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

Form C-101
August 1, 2011

Permit 305798

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address	2. OGRID Number
NOVO OIL & GAS NORTHERN DELAWARE, LLC 1001 West Wilshire Blvd Oklahoma City, OK 73116	372920
	3. API Number 30-015-49228

4. Property Code	5. Property Name	6. Well No.
327177	ASTRODOG FEE 0809	124H

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
I	7	23S	29E		2605	S	1090	E	Eddy

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
P	9	23S	29E	P	330	S	10	E	Eddy

9. Pool Information

CULEBRA BLUFF;BONE SPRING, SOUTH	15011

Additional Well Information

11. Work Type	12. Well Type	13. Cable/Rotary	14. Lease Type	15. Ground Level Elevation
New Well	OIL		Private	3009
16. Multiple	**17. Proposed Depth**	**18. Formation**	**19. Contractor**	**20. Spud Date**
N	19479	Bone Spring		2/1/2022
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

☒ **We will be using a closed-loop system in lieu of lined pits**

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	17.5	13.375	54.5	400	343	0
Int1	9.875	8.625	32	3100	505	0
Prod	7.875	5.5	20	19479	1820	0

Casing/Cement Program: Additional Comments

0-400' Spud Mud; 400-3100' Brine; 3100'-19479' Cut-Brine/OBM; Intermediate Casing Grade - P110 HSCY; Production Casing Grade P110 EC.

22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular	5000	5000	TBD
Double Ram	5000	5000	TBD

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. **I further certify I have complied with 19.15.14.9 (A) NMAC ☒ and/or 19.15.14.9 (B) NMAC ☒, if applicable.** Signature:		**OIL CONSERVATION DIVISION**	
Printed Name:	Electronically filed by Kurt Shipley	Approved By:	Katherine Pickford
Title:	Chief Operating Officer	Title:	Geoscientist
Email Address:	kshipley@novoog.com	Approved Date:	1/31/2022 Expiration Date: 1/31/2024
Date:	1/6/2022 Phone: 405-286-3916	Conditions of Approval Attached	

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Phone: (505) 476-3460 Fax: (505) 476-3462

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-015- 49228	15011	CULEBRA BLUFF; BONE SPRING, SOUTH

[4] Property Code	[5] Property Name	[6] Well Number
327177	ASTRODOG FEE 0809	124H

[7] OGRID No.	[8] Operator Name	[9] Elevation
372920	NOVO OIL & GAS NORTHERN DELAWARE, LLC	3008.9

[10] Surface Location

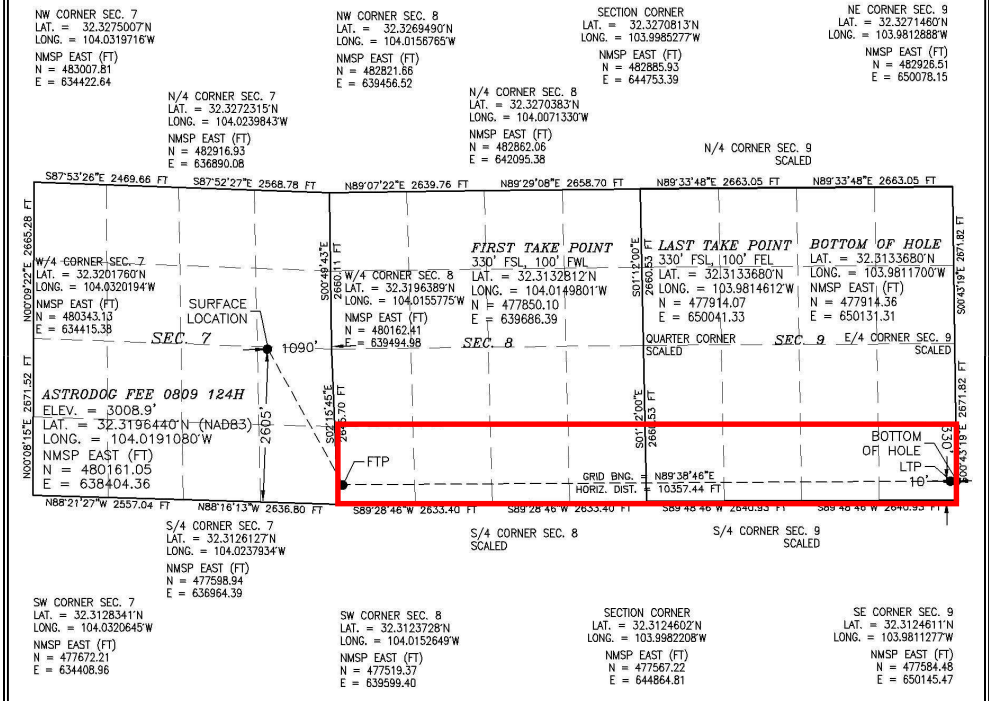
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	7	23 S	29 E		2605	SOUTH	1090	EAST	EDDY

[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	9	23 S	29 E		330	SOUTH	10	EAST	EDDY

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
320			

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.

Cory Walk 12-13-2021
Signature Date

Cory Walk
Printed Name

cory@permitswest.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.

NOVEMBER 9, 2021
Date of Survey

Signature and Seal of Professional Surveyor:

Certificate Number: FILIMON F. JARAMILLO PLS 12797

Intent [ ] As Drilled [ ]

API #

Operator Name:	Property Name:	Well Number
NOVO OIL & GAS NORTHERN DELAWARE, LLC	ASTRODOG FEE 0809	124H

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	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
M	8	23S	29E		330	SOUTH	100	WEST	EDDY

Latitude	Longitude	NAD
32.3132812	104.0149801	83

Last Take Point (LTP)

UL	Section	Township	Range	Lot	Feet	From N/S	Feet	From E/W	County
P	9	23S	29E		330	SOUTH	100	EAST	EDDY

Latitude	Longitude	NAD
32.3133680	103.9814612	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

ACCESS ROAD PLAT

ACCESS ROAD FOR ASTRODOG PAD U (ASTRODOG FEE 0809 236H, 233H, 234H, 213H, 133H, 224H, 214H, 123H, 124H, & ASTRODOG FEE 08 113H & 114H)

NOVO OIL & GAS NORTHERN DELAWARE, LLC

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 8, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
NOVEMBER 9, 2021

