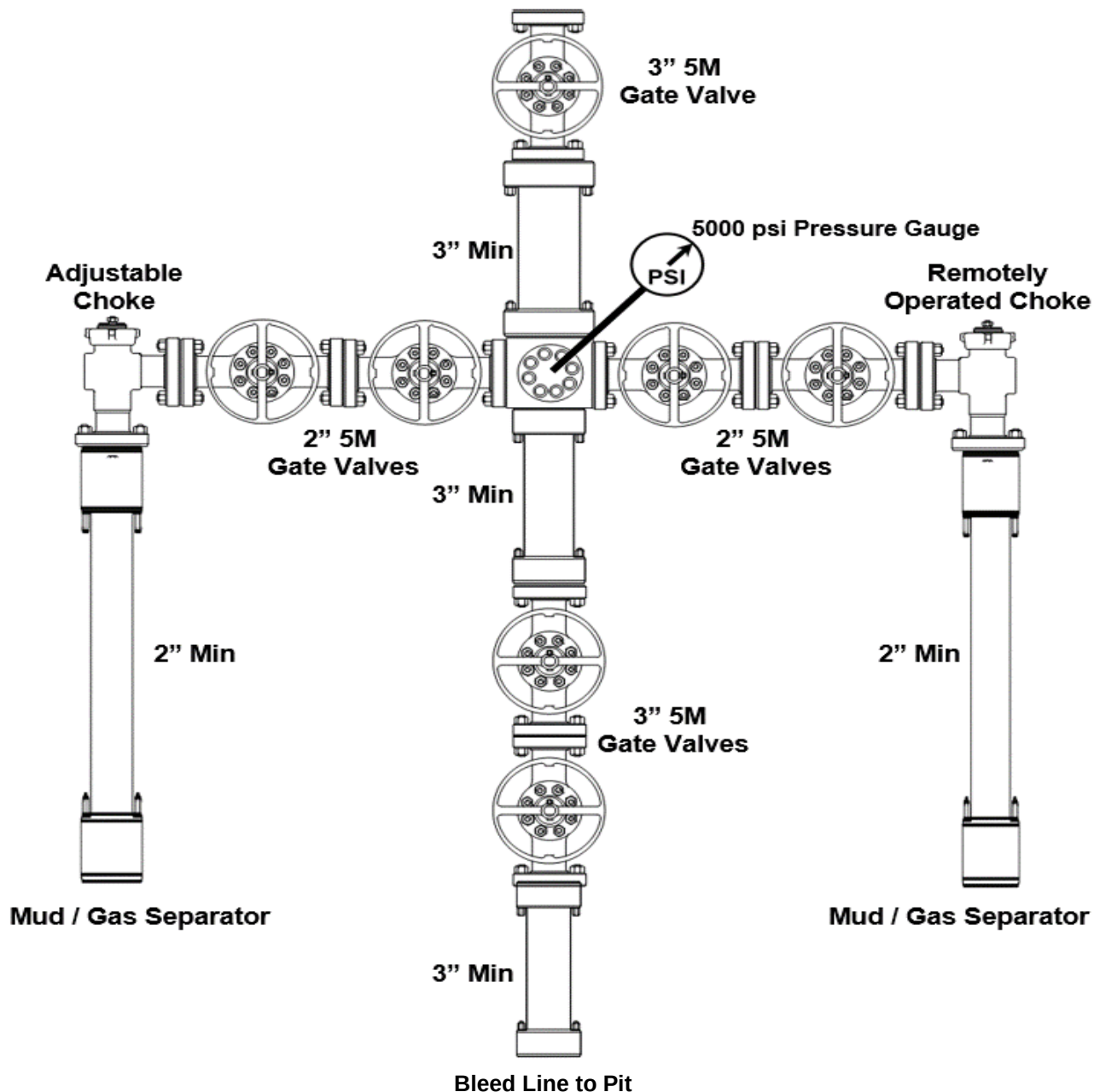
1001 West Wilshire Boulevard, Suite 206
Oklahoma City, Oklahoma 73116

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5M CHOKE MANIFOLD SCHEMATIC

ITEM	SIZE	PRESSURE	DESCRIPTION



WELL DETAILS: Rana Salada Fed Com 0106 223H Plan 1

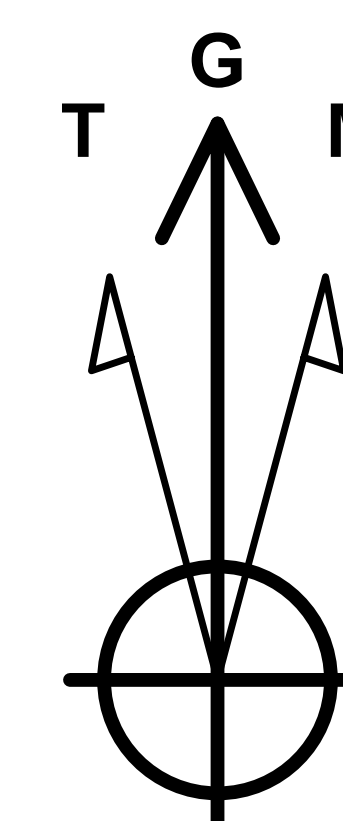
GL Elev (ft.): 3064.8

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	485254.81	629041.42	32° 20' 1.384 N	104° 2' 57.746 W

SECTION DETAILS

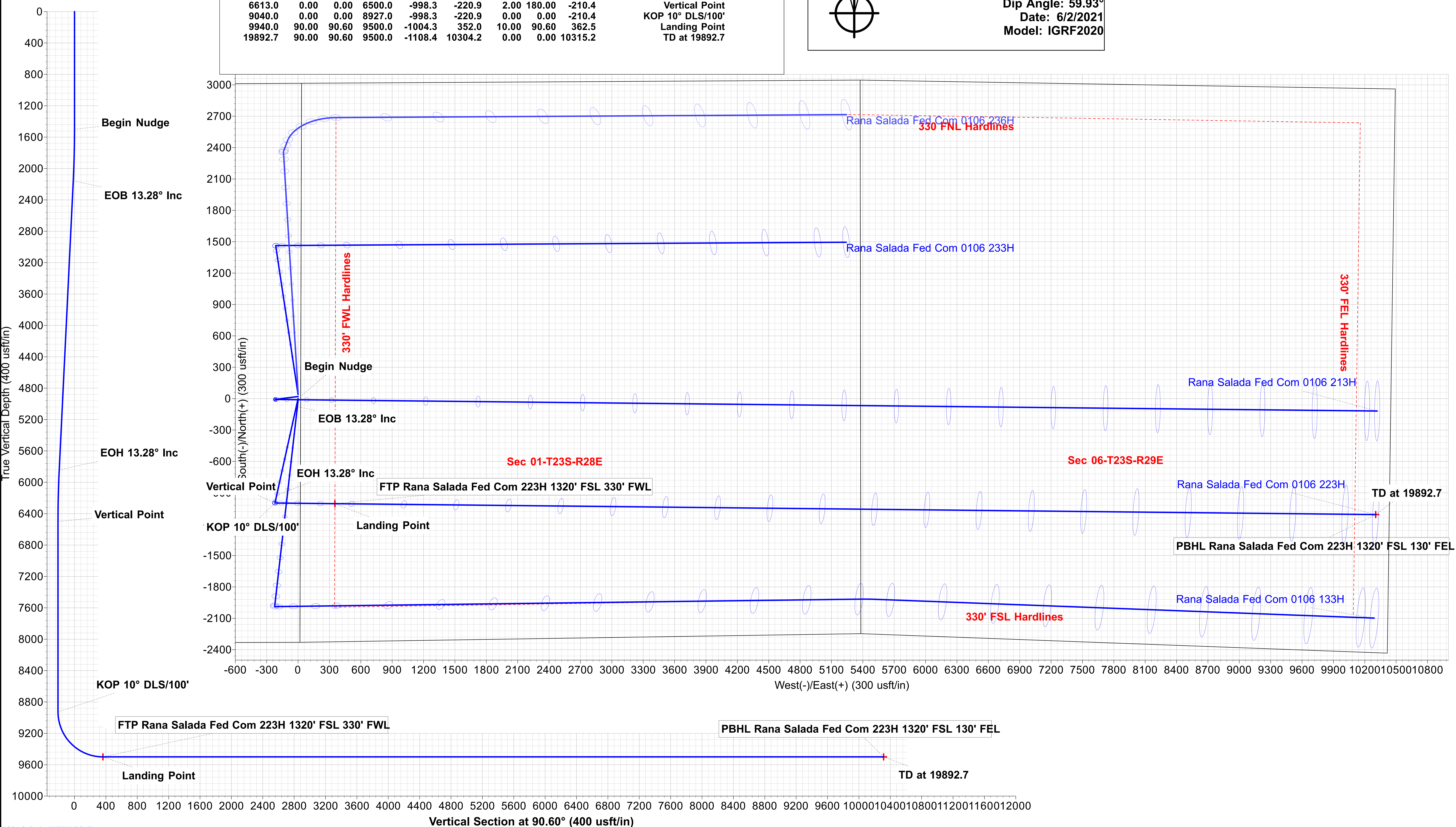
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
1500.0	0.00	0.00	1500.0	0.0	0.0	0.00	0.00	0.0	Begin Nudge
2163.8	13.28	192.48	2157.9	-74.8	-16.5	2.00	192.48	-15.8	EOB 13.28° Inc
5949.2	13.28	192.48	5842.1	-923.5	-204.4	0.00	0.00	-194.7	EOH 13.28° Inc
6613.0	0.00	0.00	6500.0	-998.3	-220.9	2.00	180.00	-210.4	Vertical Point
9040.0	0.00	0.00	8927.0	-998.3	-220.9	0.00	0.00	-210.4	KOP 10° DLS/100'
9940.0	90.00	90.60	9500.0	-1004.3	352.0	10.00	90.60	362.5	Landing Point
19892.7	90.00	90.60	9500.0	-1108.4	10304.2	0.00	0.00	10315.2	TD at 19892.7

Project: EDDY CO., NM (NAD83)
Site: SEC 02-T23S-R28E
Well: Rana Salada Fed Com 0106 223H
Wellbore: Wellbore #1
Design: Plan 1



Azimuths to Grid North
True North: -0.15°
Magnetic North: 6.63°

Magnetic Field
Strength: 47516.0nT
Dip Angle: 59.93°
Date: 6/2/2021
Model: IGRF2020





NOVO Oil & Gas

EDDY CO., NM (NAD83)

SEC 02-T23S-R28E

Rana Salada Fed Com 0106 223H

Wellbore #1

Plan: Plan 1

Standard Planning Report

02 June, 2021





SB Directional Services

Planning Report



Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Company:	NOVO Oil & Gas	TVD Reference:	RKB 25' + GL @ 3089.8usft
Project:	EDDY CO., NM (NAD83)	MD Reference:	RKB 25' + GL @ 3089.8usft
Site:	SEC 02-T23S-R28E	North Reference:	Grid
Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Project	EDDY CO., NM (NAD83)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	SEC 02-T23S-R28E		
Site Position:		Northing:	485,314.80 usft
From:	Map	Easting:	629,041.60 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 20' 1.977 N
		Longitude:	104° 2' 57.742 W

Well	Rana Salada Fed Com 0106 223H		
Well Position	+N/-S	0.0 usft	Northing: 485,254.81 usft
	+E/-W	0.0 usft	Easting: 629,041.42 usft
Position Uncertainty	0.5 usft	Wellhead Elevation:	usft
Grid Convergence:	0.15 °	Ground Level:	3,064.8 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	6/2/2021	6.78	59.93	47,516.02612363

Design	Plan 1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	90.60	

Plan Survey Tool Program	Date	6/2/2021			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.0	19,892.7	Plan 1 (Wellbore #1)	MWD	
			MWD - Standard		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,163.8	13.28	192.48	2,157.9	-74.8	-16.5	2.00	2.00	0.00	192.48	
5,949.2	13.28	192.48	5,842.1	-923.5	-204.4	0.00	0.00	0.00	0.00	
6,613.0	0.00	0.00	6,500.0	-998.3	-220.9	2.00	-2.00	0.00	180.00	
9,040.0	0.00	0.00	8,927.0	-998.3	-220.9	0.00	0.00	0.00	0.00	
9,940.0	90.00	90.60	9,500.0	-1,004.3	352.0	10.00	10.00	10.07	90.60	
19,892.7	90.00	90.60	9,500.0	-1,108.4	10,304.2	0.00	0.00	0.00	0.00	PBHL Rana Salada F



SB Directional Services

Planning Report



Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Company:	NOVO Oil & Gas	TVD Reference:	RKB 25' + GL @ 3089.8usft
Project:	EDDY CO., NM (NAD83)	MD Reference:	RKB 25' + GL @ 3089.8usft
Site:	SEC 02-T23S-R28E	North Reference:	Grid
Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
Begin Nudge									
1,600.0	2.00	192.48	1,600.0	-1.7	-0.4	-0.4	2.00	2.00	0.00
1,700.0	4.00	192.48	1,699.8	-6.8	-1.5	-1.4	2.00	2.00	0.00
1,800.0	6.00	192.48	1,799.5	-15.3	-3.4	-3.2	2.00	2.00	0.00
1,900.0	8.00	192.48	1,898.7	-27.2	-6.0	-5.7	2.00	2.00	0.00
2,000.0	10.00	192.48	1,997.5	-42.5	-9.4	-9.0	2.00	2.00	0.00
2,100.0	12.00	192.48	2,095.6	-61.1	-13.5	-12.9	2.00	2.00	0.00
2,163.8	13.28	192.48	2,157.9	-74.8	-16.5	-15.8	2.00	2.00	0.00
EOB 13.28° Inc									
2,200.0	13.28	192.48	2,193.1	-82.9	-18.3	-17.5	0.00	0.00	0.00
2,300.0	13.28	192.48	2,290.4	-105.3	-23.3	-22.2	0.00	0.00	0.00
2,400.0	13.28	192.48	2,387.8	-127.7	-28.3	-26.9	0.00	0.00	0.00
2,500.0	13.28	192.48	2,485.1	-150.1	-33.2	-31.6	0.00	0.00	0.00
2,600.0	13.28	192.48	2,582.4	-172.6	-38.2	-36.4	0.00	0.00	0.00
2,700.0	13.28	192.48	2,679.7	-195.0	-43.1	-41.1	0.00	0.00	0.00
2,800.0	13.28	192.48	2,777.1	-217.4	-48.1	-45.8	0.00	0.00	0.00
2,900.0	13.28	192.48	2,874.4	-239.8	-53.1	-50.6	0.00	0.00	0.00
3,000.0	13.28	192.48	2,971.7	-262.3	-58.0	-55.3	0.00	0.00	0.00
3,100.0	13.28	192.48	3,069.1	-284.7	-63.0	-60.0	0.00	0.00	0.00
3,200.0	13.28	192.48	3,166.4	-307.1	-68.0	-64.7	0.00	0.00	0.00
3,300.0	13.28	192.48	3,263.7	-329.5	-72.9	-69.5	0.00	0.00	0.00
3,400.0	13.28	192.48	3,361.0	-351.9	-77.9	-74.2	0.00	0.00	0.00
3,500.0	13.28	192.48	3,458.4	-374.4	-82.8	-78.9	0.00	0.00	0.00
3,600.0	13.28	192.48	3,555.7	-396.8	-87.8	-83.6	0.00	0.00	0.00
3,700.0	13.28	192.48	3,653.0	-419.2	-92.8	-88.4	0.00	0.00	0.00
3,800.0	13.28	192.48	3,750.3	-441.6	-97.7	-93.1	0.00	0.00	0.00
3,900.0	13.28	192.48	3,847.7	-464.1	-102.7	-97.8	0.00	0.00	0.00
4,000.0	13.28	192.48	3,945.0	-486.5	-107.6	-102.5	0.00	0.00	0.00
4,100.0	13.28	192.48	4,042.3	-508.9	-112.6	-107.3	0.00	0.00	0.00
4,200.0	13.28	192.48	4,139.7	-531.3	-117.6	-112.0	0.00	0.00	0.00
4,300.0	13.28	192.48	4,237.0	-553.7	-122.5	-116.7	0.00	0.00	0.00
4,400.0	13.28	192.48	4,334.3	-576.2	-127.5	-121.5	0.00	0.00	0.00
4,500.0	13.28	192.48	4,431.6	-598.6	-132.5	-126.2	0.00	0.00	0.00
4,600.0	13.28	192.48	4,529.0	-621.0	-137.4	-130.9	0.00	0.00	0.00
4,700.0	13.28	192.48	4,626.3	-643.4	-142.4	-135.6	0.00	0.00	0.00
4,800.0	13.28	192.48	4,723.6	-665.9	-147.3	-140.4	0.00	0.00	0.00
4,900.0	13.28	192.48	4,820.9	-688.3	-152.3	-145.1	0.00	0.00	0.00