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 8, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE NW/4 NW/4 OF SAID SECTION 8, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M., WHENCE THE NORTHWEST CORNER OF SAID SECTION 8, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N00°49'43"W, A DISTANCE OF 1269.98 FEET;
THENCE N89°14'00"E A DISTANCE OF 544.98 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N61°49'40"E A DISTANCE OF 280.75 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 8, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M. BEARS N57°22'45"E, A DISTANCE OF 2171.15 FEET;

SAID STRIP OF LAND BEING 825.73 FEET OR 50.04 RODS IN LENGTH, CONTAINING 0.569 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NW/4 NW/4	825.73 L.F.	50.04 RODS	0.569 ACRES

GENERAL NOTES

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

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

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 11TH DAY OF NOVEMBER 2021

FILIMON F. JARAMILLO PLS 12797

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

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1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
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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

Form APD Conditions

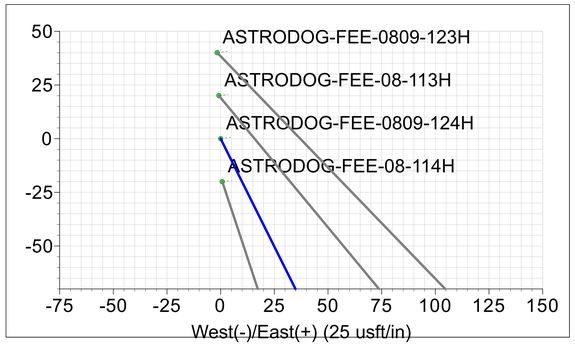
Permit 305798

PERMIT CONDITIONS OF APPROVAL

Operator Name and Address:	API Number:
NOVO OIL & GAS NORTHERN DELAWARE, LLC [372920] 1001 West Wilshire Blvd Oklahoma City, OK 73116	30-015-49228
	Well: ASTRODOG FEE 0809 #124H

OCD Reviewer	Condition
kpickford	Surface casing must be set 25' below top of Rustler Anhydrite or other competent layer in order to seal off protectable water
kpickford	Three String Casing Program - In accordance with R-111-P all strings shall be cemented to surface.
kpickford	Notify OCD 24 hours prior to casing & cement
kpickford	Will require a File As Drilled C-102 and a Directional Survey with the C-104
kpickford	The Operator is to notify NMOCD by sundry (Form C-103) within ten (10) days of the well being spud
kpickford	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string
kpickford	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system

ASTRODOG-FEE-0809-124H



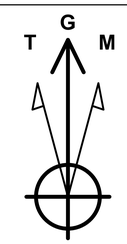
WELL DETAILS: ASTRODOG-FEE-0809-124H
Plan 1

GL Elev (ft).: 3008.90

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	480161.05	638404.36	32.31964398	-104.01910805

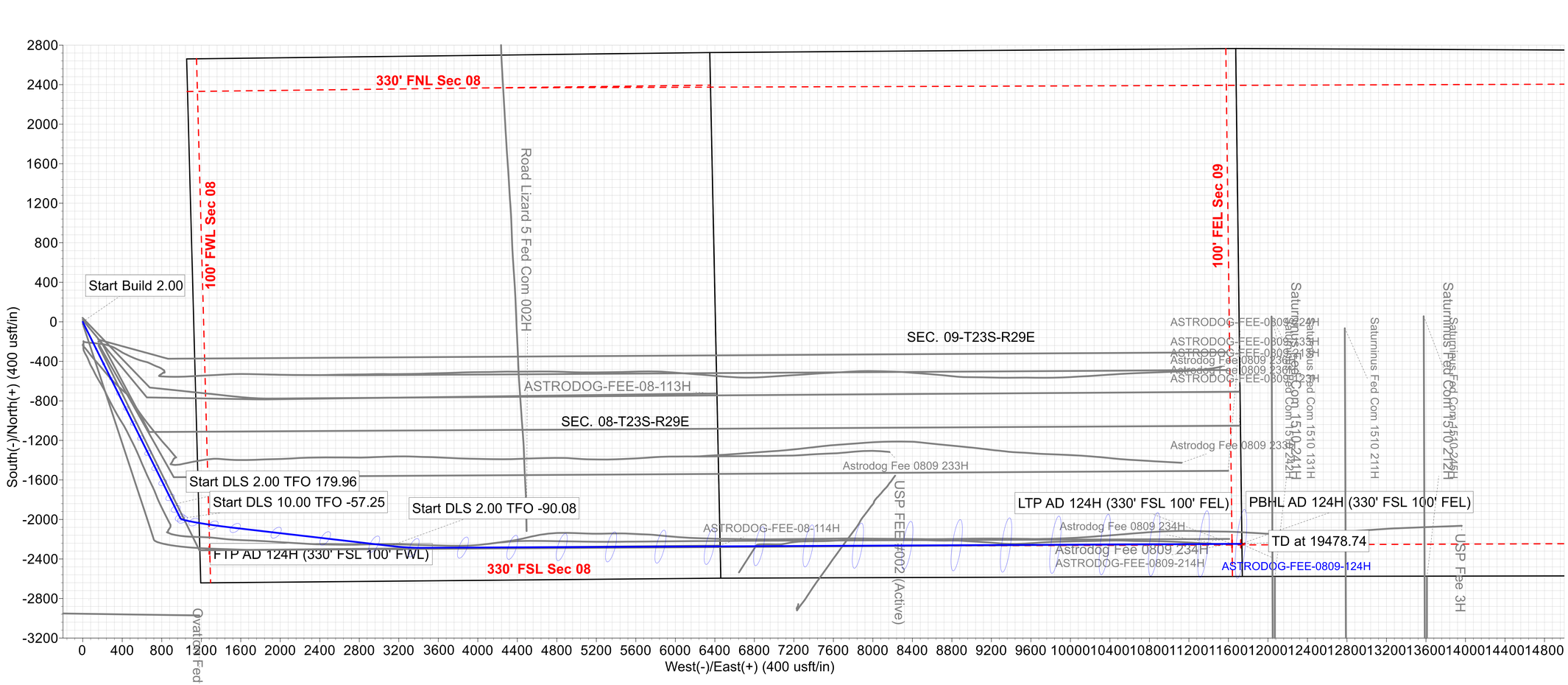
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	
1980.27	19.61	153.55	1961.25	-148.70	73.98	2.00	153.55	73.98	
7635.20	19.61	153.55	7288.34	-1847.51	919.18	0.00	0.00	919.18	
8415.47	4.00	153.72	8049.76	-1990.00	989.98	2.00	179.96	989.98	
9282.79	88.90	96.60	8600.00	-2086.04	1544.18	10.00	-57.25	1544.18	
10862.79	88.90	96.60	8630.33	-2267.60	3113.42	0.00	0.00	3113.42	
11206.53	88.90	89.72	8636.95	-2286.55	3456.37	2.00	-90.08	3456.37	
19478.74	88.90	89.72	8796.07	-2246.69	11726.95	0.00	0.00	11726.95	