SB Directional Services

Planning Report



Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Company:	NOVO Oil & Gas	TVD Reference:	RKB 25' + GL @ 3089.8usft
Project:	EDDY CO., NM (NAD83)	MD Reference:	RKB 25' + GL @ 3089.8usft
Site:	SEC 02-T23S-R28E	North Reference:	Grid
Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 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)
5,000.0	13.28	192.48	4,918.3	-710.7	-157.3	-149.8	0.00	0.00	0.00
5,100.0	13.28	192.48	5,015.6	-733.1	-162.2	-154.5	0.00	0.00	0.00
5,200.0	13.28	192.48	5,112.9	-755.6	-167.2	-159.3	0.00	0.00	0.00
5,300.0	13.28	192.48	5,210.3	-778.0	-172.1	-164.0	0.00	0.00	0.00
5,400.0	13.28	192.48	5,307.6	-800.4	-177.1	-168.7	0.00	0.00	0.00
5,500.0	13.28	192.48	5,404.9	-822.8	-182.1	-173.4	0.00	0.00	0.00
5,600.0	13.28	192.48	5,502.2	-845.2	-187.0	-178.2	0.00	0.00	0.00
5,700.0	13.28	192.48	5,599.6	-867.7	-192.0	-182.9	0.00	0.00	0.00
5,800.0	13.28	192.48	5,696.9	-890.1	-197.0	-187.6	0.00	0.00	0.00
5,900.0	13.28	192.48	5,794.2	-912.5	-201.9	-192.4	0.00	0.00	0.00
5,949.2	13.28	192.48	5,842.1	-923.5	-204.4	-194.7	0.00	0.00	0.00
EOH 13.28° Inc									
6,000.0	12.26	192.48	5,891.6	-934.5	-206.8	-197.0	2.00	-2.00	0.00
6,100.0	10.26	192.48	5,989.7	-953.6	-211.0	-201.0	2.00	-2.00	0.00
6,200.0	8.26	192.48	6,088.4	-969.3	-214.5	-204.3	2.00	-2.00	0.00
6,300.0	6.26	192.48	6,187.6	-981.6	-217.2	-206.9	2.00	-2.00	0.00
6,400.0	4.26	192.48	6,287.2	-990.6	-219.2	-208.8	2.00	-2.00	0.00
6,500.0	2.26	192.48	6,387.0	-996.1	-220.4	-210.0	2.00	-2.00	0.00
6,600.0	0.26	192.48	6,487.0	-998.3	-220.9	-210.4	2.00	-2.00	0.00
6,613.0	0.00	0.00	6,500.0	-998.3	-220.9	-210.4	2.00	-2.00	0.00
Vertical Point									
6,700.0	0.00	0.00	6,587.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
6,800.0	0.00	0.00	6,687.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
6,900.0	0.00	0.00	6,787.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,000.0	0.00	0.00	6,887.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,100.0	0.00	0.00	6,987.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,200.0	0.00	0.00	7,087.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,300.0	0.00	0.00	7,187.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,400.0	0.00	0.00	7,287.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,500.0	0.00	0.00	7,387.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,600.0	0.00	0.00	7,487.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,700.0	0.00	0.00	7,587.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,800.0	0.00	0.00	7,687.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
7,900.0	0.00	0.00	7,787.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,000.0	0.00	0.00	7,887.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,100.0	0.00	0.00	7,987.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,200.0	0.00	0.00	8,087.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,300.0	0.00	0.00	8,187.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,400.0	0.00	0.00	8,287.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,500.0	0.00	0.00	8,387.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,600.0	0.00	0.00	8,487.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,700.0	0.00	0.00	8,587.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,800.0	0.00	0.00	8,687.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
8,900.0	0.00	0.00	8,787.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
9,000.0	0.00	0.00	8,887.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
9,040.0	0.00	0.00	8,927.0	-998.3	-220.9	-210.4	0.00	0.00	0.00
KOP 10° DLS/100'									
9,050.0	1.00	90.60	8,937.0	-998.3	-220.8	-210.3	10.00	10.00	0.00
9,100.0	6.00	90.60	8,986.9	-998.3	-217.8	-207.3	10.00	10.00	0.00
9,150.0	11.00	90.60	9,036.3	-998.4	-210.4	-199.9	10.00	10.00	0.00
9,200.0	16.00	90.60	9,084.9	-998.5	-198.7	-188.2	10.00	10.00	0.00
9,250.0	21.00	90.60	9,132.3	-998.7	-182.9	-172.4	10.00	10.00	0.00
9,300.0	26.00	90.60	9,178.1	-998.9	-162.9	-152.5	10.00	10.00	0.00



SB Directional Services

Planning Report



Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Company:	NOVO Oil & Gas	TVD Reference:	RKB 25' + GL @ 3089.8usft
Project:	EDDY CO., NM (NAD83)	MD Reference:	RKB 25' + GL @ 3089.8usft
Site:	SEC 02-T23S-R28E	North Reference:	Grid
Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 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)
9,350.0	31.00	90.60	9,222.1	-999.2	-139.1	-128.6	10.00	10.00	0.00
9,400.0	36.00	90.60	9,263.8	-999.4	-111.5	-101.0	10.00	10.00	0.00
9,450.0	41.00	90.60	9,302.9	-999.8	-80.4	-69.9	10.00	10.00	0.00
9,500.0	46.00	90.60	9,339.1	-1,000.1	-46.0	-35.5	10.00	10.00	0.00
9,550.0	51.00	90.60	9,372.3	-1,000.5	-8.5	1.9	10.00	10.00	0.00
9,600.0	56.00	90.60	9,402.0	-1,000.9	31.6	42.1	10.00	10.00	0.00
9,650.0	61.00	90.60	9,428.1	-1,001.4	74.2	84.7	10.00	10.00	0.00
9,700.0	66.00	90.60	9,450.4	-1,001.9	119.0	129.5	10.00	10.00	0.00
9,750.0	71.00	90.60	9,468.7	-1,002.3	165.5	176.0	10.00	10.00	0.00
9,800.0	76.00	90.60	9,482.9	-1,002.8	213.4	223.9	10.00	10.00	0.00
9,850.0	81.00	90.60	9,492.9	-1,003.4	262.4	272.9	10.00	10.00	0.00
9,900.0	86.00	90.60	9,498.6	-1,003.9	312.0	322.5	10.00	10.00	0.00
9,940.0	90.00	90.60	9,500.0	-1,004.3	352.0	362.5	10.00	10.00	0.00
Landing Point									
10,000.0	90.00	90.60	9,500.0	-1,004.9	412.0	422.5	0.00	0.00	0.00
10,100.0	90.00	90.60	9,500.0	-1,006.0	512.0	522.5	0.00	0.00	0.00
10,200.0	90.00	90.60	9,500.0	-1,007.0	612.0	622.5	0.00	0.00	0.00
10,300.0	90.00	90.60	9,500.0	-1,008.1	712.0	722.5	0.00	0.00	0.00
10,400.0	90.00	90.60	9,500.0	-1,009.1	812.0	822.5	0.00	0.00	0.00
10,500.0	90.00	90.60	9,500.0	-1,010.2	912.0	922.5	0.00	0.00	0.00
10,600.0	90.00	90.60	9,500.0	-1,011.2	1,012.0	1,022.5	0.00	0.00	0.00
10,700.0	90.00	90.60	9,500.0	-1,012.2	1,112.0	1,122.5	0.00	0.00	0.00
10,800.0	90.00	90.60	9,500.0	-1,013.3	1,212.0	1,222.5	0.00	0.00	0.00
10,900.0	90.00	90.60	9,500.0	-1,014.3	1,312.0	1,322.5	0.00	0.00	0.00
11,000.0	90.00	90.60	9,500.0	-1,015.4	1,411.9	1,422.5	0.00	0.00	0.00
11,100.0	90.00	90.60	9,500.0	-1,016.4	1,511.9	1,522.5	0.00	0.00	0.00
11,200.0	90.00	90.60	9,500.0	-1,017.5	1,611.9	1,622.5	0.00	0.00	0.00
11,300.0	90.00	90.60	9,500.0	-1,018.5	1,711.9	1,722.5	0.00	0.00	0.00
11,400.0	90.00	90.60	9,500.0	-1,019.6	1,811.9	1,822.5	0.00	0.00	0.00
11,500.0	90.00	90.60	9,500.0	-1,020.6	1,911.9	1,922.5	0.00	0.00	0.00
11,600.0	90.00	90.60	9,500.0	-1,021.7	2,011.9	2,022.5	0.00	0.00	0.00
11,700.0	90.00	90.60	9,500.0	-1,022.7	2,111.9	2,122.5	0.00	0.00	0.00
11,800.0	90.00	90.60	9,500.0	-1,023.8	2,211.9	2,222.5	0.00	0.00	0.00
11,900.0	90.00	90.60	9,500.0	-1,024.8	2,311.9	2,322.5	0.00	0.00	0.00
12,000.0	90.00	90.60	9,500.0	-1,025.8	2,411.9	2,422.5	0.00	0.00	0.00
12,100.0	90.00	90.60	9,500.0	-1,026.9	2,511.9	2,522.5	0.00	0.00	0.00
12,200.0	90.00	90.60	9,500.0	-1,027.9	2,611.9	2,622.5	0.00	0.00	0.00
12,300.0	90.00	90.60	9,500.0	-1,029.0	2,711.9	2,722.5	0.00	0.00	0.00
12,400.0	90.00	90.60	9,500.0	-1,030.0	2,811.9	2,822.5	0.00	0.00	0.00
12,500.0	90.00	90.60	9,500.0	-1,031.1	2,911.9	2,922.5	0.00	0.00	0.00
12,600.0	90.00	90.60	9,500.0	-1,032.1	3,011.9	3,022.5	0.00	0.00	0.00
12,700.0	90.00	90.60	9,500.0	-1,033.2	3,111.9	3,122.5	0.00	0.00	0.00
12,800.0	90.00	90.60	9,500.0	-1,034.2	3,211.8	3,222.5	0.00	0.00	0.00
12,900.0	90.00	90.60	9,500.0	-1,035.3	3,311.8	3,322.5	0.00	0.00	0.00
13,000.0	90.00	90.60	9,500.0	-1,036.3	3,411.8	3,422.5	0.00	0.00	0.00
13,100.0	90.00	90.60	9,500.0	-1,037.4	3,511.8	3,522.5	0.00	0.00	0.00
13,200.0	90.00	90.60	9,500.0	-1,038.4	3,611.8	3,622.5	0.00	0.00	0.00
13,300.0	90.00	90.60	9,500.0	-1,039.4	3,711.8	3,722.5	0.00	0.00	0.00
13,400.0	90.00	90.60	9,500.0	-1,040.5	3,811.8	3,822.5	0.00	0.00	0.00
13,500.0	90.00	90.60	9,500.0	-1,041.5	3,911.8	3,922.5	0.00	0.00	0.00
13,600.0	90.00	90.60	9,500.0	-1,042.6	4,011.8	4,022.5	0.00	0.00	0.00
13,700.0	90.00	90.60	9,500.0	-1,043.6	4,111.8	4,122.5	0.00	0.00	0.00
13,800.0	90.00	90.60	9,500.0	-1,044.7	4,211.8	4,222.5	0.00	0.00	0.00
13,900.0	90.00	90.60	9,500.0	-1,045.7	4,311.8	4,322.5	0.00	0.00	0.00



SB Directional Services

Planning Report



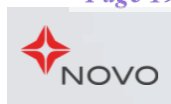
Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Company:	NOVO Oil & Gas	TVD Reference:	RKB 25' + GL @ 3089.8usft
Project:	EDDY CO., NM (NAD83)	MD Reference:	RKB 25' + GL @ 3089.8usft
Site:	SEC 02-T23S-R28E	North Reference:	Grid
Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 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)
14,000.0	90.00	90.60	9,500.0	-1,046.8	4,411.8	4,422.5	0.00	0.00	0.00
14,100.0	90.00	90.60	9,500.0	-1,047.8	4,511.8	4,522.5	0.00	0.00	0.00
14,200.0	90.00	90.60	9,500.0	-1,048.9	4,611.8	4,622.5	0.00	0.00	0.00
14,300.0	90.00	90.60	9,500.0	-1,049.9	4,711.8	4,722.5	0.00	0.00	0.00
14,400.0	90.00	90.60	9,500.0	-1,051.0	4,811.8	4,822.5	0.00	0.00	0.00
14,500.0	90.00	90.60	9,500.0	-1,052.0	4,911.8	4,922.5	0.00	0.00	0.00
14,600.0	90.00	90.60	9,500.0	-1,053.0	5,011.8	5,022.5	0.00	0.00	0.00
14,700.0	90.00	90.60	9,500.0	-1,054.1	5,111.7	5,122.5	0.00	0.00	0.00
14,800.0	90.00	90.60	9,500.0	-1,055.1	5,211.7	5,222.5	0.00	0.00	0.00
14,900.0	90.00	90.60	9,500.0	-1,056.2	5,311.7	5,322.5	0.00	0.00	0.00
15,000.0	90.00	90.60	9,500.0	-1,057.2	5,411.7	5,422.5	0.00	0.00	0.00
15,100.0	90.00	90.60	9,500.0	-1,058.3	5,511.7	5,522.5	0.00	0.00	0.00
15,200.0	90.00	90.60	9,500.0	-1,059.3	5,611.7	5,622.5	0.00	0.00	0.00
15,300.0	90.00	90.60	9,500.0	-1,060.4	5,711.7	5,722.5	0.00	0.00	0.00
15,400.0	90.00	90.60	9,500.0	-1,061.4	5,811.7	5,822.5	0.00	0.00	0.00
15,500.0	90.00	90.60	9,500.0	-1,062.5	5,911.7	5,922.5	0.00	0.00	0.00
15,600.0	90.00	90.60	9,500.0	-1,063.5	6,011.7	6,022.5	0.00	0.00	0.00
15,700.0	90.00	90.60	9,500.0	-1,064.5	6,111.7	6,122.5	0.00	0.00	0.00
15,800.0	90.00	90.60	9,500.0	-1,065.6	6,211.7	6,222.5	0.00	0.00	0.00
15,900.0	90.00	90.60	9,500.0	-1,066.6	6,311.7	6,322.5	0.00	0.00	0.00
16,000.0	90.00	90.60	9,500.0	-1,067.7	6,411.7	6,422.5	0.00	0.00	0.00
16,100.0	90.00	90.60	9,500.0	-1,068.7	6,511.7	6,522.5	0.00	0.00	0.00
16,200.0	90.00	90.60	9,500.0	-1,069.8	6,611.7	6,622.5	0.00	0.00	0.00
16,300.0	90.00	90.60	9,500.0	-1,070.8	6,711.7	6,722.5	0.00	0.00	0.00
16,400.0	90.00	90.60	9,500.0	-1,071.9	6,811.7	6,822.5	0.00	0.00	0.00
16,500.0	90.00	90.60	9,500.0	-1,072.9	6,911.6	6,922.5	0.00	0.00	0.00
16,600.0	90.00	90.60	9,500.0	-1,074.0	7,011.6	7,022.5	0.00	0.00	0.00
16,700.0	90.00	90.60	9,500.0	-1,075.0	7,111.6	7,122.5	0.00	0.00	0.00
16,800.0	90.00	90.60	9,500.0	-1,076.1	7,211.6	7,222.5	0.00	0.00	0.00
16,900.0	90.00	90.60	9,500.0	-1,077.1	7,311.6	7,322.5	0.00	0.00	0.00
17,000.0	90.00	90.60	9,500.0	-1,078.1	7,411.6	7,422.5	0.00	0.00	0.00
17,100.0	90.00	90.60	9,500.0	-1,079.2	7,511.6	7,522.5	0.00	0.00	0.00
17,200.0	90.00	90.60	9,500.0	-1,080.2	7,611.6	7,622.5	0.00	0.00	0.00
17,300.0	90.00	90.60	9,500.0	-1,081.3	7,711.6	7,722.5	0.00	0.00	0.00
17,400.0	90.00	90.60	9,500.0	-1,082.3	7,811.6	7,822.5	0.00	0.00	0.00
17,500.0	90.00	90.60	9,500.0	-1,083.4	7,911.6	7,922.5	0.00	0.00	0.00
17,600.0	90.00	90.60	9,500.0	-1,084.4	8,011.6	8,022.5	0.00	0.00	0.00
17,700.0	90.00	90.60	9,500.0	-1,085.5	8,111.6	8,122.5	0.00	0.00	0.00
17,800.0	90.00	90.60	9,500.0	-1,086.5	8,211.6	8,222.5	0.00	0.00	0.00
17,900.0	90.00	90.60	9,500.0	-1,087.6	8,311.6	8,322.5	0.00	0.00	0.00
18,000.0	90.00	90.60	9,500.0	-1,088.6	8,411.6	8,422.5	0.00	0.00	0.00
18,100.0	90.00	90.60	9,500.0	-1,089.7	8,511.6	8,522.5	0.00	0.00	0.00
18,200.0	90.00	90.60	9,500.0	-1,090.7	8,611.6	8,622.5	0.00	0.00	0.00
18,300.0	90.00	90.60	9,500.0	-1,091.7	8,711.5	8,722.5	0.00	0.00	0.00
18,400.0	90.00	90.60	9,500.0	-1,092.8	8,811.5	8,822.5	0.00	0.00	0.00
18,500.0	90.00	90.60	9,500.0	-1,093.8	8,911.5	8,922.5	0.00	0.00	0.00
18,600.0	90.00	90.60	9,500.0	-1,094.9	9,011.5	9,022.5	0.00	0.00	0.00
18,700.0	90.00	90.60	9,500.0	-1,095.9	9,111.5	9,122.5	0.00	0.00	0.00
18,800.0	90.00	90.60	9,500.0	-1,097.0	9,211.5	9,222.5	0.00	0.00	0.00
18,900.0	90.00	90.60	9,500.0	-1,098.0	9,311.5	9,322.5	0.00	0.00	0.00
19,000.0	90.00	90.60	9,500.0	-1,099.1	9,411.5	9,422.5	0.00	0.00	0.00
19,100.0	90.00	90.60	9,500.0	-1,100.1	9,511.5	9,522.5	0.00	0.00	0.00
19,200.0	90.00	90.60	9,500.0	-1,101.2	9,611.5	9,622.5	0.00	0.00	0.00
19,300.0	90.00	90.60	9,500.0	-1,102.2	9,711.5	9,722.5	0.00	0.00	0.00



SB Directional Services

Planning Report



Database:	EDM 5000.16 Single User Db	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Company:	NOVO Oil & Gas	TVD Reference:	RKB 25' + GL @ 3089.8usft
Project:	EDDY CO., NM (NAD83)	MD Reference:	RKB 25' + GL @ 3089.8usft
Site:	SEC 02-T23S-R28E	North Reference:	Grid
Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 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)	
19,400.0	90.00	90.60	9,500.0	-1,103.3	9,811.5	9,822.5	0.00	0.00	0.00	
19,500.0	90.00	90.60	9,500.0	-1,104.3	9,911.5	9,922.5	0.00	0.00	0.00	
19,600.0	90.00	90.60	9,500.0	-1,105.3	10,011.5	10,022.5	0.00	0.00	0.00	
19,700.0	90.00	90.60	9,500.0	-1,106.4	10,111.5	10,122.5	0.00	0.00	0.00	
19,800.0	90.00	90.60	9,500.0	-1,107.4	10,211.5	10,222.5	0.00	0.00	0.00	
19,892.7	90.00	90.60	9,500.0	-1,108.4	10,304.2	10,315.2	0.00	0.00	0.00	
TD at 19892.7										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
FTP Rana Salada Fed C - plan misses target center by 0.1usft at 9940.0usft MD (9500.0 TVD, -1004.3 N, 352.0 E) - Point	0.00	0.00	9,500.0	-1,004.3	352.0	484,250.47	629,393.43	32° 19' 51.436 N	104° 2' 53.674 W	
PBHL Rana Salada Fed - plan hits target center - Point	0.00	0.00	9,500.0	-1,108.4	10,304.2	484,146.40	639,345.58	32° 19' 50.129 N	104° 0' 57.683 W	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,500.0	1,500.0	0.0	0.0	Begin Nudge	
2,163.8	2,157.9	-74.8	-16.5	EOB 13.28° Inc	
5,949.2	5,842.1	-923.5	-204.4	EOH 13.28° Inc	
6,613.0	6,500.0	-998.3	-220.9	Vertical Point	
9,040.0	8,927.0	-998.3	-220.9	KOP 10° DLS/100'	
9,940.0	9,500.0	-1,004.3	352.0	Landing Point	
19,892.7	9,500.0	-1,108.4	10,304.2	TD at 19892.7	



NOVO Oil & Gas

EDDY CO., NM (NAD83)

SEC 02-T23S-R28E

Rana Salada Fed Com 0106 223H

Wellbore #1

Plan 1

Anticollision Report

02 June, 2021





SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Reference	Plan 1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISWCSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum centre distance of 2,179.7usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	6/2/2021		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	19,892.7	Plan 1 (Wellbore #1)	MWD	MWD - Standard	

Summary						
Site Name	Reference	Offset	Distance		Separation	Warning
	Measured	Measured	Between	Between		
	Depth	Depth	Centres	Ellipses		
Offset Well - Wellbore - Design		(usft)	(usft)	(usft)	(usft)	Factor
SEC 02-T23S-R28E						
Rana Salada Fed Com 0106 133H - Wellbore #1 - Plan 1		800.0	799.5	20.0	16.4	5.520 CC, ES
Rana Salada Fed Com 0106 133H - Wellbore #1 - Plan 1		19,892.7	20,005.9	989.8	415.5	1.723 Collision Risk Procedures R
Rana Salada Fed Com 0106 213H - Wellbore #1 - Plan 1		1,500.1	1,500.6	20.0	13.3	2.982 CC, ES
Rana Salada Fed Com 0106 213H - Wellbore #1 - Plan 1		19,892.7	19,793.4	990.0	415.3	1.723 Collision Risk Procedures R
Rana Salada Fed Com 0106 233H - Wellbore #1 - Plan 1		1,416.3	1,417.3	40.0	33.7	6.313 CC
Rana Salada Fed Com 0106 233H - Wellbore #1 - Plan 1		1,500.0	1,501.0	40.0	33.3	5.963 ES, SF
Rana Salada Fed Com 0106 236H - Wellbore #1 - Plan 1		616.2	617.7	60.0	57.1	21.105 CC
Rana Salada Fed Com 0106 236H - Wellbore #1 - Plan 1		700.0	701.5	60.0	56.8	18.759 ES
Rana Salada Fed Com 0106 236H - Wellbore #1 - Plan 1		900.0	897.1	66.9	62.9	16.511 SF

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 133H - Wellbore #1 - Plan 1													Offset Site Error:	0.0 usft
Survey Program:		0-MWD						Rule Assigned:				Offset Well Error:	0.5 usft	
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance			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)	Minimum Separation (usft)	Separation Factor	Warning	
0.0	0.0	0.0	0.0	0.5	0.5	-179.83	-20.0	-0.1	20.0					
100.0	100.0	99.5	99.5	0.5	0.5	-179.83	-20.0	-0.1	20.0	18.9	1.06	18.957		
200.0	200.0	199.5	199.5	0.6	0.6	-179.83	-20.0	-0.1	20.0	18.7	1.27	15.728		
300.0	300.0	299.5	299.5	0.8	0.8	-179.83	-20.0	-0.1	20.0	18.4	1.59	12.585		
400.0	400.0	399.5	399.5	1.0	1.0	-179.83	-20.0	-0.1	20.0	18.0	1.96	10.209		
500.0	500.0	499.5	499.5	1.2	1.2	-179.83	-20.0	-0.1	20.0	17.6	2.36	8.486		
600.0	600.0	599.5	599.5	1.4	1.4	-179.83	-20.0	-0.1	20.0	17.2	2.77	7.219		
700.0	700.0	699.5	699.5	1.6	1.6	-179.83	-20.0	-0.1	20.0	16.8	3.19	6.262		
800.0	800.0	799.5	799.5	1.8	1.8	-179.83	-20.0	-0.1	20.0	16.4	3.62	5.520 CC, ES		
900.0	900.0	898.8	898.8	2.0	2.0	-179.33	-21.7	-0.3	21.7	17.7	4.03	5.387		
1,000.0	1,000.0	997.8	997.7	2.2	2.2	-178.22	-26.8	-0.8	26.9	22.4	4.42	6.082		
1,100.0	1,100.0	1,096.4	1,095.8	2.5	2.4	-177.09	-35.2	-1.8	35.5	30.6	4.81	7.372		
1,200.0	1,200.0	1,194.2	1,193.0	2.7	2.6	-176.20	-46.9	-3.1	47.5	42.3	5.20	9.119		
1,300.0	1,300.0	1,291.2	1,288.8	2.9	2.8	-175.55	-61.7	-4.8	62.8	57.2	5.60	11.217		
1,400.0	1,400.0	1,387.0	1,382.9	3.1	3.1	-175.09	-79.5	-6.8	81.5	75.5	6.00	13.588		
1,500.0	1,500.0	1,481.5	1,475.1	3.4	3.4	-174.77	-100.2	-9.2	103.5	97.1	6.40	16.174		
1,600.0	1,600.0	1,575.4	1,565.9	3.5	3.8	-7.05	-123.6	-11.8	127.0	120.2	6.77	18.758		
1,700.0	1,699.8	1,673.0	1,660.1	3.7	4.2	-7.05	-149.3	-14.7	148.3	141.2	7.16	20.714		

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 133H - Wellbore #1 - Plan 1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.5 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
1,800.0	1,799.5	1,771.4	1,755.0	3.9	4.6	-7.20	-175.1	-17.7	166.3	158.7	7.57	21.969	
1,900.0	1,898.7	1,870.3	1,850.4	4.1	5.1	-7.46	-201.1	-20.6	180.9	172.9	8.00	22.624	
2,000.0	1,997.5	1,969.7	1,946.2	4.3	5.6	-7.83	-227.2	-23.6	192.0	183.6	8.44	22.753	
2,100.0	2,095.6	2,069.4	2,042.4	4.6	6.0	-8.30	-253.3	-26.6	199.8	190.9	8.90	22.444	
2,200.0	2,193.1	2,169.2	2,138.7	4.9	6.5	-8.89	-279.6	-29.6	204.3	194.9	9.38	21.785	
2,300.0	2,290.4	2,269.1	2,235.0	5.2	7.0	-9.49	-305.8	-32.5	208.1	198.2	9.87	21.089	
2,400.0	2,387.8	2,369.1	2,331.4	5.5	7.5	-10.08	-332.0	-35.5	212.0	201.6	10.37	20.439	
2,500.0	2,485.1	2,469.0	2,427.7	5.9	8.0	-10.64	-358.3	-38.5	215.8	204.9	10.88	19.832	
2,600.0	2,582.4	2,568.9	2,524.1	6.3	8.6	-11.18	-384.5	-41.5	219.7	208.3	11.41	19.265	
2,700.0	2,679.7	2,668.8	2,620.4	6.7	9.1	-11.70	-410.8	-44.5	223.6	211.7	11.94	18.735	
2,800.0	2,777.1	2,768.7	2,716.8	7.1	9.6	-12.21	-437.0	-47.4	227.6	215.1	12.48	18.240	
2,900.0	2,874.4	2,868.6	2,813.1	7.5	10.1	-12.70	-463.2	-50.4	231.5	218.5	13.02	17.776	
3,000.0	2,971.7	2,968.5	2,909.5	7.9	10.6	-13.17	-489.5	-53.4	235.5	221.9	13.58	17.342	
3,100.0	3,069.1	3,068.4	3,005.8	8.3	11.1	-13.62	-515.7	-56.4	239.5	225.3	14.14	16.935	
3,200.0	3,166.4	3,168.3	3,102.2	8.7	11.6	-14.06	-541.9	-59.4	243.5	228.8	14.71	16.552	
3,300.0	3,263.7	3,268.2	3,198.6	9.2	12.2	-14.49	-568.2	-62.4	247.5	232.2	15.28	16.193	
3,400.0	3,361.0	3,368.1	3,294.9	9.6	12.7	-14.90	-594.4	-65.3	251.5	235.6	15.86	15.854	
3,500.0	3,458.4	3,468.0	3,391.3	10.0	13.2	-15.30	-620.6	-68.3	255.5	239.1	16.45	15.535	
3,600.0	3,555.7	3,567.9	3,487.6	10.5	13.7	-15.69	-646.9	-71.3	259.6	242.6	17.04	15.234	
3,700.0	3,653.0	3,667.8	3,584.0	10.9	14.3	-16.07	-673.1	-74.3	263.7	246.0	17.64	14.950	
3,800.0	3,750.3	3,767.7	3,680.3	11.4	14.8	-16.43	-699.4	-77.3	267.7	249.5	18.24	14.681	
3,900.0	3,847.7	3,867.6	3,776.7	11.8	15.3	-16.78	-725.6	-80.2	271.8	253.0	18.84	14.426	
4,000.0	3,945.0	3,967.5	3,873.0	12.3	15.8	-17.13	-751.8	-83.2	275.9	256.4	19.45	14.184	
4,100.0	4,042.3	4,067.4	3,969.4	12.7	16.4	-17.46	-778.1	-86.2	280.0	259.9	20.07	13.954	
4,200.0	4,139.7	4,167.3	4,065.7	13.2	16.9	-17.78	-804.3	-89.2	284.1	263.4	20.68	13.736	
4,300.0	4,237.0	4,267.2	4,162.1	13.7	17.4	-18.10	-830.5	-92.2	288.2	266.9	21.30	13.529	
4,400.0	4,334.3	4,367.1	4,258.4	14.1	17.9	-18.40	-856.8	-95.2	292.4	270.4	21.93	13.331	
4,500.0	4,431.6	4,467.0	4,354.8	14.6	18.5	-18.70	-883.0	-98.1	296.5	273.9	22.56	13.143	
4,600.0	4,529.0	4,566.9	4,451.1	15.0	19.0	-18.98	-909.2	-101.1	300.6	277.4	23.19	12.963	
4,700.0	4,626.3	4,666.8	4,547.5	15.5	19.5	-19.27	-935.5	-104.1	304.8	281.0	23.83	12.792	
4,800.0	4,723.6	4,766.7	4,643.8	16.0	20.0	-19.54	-961.7	-107.1	308.9	284.5	24.47	12.628	
4,900.0	4,820.9	4,866.6	4,740.2	16.4	20.6	-19.80	-988.0	-110.1	313.1	288.0	25.11	12.471	
5,000.0	4,918.3	4,966.5	4,836.5	16.9	21.1	-20.06	-1,014.2	-113.0	317.3	291.5	25.75	12.321	
5,100.0	5,015.6	5,066.4	4,932.9	17.4	21.6	-20.31	-1,040.4	-116.0	321.5	295.1	26.40	12.177	
5,200.0	5,112.9	5,166.3	5,029.2	17.8	22.1	-20.56	-1,066.7	-119.0	325.6	298.6	27.05	12.039	
5,300.0	5,210.3	5,266.2	5,125.6	18.3	22.7	-20.80	-1,092.9	-122.0	329.8	302.1	27.70	11.907	
5,400.0	5,307.6	5,366.1	5,221.9	18.8	23.2	-21.03	-1,119.1	-125.0	334.0	305.7	28.36	11.779	
5,500.0	5,404.9	5,466.0	5,318.3	19.2	23.7	-21.26	-1,145.4	-127.9	338.2	309.2	29.01	11.657	
5,600.0	5,502.2	5,565.9	5,414.6	19.7	24.3	-21.48	-1,171.6	-130.9	342.4	312.8	29.67	11.540	
5,700.0	5,599.6	5,665.8	5,511.0	20.2	24.8	-21.70	-1,197.8	-133.9	346.6	316.3	30.34	11.427	
5,800.0	5,696.9	5,765.7	5,607.3	20.6	25.3	-21.91	-1,224.1	-136.9	350.8	319.9	31.00	11.318	
5,900.0	5,794.2	5,865.7	5,703.7	21.1	25.8	-22.12	-1,250.3	-139.9	355.1	323.4	31.67	11.213	
6,000.0	5,891.6	5,965.5	5,800.0	21.5	26.4	-22.31	-1,276.5	-142.9	359.7	327.4	32.32	11.131	
6,100.0	5,989.7	6,065.3	5,896.2	21.9	26.9	-22.35	-1,302.7	-145.8	367.2	334.3	32.88	11.168	
6,200.0	6,088.4	6,164.7	5,992.0	22.1	27.4	-22.22	-1,328.8	-148.8	377.9	344.5	33.38	11.322	
6,300.0	6,187.6	6,263.7	6,087.5	22.4	28.0	-21.93	-1,354.8	-151.8	391.8	358.0	33.81	11.586	
6,400.0	6,287.2	6,362.1	6,182.4	22.6	28.5	-21.51	-1,380.7	-154.7	408.9	374.7	34.20	11.957	
6,500.0	6,387.0	6,459.9	6,276.7	22.8	29.0	-20.98	-1,406.4	-157.6	429.3	394.8	34.54	12.430	
6,600.0	6,487.0	6,556.9	6,370.3	22.9	29.5	-20.38	-1,431.8	-160.5	452.9	418.1	34.84	13.000	
6,700.0	6,587.0	6,653.3	6,463.3	23.1	30.0	172.86	-1,457.2	-163.4	478.6	443.4	35.14	13.620	
6,800.0	6,687.0	6,749.8	6,556.3	23.2	30.5	173.56	-1,482.5	-166.3	504.4	468.9	35.45	14.227	
6,900.0	6,787.0	6,846.2	6,649.3	23.3	31.0	174.20	-1,507.8	-169.1	530.2	494.4	35.78	14.818	

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 133H - Wellbore #1 - Plan 1													Offset Site Error: 0.0 usft
Survey Program: 0-MWD													Offset Well Error: 0.5 usft
Reference	Offset	Semi Major Axis	Highside	Offset Wellbore Centre	Distance	Minimum	Separation	Rule Assigned:					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor	Warning
7,000.0	6,887.0	6,942.6	6,742.3	23.4	31.6	174.78	-1,533.2	-172.0	556.1	520.0	36.13	15.393	
7,100.0	6,987.0	7,039.1	6,835.4	23.5	32.1	175.30	-1,558.5	-174.9	582.0	545.5	36.49	15.952	
7,200.0	7,087.0	7,135.5	6,928.4	23.6	32.6	175.79	-1,583.8	-177.8	608.0	571.2	36.86	16.496	
7,300.0	7,187.0	7,232.0	7,021.4	23.8	33.1	176.23	-1,609.1	-180.6	634.0	596.8	37.24	17.026	
7,400.0	7,287.0	7,328.4	7,114.4	23.9	33.6	176.64	-1,634.5	-183.5	660.1	622.5	37.63	17.542	
7,500.0	7,387.0	7,424.9	7,207.4	24.0	34.1	177.01	-1,659.8	-186.4	686.2	648.1	38.03	18.045	
7,600.0	7,487.0	7,521.3	7,300.4	24.1	34.6	177.36	-1,685.1	-189.3	712.3	673.8	38.43	18.534	
7,700.0	7,587.0	7,617.8	7,393.4	24.3	35.1	177.69	-1,710.5	-192.2	738.4	699.6	38.84	19.011	
7,800.0	7,687.0	7,714.2	7,486.5	24.4	35.6	177.99	-1,735.8	-195.0	764.6	725.3	39.26	19.476	
7,900.0	7,787.0	7,810.6	7,579.5	24.5	36.2	178.27	-1,761.1	-197.9	790.7	751.1	39.68	19.929	
8,000.0	7,887.0	7,907.1	7,672.5	24.7	36.7	178.54	-1,786.4	-200.8	816.9	776.8	40.10	20.370	
8,100.0	7,987.0	8,003.5	7,765.5	24.8	37.2	178.79	-1,811.8	-203.7	843.1	802.6	40.53	20.801	
8,200.0	8,087.0	8,100.0	7,858.5	24.9	37.7	179.02	-1,837.1	-206.6	869.3	828.4	40.97	21.221	
8,300.0	8,187.0	8,196.4	7,951.5	25.1	38.2	179.24	-1,862.4	-209.4	895.6	854.2	41.40	21.631	
8,400.0	8,287.0	8,293.7	8,045.4	25.2	38.7	179.45	-1,888.0	-212.3	921.8	880.0	41.85	22.028	
8,500.0	8,387.0	8,437.3	8,184.8	25.4	39.2	179.71	-1,922.1	-216.2	945.6	903.1	42.42	22.289	
8,600.0	8,487.0	8,584.1	8,328.9	25.5	39.7	179.91	-1,949.7	-219.4	964.4	921.5	42.91	22.476	
8,700.0	8,587.0	8,733.5	8,476.8	25.6	40.1	-179.95	-1,970.3	-221.7	978.2	934.9	43.29	22.596	
8,800.0	8,687.0	8,884.6	8,627.4	25.8	40.3	-179.87	-1,983.3	-223.2	986.8	943.2	43.56	22.652	
8,900.0	8,787.0	9,036.8	8,779.4	25.9	40.5	-179.83	-1,988.4	-223.8	990.2	946.4	43.73	22.642	
9,000.0	8,887.0	9,143.8	8,886.5	26.1	40.6	-179.83	-1,988.5	-223.8	990.2	946.2	44.04	22.683	
9,100.0	8,986.9	9,245.5	8,988.0	26.2	40.7	89.57	-1,988.5	-220.5	990.1	945.8	44.36	22.323	
9,200.0	9,084.9	9,348.2	9,088.6	26.3	40.8	89.59	-1,988.2	-200.5	989.7	945.1	44.58	22.201	
9,300.0	9,178.1	9,450.8	9,184.0	26.4	40.8	89.62	-1,987.7	-162.9	988.8	944.1	44.73	22.106	
9,400.0	9,263.8	9,553.2	9,270.9	26.4	40.8	89.66	-1,987.0	-109.1	987.6	942.7	44.88	22.004	
9,500.0	9,339.1	9,655.3	9,346.7	26.5	40.9	89.71	-1,986.2	-40.9	986.1	940.9	45.15	21.840	
9,600.0	9,402.0	9,757.0	9,409.0	26.5	40.9	89.77	-1,985.1	39.4	984.3	938.6	45.69	21.543	
9,700.0	9,450.4	9,858.4	9,456.0	26.6	40.9	89.84	-1,984.0	129.0	982.2	935.6	46.66	21.052	
9,800.0	9,482.9	9,959.2	9,486.4	26.8	41.0	89.91	-1,982.8	225.0	980.0	931.8	48.16	20.348	
9,900.0	9,498.6	10,059.7	9,499.4	27.2	41.2	89.99	-1,981.5	324.5	977.7	927.5	50.22	19.469	
10,000.0	9,500.0	10,159.7	9,500.0	27.9	41.4	90.03	-1,980.2	424.4	975.4	922.6	52.77	18.485	
10,100.0	9,500.0	10,259.6	9,500.0	28.9	41.8	90.03	-1,979.0	524.4	973.1	917.4	55.71	17.467	
10,200.0	9,500.0	10,359.6	9,500.0	30.3	42.3	90.03	-1,977.7	624.4	970.7	911.7	59.02	16.446	
10,300.0	9,500.0	10,459.6	9,500.0	32.0	43.0	90.03	-1,976.4	724.3	968.4	905.8	62.65	15.458	
10,400.0	9,500.0	10,559.6	9,500.0	33.8	43.8	90.03	-1,975.1	824.3	966.1	899.6	66.54	14.520	
10,500.0	9,500.0	10,659.5	9,500.0	35.8	44.9	90.03	-1,973.8	924.3	963.8	893.1	70.64	13.644	
10,600.0	9,500.0	10,759.5	9,500.0	37.9	46.1	90.03	-1,972.6	1,024.2	961.5	886.5	74.92	12.833	
10,700.0	9,500.0	10,859.5	9,500.0	40.1	47.5	90.03	-1,971.3	1,124.2	959.1	879.8	79.36	12.086	
10,800.0	9,500.0	10,959.4	9,500.0	42.3	49.1	90.03	-1,970.0	1,224.2	956.8	872.9	83.92	11.401	
10,900.0	9,500.0	11,059.4	9,500.0	44.7	50.9	90.03	-1,968.7	1,324.1	954.5	865.9	88.60	10.773	
11,000.0	9,500.0	11,159.4	9,500.0	47.0	52.8	90.03	-1,967.5	1,424.1	952.2	858.8	93.36	10.199	
11,100.0	9,500.0	11,259.4	9,500.0	49.5	54.8	90.03	-1,966.2	1,524.1	949.8	851.6	98.21	9.672	
11,200.0	9,500.0	11,359.3	9,500.0	51.9	56.8	90.03	-1,964.9	1,624.0	947.5	844.4	103.12	9.189	
11,300.0	9,500.0	11,459.3	9,500.0	54.4	59.0	90.03	-1,963.6	1,724.0	945.2	837.1	108.09	8.745	
11,400.0	9,500.0	11,559.3	9,500.0	56.9	61.2	90.03	-1,962.4	1,824.0	942.9	829.8	113.11	8.336	
11,500.0	9,500.0	11,659.3	9,500.0	59.4	63.5	90.03	-1,961.1	1,923.9	940.6	822.4	118.17	7.959	
11,600.0	9,500.0	11,759.2	9,500.0	62.0	65.8	90.03	-1,959.8	2,023.9	938.2	815.0	123.28	7.611	
11,700.0	9,500.0	11,859.2	9,500.0	64.5	68.2	90.03	-1,958.5	2,123.9	935.9	807.5	128.42	7.288	
11,800.0	9,500.0	11,959.2	9,500.0	67.1	70.6	90.03	-1,957.3	2,223.8	933.6	800.0	133.58	6.989	
11,900.0	9,500.0	12,059.1	9,500.0	69.7	73.0	90.03	-1,956.0	2,323.8	931.3	792.5	138.78	6.710	
12,000.0	9,500.0	12,159.1	9,500.0	72.3	75.5	90.03	-1,954.7	2,423.7	928.9	784.9	144.00	6.451	
12,100.0	9,500.0	12,259.1	9,500.0	75.0	78.0	90.03	-1,953.4	2,523.7	926.6	777.4	149.24	6.209	