Azimuths to Grid North
Magnetic North: 6.54°
Magnetic Field
Strength: 47462.9nT
Dip Angle: 59.91°
Date: 11/17/2021
Model: IGRF2020

Project: EDDY CO., NM (NAD83)
Site: SEC 08-T23S-R29E
Well: ASTRODOG-FEE-0809-124H
Wellbore: Wellbore #1
Design: Plan 1



NOVO Oil & Gas

EDDY CO., NM (NAD83)
SEC 08-T23S-R29E
ASTRODOG-FEE-0809-124H

Wellbore #1

Plan: Plan 1

Standard Planning Report

22 November, 2021

Planning Report

Database:	1 - EDM Production	**Local Co-ordinate Reference:**	Well ASTRODOG-FEE-0809-124H
Company:	NOVO Oil & Gas	**TVD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Project:	EDDY CO., NM (NAD83)	**MD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Site:	SEC 08-T23S-R29E	**North Reference:**	Grid
Well:	ASTRODOG-FEE-0809-124H	**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 08-T23S-R29E

Site Position:		**Northing:**	482,885.93 usft	**Latitude:**	32.32708133
From:	Map	**Easting:**	644,753.39 usft	**Longitude:**	-103.99852767
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "		

Well ASTRODOG-FEE-0809-124H

Well Position	**+N/-S**	0.00 usft	**Northing:**	480,161.05 usft	**Latitude:**	32.31964398
	+E/-W	0.00 usft	**Easting:**	638,404.36 usft	**Longitude:**	-104.01910805
Position Uncertainty		0.50 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,008.90 usft
Grid Convergence:		0.17 °				

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	11/17/2021	6.71	59.91	47,462.88238980

Design Plan 1

Audit Notes:

Version:	**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	90.00

Plan Survey Tool Program **Date** 11/19/2021

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	19,478.74	Plan 1 (Wellbore #1)	MWD+IGRF	
				OWSG MWD + IGRF or WMM	

Planning Report

Database:	1 - EDM Production	**Local Co-ordinate Reference:**	Well ASTRODOG-FEE-0809-124H
Company:	NOVO Oil & Gas	**TVD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Project:	EDDY CO., NM (NAD83)	**MD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Site:	SEC 08-T23S-R29E	**North Reference:**	Grid
Well:	ASTRODOG-FEE-0809-124H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,980.27	19.61	153.55	1,961.25	-148.70	73.98	2.00	2.00	0.00	153.55	
7,635.20	19.61	153.55	7,288.34	-1,847.51	919.18	0.00	0.00	0.00	0.00	
8,415.47	4.00	153.72	8,049.76	-1,990.00	989.98	2.00	-2.00	0.02	179.96	
9,282.79	88.90	96.60	8,600.00	-2,086.04	1,544.18	10.00	9.79	-6.59	-57.25	
10,862.79	88.90	96.60	8,630.33	-2,267.60	3,113.42	0.00	0.00	0.00	0.00	
11,206.53	88.90	89.72	8,636.95	-2,286.55	3,456.37	2.00	0.00	-2.00	-90.08	
19,478.74	88.90	89.72	8,796.07	-2,246.69	11,726.95	0.00	0.00	0.00	0.00	

SB DIRECTIONAL

Planning Report

NOVO

Database:	1 - EDM Production	**Local Co-ordinate Reference:**	Well ASTRODOG-FEE-0809-124H
Company:	NOVO Oil & Gas	**TVD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Project:	EDDY CO., NM (NAD83)	**MD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Site:	SEC 08-T23S-R29E	**North Reference:**	Grid
Well:	ASTRODOG-FEE-0809-124H	**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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	2.00	153.55	1,099.98	-1.56	0.78	0.78	2.00	2.00	0.00
1,200.00	4.00	153.55	1,199.84	-6.25	3.11	3.11	2.00	2.00	0.00
1,300.00	6.00	153.55	1,299.45	-14.05	6.99	6.99	2.00	2.00	0.00
1,400.00	8.00	153.55	1,398.70	-24.96	12.42	12.42	2.00	2.00	0.00
1,500.00	10.00	153.55	1,497.47	-38.97	19.39	19.39	2.00	2.00	0.00
1,600.00	12.00	153.55	1,595.62	-56.05	27.89	27.89	2.00	2.00	0.00
1,700.00	14.00	153.55	1,693.06	-76.19	37.91	37.91	2.00	2.00	0.00
1,800.00	16.00	153.55	1,789.64	-99.36	49.43	49.43	2.00	2.00	0.00
1,900.00	18.00	153.55	1,885.27	-125.53	62.46	62.46	2.00	2.00	0.00
1,980.27	19.61	153.55	1,961.25	-148.70	73.98	73.98	2.00	2.00	0.00
2,000.00	19.61	153.55	1,979.84	-154.62	76.93	76.93	0.00	0.00	0.00
2,100.00	19.61	153.55	2,074.04	-184.67	91.88	91.88	0.00	0.00	0.00
2,200.00	19.61	153.55	2,168.24	-214.71	106.82	106.82	0.00	0.00	0.00
2,300.00	19.61	153.55	2,262.45	-244.75	121.77	121.77	0.00	0.00	0.00
2,400.00	19.61	153.55	2,356.65	-274.79	136.71	136.71	0.00	0.00	0.00
2,500.00	19.61	153.55	2,450.85	-304.83	151.66	151.66	0.00	0.00	0.00
2,600.00	19.61	153.55	2,545.05	-334.87	166.61	166.61	0.00	0.00	0.00
2,700.00	19.61	153.55	2,639.26	-364.91	181.55	181.55	0.00	0.00	0.00
2,800.00	19.61	153.55	2,733.46	-394.95	196.50	196.50	0.00	0.00	0.00
2,900.00	19.61	153.55	2,827.66	-425.00	211.45	211.45	0.00	0.00	0.00
3,000.00	19.61	153.55	2,921.86	-455.04	226.39	226.39	0.00	0.00	0.00
3,100.00	19.61	153.55	3,016.07	-485.08	241.34	241.34	0.00	0.00	0.00
3,200.00	19.61	153.55	3,110.27	-515.12	256.28	256.28	0.00	0.00	0.00
3,300.00	19.61	153.55	3,204.47	-545.16	271.23	271.23	0.00	0.00	0.00
3,400.00	19.61	153.55	3,298.67	-575.20	286.18	286.18	0.00	0.00	0.00
3,500.00	19.61	153.55	3,392.88	-605.24	301.12	301.12	0.00	0.00	0.00
3,600.00	19.61	153.55	3,487.08	-635.29	316.07	316.07	0.00	0.00	0.00
3,700.00	19.61	153.55	3,581.28	-665.33	331.02	331.02	0.00	0.00	0.00
3,800.00	19.61	153.55	3,675.49	-695.37	345.96	345.96	0.00	0.00	0.00
3,900.00	19.61	153.55	3,769.69	-725.41	360.91	360.91	0.00	0.00	0.00
4,000.00	19.61	153.55	3,863.89	-755.45	375.85	375.85	0.00	0.00	0.00
4,100.00	19.61	153.55	3,958.09	-785.49	390.80	390.80	0.00	0.00	0.00
4,200.00	19.61	153.55	4,052.30	-815.53	405.75	405.75	0.00	0.00	0.00
4,300.00	19.61	153.55	4,146.50	-845.57	420.69	420.69	0.00	0.00	0.00
4,400.00	19.61	153.55	4,240.70	-875.62	435.64	435.64	0.00	0.00	0.00
4,500.00	19.61	153.55	4,334.90	-905.66	450.59	450.59	0.00	0.00	0.00
4,600.00	19.61	153.55	4,429.11	-935.70	465.53	465.53	0.00	0.00	0.00
4,700.00	19.61	153.55	4,523.31	-965.74	480.48	480.48	0.00	0.00	0.00
4,800.00	19.61	153.55	4,617.51	-995.78	495.42	495.42	0.00	0.00	0.00
4,900.00	19.61	153.55	4,711.71	-1,025.82	510.37	510.37	0.00	0.00	0.00
5,000.00	19.61	153.55	4,805.92	-1,055.86	525.32	525.32	0.00	0.00	0.00
5,100.00	19.61	153.55	4,900.12	-1,085.91	540.26	540.26	0.00	0.00	0.00
5,200.00	19.61	153.55	4,994.32	-1,115.95	555.21	555.21	0.00	0.00	0.00

SB DIRECTIONAL

Planning Report

NOVO

Database:	1 - EDM Production	**Local Co-ordinate Reference:**	Well ASTRODOG-FEE-0809-124H
Company:	NOVO Oil & Gas	**TVD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Project:	EDDY CO., NM (NAD83)	**MD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Site:	SEC 08-T23S-R29E	**North Reference:**	Grid
Well:	ASTRODOG-FEE-0809-124H	**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)
5,300.00	19.61	153.55	5,088.52	-1,145.99	570.16	570.16	0.00	0.00	0.00
5,400.00	19.61	153.55	5,182.73	-1,176.03	585.10	585.10	0.00	0.00	0.00
5,500.00	19.61	153.55	5,276.93	-1,206.07	600.05	600.05	0.00	0.00	0.00
5,600.00	19.61	153.55	5,371.13	-1,236.11	614.99	614.99	0.00	0.00	0.00
5,700.00	19.61	153.55	5,465.33	-1,266.15	629.94	629.94	0.00	0.00	0.00
5,800.00	19.61	153.55	5,559.54	-1,296.20	644.89	644.89	0.00	0.00	0.00
5,900.00	19.61	153.55	5,653.74	-1,326.24	659.83	659.83	0.00	0.00	0.00
6,000.00	19.61	153.55	5,747.94	-1,356.28	674.78	674.78	0.00	0.00	0.00
6,100.00	19.61	153.55	5,842.14	-1,386.32	689.73	689.73	0.00	0.00	0.00
6,200.00	19.61	153.55	5,936.35	-1,416.36	704.67	704.67	0.00	0.00	0.00
6,300.00	19.61	153.55	6,030.55	-1,446.40	719.62	719.62	0.00	0.00	0.00
6,400.00	19.61	153.55	6,124.75	-1,476.44	734.57	734.57	0.00	0.00	0.00
6,500.00	19.61	153.55	6,218.95	-1,506.48	749.51	749.51	0.00	0.00	0.00
6,600.00	19.61	153.55	6,313.16	-1,536.53	764.46	764.46	0.00	0.00	0.00
6,700.00	19.61	153.55	6,407.36	-1,566.57	779.40	779.40	0.00	0.00	0.00
6,800.00	19.61	153.55	6,501.56	-1,596.61	794.35	794.35	0.00	0.00	0.00
6,900.00	19.61	153.55	6,595.77	-1,626.65	809.30	809.30	0.00	0.00	0.00
7,000.00	19.61	153.55	6,689.97	-1,656.69	824.24	824.24	0.00	0.00	0.00
7,100.00	19.61	153.55	6,784.17	-1,686.73	839.19	839.19	0.00	0.00	0.00
7,200.00	19.61	153.55	6,878.37	-1,716.77	854.14	854.14	0.00	0.00	0.00
7,300.00	19.61	153.55	6,972.58	-1,746.82	869.08	869.08	0.00	0.00	0.00
7,400.00	19.61	153.55	7,066.78	-1,776.86	884.03	884.03	0.00	0.00	0.00
7,500.00	19.61	153.55	7,160.98	-1,806.90	898.97	898.97	0.00	0.00	0.00
7,600.00	19.61	153.55	7,255.18	-1,836.94	913.92	913.92	0.00	0.00	0.00
7,635.20	19.61	153.55	7,288.34	-1,847.51	919.18	919.18	0.00	0.00	0.00
7,700.00	18.31	153.55	7,349.63	-1,866.36	928.56	928.56	2.00	-2.00	0.00
7,800.00	16.31	153.56	7,445.09	-1,893.00	941.81	941.81	2.00	-2.00	0.01
7,900.00	14.31	153.57	7,541.54	-1,916.64	953.56	953.56	2.00	-2.00	0.01
8,000.00	12.31	153.58	7,638.85	-1,937.25	963.81	963.81	2.00	-2.00	0.01
8,100.00	10.31	153.59	7,736.90	-1,954.82	972.53	972.53	2.00	-2.00	0.01
8,200.00	8.31	153.61	7,835.58	-1,969.30	979.73	979.73	2.00	-2.00	0.02
8,300.00	6.31	153.64	7,934.76	-1,980.70	985.38	985.38	2.00	-2.00	0.03
8,400.00	4.31	153.70	8,034.33	-1,988.99	989.48	989.48	2.00	-2.00	0.06
8,415.47	4.00	153.72	8,049.76	-1,990.00	989.98	989.98	2.00	-2.00	0.10
8,450.00	6.55	127.34	8,084.14	-1,992.27	992.08	992.08	10.00	7.37	-76.40
8,500.00	11.13	113.91	8,133.54	-1,995.96	998.76	998.76	10.00	9.17	-26.86
8,550.00	15.97	108.39	8,182.14	-2,000.09	1,009.71	1,009.71	10.00	9.67	-11.05
8,600.00	20.88	105.40	8,229.56	-2,004.63	1,024.83	1,024.83	10.00	9.82	-5.98
8,650.00	25.82	103.51	8,275.45	-2,009.54	1,044.03	1,044.03	10.00	9.89	-3.77
8,700.00	30.79	102.20	8,319.46	-2,014.79	1,067.14	1,067.14	10.00	9.92	-2.63
8,750.00	35.76	101.22	8,361.25	-2,020.34	1,093.99	1,093.99	10.00	9.94	-1.96
8,800.00	40.73	100.45	8,400.51	-2,026.14	1,124.38	1,124.38	10.00	9.95	-1.54
8,850.00	45.72	99.82	8,436.93	-2,032.16	1,158.08	1,158.08	10.00	9.96	-1.25
8,900.00	50.70	99.29	8,470.24	-2,038.34	1,194.83	1,194.83	10.00	9.97	-1.06
8,950.00	55.69	98.83	8,500.19	-2,044.64	1,234.35	1,234.35	10.00	9.97	-0.92
9,000.00	60.67	98.43	8,526.54	-2,051.01	1,276.35	1,276.35	10.00	9.98	-0.81
9,050.00	65.66	98.06	8,549.10	-2,057.40	1,320.49	1,320.49	10.00	9.98	-0.74
9,100.00	70.65	97.72	8,567.70	-2,063.77	1,366.45	1,366.45	10.00	9.98	-0.68
9,150.00	75.64	97.40	8,582.19	-2,070.06	1,413.87	1,413.87	10.00	9.98	-0.64
9,200.00	80.64	97.09	8,592.46	-2,076.22	1,462.40	1,462.40	10.00	9.98	-0.61
9,250.00	85.63	96.79	8,598.44	-2,082.22	1,511.66	1,511.66	10.00	9.98	-0.60
9,282.79	88.90	96.60	8,600.00	-2,086.04	1,544.18	1,544.18	10.00	9.98	-0.59
9,300.00	88.90	96.60	8,600.33	-2,088.02	1,561.27	1,561.27	0.00	0.00	0.00
9,400.00	88.90	96.60	8,602.25	-2,099.51	1,660.59	1,660.59	0.00	0.00	0.00