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 133H - Wellbore #1 - Plan 1													Offset Site Error:	0.0 usft	
Survey Program: 0-MWD				Offset		Semi Major Axis		Offset Wellbore Centre		Rule Assigned:				Offset Well Error:	0.5 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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
12,200.0	9,500.0	12,359.1	9,500.0	77.6	80.5	90.03	-1,952.2	2,623.7	924.3	769.8	154.50	5.983			
12,300.0	9,500.0	12,459.0	9,500.0	80.2	83.0	90.03	-1,950.9	2,723.6	922.0	762.2	159.78	5.770			
12,400.0	9,500.0	12,559.0	9,500.0	82.9	85.5	90.03	-1,949.6	2,823.6	919.7	754.6	165.07	5.571			
12,500.0	9,500.0	12,659.0	9,500.0	85.5	88.1	90.03	-1,948.3	2,923.6	917.3	747.0	170.38	5.384			
12,600.0	9,500.0	12,759.0	9,500.0	88.2	90.7	90.03	-1,947.1	3,023.5	915.0	739.3	175.70	5.208			
12,700.0	9,500.0	12,858.9	9,500.0	90.8	93.2	90.03	-1,945.8	3,123.5	912.7	731.7	181.03	5.042			
12,800.0	9,500.0	12,958.9	9,500.0	93.5	95.8	90.03	-1,944.5	3,223.5	910.4	724.0	186.37	4.885			
12,900.0	9,500.0	13,058.9	9,500.0	96.2	98.4	90.03	-1,943.2	3,323.4	908.0	716.3	191.73	4.736			
13,000.0	9,500.0	13,158.9	9,500.0	98.9	101.0	90.03	-1,942.0	3,423.4	905.7	708.6	197.09	4.596			
13,100.0	9,500.0	13,258.8	9,500.0	101.6	103.6	90.03	-1,940.7	3,523.4	903.4	700.9	202.46	4.462			
13,200.0	9,500.0	13,358.8	9,500.0	104.3	106.3	90.03	-1,939.4	3,623.3	901.1	693.2	207.84	4.335			
13,300.0	9,500.0	13,458.8	9,500.0	107.0	108.9	90.03	-1,938.1	3,723.3	898.8	685.5	213.22	4.215			
13,400.0	9,500.0	13,558.7	9,500.0	109.6	111.5	90.03	-1,936.9	3,823.3	896.4	677.8	218.62	4.101			
13,500.0	9,500.0	13,658.7	9,500.0	112.4	114.2	90.03	-1,935.6	3,923.2	894.1	670.1	224.01	3.991			
13,600.0	9,500.0	13,758.7	9,500.0	115.1	116.8	90.03	-1,934.3	4,023.2	891.8	662.4	229.42	3.887			
13,700.0	9,500.0	13,858.7	9,500.0	117.8	119.5	90.03	-1,933.0	4,123.1	889.5	654.6	234.83	3.788			
13,800.0	9,500.0	13,958.6	9,500.0	120.5	122.1	90.03	-1,931.8	4,223.1	887.2	646.9	240.24	3.693			
13,900.0	9,500.0	14,058.6	9,500.0	123.2	124.8	90.03	-1,930.5	4,323.1	884.8	639.2	245.66	3.602			
14,000.0	9,500.0	14,158.6	9,500.0	125.9	127.5	90.03	-1,929.2	4,423.0	882.5	631.4	251.08	3.515			
14,100.0	9,500.0	14,258.6	9,500.0	128.6	130.1	90.03	-1,927.9	4,523.0	880.2	623.7	256.51	3.431			
14,200.0	9,500.0	14,358.5	9,500.0	131.3	132.8	90.03	-1,926.7	4,623.0	877.9	615.9	261.94	3.351			
14,300.0	9,500.0	14,458.5	9,500.0	134.0	135.5	90.03	-1,925.4	4,722.9	875.5	608.2	267.38	3.275			
14,400.0	9,500.0	14,558.5	9,500.0	136.8	138.2	90.03	-1,924.1	4,822.9	873.2	600.4	272.81	3.201			
14,500.0	9,500.0	14,658.4	9,500.0	139.5	140.8	90.03	-1,922.8	4,922.9	870.9	592.6	278.25	3.130			
14,600.0	9,500.0	14,758.4	9,500.0	142.2	143.5	90.03	-1,921.5	5,022.8	868.6	584.9	283.70	3.062			
14,700.0	9,500.0	14,858.4	9,500.0	144.9	146.2	90.03	-1,920.3	5,122.8	866.3	577.1	289.15	2.996			
14,800.0	9,500.0	14,958.4	9,500.0	147.7	148.9	90.03	-1,919.0	5,222.8	863.9	569.3	294.59	2.933			
14,900.0	9,500.0	15,058.3	9,500.0	150.4	151.6	90.03	-1,917.7	5,322.7	861.6	561.6	300.05	2.872			
15,000.0	9,500.0	15,147.6	9,500.0	153.1	154.0	90.03	-1,916.8	5,412.0	859.6	554.0	305.60	2.813			
15,039.9	9,500.0	15,178.3	9,500.0	154.2	154.8	90.03	-1,917.0	5,442.7	859.4	551.5	307.82	2.792			
15,100.0	9,500.0	15,224.5	9,500.0	155.9	156.1	90.03	-1,917.8	5,488.9	859.8	548.7	311.11	2.764			
15,200.0	9,500.0	15,315.0	9,500.0	158.6	158.6	90.03	-1,921.0	5,579.3	862.3	545.8	316.53	2.724			
15,300.0	9,500.0	15,414.9	9,500.0	161.3	161.3	90.03	-1,924.8	5,679.2	865.1	543.1	322.00	2.687			
15,400.0	9,500.0	15,514.9	9,500.0	164.0	164.0	90.03	-1,928.6	5,779.1	867.8	540.3	327.47	2.650			
15,500.0	9,500.0	15,614.9	9,500.0	166.8	166.7	90.03	-1,932.3	5,879.0	870.5	537.5	332.94	2.615			
15,600.0	9,500.0	15,714.8	9,500.0	169.5	169.5	90.03	-1,936.1	5,978.9	873.2	534.8	338.41	2.580			
15,700.0	9,500.0	15,814.8	9,500.0	172.3	172.2	90.03	-1,939.8	6,078.7	875.9	532.0	343.89	2.547			
15,800.0	9,500.0	15,914.7	9,500.0	175.0	174.9	90.03	-1,943.6	6,178.6	878.6	529.3	349.36	2.515			
15,900.0	9,500.0	16,014.7	9,500.0	177.7	177.6	90.03	-1,947.4	6,278.5	881.3	526.5	354.84	2.484			
16,000.0	9,500.0	16,114.7	9,500.0	180.5	180.4	90.03	-1,951.1	6,378.4	884.1	523.7	360.32	2.454			
16,100.0	9,500.0	16,214.6	9,500.0	183.2	183.1	90.03	-1,954.9	6,478.3	886.8	521.0	365.80	2.424			
16,200.0	9,500.0	16,314.6	9,500.0	185.9	185.8	90.03	-1,958.6	6,578.2	889.5	518.2	371.29	2.396			
16,300.0	9,500.0	16,414.6	9,500.0	188.7	188.6	90.03	-1,962.4	6,678.1	892.2	515.4	376.77	2.368			
16,400.0	9,500.0	16,514.5	9,500.0	191.4	191.3	90.03	-1,966.2	6,778.0	894.9	512.7	382.25	2.341			
16,500.0	9,500.0	16,614.5	9,500.0	194.2	194.0	90.03	-1,969.9	6,877.9	897.6	509.9	387.74	2.315			
16,600.0	9,500.0	16,714.4	9,500.0	196.9	196.8	90.03	-1,973.7	6,977.8	900.4	507.1	393.23	2.290			
16,700.0	9,500.0	16,814.4	9,500.0	199.7	199.5	90.03	-1,977.4	7,077.7	903.1	504.4	398.72	2.265			
16,800.0	9,500.0	16,914.4	9,500.0	202.4	202.3	90.03	-1,981.2	7,177.6	905.8	501.6	404.21	2.241			
16,900.0	9,500.0	17,014.3	9,500.0	205.1	205.0	90.03	-1,985.0	7,277.5	908.5	498.8	409.70	2.218			
17,000.0	9,500.0	17,114.3	9,500.0	207.9	207.7	90.03	-1,988.7	7,377.3	911.2	496.0	415.19	2.195			
17,100.0	9,500.0	17,214.3	9,500.0	210.6	210.5	90.03	-1,992.5	7,477.2	913.9	493.3	420.68	2.173			
17,200.0	9,500.0	17,314.2	9,500.0	213.4	213.2	90.03	-1,996.2	7,577.1	916.7	490.5	426.17	2.151			

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 133H - Wellbore #1 - Plan 1													Offset Site Error: 0.0 usft
Survey Program: 0-MWD													Offset Well Error: 0.5 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
17,300.0	9,500.0	17,414.2	9,500.0	216.1	216.0	90.03	-2,000.0	7,677.0	919.4	487.7	431.67	2.130	
17,400.0	9,500.0	17,514.2	9,500.0	218.9	218.7	90.03	-2,003.8	7,776.9	922.1	484.9	437.16	2.109	
17,500.0	9,500.0	17,614.1	9,500.0	221.6	221.4	90.03	-2,007.5	7,876.8	924.8	482.1	442.66	2.089	
17,600.0	9,500.0	17,714.1	9,500.0	224.4	224.2	90.03	-2,011.3	7,976.7	927.5	479.4	448.15	2.070	
17,700.0	9,500.0	17,814.0	9,500.0	227.1	226.9	90.03	-2,015.0	8,076.6	930.2	476.6	453.65	2.051	
17,800.0	9,500.0	17,914.0	9,500.0	229.9	229.7	90.03	-2,018.8	8,176.5	932.9	473.8	459.15	2.032	
17,900.0	9,500.0	18,014.0	9,500.0	232.6	232.4	90.03	-2,022.6	8,276.4	935.7	471.0	464.64	2.014	
18,000.0	9,500.0	18,113.9	9,500.0	235.3	235.2	90.03	-2,026.3	8,376.3	938.4	468.2	470.14	1.996 Collision Risk Procedures Req.	
18,100.0	9,500.0	18,213.9	9,500.0	238.1	237.9	90.03	-2,030.1	8,476.2	941.1	465.4	475.64	1.979 Collision Risk Procedures Req.	
18,200.0	9,500.0	18,313.9	9,500.0	240.8	240.7	90.03	-2,033.8	8,576.1	943.8	462.7	481.14	1.962 Collision Risk Procedures Req.	
18,300.0	9,500.0	18,413.8	9,500.0	243.6	243.4	90.03	-2,037.6	8,675.9	946.5	459.9	486.64	1.945 Collision Risk Procedures Req.	
18,400.0	9,500.0	18,513.8	9,500.0	246.3	246.2	90.03	-2,041.4	8,775.8	949.2	457.1	492.14	1.929 Collision Risk Procedures Req.	
18,500.0	9,500.0	18,613.7	9,500.0	249.1	248.9	90.03	-2,045.1	8,875.7	952.0	454.3	497.65	1.913 Collision Risk Procedures Req.	
18,600.0	9,500.0	18,713.7	9,500.0	251.8	251.6	90.03	-2,048.9	8,975.6	954.7	451.5	503.15	1.897 Collision Risk Procedures Req.	
18,700.0	9,500.0	18,813.7	9,500.0	254.6	254.4	90.03	-2,052.6	9,075.5	957.4	448.7	508.65	1.882 Collision Risk Procedures Req.	
18,800.0	9,500.0	18,913.6	9,500.0	257.3	257.1	90.03	-2,056.4	9,175.4	960.1	445.9	514.15	1.867 Collision Risk Procedures Req.	
18,900.0	9,500.0	19,013.6	9,500.0	260.1	259.9	90.03	-2,060.2	9,275.3	962.8	443.2	519.66	1.853 Collision Risk Procedures Req.	
19,000.0	9,500.0	19,113.6	9,500.0	262.8	262.6	90.03	-2,063.9	9,375.2	965.5	440.4	525.16	1.839 Collision Risk Procedures Req.	
19,100.0	9,500.0	19,213.5	9,500.0	265.6	265.4	90.03	-2,067.7	9,475.1	968.2	437.6	530.67	1.825 Collision Risk Procedures Req.	
19,200.0	9,500.0	19,313.5	9,500.0	268.3	268.1	90.03	-2,071.4	9,575.0	971.0	434.8	536.17	1.811 Collision Risk Procedures Req.	
19,300.0	9,500.0	19,413.5	9,500.0	271.1	270.9	90.03	-2,075.2	9,674.9	973.7	432.0	541.68	1.798 Collision Risk Procedures Req.	
19,400.0	9,500.0	19,513.4	9,500.0	273.9	273.6	90.03	-2,079.0	9,774.8	976.4	429.2	547.18	1.784 Collision Risk Procedures Req.	
19,500.0	9,500.0	19,613.4	9,500.0	276.6	276.4	90.03	-2,082.7	9,874.7	979.1	426.4	552.69	1.772 Collision Risk Procedures Req.	
19,600.0	9,500.0	19,713.3	9,500.0	279.4	279.1	90.03	-2,086.5	9,974.5	981.8	423.6	558.19	1.759 Collision Risk Procedures Req.	
19,700.0	9,500.0	19,813.3	9,500.0	282.1	281.9	90.03	-2,090.2	10,074.4	984.5	420.8	563.70	1.747 Collision Risk Procedures Req.	
19,800.0	9,500.0	19,913.3	9,500.0	284.9	284.6	90.03	-2,094.0	10,174.3	987.3	418.0	569.21	1.734 Collision Risk Procedures Req.	
19,892.7	9,500.0	20,005.9	9,500.0	287.4	287.2	90.03	-2,097.5	10,266.9	989.8	415.5	574.31	1.723 Collision Risk Procedures Req., SF	

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 213H - Wellbore #1 - Plan 1													Offset Site Error: 0.0 usft
Survey Program: 0-MWD													Offset Well Error: 0.5 usft
Reference	Offset	Semi Major Axis	Highside	Offset Wellbore Centre	Distance	Rule Assigned:							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.5	0.5	0.5	0.5	0.17	20.0	0.1	20.0				
100.0	100.0	100.5	100.5	0.5	0.5	0.17	20.0	0.1	20.0	18.9	1.06	18.945	
200.0	200.0	200.5	200.5	0.6	0.6	0.17	20.0	0.1	20.0	18.7	1.27	15.710	
300.0	300.0	300.5	300.5	0.8	0.8	0.17	20.0	0.1	20.0	18.4	1.59	12.571	
400.0	400.0	400.5	400.5	1.0	1.0	0.17	20.0	0.1	20.0	18.0	1.96	10.199	
500.0	500.0	500.5	500.5	1.2	1.2	0.17	20.0	0.1	20.0	17.6	2.36	8.479	
600.0	600.0	600.5	600.5	1.4	1.4	0.17	20.0	0.1	20.0	17.2	2.77	7.214	
700.0	700.0	700.5	700.5	1.6	1.6	0.17	20.0	0.1	20.0	16.8	3.20	6.258	
800.0	800.0	800.5	800.5	1.8	1.8	0.17	20.0	0.1	20.0	16.4	3.63	5.516	
900.0	900.0	900.5	900.5	2.0	2.0	0.17	20.0	0.1	20.0	15.9	4.06	4.927	
1,000.0	1,000.0	1,000.5	1,000.5	2.2	2.2	0.17	20.0	0.1	20.0	15.5	4.50	4.448	
1,100.0	1,100.0	1,100.5	1,100.5	2.5	2.5	0.17	20.0	0.1	20.0	15.1	4.94	4.052	
1,200.0	1,200.0	1,200.5	1,200.5	2.7	2.7	0.17	20.0	0.1	20.0	14.6	5.38	3.720	
1,300.0	1,300.0	1,300.5	1,300.5	2.9	2.9	0.17	20.0	0.1	20.0	14.2	5.82	3.437	
1,400.0	1,400.0	1,400.5	1,400.5	3.1	3.1	0.17	20.0	0.1	20.0	13.7	6.26	3.194	
1,500.0	1,500.0	1,500.5	1,500.5	3.4	3.4	0.17	20.0	0.1	20.0	13.3	6.71	2.982	
1,500.1	1,500.1	1,500.6	1,500.6	3.4	3.4	0.17	20.0	0.1	20.0	13.3	6.71	2.982 CC, ES	
1,600.0	1,600.0	1,600.6	1,600.5	3.5	3.6	164.02	19.8	-1.7	21.5	14.4	7.11	3.027	
1,700.0	1,699.8	1,700.4	1,700.2	3.7	3.8	156.23	19.1	-6.7	26.5	19.0	7.48	3.537	
1,800.0	1,799.5	1,800.0	1,799.7	3.9	4.0	152.55	18.4	-12.3	34.9	27.0	7.86	4.437	
1,900.0	1,898.7	1,899.3	1,898.9	4.1	4.2	152.38	17.7	-18.0	46.5	38.2	8.26	5.625	
2,000.0	1,997.5	1,998.2	1,997.6	4.3	4.4	153.75	16.9	-23.6	61.1	52.4	8.67	7.050	
2,100.0	2,095.6	2,096.6	2,095.8	4.6	4.6	155.61	16.2	-29.2	78.9	69.8	9.09	8.683	
2,200.0	2,193.1	2,194.4	2,193.4	4.9	4.8	157.53	15.5	-34.7	99.7	90.2	9.52	10.475	
2,300.0	2,290.4	2,292.0	2,290.9	5.2	5.0	158.97	14.8	-40.2	121.3	111.3	9.95	12.182	
2,400.0	2,387.8	2,389.6	2,388.3	5.5	5.2	159.99	14.1	-45.8	142.9	132.5	10.40	13.740	
2,500.0	2,485.1	2,487.2	2,485.8	5.9	5.5	160.73	13.4	-51.3	164.5	153.6	10.85	15.163	
2,600.0	2,582.4	2,584.8	2,583.2	6.3	5.7	161.30	12.6	-56.9	186.1	174.8	11.31	16.464	
2,700.0	2,679.7	2,682.4	2,680.7	6.7	5.9	161.76	11.9	-62.4	207.8	196.0	11.77	17.656	
2,800.0	2,777.1	2,780.0	2,778.1	7.1	6.1	162.12	11.2	-67.9	229.5	217.2	12.24	18.750	
2,900.0	2,874.4	2,877.7	2,875.6	7.5	6.4	162.43	10.5	-73.5	251.2	238.4	12.71	19.756	
3,000.0	2,971.7	2,975.3	2,973.0	7.9	6.6	162.68	9.8	-79.0	272.8	259.6	13.19	20.684	
3,100.0	3,069.1	3,072.9	3,070.5	8.3	6.8	162.90	9.1	-84.6	294.5	280.9	13.67	21.541	
3,200.0	3,166.4	3,170.5	3,167.9	8.7	7.0	163.09	8.3	-90.1	316.2	302.1	14.16	22.334	
3,300.0	3,263.7	3,268.1	3,265.4	9.2	7.3	163.25	7.6	-95.7	337.9	323.3	14.65	23.070	
3,400.0	3,361.0	3,365.7	3,362.8	9.6	7.5	163.40	6.9	-101.2	359.6	344.5	15.14	23.754	
3,500.0	3,458.4	3,463.3	3,460.3	10.0	7.7	163.53	6.2	-106.7	381.3	365.7	15.63	24.392	
3,600.0	3,555.7	3,561.0	3,557.8	10.5	8.0	163.64	5.5	-112.3	403.0	386.9	16.13	24.987	
3,700.0	3,653.0	3,658.6	3,655.2	10.9	8.2	163.74	4.8	-117.8	424.7	408.1	16.63	25.543	
3,800.0	3,750.3	3,756.2	3,752.7	11.4	8.4	163.84	4.0	-123.4	446.4	429.3	17.13	26.064	
3,900.0	3,847.7	3,853.8	3,850.1	11.8	8.7	163.92	3.3	-128.9	468.1	450.5	17.63	26.553	
4,000.0	3,945.0	3,951.4	3,947.6	12.3	8.9	164.00	2.6	-134.4	489.8	471.7	18.13	27.012	
4,100.0	4,042.3	4,049.0	4,045.0	12.7	9.1	164.07	1.9	-140.0	511.5	492.9	18.64	27.444	
4,200.0	4,139.7	4,146.6	4,142.5	13.2	9.4	164.13	1.2	-145.5	533.2	514.1	19.15	27.852	
4,300.0	4,237.0	4,244.3	4,239.9	13.7	9.6	164.19	0.5	-151.1	554.9	535.3	19.65	28.237	
4,400.0	4,334.3	4,341.9	4,337.4	14.1	9.8	164.24	-0.3	-156.6	576.7	556.5	20.16	28.601	
4,500.0	4,431.6	4,439.5	4,434.8	14.6	10.1	164.30	-1.0	-162.1	598.4	577.7	20.67	28.945	
4,600.0	4,529.0	4,537.1	4,532.3	15.0	10.3	164.34	-1.7	-167.7	620.1	598.9	21.18	29.271	
4,700.0	4,626.3	4,634.7	4,629.7	15.5	10.6	164.39	-2.4	-173.2	641.8	620.1	21.70	29.581	
4,800.0	4,723.6	4,732.3	4,727.2	16.0	10.8	164.43	-3.1	-178.8	663.5	641.3	22.21	29.876	
4,900.0	4,820.9	4,829.9	4,824.7	16.4	11.0	164.47	-3.8	-184.3	685.2	662.5	22.72	30.156	
5,000.0	4,918.3	4,927.6	4,922.1	16.9	11.3	164.50	-4.6	-189.8	706.9	683.7	23.24	30.422	

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 213H - Wellbore #1 - Plan 1													Offset Site Error:	0.0 usft	
Survey Program:		0-MWD						Rule Assigned:						Offset Well Error:	0.5 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance			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)	Minimum Separation (usft)	Separation Factor	Warning		
5,100.0	5,015.6	5,025.2	5,019.6	17.4	11.5	164.54	-5.3	-195.4	728.6	704.9	23.75	30.676			
5,200.0	5,112.9	5,122.8	5,117.0	17.8	11.7	164.57	-6.0	-200.9	750.3	726.1	24.27	30.919			
5,300.0	5,210.3	5,220.4	5,214.5	18.3	12.0	164.60	-6.7	-206.5	772.0	747.3	24.78	31.150			
5,400.0	5,307.6	5,318.0	5,311.9	18.8	12.2	164.63	-7.4	-212.0	793.8	768.5	25.30	31.372			
5,500.0	5,404.9	5,413.9	5,407.7	19.2	12.4	164.72	-8.0	-216.6	815.5	789.8	25.78	31.632			
5,600.0	5,502.2	5,508.9	5,502.7	19.7	12.6	165.02	-8.2	-218.0	837.6	811.4	26.21	31.953			
5,700.0	5,599.6	5,606.3	5,600.1	20.2	12.8	165.41	-8.2	-218.0	859.9	833.2	26.65	32.260			
5,800.0	5,696.9	5,703.6	5,697.4	20.6	13.0	165.79	-8.2	-218.0	882.1	855.0	27.10	32.549			
5,900.0	5,794.2	5,800.9	5,794.7	21.1	13.2	166.14	-8.2	-218.0	904.5	876.9	27.55	32.828			
6,000.0	5,891.6	5,898.4	5,892.1	21.5	13.4	166.53	-8.2	-218.0	926.4	898.4	27.99	33.093			
6,100.0	5,989.7	5,996.4	5,990.2	21.9	13.6	166.89	-8.2	-218.0	945.4	917.0	28.41	33.280			
6,200.0	6,088.4	6,095.1	6,088.9	22.1	13.8	167.18	-8.2	-218.0	961.1	932.3	28.82	33.353			
6,300.0	6,187.6	6,194.3	6,188.1	22.4	14.0	167.40	-8.2	-218.0	973.4	944.2	29.22	33.315			
6,400.0	6,287.2	6,293.9	6,287.7	22.6	14.2	167.56	-8.2	-218.0	982.4	952.8	29.61	33.173			
6,500.0	6,387.0	6,393.7	6,387.5	22.8	14.4	167.65	-8.2	-218.0	987.9	957.9	30.00	32.930			
6,600.0	6,487.0	6,493.7	6,487.5	22.9	14.6	167.69	-8.2	-218.0	990.1	959.7	30.38	32.591			
6,700.0	6,587.0	6,593.7	6,587.5	23.1	14.8	0.17	-8.2	-218.0	990.1	959.3	30.76	32.187			
6,800.0	6,687.0	6,693.7	6,687.5	23.2	15.0	0.17	-8.2	-218.0	990.1	959.0	31.14	31.799			
6,900.0	6,787.0	6,793.7	6,787.5	23.3	15.2	0.17	-8.2	-218.0	990.1	958.6	31.51	31.418			
7,000.0	6,887.0	6,893.7	6,887.5	23.4	15.4	0.17	-8.2	-218.0	990.1	958.2	31.89	31.045			
7,100.0	6,987.0	6,993.7	6,987.5	23.5	15.6	0.17	-8.2	-218.0	990.1	957.8	32.27	30.679			
7,200.0	7,087.0	7,093.7	7,087.5	23.6	15.8	0.17	-8.2	-218.0	990.1	957.4	32.66	30.319			
7,300.0	7,187.0	7,193.7	7,187.5	23.8	16.0	0.17	-8.2	-218.0	990.1	957.1	33.04	29.967			
7,400.0	7,287.0	7,293.7	7,287.5	23.9	16.2	0.17	-8.2	-218.0	990.1	956.7	33.43	29.621			
7,500.0	7,387.0	7,393.7	7,387.5	24.0	16.4	0.17	-8.2	-218.0	990.1	956.3	33.81	29.282			
7,600.0	7,487.0	7,493.7	7,487.5	24.1	16.6	0.17	-8.2	-218.0	990.1	955.9	34.20	28.949			
7,700.0	7,587.0	7,593.7	7,587.5	24.3	16.9	0.17	-8.2	-218.0	990.1	955.5	34.59	28.622			
7,800.0	7,687.0	7,693.7	7,687.5	24.4	17.1	0.17	-8.2	-218.0	990.1	955.1	34.98	28.302			
7,900.0	7,787.0	7,793.7	7,787.5	24.5	17.3	0.17	-8.2	-218.0	990.1	954.7	35.38	27.988			
8,000.0	7,887.0	7,893.7	7,887.5	24.7	17.5	0.17	-8.2	-218.0	990.1	954.3	35.77	27.679			
8,100.0	7,987.0	7,993.7	7,987.5	24.8	17.7	0.17	-8.2	-218.0	990.1	953.9	36.17	27.377			
8,200.0	8,087.0	8,093.7	8,087.5	24.9	17.9	0.17	-8.2	-218.0	990.1	953.5	36.56	27.080			
8,300.0	8,187.0	8,193.7	8,187.5	25.1	18.1	0.17	-8.2	-218.0	990.1	953.1	36.96	26.788			
8,400.0	8,287.0	8,293.7	8,287.5	25.2	18.3	0.17	-8.2	-218.0	990.1	952.7	37.36	26.502			
8,500.0	8,387.0	8,393.7	8,387.5	25.4	18.5	0.17	-8.2	-218.0	990.1	952.3	37.76	26.221			
8,600.0	8,487.0	8,493.7	8,487.5	25.5	18.8	0.17	-8.2	-218.0	990.1	951.9	38.16	25.946			
8,700.0	8,587.0	8,593.7	8,587.5	25.6	19.0	0.17	-8.2	-218.0	990.1	951.5	38.56	25.675			
8,800.0	8,687.0	8,693.7	8,687.5	25.8	19.2	0.17	-8.2	-218.0	990.1	951.1	38.97	25.409			
8,900.0	8,787.0	8,793.7	8,787.5	25.9	19.4	0.17	-8.2	-218.0	990.1	950.7	39.37	25.148			
9,000.0	8,887.0	8,893.7	8,887.5	26.1	19.6	0.17	-8.2	-218.0	990.1	950.3	39.78	24.892			
9,100.0	8,986.9	8,994.5	8,988.2	26.2	19.8	-90.43	-8.2	-214.8	990.1	950.0	40.15	24.662			
9,200.0	9,084.9	9,095.8	9,087.4	26.3	19.9	-90.41	-8.4	-195.1	990.1	949.7	40.42	24.496			
9,300.0	9,178.1	9,197.0	9,181.5	26.4	20.1	-90.38	-8.8	-158.4	990.1	949.5	40.63	24.369			
9,400.0	9,263.8	9,298.1	9,267.7	26.4	20.2	-90.33	-9.4	-105.8	990.1	949.2	40.85	24.235			
9,418.6	9,278.6	9,316.9	9,282.6	26.4	20.2	-90.32	-9.5	-94.3	990.1	949.2	40.92	24.198			
9,500.0	9,339.1	9,399.0	9,343.1	26.5	20.4	-90.28	-10.1	-38.9	990.1	948.9	41.22	24.019			
9,520.2	9,352.9	9,419.3	9,356.9	26.5	20.5	-90.27	-10.2	-23.9	990.1	948.7	41.35	23.945			
9,600.0	9,402.0	9,499.7	9,405.6	26.5	20.8	-90.22	-10.9	39.9	990.1	948.2	41.90	23.632			
9,622.0	9,413.9	9,521.9	9,417.4	26.6	20.9	-90.20	-11.1	58.7	990.1	947.9	42.13	23.500			
9,700.0	9,450.4	9,600.3	9,453.3	26.6	21.4	-90.15	-11.8	128.3	990.1	947.0	43.04	23.005			
9,724.9	9,460.1	9,625.3	9,462.7	26.7	21.6	-90.13	-12.1	151.5	990.1	946.6	43.45	22.789			
9,800.0	9,482.9	9,700.6	9,484.7	26.8	22.2	-90.07	-12.8	223.5	990.1	945.3	44.75	22.126			

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 213H - Wellbore #1 - Plan 1													Offset Site Error:	0.0 usft	
Survey Program:		0-MWD					Rule Assigned:							Offset Well Error:	0.5 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		
9,834.6	9,490.3	9,735.2	9,491.6	26.9	22.6	-90.05	-13.2	257.4	990.1	944.6	45.51	21.756			
9,900.0	9,498.6	9,800.7	9,499.0	27.2	23.4	-90.00	-13.9	322.4	990.1	943.1	47.02	21.059			
10,000.0	9,500.0	9,900.7	9,500.0	27.9	24.8	-89.97	-14.9	422.4	990.1	940.3	49.76	19.897			
10,008.2	9,500.0	9,908.9	9,500.0	27.9	24.9	-89.97	-15.0	430.6	990.1	940.1	50.02	19.793			
10,100.0	9,500.0	10,000.7	9,500.0	28.9	26.4	-89.97	-15.9	522.4	990.1	937.1	52.93	18.704			
10,129.6	9,500.0	10,030.3	9,500.0	29.3	26.9	-89.97	-16.3	552.0	990.1	936.1	53.98	18.340			
10,200.0	9,500.0	10,100.7	9,500.0	30.3	28.2	-89.97	-17.0	622.4	990.1	933.6	56.47	17.532			
10,229.6	9,500.0	10,130.3	9,500.0	30.8	28.8	-89.97	-17.3	652.0	990.1	932.5	57.61	17.186			
10,300.0	9,500.0	10,200.7	9,500.0	32.0	30.1	-89.97	-18.0	722.3	990.1	929.8	60.31	16.416			
10,329.6	9,500.0	10,230.3	9,500.0	32.5	30.7	-89.97	-18.4	752.0	990.1	928.6	61.52	16.093			
10,400.0	9,500.0	10,300.7	9,500.0	33.8	32.2	-89.97	-19.1	822.3	990.1	925.7	64.39	15.375			
10,429.6	9,500.0	10,330.3	9,500.0	34.4	32.8	-89.97	-19.4	852.0	990.1	924.4	65.66	15.078			
10,500.0	9,500.0	10,400.7	9,500.0	35.8	34.3	-89.97	-20.1	922.3	990.1	921.4	68.68	14.416			
10,529.6	9,500.0	10,430.3	9,500.0	36.4	35.0	-89.97	-20.4	952.0	990.1	920.1	70.00	14.144			
10,600.0	9,500.0	10,500.7	9,500.0	37.9	36.6	-89.97	-21.2	1,022.3	990.1	916.9	73.13	13.538			
10,629.6	9,500.0	10,530.3	9,500.0	38.5	37.3	-89.97	-21.5	1,052.0	990.1	915.6	74.49	13.291			
10,700.0	9,500.0	10,600.7	9,500.0	40.1	38.9	-89.97	-22.2	1,122.3	990.1	912.4	77.72	12.739			
10,729.6	9,500.0	10,630.3	9,500.0	40.7	39.6	-89.97	-22.5	1,152.0	990.1	911.0	79.11	12.515			
10,800.0	9,500.0	10,700.7	9,500.0	42.3	41.2	-89.97	-23.3	1,222.3	990.1	907.6	82.42	12.012			
10,829.6	9,500.0	10,730.3	9,500.0	43.0	42.0	-89.97	-23.6	1,252.0	990.1	906.2	83.85	11.808			
10,900.0	9,500.0	10,800.7	9,500.0	44.7	43.7	-89.97	-24.3	1,322.3	990.1	902.8	87.22	11.351			
10,929.6	9,500.0	10,830.3	9,500.0	45.4	44.4	-89.97	-24.6	1,352.0	990.1	901.4	88.67	11.166			
11,000.0	9,500.0	10,900.7	9,500.0	47.0	46.1	-89.97	-25.4	1,422.3	990.1	898.0	92.10	10.749			
11,029.6	9,500.0	10,930.3	9,500.0	47.8	46.8	-89.97	-25.7	1,452.0	990.1	896.5	93.57	10.581			
11,100.0	9,500.0	11,000.7	9,500.0	49.5	48.6	-89.97	-26.4	1,522.3	990.1	893.0	97.05	10.201			
11,129.6	9,500.0	11,030.3	9,500.0	50.2	49.3	-89.97	-26.7	1,551.9	990.1	891.5	98.54	10.047			
11,200.0	9,500.0	11,100.7	9,500.0	51.9	51.1	-89.97	-27.5	1,622.3	990.1	888.0	102.06	9.700			
11,229.6	9,500.0	11,130.3	9,500.0	52.6	51.8	-89.97	-27.8	1,651.9	990.1	886.5	103.56	9.560			
11,300.0	9,500.0	11,200.7	9,500.0	54.4	53.6	-89.97	-28.5	1,722.3	990.1	882.9	107.12	9.242			
11,329.6	9,500.0	11,230.3	9,500.0	55.1	54.4	-89.97	-28.8	1,751.9	990.1	881.4	108.64	9.114			
11,400.0	9,500.0	11,300.7	9,500.0	56.9	56.2	-89.97	-29.6	1,822.3	990.1	877.8	112.23	8.822			
11,429.6	9,500.0	11,330.3	9,500.0	57.6	56.9	-89.97	-29.9	1,851.9	990.1	876.3	113.75	8.704			
11,500.0	9,500.0	11,400.7	9,500.0	59.4	58.8	-89.97	-30.6	1,922.3	990.1	872.7	117.37	8.436			
11,529.6	9,500.0	11,430.3	9,500.0	60.2	59.5	-89.97	-30.9	1,951.9	990.1	871.2	118.90	8.327			
11,600.0	9,500.0	11,500.7	9,500.0	62.0	61.3	-89.97	-31.6	2,022.3	990.1	867.5	122.54	8.079			
11,629.6	9,500.0	11,530.3	9,500.0	62.7	62.1	-89.97	-32.0	2,051.9	990.1	866.0	124.09	7.979			
11,700.0	9,500.0	11,600.7	9,500.0	64.5	64.0	-89.97	-32.7	2,122.3	990.1	862.3	127.75	7.750			
11,729.6	9,500.0	11,630.3	9,500.0	65.3	64.7	-89.97	-33.0	2,151.9	990.1	860.8	129.30	7.657			
11,800.0	9,500.0	11,700.7	9,500.0	67.1	66.6	-89.97	-33.7	2,222.3	990.1	857.1	132.98	7.445			
11,829.6	9,500.0	11,730.3	9,500.0	67.9	67.3	-89.97	-34.1	2,251.9	990.1	855.5	134.53	7.359			
11,900.0	9,500.0	11,800.7	9,500.0	69.7	69.2	-89.97	-34.8	2,322.3	990.1	851.8	138.23	7.162			
11,929.6	9,500.0	11,830.3	9,500.0	70.5	70.0	-89.97	-35.1	2,351.9	990.1	850.3	139.79	7.082			
12,000.0	9,500.0	11,900.7	9,500.0	72.3	71.8	-89.97	-35.8	2,422.3	990.1	846.6	143.50	6.899			
12,029.6	9,500.0	11,930.3	9,500.0	73.1	72.6	-89.97	-36.1	2,451.9	990.1	845.0	145.07	6.825			
12,100.0	9,500.0	12,000.7	9,500.0	75.0	74.5	-89.97	-36.9	2,522.2	990.1	841.3	148.79	6.654			
12,129.6	9,500.0	12,030.3	9,500.0	75.7	75.3	-89.97	-37.2	2,551.9	990.1	839.7	150.37	6.584			
12,200.0	9,500.0	12,100.7	9,500.0	77.6	77.1	-89.97	-37.9	2,622.2	990.1	836.0	154.10	6.425			
12,229.6	9,500.0	12,130.3	9,500.0	78.4	77.9	-89.97	-38.2	2,651.9	990.1	834.4	155.68	6.360			
12,300.0	9,500.0	12,200.7	9,500.0	80.2	79.8	-89.97	-39.0	2,722.2	990.1	830.6	159.42	6.210			
12,329.6	9,500.0	12,230.3	9,500.0	81.0	80.6	-89.97	-39.3	2,751.9	990.1	829.1	161.00	6.149			
12,400.0	9,500.0	12,300.7	9,500.0	82.9	82.5	-89.97	-40.0	2,822.2	990.1	825.3	164.76	6.009			
12,429.6	9,500.0	12,330.3	9,500.0	83.7	83.3	-89.97	-40.3	2,851.9	990.1	823.7	166.34	5.952			