Planning Report

Database:	1 - EDM Production	**Local Co-ordinate Reference:**	Well ASTRODOG-FEE-0809-124H
Company:	NOVO Oil & Gas	**TVD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Project:	EDDY CO., NM (NAD83)	**MD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Site:	SEC 08-T23S-R29E	**North Reference:**	Grid
Well:	ASTRODOG-FEE-0809-124H	**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)
9,500.00	88.90	96.60	8,604.17	-2,111.00	1,759.91	1,759.91	0.00	0.00	0.00
9,600.00	88.90	96.60	8,606.09	-2,122.49	1,859.23	1,859.23	0.00	0.00	0.00
9,700.00	88.90	96.60	8,608.01	-2,133.98	1,958.55	1,958.55	0.00	0.00	0.00
9,800.00	88.90	96.60	8,609.93	-2,145.47	2,057.87	2,057.87	0.00	0.00	0.00
9,900.00	88.90	96.60	8,611.85	-2,156.97	2,157.19	2,157.19	0.00	0.00	0.00
10,000.00	88.90	96.60	8,613.77	-2,168.46	2,256.51	2,256.51	0.00	0.00	0.00
10,100.00	88.90	96.60	8,615.69	-2,179.95	2,355.83	2,355.83	0.00	0.00	0.00
10,200.00	88.90	96.60	8,617.61	-2,191.44	2,455.14	2,455.14	0.00	0.00	0.00
10,300.00	88.90	96.60	8,619.53	-2,202.93	2,554.46	2,554.46	0.00	0.00	0.00
10,400.00	88.90	96.60	8,621.45	-2,214.42	2,653.78	2,653.78	0.00	0.00	0.00
10,500.00	88.90	96.60	8,623.37	-2,225.91	2,753.10	2,753.10	0.00	0.00	0.00
10,600.00	88.90	96.60	8,625.29	-2,237.41	2,852.42	2,852.42	0.00	0.00	0.00
10,700.00	88.90	96.60	8,627.21	-2,248.90	2,951.74	2,951.74	0.00	0.00	0.00
10,800.00	88.90	96.60	8,629.13	-2,260.39	3,051.06	3,051.06	0.00	0.00	0.00
10,862.79	88.90	96.60	8,630.33	-2,267.60	3,113.42	3,113.42	0.00	0.00	0.00
10,900.00	88.90	95.86	8,631.05	-2,271.64	3,150.40	3,150.40	2.00	0.00	-2.00
11,000.00	88.90	93.86	8,632.97	-2,280.10	3,250.02	3,250.02	2.00	0.00	-2.00
11,100.00	88.90	91.85	8,634.90	-2,285.08	3,349.87	3,349.87	2.00	0.00	-2.00
11,206.53	88.90	89.72	8,636.95	-2,286.55	3,456.37	3,456.37	2.00	0.00	-2.00
11,300.00	88.90	89.72	8,638.75	-2,286.10	3,549.82	3,549.82	0.00	0.00	0.00
11,400.00	88.90	89.72	8,640.67	-2,285.62	3,649.80	3,649.80	0.00	0.00	0.00
11,500.00	88.90	89.72	8,642.59	-2,285.14	3,749.78	3,749.78	0.00	0.00	0.00
11,600.00	88.90	89.72	8,644.52	-2,284.65	3,849.76	3,849.76	0.00	0.00	0.00
11,700.00	88.90	89.72	8,646.44	-2,284.17	3,949.74	3,949.74	0.00	0.00	0.00
11,800.00	88.90	89.72	8,648.36	-2,283.69	4,049.72	4,049.72	0.00	0.00	0.00
11,900.00	88.90	89.72	8,650.29	-2,283.21	4,149.70	4,149.70	0.00	0.00	0.00
12,000.00	88.90	89.72	8,652.21	-2,282.73	4,249.68	4,249.68	0.00	0.00	0.00
12,100.00	88.90	89.72	8,654.13	-2,282.25	4,349.66	4,349.66	0.00	0.00	0.00
12,200.00	88.90	89.72	8,656.06	-2,281.76	4,449.64	4,449.64	0.00	0.00	0.00
12,300.00	88.90	89.72	8,657.98	-2,281.28	4,549.62	4,549.62	0.00	0.00	0.00
12,400.00	88.90	89.72	8,659.91	-2,280.80	4,649.60	4,649.60	0.00	0.00	0.00
12,500.00	88.90	89.72	8,661.83	-2,280.32	4,749.58	4,749.58	0.00	0.00	0.00
12,600.00	88.90	89.72	8,663.75	-2,279.84	4,849.56	4,849.56	0.00	0.00	0.00
12,700.00	88.90	89.72	8,665.68	-2,279.35	4,949.54	4,949.54	0.00	0.00	0.00
12,800.00	88.90	89.72	8,667.60	-2,278.87	5,049.53	5,049.53	0.00	0.00	0.00
12,900.00	88.90	89.72	8,669.52	-2,278.39	5,149.51	5,149.51	0.00	0.00	0.00
13,000.00	88.90	89.72	8,671.45	-2,277.91	5,249.49	5,249.49	0.00	0.00	0.00
13,100.00	88.90	89.72	8,673.37	-2,277.43	5,349.47	5,349.47	0.00	0.00	0.00
13,200.00	88.90	89.72	8,675.29	-2,276.94	5,449.45	5,449.45	0.00	0.00	0.00
13,300.00	88.90	89.72	8,677.22	-2,276.46	5,549.43	5,549.43	0.00	0.00	0.00
13,400.00	88.90	89.72	8,679.14	-2,275.98	5,649.41	5,649.41	0.00	0.00	0.00
13,500.00	88.90	89.72	8,681.06	-2,275.50	5,749.39	5,749.39	0.00	0.00	0.00
13,600.00	88.90	89.72	8,682.99	-2,275.02	5,849.37	5,849.37	0.00	0.00	0.00
13,700.00	88.90	89.72	8,684.91	-2,274.54	5,949.35	5,949.35	0.00	0.00	0.00
13,800.00	88.90	89.72	8,686.84	-2,274.05	6,049.33	6,049.33	0.00	0.00	0.00
13,900.00	88.90	89.72	8,688.76	-2,273.57	6,149.31	6,149.31	0.00	0.00	0.00
14,000.00	88.90	89.72	8,690.68	-2,273.09	6,249.29	6,249.29	0.00	0.00	0.00
14,100.00	88.90	89.72	8,692.61	-2,272.61	6,349.27	6,349.27	0.00	0.00	0.00
14,200.00	88.90	89.72	8,694.53	-2,272.13	6,449.25	6,449.25	0.00	0.00	0.00
14,300.00	88.90	89.72	8,696.45	-2,271.64	6,549.23	6,549.23	0.00	0.00	0.00
14,400.00	88.90	89.72	8,698.38	-2,271.16	6,649.21	6,649.21	0.00	0.00	0.00
14,500.00	88.90	89.72	8,700.30	-2,270.68	6,749.19	6,749.19	0.00	0.00	0.00
14,600.00	88.90	89.72	8,702.22	-2,270.20	6,849.17	6,849.17	0.00	0.00	0.00
14,700.00	88.90	89.72	8,704.15	-2,269.72	6,949.15	6,949.15	0.00	0.00	0.00