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 213H - Wellbore #1 - Plan 1													Offset Site Error: 0.0 usft	
Survey Program: 0-MWD									Rule Assigned:				Offset Well Error: 0.5 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)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
12,500.0	9,500.0	12,400.7	9,500.0	85.5	85.1	-89.97	-41.1	2,922.2	990.1	820.0	170.11	5.820		
12,529.6	9,500.0	12,430.3	9,500.0	86.3	85.9	-89.97	-41.4	2,951.9	990.1	818.4	171.69	5.766		
12,600.0	9,500.0	12,500.7	9,500.0	88.2	87.8	-89.97	-42.1	3,022.2	990.1	814.6	175.46	5.643		
12,629.6	9,500.0	12,530.3	9,500.0	89.0	88.6	-89.97	-42.4	3,051.9	990.1	813.0	177.06	5.592		
12,700.0	9,500.0	12,600.7	9,500.0	90.8	90.5	-89.97	-43.2	3,122.2	990.1	809.2	180.83	5.475		
12,729.6	9,500.0	12,630.3	9,500.0	91.6	91.3	-89.97	-43.5	3,151.9	990.1	807.6	182.43	5.427		
12,800.0	9,500.0	12,700.7	9,500.0	93.5	93.2	-89.97	-44.2	3,222.2	990.1	803.8	186.21	5.317		
12,829.6	9,500.0	12,730.3	9,500.0	94.3	94.0	-89.97	-44.5	3,251.9	990.1	802.3	187.81	5.272		
12,900.0	9,500.0	12,800.7	9,500.0	96.2	95.9	-89.97	-45.3	3,322.2	990.1	798.5	191.60	5.167		
12,929.6	9,500.0	12,830.3	9,500.0	97.0	96.7	-89.97	-45.6	3,351.8	990.1	796.9	193.19	5.125		
13,000.0	9,500.0	12,900.7	9,500.0	98.9	98.6	-89.97	-46.3	3,422.2	990.1	793.1	196.99	5.026		
13,029.6	9,500.0	12,930.3	9,500.0	99.7	99.4	-89.97	-46.6	3,451.8	990.1	791.5	198.59	4.985		
13,100.0	9,500.0	13,000.7	9,500.0	101.6	101.3	-89.97	-47.3	3,522.2	990.1	787.7	202.39	4.892		
13,129.6	9,500.0	13,030.3	9,500.0	102.4	102.1	-89.97	-47.7	3,551.8	990.1	786.1	203.99	4.853		
13,200.0	9,500.0	13,100.7	9,500.0	104.3	104.0	-89.97	-48.4	3,622.2	990.1	782.3	207.80	4.765		
13,229.6	9,500.0	13,130.3	9,500.0	105.1	104.8	-89.97	-48.7	3,651.8	990.1	780.7	209.40	4.728		
13,300.0	9,500.0	13,200.7	9,500.0	107.0	106.7	-89.97	-49.4	3,722.2	990.1	776.8	213.21	4.644		
13,329.6	9,500.0	13,230.3	9,500.0	107.8	107.5	-89.97	-49.8	3,751.8	990.1	775.2	214.82	4.609		
13,400.0	9,500.0	13,300.7	9,500.0	109.6	109.4	-89.97	-50.5	3,822.2	990.1	771.4	218.63	4.528		
13,429.6	9,500.0	13,330.3	9,500.0	110.5	110.2	-89.97	-50.8	3,851.8	990.1	769.8	220.24	4.495		
13,500.0	9,500.0	13,400.7	9,500.0	112.4	112.1	-89.97	-51.5	3,922.2	990.1	766.0	224.05	4.419		
13,529.6	9,500.0	13,430.3	9,500.0	113.2	112.9	-89.97	-51.8	3,951.8	990.1	764.4	225.66	4.387		
13,600.0	9,500.0	13,500.7	9,500.0	115.1	114.8	-89.97	-52.6	4,022.2	990.1	760.6	229.48	4.314		
13,629.6	9,500.0	13,530.3	9,500.0	115.9	115.7	-89.97	-52.9	4,051.8	990.1	759.0	231.09	4.284		
13,700.0	9,500.0	13,600.7	9,500.0	117.8	117.6	-89.97	-53.6	4,122.2	990.1	755.1	234.91	4.215		
13,729.6	9,500.0	13,630.3	9,500.0	118.6	118.4	-89.97	-53.9	4,151.8	990.1	753.5	236.52	4.186		
13,800.0	9,500.0	13,700.7	9,500.0	120.5	120.3	-89.97	-54.7	4,222.2	990.1	749.7	240.35	4.119		
13,829.6	9,500.0	13,730.3	9,500.0	121.3	121.1	-89.97	-55.0	4,251.8	990.1	748.1	241.96	4.092		
13,900.0	9,500.0	13,800.7	9,500.0	123.2	123.0	-89.97	-55.7	4,322.2	990.1	744.3	245.79	4.028		
13,929.6	9,500.0	13,830.3	9,500.0	124.0	123.8	-89.97	-56.0	4,351.8	990.1	742.6	247.40	4.002		
14,000.0	9,500.0	13,900.7	9,500.0	125.9	125.7	-89.97	-56.8	4,422.1	990.1	738.8	251.24	3.941		
14,029.6	9,500.0	13,930.3	9,500.0	126.7	126.5	-89.97	-57.1	4,451.8	990.1	737.2	252.85	3.916		
14,100.0	9,500.0	14,000.7	9,500.0	128.6	128.5	-89.97	-57.8	4,522.1	990.1	733.4	256.68	3.857		
14,129.6	9,500.0	14,030.3	9,500.0	129.4	129.3	-89.97	-58.1	4,551.8	990.1	731.8	258.30	3.833		
14,200.0	9,500.0	14,100.7	9,500.0	131.3	131.2	-89.97	-58.9	4,622.1	990.1	727.9	262.13	3.777		
14,229.6	9,500.0	14,130.3	9,500.0	132.1	132.0	-89.97	-59.2	4,651.8	990.1	726.3	263.75	3.754		
14,300.0	9,500.0	14,200.7	9,500.0	134.0	133.9	-89.97	-59.9	4,722.1	990.1	722.5	267.59	3.700		
14,329.6	9,500.0	14,230.3	9,500.0	134.9	134.7	-89.97	-60.2	4,751.8	990.1	720.8	269.21	3.678		
14,400.0	9,500.0	14,300.7	9,500.0	136.8	136.6	-89.97	-61.0	4,822.1	990.1	717.0	273.05	3.626		
14,429.6	9,500.0	14,330.3	9,500.0	137.6	137.4	-89.97	-61.3	4,851.8	990.1	715.4	274.66	3.605		
14,500.0	9,500.0	14,400.7	9,500.0	139.5	139.4	-89.97	-62.0	4,922.1	990.1	711.5	278.50	3.555		
14,529.6	9,500.0	14,430.3	9,500.0	140.3	140.2	-89.97	-62.3	4,951.8	990.1	709.9	280.12	3.534		
14,600.0	9,500.0	14,500.7	9,500.0	142.2	142.1	-89.97	-63.0	5,022.1	990.1	706.1	283.97	3.487		
14,629.6	9,500.0	14,530.3	9,500.0	143.0	142.9	-89.97	-63.4	5,051.8	990.1	704.5	285.59	3.467		
14,700.0	9,500.0	14,600.7	9,500.0	144.9	144.8	-89.97	-64.1	5,122.1	990.1	700.6	289.43	3.421		
14,729.6	9,500.0	14,630.3	9,500.0	145.7	145.6	-89.97	-64.4	5,151.7	990.0	699.0	291.05	3.402		
14,800.0	9,500.0	14,700.7	9,500.0	147.7	147.6	-89.97	-65.1	5,222.1	990.0	695.2	294.90	3.357		
14,829.6	9,500.0	14,730.3	9,500.0	148.5	148.4	-89.97	-65.4	5,251.7	990.0	693.5	296.52	3.339		
14,900.0	9,500.0	14,800.7	9,500.0	150.4	150.3	-89.97	-66.2	5,322.1	990.0	689.7	300.37	3.296		
14,929.6	9,500.0	14,830.3	9,500.0	151.2	151.1	-89.97	-66.5	5,351.7	990.0	688.1	301.99	3.278		
15,000.0	9,500.0	14,900.7	9,500.0	153.1	153.0	-89.97	-67.2	5,422.1	990.0	684.2	305.84	3.237		
15,029.6	9,500.0	14,930.3	9,500.0	153.9	153.8	-89.97	-67.5	5,451.7	990.0	682.6	307.46	3.220		

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 213H - Wellbore #1 - Plan 1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.5 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
15,100.0	9,500.0	15,000.7	9,500.0	155.9	155.8	-89.97	-68.3	5,522.1	990.0	678.7	311.31	3.180	
15,129.6	9,500.0	15,030.3	9,500.0	156.7	156.6	-89.97	-68.6	5,551.7	990.0	677.1	312.93	3.164	
15,200.0	9,500.0	15,100.7	9,500.0	158.6	158.5	-89.97	-69.3	5,622.1	990.0	673.3	316.78	3.125	
15,229.6	9,500.0	15,130.3	9,500.0	159.4	159.3	-89.97	-69.6	5,651.7	990.0	671.6	318.41	3.109	
15,300.0	9,500.0	15,200.7	9,500.0	161.3	161.2	-89.97	-70.4	5,722.1	990.0	667.8	322.26	3.072	
15,329.6	9,500.0	15,230.3	9,500.0	162.1	162.1	-89.97	-70.7	5,751.7	990.0	666.2	323.88	3.057	
15,400.0	9,500.0	15,300.7	9,500.0	164.0	164.0	-89.97	-71.4	5,822.1	990.0	662.3	327.74	3.021	
15,429.6	9,500.0	15,330.3	9,500.0	164.9	164.8	-89.97	-71.7	5,851.7	990.0	660.7	329.36	3.006	
15,500.0	9,500.0	15,400.7	9,500.0	166.8	166.7	-89.97	-72.5	5,922.1	990.0	656.8	333.22	2.971	
15,529.6	9,500.0	15,430.3	9,500.0	167.6	167.5	-89.97	-72.8	5,951.7	990.0	655.2	334.84	2.957	
15,600.0	9,500.0	15,500.7	9,500.0	169.5	169.5	-89.97	-73.5	6,022.1	990.0	651.3	338.70	2.923	
15,629.6	9,500.0	15,530.3	9,500.0	170.3	170.3	-89.97	-73.8	6,051.7	990.0	649.7	340.32	2.909	
15,700.0	9,500.0	15,600.7	9,500.0	172.3	172.2	-89.97	-74.6	6,122.1	990.0	645.9	344.18	2.877	
15,729.6	9,500.0	15,630.3	9,500.0	173.1	173.0	-89.97	-74.9	6,151.7	990.0	644.2	345.80	2.863	
15,800.0	9,500.0	15,700.7	9,500.0	175.0	175.0	-89.97	-75.6	6,222.0	990.0	640.4	349.66	2.831	
15,829.6	9,500.0	15,730.3	9,500.0	175.8	175.8	-89.97	-75.9	6,251.7	990.0	638.8	351.29	2.818	
15,900.0	9,500.0	15,800.7	9,500.0	177.7	177.7	-89.97	-76.7	6,322.0	990.0	634.9	355.15	2.788	
15,929.6	9,500.0	15,830.3	9,500.0	178.5	178.5	-89.97	-77.0	6,351.7	990.0	633.3	356.77	2.775	
16,000.0	9,500.0	15,900.7	9,500.0	180.5	180.4	-89.97	-77.7	6,422.0	990.0	629.4	360.63	2.745	
16,029.6	9,500.0	15,930.3	9,500.0	181.3	181.3	-89.97	-78.0	6,451.7	990.0	627.8	362.26	2.733	
16,100.0	9,500.0	16,000.7	9,500.0	183.2	183.2	-89.97	-78.7	6,522.0	990.0	623.9	366.12	2.704	
16,129.6	9,500.0	16,030.3	9,500.0	184.0	184.0	-89.97	-79.1	6,551.7	990.0	622.3	367.75	2.692	
16,200.0	9,500.0	16,100.7	9,500.0	185.9	185.9	-89.97	-79.8	6,622.0	990.0	618.4	371.61	2.664	
16,229.6	9,500.0	16,130.3	9,500.0	186.8	186.7	-89.97	-80.1	6,651.7	990.0	616.8	373.23	2.653	
16,300.0	9,500.0	16,200.7	9,500.0	188.7	188.7	-89.97	-80.8	6,722.0	990.0	612.9	377.10	2.625	
16,329.6	9,500.0	16,230.3	9,500.0	189.5	189.5	-89.97	-81.1	6,751.7	990.0	611.3	378.72	2.614	
16,400.0	9,500.0	16,300.7	9,500.0	191.4	191.4	-89.97	-81.9	6,822.0	990.0	607.5	382.59	2.588	
16,429.6	9,500.0	16,330.3	9,500.0	192.2	192.2	-89.97	-82.2	6,851.7	990.0	605.8	384.21	2.577	
16,500.0	9,500.0	16,400.7	9,500.0	194.2	194.2	-89.97	-82.9	6,922.0	990.0	602.0	388.08	2.551	
16,529.6	9,500.0	16,430.3	9,500.0	195.0	195.0	-89.97	-83.2	6,951.6	990.0	600.3	389.70	2.540	
16,600.0	9,500.0	16,500.7	9,500.0	196.9	196.9	-89.97	-84.0	7,022.0	990.0	596.5	393.57	2.516	
16,629.6	9,500.0	16,530.3	9,500.0	197.7	197.7	-89.97	-84.3	7,051.6	990.0	594.8	395.20	2.505	
16,700.0	9,500.0	16,600.7	9,500.0	199.7	199.7	-89.97	-85.0	7,122.0	990.0	591.0	399.06	2.481	
16,729.6	9,500.0	16,630.3	9,500.0	200.5	200.5	-89.97	-85.3	7,151.6	990.0	589.4	400.69	2.471	
16,800.0	9,500.0	16,700.7	9,500.0	202.4	202.4	-89.97	-86.1	7,222.0	990.0	585.5	404.55	2.447	
16,829.6	9,500.0	16,730.3	9,500.0	203.2	203.2	-89.97	-86.4	7,251.6	990.0	583.9	406.18	2.437	
16,900.0	9,500.0	16,800.7	9,500.0	205.1	205.1	-89.97	-87.1	7,322.0	990.0	580.0	410.05	2.414	
16,929.6	9,500.0	16,830.3	9,500.0	206.0	206.0	-89.97	-87.4	7,351.6	990.0	578.4	411.68	2.405	
17,000.0	9,500.0	16,900.7	9,500.0	207.9	207.9	-89.97	-88.2	7,422.0	990.0	574.5	415.54	2.383	
17,029.6	9,500.0	16,930.3	9,500.0	208.7	208.7	-89.97	-88.5	7,451.6	990.0	572.9	417.17	2.373	
17,100.0	9,500.0	17,000.7	9,500.0	210.6	210.6	-89.97	-89.2	7,522.0	990.0	569.0	421.04	2.351	
17,129.6	9,500.0	17,030.3	9,500.0	211.4	211.5	-89.97	-89.5	7,551.6	990.0	567.4	422.67	2.342	
17,200.0	9,500.0	17,100.7	9,500.0	213.4	213.4	-89.97	-90.3	7,622.0	990.0	563.5	426.54	2.321	
17,229.6	9,500.0	17,130.3	9,500.0	214.2	214.2	-89.97	-90.6	7,651.6	990.0	561.9	428.17	2.312	
17,300.0	9,500.0	17,200.7	9,500.0	216.1	216.1	-89.97	-91.3	7,722.0	990.0	558.0	432.03	2.292	
17,329.6	9,500.0	17,230.3	9,500.0	216.9	217.0	-89.97	-91.6	7,751.6	990.0	556.4	433.66	2.283	
17,400.0	9,500.0	17,300.7	9,500.0	218.9	218.9	-89.97	-92.4	7,822.0	990.0	552.5	437.53	2.263	
17,429.6	9,500.0	17,330.3	9,500.0	219.7	219.7	-89.97	-92.7	7,851.6	990.0	550.9	439.16	2.254	
17,500.0	9,500.0	17,400.7	9,500.0	221.6	221.6	-89.97	-93.4	7,922.0	990.0	547.0	443.03	2.235	
17,529.6	9,500.0	17,430.3	9,500.0	222.4	222.5	-89.97	-93.7	7,951.6	990.0	545.4	444.66	2.227	
17,600.0	9,500.0	17,500.7	9,500.0	224.4	224.4	-89.97	-94.4	8,021.9	990.0	541.5	448.53	2.207	
17,629.6	9,500.0	17,530.3	9,500.0	225.2	225.2	-89.97	-94.8	8,051.6	990.0	539.9	450.16	2.199	

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 213H - Wellbore #1 - Plan 1													Offset Site Error: 0.0 usft	
Survey Program: 0-MWD		Offset		Semi Major Axis		Offset Wellbore Centre			Rule Assigned:				Offset Well Error: 0.5 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)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
17,700.0	9,500.0	17,600.7	9,500.0	227.1	227.1	-89.97	-95.5	8,121.9	990.0	536.0	454.03	2.181		
17,729.6	9,500.0	17,630.3	9,500.0	227.9	228.0	-89.97	-95.8	8,151.6	990.0	534.4	455.66	2.173		
17,800.0	9,500.0	17,700.7	9,500.0	229.9	229.9	-89.97	-96.5	8,221.9	990.0	530.5	459.53	2.154		
17,829.6	9,500.0	17,730.3	9,500.0	230.7	230.7	-89.97	-96.8	8,251.6	990.0	528.9	461.16	2.147		
17,900.0	9,500.0	17,800.7	9,500.0	232.6	232.6	-89.97	-97.6	8,321.9	990.0	525.0	465.03	2.129		
17,929.6	9,500.0	17,830.3	9,500.0	233.4	233.5	-89.97	-97.9	8,351.6	990.0	523.4	466.66	2.122		
18,000.0	9,500.0	17,900.7	9,500.0	235.3	235.4	-89.97	-98.6	8,421.9	990.0	519.5	470.53	2.104		
18,029.6	9,500.0	17,930.3	9,500.0	236.2	236.2	-89.97	-98.9	8,451.6	990.0	517.9	472.16	2.097		
18,100.0	9,500.0	18,000.7	9,500.0	238.1	238.1	-89.97	-99.7	8,521.9	990.0	514.0	476.03	2.080		
18,129.6	9,500.0	18,030.3	9,500.0	238.9	239.0	-89.97	-100.0	8,551.6	990.0	512.4	477.67	2.073		
18,200.0	9,500.0	18,100.7	9,500.0	240.8	240.9	-89.97	-100.7	8,621.9	990.0	508.5	481.54	2.056		
18,229.6	9,500.0	18,130.3	9,500.0	241.7	241.7	-89.97	-101.0	8,651.6	990.0	506.9	483.17	2.049		
18,300.0	9,500.0	18,200.7	9,500.0	243.6	243.6	-89.97	-101.8	8,721.9	990.0	503.0	487.04	2.033		
18,329.6	9,500.0	18,230.3	9,500.0	244.4	244.5	-89.97	-102.1	8,751.6	990.0	501.4	488.67	2.026		
18,400.0	9,500.0	18,300.7	9,500.0	246.3	246.4	-89.97	-102.8	8,821.9	990.0	497.5	492.54	2.010		
18,429.6	9,500.0	18,330.3	9,500.0	247.2	247.2	-89.97	-103.1	8,851.5	990.0	495.9	494.17	2.003		
18,500.0	9,500.0	18,400.7	9,500.0	249.1	249.2	-89.97	-103.9	8,921.9	990.0	492.0	498.05	1.988	Collision Risk Procedures Req.	
18,529.6	9,500.0	18,430.3	9,500.0	249.9	250.0	-89.97	-104.2	8,951.5	990.0	490.4	499.68	1.981	Collision Risk Procedures Req.	
18,600.0	9,500.0	18,500.7	9,500.0	251.8	251.9	-89.97	-104.9	9,021.9	990.0	486.5	503.55	1.966	Collision Risk Procedures Req.	
18,629.6	9,500.0	18,530.3	9,500.0	252.7	252.7	-89.97	-105.2	9,051.5	990.0	484.8	505.18	1.960	Collision Risk Procedures Req.	
18,700.0	9,500.0	18,600.7	9,500.0	254.6	254.7	-89.97	-106.0	9,121.9	990.0	481.0	509.06	1.945	Collision Risk Procedures Req.	
18,729.6	9,500.0	18,630.3	9,500.0	255.4	255.5	-89.97	-106.3	9,151.5	990.0	479.3	510.69	1.939	Collision Risk Procedures Req.	
18,800.0	9,500.0	18,700.7	9,500.0	257.3	257.4	-89.97	-107.0	9,221.9	990.0	475.5	514.56	1.924	Collision Risk Procedures Req.	
18,829.6	9,500.0	18,730.3	9,500.0	258.2	258.2	-89.97	-107.3	9,251.5	990.0	473.8	516.19	1.918	Collision Risk Procedures Req.	
18,900.0	9,500.0	18,800.7	9,500.0	260.1	260.2	-89.97	-108.0	9,321.9	990.0	470.0	520.07	1.904	Collision Risk Procedures Req.	
18,929.6	9,500.0	18,830.3	9,500.0	260.9	261.0	-89.97	-108.4	9,351.5	990.0	468.3	521.70	1.898	Collision Risk Procedures Req.	
19,000.0	9,500.0	18,900.7	9,500.0	262.8	262.9	-89.97	-109.1	9,421.9	990.0	464.5	525.57	1.884	Collision Risk Procedures Req.	
19,029.6	9,500.0	18,930.3	9,500.0	263.7	263.7	-89.97	-109.4	9,451.5	990.0	462.8	527.20	1.878	Collision Risk Procedures Req.	
19,100.0	9,500.0	19,000.7	9,500.0	265.6	265.7	-89.97	-110.1	9,521.9	990.0	458.9	531.08	1.864	Collision Risk Procedures Req.	
19,129.6	9,500.0	19,030.3	9,500.0	266.4	266.5	-89.97	-110.5	9,551.5	990.0	457.3	532.71	1.858	Collision Risk Procedures Req.	
19,200.0	9,500.0	19,100.7	9,500.0	268.3	268.4	-89.97	-111.2	9,621.9	990.0	453.4	536.59	1.845	Collision Risk Procedures Req.	
19,229.6	9,500.0	19,130.3	9,500.0	269.2	269.2	-89.97	-111.5	9,651.5	990.0	451.8	538.22	1.839	Collision Risk Procedures Req.	
19,300.0	9,500.0	19,200.7	9,500.0	271.1	271.2	-89.97	-112.2	9,721.9	990.0	447.9	542.09	1.826	Collision Risk Procedures Req.	
19,329.6	9,500.0	19,230.3	9,500.0	271.9	272.0	-89.97	-112.5	9,751.5	990.0	446.3	543.73	1.821	Collision Risk Procedures Req.	
19,400.0	9,500.0	19,300.7	9,500.0	273.9	273.9	-89.97	-113.3	9,821.8	990.0	442.4	547.60	1.808	Collision Risk Procedures Req.	
19,429.6	9,500.0	19,330.3	9,500.0	274.7	274.7	-89.97	-113.6	9,851.5	990.0	440.8	549.23	1.803	Collision Risk Procedures Req.	
19,500.0	9,500.0	19,400.7	9,500.0	276.6	276.7	-89.97	-114.3	9,921.8	990.0	436.9	553.11	1.790	Collision Risk Procedures Req.	
19,529.6	9,500.0	19,430.3	9,500.0	277.4	277.5	-89.97	-114.6	9,951.5	990.0	435.3	554.74	1.785	Collision Risk Procedures Req.	
19,600.0	9,500.0	19,500.7	9,500.0	279.4	279.4	-89.97	-115.4	10,021.8	990.0	431.4	558.62	1.772	Collision Risk Procedures Req.	
19,629.6	9,500.0	19,530.3	9,500.0	280.2	280.3	-89.97	-115.7	10,051.5	990.0	429.8	560.25	1.767	Collision Risk Procedures Req.	
19,700.0	9,500.0	19,600.7	9,500.0	282.1	282.2	-89.97	-116.4	10,121.8	990.0	425.9	564.12	1.755	Collision Risk Procedures Req.	
19,729.6	9,500.0	19,630.3	9,500.0	282.9	283.0	-89.97	-116.7	10,151.5	990.0	424.3	565.76	1.750	Collision Risk Procedures Req.	
19,800.0	9,500.0	19,700.7	9,500.0	284.9	284.9	-89.97	-117.5	10,221.8	990.0	420.4	569.63	1.738	Collision Risk Procedures Req.	
19,829.6	9,500.0	19,730.3	9,500.0	285.7	285.8	-89.97	-117.8	10,251.5	990.0	418.8	571.27	1.733	Collision Risk Procedures Req.	
19,873.4	9,500.0	19,774.1	9,500.0	286.9	287.0	-89.97	-118.2	10,295.2	990.0	416.4	573.67	1.726	Collision Risk Procedures Req.	
19,892.7	9,500.0	19,793.4	9,500.0	287.4	287.5	-89.97	-118.4	10,314.5	990.0	415.3	574.74	1.723	Collision Risk Procedures Req., SF	

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 233H - Wellbore #1 - Plan 1													Offset Site Error: 0.0 usft
Survey Program: 0-MWD													Offset Well Error: 0.5 usft
Reference	Offset	Semi Major Axis	Highside	Offset Wellbore Centre	Distance	Rule Assigned:							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	1.0	1.0	0.5	0.5	0.17	40.0	0.1	40.0				
100.0	100.0	101.0	101.0	0.5	0.5	0.17	40.0	0.1	40.0	38.9	1.06	37.878	
200.0	200.0	201.0	201.0	0.6	0.6	0.17	40.0	0.1	40.0	38.7	1.27	31.404	
300.0	300.0	301.0	301.0	0.8	0.8	0.17	40.0	0.1	40.0	38.4	1.59	25.129	
400.0	400.0	401.0	401.0	1.0	1.0	0.17	40.0	0.1	40.0	38.0	1.96	20.388	
500.0	500.0	501.0	501.0	1.2	1.2	0.17	40.0	0.1	40.0	37.6	2.36	16.950	
600.0	600.0	601.0	601.0	1.4	1.4	0.17	40.0	0.1	40.0	37.2	2.77	14.422	
700.0	700.0	701.0	701.0	1.6	1.6	0.17	40.0	0.1	40.0	36.8	3.20	12.512	
800.0	800.0	801.0	801.0	1.8	1.8	0.17	40.0	0.1	40.0	36.4	3.63	11.029	
900.0	900.0	901.0	901.0	2.0	2.0	0.17	40.0	0.1	40.0	35.9	4.06	9.851	
1,000.0	1,000.0	1,001.0	1,001.0	2.2	2.2	0.17	40.0	0.1	40.0	35.5	4.50	8.893	
1,100.0	1,100.0	1,101.0	1,101.0	2.5	2.5	0.17	40.0	0.1	40.0	35.1	4.94	8.102	
1,200.0	1,200.0	1,201.0	1,201.0	2.7	2.7	0.17	40.0	0.1	40.0	34.6	5.38	7.438	
1,300.0	1,300.0	1,301.0	1,301.0	2.9	2.9	0.17	40.0	0.1	40.0	34.2	5.82	6.872	
1,400.0	1,400.0	1,401.0	1,401.0	3.1	3.1	0.17	40.0	0.1	40.0	33.7	6.26	6.386	
1,416.3	1,416.3	1,417.3	1,417.3	3.2	3.2	0.17	40.0	0.1	40.0	33.7	6.34	6.313 CC	
1,500.0	1,500.0	1,501.0	1,501.0	3.4	3.4	0.17	40.0	0.1	40.0	33.3	6.71	5.963 ES, SF	
1,600.0	1,600.0	1,600.0	1,600.0	3.5	3.6	167.82	41.7	-0.1	43.4	36.3	7.12	6.100	
1,700.0	1,699.8	1,697.3	1,697.2	3.7	3.8	168.10	46.7	-0.9	53.7	46.2	7.51	7.150	
1,800.0	1,799.5	1,793.8	1,793.3	3.9	4.0	168.38	54.9	-2.1	70.6	62.7	7.89	8.946	
1,900.0	1,898.7	1,888.4	1,887.2	4.1	4.2	168.58	66.0	-3.8	94.1	85.8	8.27	11.373	
2,000.0	1,997.5	1,980.3	1,978.1	4.3	4.5	168.70	79.7	-5.8	124.0	115.3	8.65	14.332	
2,100.0	2,095.6	2,069.3	2,065.5	4.6	4.7	168.75	95.8	-8.3	160.0	151.0	9.02	17.739	
2,200.0	2,193.1	2,154.8	2,149.1	4.9	5.0	168.80	113.7	-10.9	201.8	192.4	9.39	21.496	
2,300.0	2,290.4	2,243.1	2,235.0	5.2	5.2	168.86	134.0	-14.0	246.0	236.3	9.78	25.146	
2,400.0	2,387.8	2,332.7	2,322.1	5.5	5.5	168.90	154.7	-17.1	290.4	280.2	10.19	28.482	
2,500.0	2,485.1	2,422.3	2,409.3	5.9	5.9	168.92	175.4	-20.2	334.7	324.1	10.62	31.511	
2,600.0	2,582.4	2,512.0	2,496.4	6.3	6.2	168.95	196.1	-23.3	379.1	368.0	11.06	34.284	
2,700.0	2,679.7	2,601.6	2,583.6	6.7	6.5	168.96	216.8	-26.4	423.4	411.9	11.50	36.825	
2,800.0	2,777.1	2,691.2	2,670.7	7.1	6.9	168.98	237.5	-29.5	467.7	455.8	11.94	39.158	
2,900.0	2,874.4	2,780.9	2,757.9	7.5	7.3	168.99	258.2	-32.7	512.1	499.7	12.40	41.303	
3,000.0	2,971.7	2,870.5	2,845.0	7.9	7.6	169.00	278.9	-35.8	556.4	543.6	12.86	43.280	
3,100.0	3,069.1	2,960.1	2,932.2	8.3	8.0	169.01	299.5	-38.9	600.8	587.4	13.32	45.105	
3,200.0	3,166.4	3,049.8	3,019.3	8.7	8.4	169.02	320.2	-42.0	645.1	631.3	13.79	46.793	
3,300.0	3,263.7	3,139.4	3,106.5	9.2	8.8	169.02	340.9	-45.1	689.4	675.2	14.26	48.359	
3,400.0	3,361.0	3,229.0	3,193.7	9.6	9.2	169.03	361.6	-48.2	733.8	719.0	14.73	49.812	
3,500.0	3,458.4	3,318.6	3,280.8	10.0	9.5	169.03	382.3	-51.3	778.1	762.9	15.21	51.165	
3,600.0	3,555.7	3,408.3	3,368.0	10.5	9.9	169.04	403.0	-54.4	822.5	806.8	15.69	52.426	
3,700.0	3,653.0	3,497.9	3,455.1	10.9	10.3	169.04	423.7	-57.5	866.8	850.6	16.17	53.603	
3,800.0	3,750.3	3,587.5	3,542.3	11.4	10.7	169.04	444.4	-60.6	911.1	894.5	16.66	54.704	
3,900.0	3,847.7	3,677.2	3,629.4	11.8	11.1	169.05	465.1	-63.7	955.5	938.3	17.14	55.735	
4,000.0	3,945.0	3,766.8	3,716.6	12.3	11.5	169.05	485.8	-66.9	999.8	982.2	17.63	56.703	
4,100.0	4,042.3	3,856.4	3,803.7	12.7	11.9	169.05	506.5	-70.0	1,044.1	1,026.0	18.12	57.613	
4,200.0	4,139.7	3,946.1	3,890.9	13.2	12.3	169.05	527.2	-73.1	1,088.5	1,069.9	18.62	58.469	
4,300.0	4,237.0	4,035.7	3,978.1	13.7	12.7	169.06	547.9	-76.2	1,132.8	1,113.7	19.11	59.275	
4,400.0	4,334.3	4,125.3	4,065.2	14.1	13.1	169.06	568.6	-79.3	1,177.2	1,157.6	19.61	60.037	
4,500.0	4,431.6	4,215.0	4,152.4	14.6	13.5	169.06	589.3	-82.4	1,221.5	1,201.4	20.11	60.756	
4,600.0	4,529.0	4,304.6	4,239.5	15.0	14.0	169.06	610.0	-85.5	1,265.8	1,245.2	20.60	61.437	
4,700.0	4,626.3	4,394.2	4,326.7	15.5	14.4	169.06	630.7	-88.6	1,310.2	1,289.1	21.10	62.081	
4,800.0	4,723.6	4,483.9	4,413.8	16.0	14.8	169.07	651.4	-91.7	1,354.5	1,332.9	21.61	62.693	
4,900.0	4,820.9	4,573.5	4,501.0	16.4	15.2	169.07	672.1	-94.8	1,398.9	1,376.8	22.11	63.273	
5,000.0	4,918.3	4,663.1	4,588.1	16.9	15.6	169.07	692.7	-97.9	1,443.2	1,420.6	22.61	63.824	

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SB Directional Services

Anticollision Report



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Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 233H - Wellbore #1 - Plan 1												Offset Site Error:	0.0 usft
Survey Program: 0-MWD												Offset Well Error:	0.5 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,100.0	5,015.6	4,752.8	4,675.3	17.4	16.0	169.07	713.4	-101.0	1,487.5	1,464.4	23.12	64.349	
5,200.0	5,112.9	4,842.4	4,762.5	17.8	16.4	169.07	734.1	-104.2	1,531.9	1,508.3	23.62	64.848	
5,300.0	5,210.3	4,932.0	4,849.6	18.3	16.8	169.07	754.8	-107.3	1,576.2	1,552.1	24.13	65.324	
5,400.0	5,307.6	5,021.7	4,936.8	18.8	17.2	169.07	775.5	-110.4	1,620.6	1,595.9	24.64	65.778	
5,500.0	5,404.9	5,111.3	5,023.9	19.2	17.7	169.07	796.2	-113.5	1,664.9	1,639.8	25.15	66.212	
5,600.0	5,502.2	5,200.9	5,111.1	19.7	18.1	169.08	816.9	-116.6	1,709.2	1,683.6	25.65	66.626	
5,700.0	5,599.6	5,290.6	5,198.2	20.2	18.5	169.08	837.6	-119.7	1,753.6	1,727.4	26.16	67.022	
5,800.0	5,696.9	5,380.2	5,285.4	20.6	18.9	169.08	858.3	-122.8	1,797.9	1,771.3	26.68	67.400	
5,900.0	5,794.2	5,469.8	5,372.5	21.1	19.3	169.08	879.0	-125.9	1,842.3	1,815.1	27.19	67.763	
6,000.0	5,891.6	5,559.7	5,459.9	21.5	19.7	169.17	899.7	-129.0	1,886.2	1,858.5	27.69	68.116	
6,100.0	5,989.7	5,650.8	5,548.5	21.9	20.2	169.32	920.8	-132.2	1,927.4	1,899.2	28.17	68.417	
6,200.0	6,088.4	5,743.2	5,638.4	22.1	20.6	169.43	942.1	-135.4	1,965.5	1,936.8	28.65	68.610	
6,300.0	6,187.6	5,836.9	5,729.5	22.4	21.0	169.51	963.8	-138.7	2,000.4	1,971.2	29.12	68.698	
6,400.0	6,287.2	5,931.7	5,821.7	22.6	21.5	169.55	985.6	-141.9	2,032.0	2,002.4	29.58	68.688	
6,500.0	6,387.0	6,027.6	5,914.9	22.8	21.9	169.57	1,007.8	-145.3	2,060.4	2,030.3	30.04	68.587	
6,600.0	6,487.0	6,124.3	6,008.9	22.9	22.4	169.55	1,030.1	-148.6	2,085.4	2,054.9	30.49	68.399	
6,700.0	6,587.0	6,221.5	6,103.5	23.1	22.8	1.92	1,052.6	-152.0	2,108.4	2,077.5	30.94	68.140	
6,800.0	6,687.0	6,318.8	6,198.0	23.2	23.3	1.81	1,075.0	-155.4	2,131.4	2,100.0	31.39	67.899	
6,900.0	6,787.0	6,416.0	6,292.6	23.3	23.7	1.70	1,097.5	-158.7	2,154.4	2,122.6	31.84	67.663	
7,000.0	6,887.0	6,513.2	6,387.1	23.4	24.2	1.59	1,119.9	-162.1	2,177.4	2,145.1	32.29	67.430	