Planning Report

Database:	1 - EDM Production	**Local Co-ordinate Reference:**	Well ASTRODOG-FEE-0809-124H
Company:	NOVO Oil & Gas	**TVD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Project:	EDDY CO., NM (NAD83)	**MD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Site:	SEC 08-T23S-R29E	**North Reference:**	Grid
Well:	ASTRODOG-FEE-0809-124H	**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)
14,800.00	88.90	89.72	8,706.07	-2,269.23	7,049.13	7,049.13	0.00	0.00	0.00
14,900.00	88.90	89.72	8,707.99	-2,268.75	7,149.11	7,149.11	0.00	0.00	0.00
15,000.00	88.90	89.72	8,709.92	-2,268.27	7,249.09	7,249.09	0.00	0.00	0.00
15,100.00	88.90	89.72	8,711.84	-2,267.79	7,349.07	7,349.07	0.00	0.00	0.00
15,200.00	88.90	89.72	8,713.77	-2,267.31	7,449.05	7,449.05	0.00	0.00	0.00
15,300.00	88.90	89.72	8,715.69	-2,266.83	7,549.03	7,549.03	0.00	0.00	0.00
15,400.00	88.90	89.72	8,717.61	-2,266.34	7,649.01	7,649.01	0.00	0.00	0.00
15,500.00	88.90	89.72	8,719.54	-2,265.86	7,748.99	7,748.99	0.00	0.00	0.00
15,600.00	88.90	89.72	8,721.46	-2,265.38	7,848.97	7,848.97	0.00	0.00	0.00
15,700.00	88.90	89.72	8,723.38	-2,264.90	7,948.95	7,948.95	0.00	0.00	0.00
15,800.00	88.90	89.72	8,725.31	-2,264.42	8,048.94	8,048.94	0.00	0.00	0.00
15,900.00	88.90	89.72	8,727.23	-2,263.93	8,148.92	8,148.92	0.00	0.00	0.00
16,000.00	88.90	89.72	8,729.15	-2,263.45	8,248.90	8,248.90	0.00	0.00	0.00
16,100.00	88.90	89.72	8,731.08	-2,262.97	8,348.88	8,348.88	0.00	0.00	0.00
16,200.00	88.90	89.72	8,733.00	-2,262.49	8,448.86	8,448.86	0.00	0.00	0.00
16,300.00	88.90	89.72	8,734.92	-2,262.01	8,548.84	8,548.84	0.00	0.00	0.00
16,400.00	88.90	89.72	8,736.85	-2,261.53	8,648.82	8,648.82	0.00	0.00	0.00
16,500.00	88.90	89.72	8,738.77	-2,261.04	8,748.80	8,748.80	0.00	0.00	0.00
16,600.00	88.90	89.72	8,740.70	-2,260.56	8,848.78	8,848.78	0.00	0.00	0.00
16,700.00	88.90	89.72	8,742.62	-2,260.08	8,948.76	8,948.76	0.00	0.00	0.00
16,800.00	88.90	89.72	8,744.54	-2,259.60	9,048.74	9,048.74	0.00	0.00	0.00
16,900.00	88.90	89.72	8,746.47	-2,259.12	9,148.72	9,148.72	0.00	0.00	0.00
17,000.00	88.90	89.72	8,748.39	-2,258.63	9,248.70	9,248.70	0.00	0.00	0.00
17,100.00	88.90	89.72	8,750.31	-2,258.15	9,348.68	9,348.68	0.00	0.00	0.00
17,200.00	88.90	89.72	8,752.24	-2,257.67	9,448.66	9,448.66	0.00	0.00	0.00
17,300.00	88.90	89.72	8,754.16	-2,257.19	9,548.64	9,548.64	0.00	0.00	0.00
17,400.00	88.90	89.72	8,756.08	-2,256.71	9,648.62	9,648.62	0.00	0.00	0.00
17,500.00	88.90	89.72	8,758.01	-2,256.22	9,748.60	9,748.60	0.00	0.00	0.00
17,600.00	88.90	89.72	8,759.93	-2,255.74	9,848.58	9,848.58	0.00	0.00	0.00
17,700.00	88.90	89.72	8,761.85	-2,255.26	9,948.56	9,948.56	0.00	0.00	0.00
17,800.00	88.90	89.72	8,763.78	-2,254.78	10,048.54	10,048.54	0.00	0.00	0.00
17,900.00	88.90	89.72	8,765.70	-2,254.30	10,148.52	10,148.52	0.00	0.00	0.00
18,000.00	88.90	89.72	8,767.63	-2,253.82	10,248.50	10,248.50	0.00	0.00	0.00
18,100.00	88.90	89.72	8,769.55	-2,253.33	10,348.48	10,348.48	0.00	0.00	0.00
18,200.00	88.90	89.72	8,771.47	-2,252.85	10,448.46	10,448.46	0.00	0.00	0.00
18,300.00	88.90	89.72	8,773.40	-2,252.37	10,548.44	10,548.44	0.00	0.00	0.00
18,400.00	88.90	89.72	8,775.32	-2,251.89	10,648.42	10,648.42	0.00	0.00	0.00
18,500.00	88.90	89.72	8,777.24	-2,251.41	10,748.40	10,748.40	0.00	0.00	0.00
18,600.00	88.90	89.72	8,779.17	-2,250.92	10,848.38	10,848.38	0.00	0.00	0.00
18,700.00	88.90	89.72	8,781.09	-2,250.44	10,948.37	10,948.37	0.00	0.00	0.00
18,800.00	88.90	89.72	8,783.01	-2,249.96	11,048.35	11,048.35	0.00	0.00	0.00
18,900.00	88.90	89.72	8,784.94	-2,249.48	11,148.33	11,148.33	0.00	0.00	0.00
19,000.00	88.90	89.72	8,786.86	-2,249.00	11,248.31	11,248.31	0.00	0.00	0.00
19,100.00	88.90	89.72	8,788.78	-2,248.52	11,348.29	11,348.29	0.00	0.00	0.00
19,200.00	88.90	89.72	8,790.71	-2,248.03	11,448.27	11,448.27	0.00	0.00	0.00
19,300.00	88.90	89.72	8,792.63	-2,247.55	11,548.25	11,548.25	0.00	0.00	0.00
19,400.00	88.90	89.72	8,794.56	-2,247.07	11,648.23	11,648.23	0.00	0.00	0.00
19,478.74	88.90	89.72	8,796.07	-2,246.69	11,726.95	11,726.95	0.00	0.00	0.00

Planning Report

Database:	1 - EDM Production	**Local Co-ordinate Reference:**	Well ASTRODOG-FEE-0809-124H
Company:	NOVO Oil & Gas	**TVD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Project:	EDDY CO., NM (NAD83)	**MD Reference:**	RKB 25' + GL 3008.90 @ 3033.90usft
Site:	SEC 08-T23S-R29E	**North Reference:**	Grid
Well:	ASTRODOG-FEE-0809-124H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan 1		

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 AD 124H (330' FSL - plan misses target center by 260.94usft at 9066.06usft MD (8555.51 TVD, -2059.45 N, 1335.07 E) - Point	0.00	0.00	8,600.51	-2,310.95	1,282.03	477,850.10	639,686.39	32.31328118	-104.01498013
LTP AD 124H (330' FSL - plan misses target center by 5.00usft at 19388.84usft MD (8794.34 TVD, -2247.12 N, 11637.07 E) - Point	0.00	0.00	8,799.34	-2,246.98	11,636.97	477,914.07	650,041.33	32.31336803	-103.98146125
PBHL AD 124H (330' FS - plan misses target center by 5.00usft at 19478.74usft MD (8796.07 TVD, -2246.69 N, 11726.95 E) - Point	0.00	0.00	8,801.07	-2,246.69	11,726.95	477,914.36	650,131.31	32.31336802	-103.98116999

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
19,793.91		20" Casing	20	24

Justin Carter
Landman
Novo Oil & Gas Northern Delaware, LLC
1001 West Wilshire Blvd, Suite 206
Oklahoma City, OK 73116
Oklahoma City, Oklahoma 73102
Office: 405.286.3375
jcarter@novoog.com

January 10, 2022

Kate Pickford
OCD District III
1000 Rio Brazos Rd
Aztec, New Mexico 87410

Re: Astrodog Fee Permits

Ms. Pickford:

There are no potash lessees within a mile radius of Novo's proposed Astrodog Fee wells in Sections 7 and 8 of Township 23 South, Range 29 East, Eddy County, NM.

If you have any questions or comments, please call me at (405) 286.3375 or contact me via email at jcarter@novoog.com.