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 236H - Wellbore #1 - Plan 1													Offset Site Error: 0.0 usft
Survey Program: 0-MWD													Offset Well Error: 0.5 usft
Reference	Offset	Semi Major Axis	Highside	Offset Wellbore Centre	Distance	Rule Assigned:							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	1.5	1.5	0.5	0.5	0.17	60.0	0.2	60.0				
100.0	100.0	101.5	101.5	0.5	0.5	0.17	60.0	0.2	60.0	58.9	1.06	56.788	
200.0	200.0	201.5	201.5	0.6	0.6	0.17	60.0	0.2	60.0	58.7	1.27	47.072	
300.0	300.0	301.5	301.5	0.8	0.8	0.17	60.0	0.2	60.0	58.4	1.59	37.667	
400.0	400.0	401.5	401.5	1.0	1.0	0.17	60.0	0.2	60.0	58.0	1.96	30.561	
500.0	500.0	501.5	501.5	1.2	1.2	0.17	60.0	0.2	60.0	57.6	2.36	25.410	
600.0	600.0	601.5	601.5	1.4	1.4	0.17	60.0	0.2	60.0	57.2	2.77	21.621	
616.2	616.2	617.7	617.7	1.4	1.4	0.17	60.0	0.2	60.0	57.1	2.84	21.105 CC	
700.0	700.0	701.5	701.5	1.6	1.6	0.17	60.0	0.2	60.0	56.8	3.20	18.759 ES	
800.0	800.0	800.0	800.0	1.8	1.8	0.07	61.7	0.1	61.8	58.1	3.62	17.035	
900.0	900.0	897.1	896.9	2.0	2.0	-0.20	66.8	-0.2	66.9	62.9	4.05	16.511 SF	
1,000.0	1,000.0	994.3	993.8	2.2	2.2	-0.56	75.1	-0.7	75.5	71.0	4.48	16.844	
1,100.0	1,100.0	1,090.8	1,089.6	2.5	2.5	-0.95	86.6	-1.4	87.4	82.5	4.91	17.811	
1,200.0	1,200.0	1,186.5	1,184.2	2.7	2.7	-1.32	101.1	-2.3	102.6	97.3	5.33	19.257	
1,300.0	1,300.0	1,281.1	1,277.1	2.9	3.0	-1.63	118.6	-3.4	121.1	115.4	5.75	21.072	
1,400.0	1,400.0	1,374.4	1,368.2	3.1	3.3	-1.90	138.9	-4.6	142.9	136.7	6.17	23.174	
1,500.0	1,500.0	1,466.3	1,457.2	3.4	3.7	-2.13	161.7	-6.0	167.7	161.2	6.58	25.501	
1,600.0	1,600.0	1,556.1	1,543.4	3.5	4.1	165.18	186.7	-7.5	197.3	190.3	6.97	28.319	
1,700.0	1,699.8	1,646.5	1,629.5	3.7	4.5	165.16	214.3	-9.2	232.6	225.2	7.37	31.567	
1,800.0	1,799.5	1,738.6	1,717.1	3.9	5.0	165.28	242.7	-10.9	271.4	263.6	7.79	34.836	
1,900.0	1,898.7	1,829.4	1,803.4	4.1	5.5	165.47	270.7	-12.6	313.3	305.1	8.23	38.073	
2,000.0	1,997.5	1,918.7	1,888.4	4.3	6.0	165.69	298.2	-14.3	358.3	349.6	8.67	41.323	
2,100.0	2,095.6	2,006.4	1,971.7	4.6	6.4	165.93	325.3	-16.0	406.3	397.1	9.11	44.575	
2,200.0	2,193.1	2,092.5	2,053.6	4.9	6.9	166.25	351.9	-17.6	457.0	447.4	9.56	47.788	
2,300.0	2,290.4	2,178.2	2,135.2	5.2	7.4	166.68	378.3	-19.2	508.4	498.4	10.00	50.839	
2,400.0	2,387.8	2,263.9	2,216.7	5.5	7.9	167.03	404.7	-20.8	559.8	549.3	10.44	53.596	
2,500.0	2,485.1	2,349.7	2,298.3	5.9	8.4	167.33	431.2	-22.4	611.2	600.3	10.90	56.094	
2,600.0	2,582.4	2,435.4	2,379.8	6.3	8.9	167.57	457.6	-24.0	662.6	651.2	11.35	58.362	
2,700.0	2,679.7	2,521.2	2,461.3	6.7	9.4	167.78	484.1	-25.6	714.0	702.2	11.82	60.427	
2,800.0	2,777.1	2,606.9	2,542.9	7.1	9.8	167.96	510.5	-27.2	765.4	753.1	12.28	62.313	
2,900.0	2,874.4	2,692.6	2,624.4	7.5	10.3	168.12	537.0	-28.8	816.9	804.1	12.76	64.038	
3,000.0	2,971.7	2,778.4	2,706.0	7.9	10.8	168.26	563.4	-30.4	868.3	855.1	13.23	65.620	
3,100.0	3,069.1	2,864.1	2,787.5	8.3	11.3	168.39	589.9	-32.0	919.7	906.0	13.71	67.075	
3,200.0	3,166.4	2,949.9	2,869.1	8.7	11.8	168.50	616.3	-33.7	971.2	957.0	14.19	68.417	
3,300.0	3,263.7	3,035.6	2,950.6	9.2	12.3	168.60	642.8	-35.3	1,022.6	1,007.9	14.68	69.656	
3,400.0	3,361.0	3,121.3	3,032.1	9.6	12.8	168.69	669.2	-36.9	1,074.1	1,058.9	15.17	70.804	
3,500.0	3,458.4	3,207.1	3,113.7	10.0	13.3	168.78	695.7	-38.5	1,125.5	1,109.9	15.66	71.869	
3,600.0	3,555.7	3,292.8	3,195.2	10.5	13.8	168.85	722.1	-40.1	1,177.0	1,160.8	16.15	72.858	
3,700.0	3,653.0	3,378.6	3,276.8	10.9	14.3	168.92	748.6	-41.7	1,228.4	1,211.8	16.65	73.780	
3,800.0	3,750.3	3,464.3	3,358.3	11.4	14.8	168.98	775.0	-43.3	1,279.9	1,262.7	17.15	74.640	
3,900.0	3,847.7	3,550.0	3,439.9	11.8	15.4	169.04	801.5	-44.9	1,331.3	1,313.7	17.65	75.444	
4,000.0	3,945.0	3,635.8	3,521.4	12.3	15.9	169.10	827.9	-46.5	1,382.8	1,364.6	18.15	76.197	
4,100.0	4,042.3	3,721.5	3,602.9	12.7	16.4	169.15	854.4	-48.1	1,434.2	1,415.6	18.65	76.903	
4,200.0	4,139.7	3,807.3	3,684.5	13.2	16.9	169.19	880.8	-49.7	1,485.7	1,466.5	19.15	77.566	
4,300.0	4,237.0	3,893.0	3,766.0	13.7	17.4	169.24	907.3	-51.3	1,537.1	1,517.5	19.66	78.189	
4,400.0	4,334.3	3,978.7	3,847.6	14.1	17.9	169.28	933.7	-53.0	1,588.6	1,568.4	20.17	78.776	
4,500.0	4,431.6	4,064.5	3,929.1	14.6	18.4	169.32	960.1	-54.6	1,640.1	1,619.4	20.67	79.330	
4,600.0	4,529.0	4,150.2	4,010.7	15.0	18.9	169.35	986.6	-56.2	1,691.5	1,670.3	21.18	79.853	
4,700.0	4,626.3	4,236.0	4,092.2	15.5	19.4	169.39	1,013.0	-57.8	1,743.0	1,721.3	21.69	80.347	
4,800.0	4,723.6	4,321.7	4,173.7	16.0	19.9	169.42	1,039.5	-59.4	1,794.4	1,772.2	22.20	80.814	
4,900.0	4,820.9	4,407.4	4,255.3	16.4	20.4	169.45	1,065.9	-61.0	1,845.9	1,823.2	22.72	81.257	
5,000.0	4,918.3	4,493.2	4,336.8	16.9	20.9	169.48	1,092.4	-62.6	1,897.3	1,874.1	23.23	81.677	

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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Offset Design: SEC 02-T23S-R28E - Rana Salada Fed Com 0106 236H - Wellbore #1 - Plan 1													Offset Site Error: 0.0 usft
Survey Program: 0-MWD													Offset Well Error: 0.5 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Rule Assigned:		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)	Minimum Separation (usft)	Separation Factor	
5,100.0	5,015.6	4,578.9	4,418.4	17.4	21.4	169.50	1,118.8	-64.2	1,948.8	1,925.1	23.74	82.076	
5,200.0	5,112.9	4,664.7	4,499.9	17.8	21.9	169.53	1,145.3	-65.8	2,000.3	1,976.0	24.26	82.455	
5,300.0	5,210.3	4,750.4	4,581.5	18.3	22.4	169.55	1,171.7	-67.4	2,051.7	2,027.0	24.77	82.815	
5,400.0	5,307.6	4,836.1	4,663.0	18.8	22.9	169.58	1,198.2	-69.0	2,103.2	2,077.9	25.29	83.157	
5,500.0	5,404.9	4,921.9	4,744.5	19.2	23.5	169.60	1,224.6	-70.6	2,154.7	2,128.8	25.81	83.484	



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to RKB 25' + GL @ 3089.8usft

Offset Depths are relative to Offset Datum

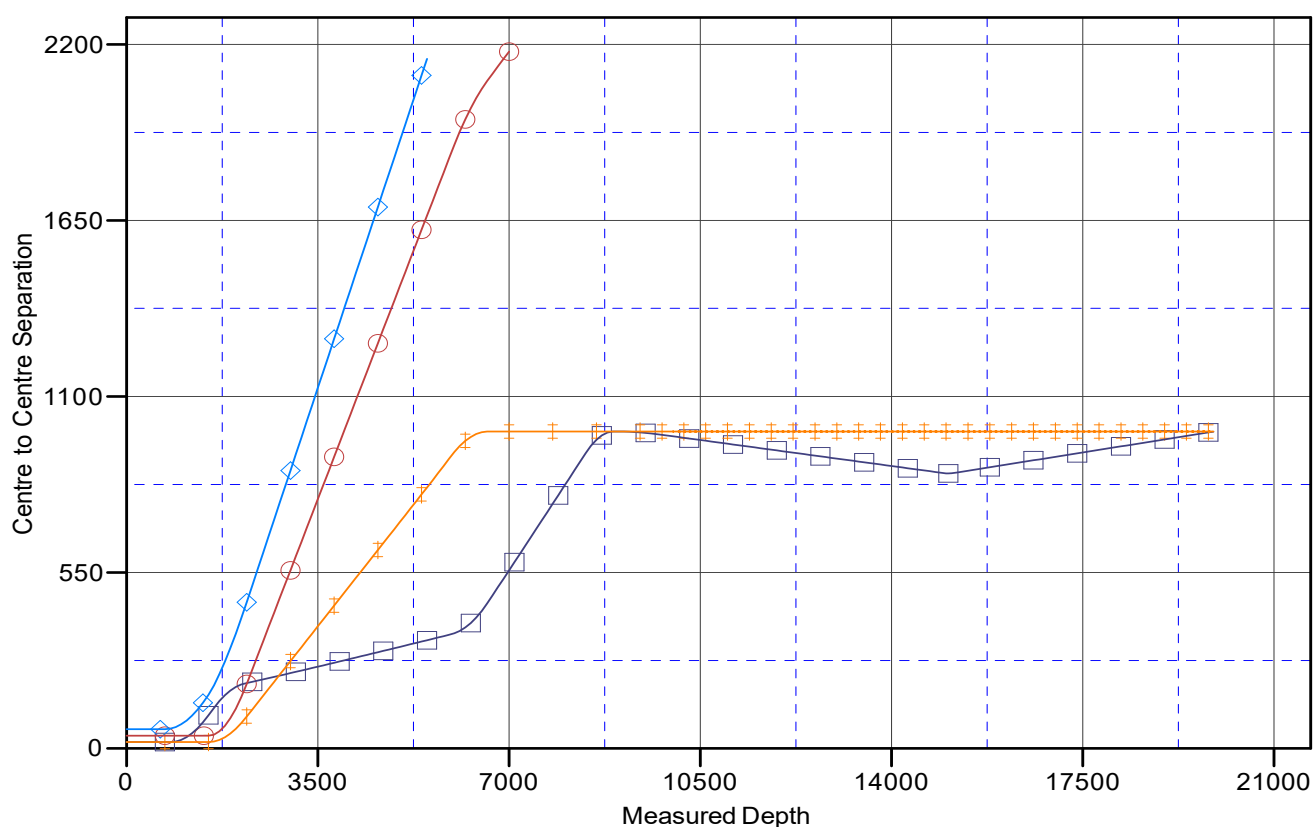
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Rana Salada Fed Com 0106 223H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone

Grid Convergence at Surface is: 0.15°

Ladder Plot



LEGEND



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



SB Directional Services

Anticollision Report



Company:	NOVO Oil & Gas	Local Co-ordinate Reference:	Well Rana Salada Fed Com 0106 223H
Project:	EDDY CO., NM (NAD83)	TVD Reference:	RKB 25' + GL @ 3089.8usft
Reference Site:	SEC 02-T23S-R28E	MD Reference:	RKB 25' + GL @ 3089.8usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	Rana Salada Fed Com 0106 223H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.5 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.16 Single User Db
Reference Design:	Plan 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to RKB 25' + GL @ 3089.8usft

Offset Depths are relative to Offset Datum

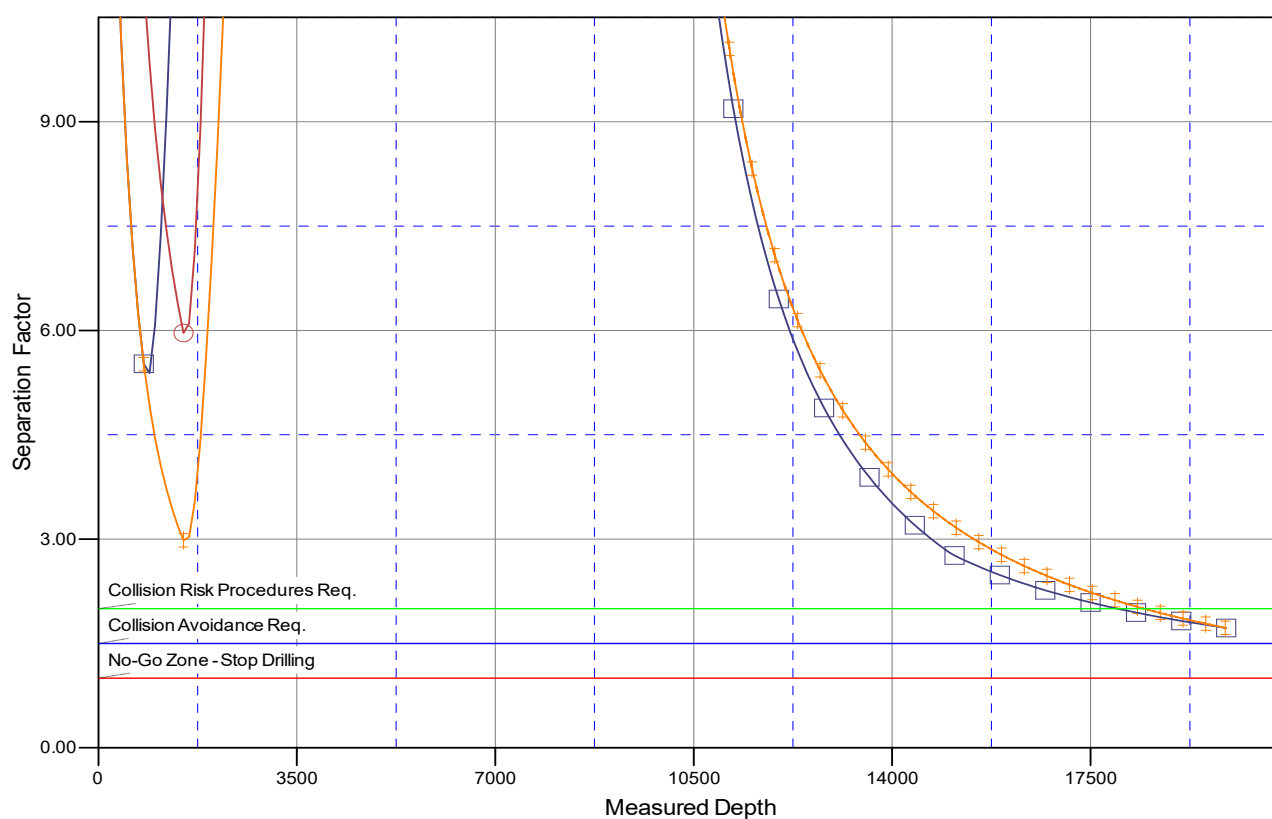
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Rana Salada Fed Com 0106 223H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone

Grid Convergence at Surface is: 0.15°

Separation Factor Plot



LEGEND

- Rana Salada FedCom0106 133H, Wellbore#1, Plan 1 V0
- + Rana Salada FedCom0106 213H, Wellbore#1, Plan 1 V0
- Rana Salada FedCom0106 233H, Wellbore#1, Plan 1 V0
- Rana Salada FedCom0106 236H, Wellbore#1, Plan 1 V0

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

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

COMMENTS

Action 31411

COMMENTS

Operator: NOVO OIL & GAS NORTHERN DELAWARE, LLC 1001 West Wilshire Blvd Oklahoma City, OK 73116	OGRID: 372920
	Action Number: 31411
	Action Type: [C-103] NOI Change of Plans (C-103A)

COMMENTS

Created By	Comment	Comment Date
kpickford	KP GEO Review 6/14/2021	6/14/2021

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
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811 S. First St., Artesia, NM 88210
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State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

CONDITIONS

Action 31411

CONDITIONS

Operator: NOVO OIL & GAS NORTHERN DELAWARE, LLC 1001 West Wilshire Blvd Oklahoma City, OK 73116	OGRID: 372920
	Action Number: 31411
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
kpickford	Adhere to previous NMOCD Conditions of Approval	6/14/2021