Sincerely,

Novo Oil & Gas, LLC

Justin Carter
Landman

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description

Effective May 25, 2021

I. Operator: _Novo Oil & Gas Northern Delaware, LLC_____ **OGRID:** ___372920_____**Date:** __11__/18_/_21____

II. Type: ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Astrodog Fee 0809 213H	30-015-xxxxx	I-07-23S-29E	2430 FSL & 940 FEL	700	5200	2300
Astrodog Fee 0809 133H	30-015-xxxxx	I-07-23S-29E	2410 FSL & 940 FEL	700	5200	2300
Astrodog Fee 0809 224H	30-015-xxxxx	I-07-23S-29E	2390 FNL & 940 FWL	700	5200	2300
Astrodog Fee 0809 214H	30-015-xxxxx	I-07-23S-29E	2370 FSL & 940 FEL	700	5200	2300
Astrodog Fee 0809 123H	30-015-xxxxx	I-07-23S-29E	2645 FSL & 1090 FEL	700	5200	2300
Astrodog Fee 0809 124H	30-015-xxxxx	I-07-23S-29E	2625 FNL & 1090 FWL	700	5200	2300
Astrodog Fee 08 113H	30-015-xxxxx	I-07-23S-29E	2605 FNL & 1090 FWL	700	5200	2300
Astrodog Fee 08 114H	30-015-xxxxx	I-07-23S-29E	2585 FNL & 1090 FWL	700	5200	2300

IV. Central Delivery Point Name: _CTB Name: Astrodog 0809 CTB 4_____ [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Astrodog Fee 0809 213H	30-015-xxxxx	10/1/2022	10/20/2022	4/1/2023	4/28/2023	5/1/2023
Astrodog Fee 0809 133H	30-015-xxxxx	10/21/2022	11/14/2022	4/1/2023	4/28/2023	5/1/2023
Astrodog Fee 0809 224H	30-015-xxxxx	11/15/2022	12/17/2022	4/1/2023	4/28/2023	5/1/2023
Astrodog Fee 0809 214H	30-015-xxxxx	12/18/2022	1/15/2023	4/1/2023	4/28/2023	5/1/2023
Astrodog Fee 0809 123H	30-015-xxxxx	1/16/2022	2/1/2023	4/1/2023	4/28/2023	5/1/2023
Astrodog Fee 0809 124H	30-015-xxxxx	2/2/2023	2/20/2023	4/1/2023	4/28/2023	5/1/2023
Astrodog Fee 08 113H	30-015-xxxxx	2/21/2023	3/10/2023	4/1/2023	4/28/2023	5/1/2023
Astrodog Fee 08 114H	30-015-xxxxx	3/11/2023	3/30/2023	4/1/2023	4/28/2023	5/1/2023

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan

EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☐ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☐ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system. ***If Operator checks this box, Operator will select one of the following:***

Well Shut-In. ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. ☒ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- **(a)** power generation on lease;
- **(b)** power generation for grid;
- **(c)** compression on lease;
- **(d)** liquids removal on lease;
- **(e)** reinjection for underground storage;
- **(f)** reinjection for temporary storage;
- **(g)** reinjection for enhanced oil recovery;
- **(h)** fuel cell production; and
- **(i)** other alternative beneficial uses approved by the division.

Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature:	Josh Cr
Printed Name:	Justin Carter
Title:	Landman
E-mail Address:	jcarter@novoog.com
Date:	11/12/2021
Phone:	405.406.0737

OIL CONSERVATION DIVISION **(Only applicable when submitted as a standalone form)**
Approved By:
Title:
Approval Date:
Conditions of Approval:

APPENDIX A

Separation Equipment

Novo Oil & Gas Northern Delaware, LLC (Novo) has pulled representative pressurized samples from wells in the same producing formation. Novo has utilized these samples in process simulations to determine the amount of gas anticipated in each stage of the process and utilized this information with a safety factor to size the equipment listed below:

- Separation equipment will be set as follows:
  - Individual 3 Phase separators will be set for each individual well.
    - The separators will be sized based on the anticipated volume of the well and the pressure of the lines utilized for oil, gas, and water takeaway.
  - Individual Heater treaters will be set for each individual well.
    - The heater treaters are sized based on the anticipated combined volume of oil and water predicted to come from the initial 3 phase separator.
    - Oil will be separated from the water and water will be sent to its respective tanks
    - The combined oil and natural gas stream is routed to the Vapor Recovery Tower.
  - The oil and water tanks utilize a closed vent capture system to ensure all breathing, working and flashing losses are routed to the Vapor Recovery Tower (VRT) and Vapor Recovery Unit (VRU)
  - The Vapor Recovery Tower has been sized, based on the anticipated volume of gas from the heater treater and oil and water tanks. A VRU is then utilized to push the recovered gas into the sales pipeline.
    - The VRU will be sized based on the anticipated gas volume and the gas pressure for the line utilized for takeaway.

All equipment has been sized based on the modeled projected need and a safety factor of at least 10%. This is ensuring that the capture of methane gas and VOC will minimize flaring below 50mcf/d per facility.

Operational Practices

19.15.27.8 (A) Venting and Flaring of Natural Gas

Novo Oil & Gas Northern Delaware, LLC (Novo) understands the requirements of NMAC 19.15.27.8 which states that the venting and flaring of natural gas during drilling, completion or production that constitutes waste as defined in 19.15.2 are prohibited.

19.15.27.8 (B) Venting and flaring during drilling operations

1. Novo shall capture or combust natural gas if technically feasible during drilling operations using best industry practices.
2. A flare stack with a 100 percent capacity for expected volumes will be set on location of the CTB at least 100 feet from the nearest surface hole location, well heads, and storage tanks.
3. In the event of an emergency, Novo will vent natural gas in order to avoid substantial impact. Novo shall report the vented or flared gas to the NMOCD.

19.15.27.8 (C) Venting and flaring during completion or recompletion

During completion operations, Novo utilizes the following:

1. Novo facilities are built and ready from day 1 of flowback
2. Individual well test separators will be set to properly separate gas and liquids. Temporary test separator will be utilized initially to process volumes. In addition, separators will be tied into flowback tanks which will be tied into the gas processing equipment for sales down a pipeline. See **Appendix A** for details on Separation Equipment used by Novo.
3. Should the facility not yet be capable of processing gas, or the gas does not meet quality standards, then storage tanks will be set that are tied into gas busters or a temporary flare to manage all natural gas. This flare would meet the following requirements:
    a) An appropriately sized flare stack with an automatic igniter
    b) Novo analyzes the natural gas samples twice per week

c) Novo routes the natural gas into a gathering pipeline as soon as the pipeline specifications are met
d) Novo provides the NMOCD with pipeline specifications and natural gas data.

19.15.27.8 (D) Venting and flaring during production operations.

Novo will not vent or flare natural gas except under the following circumstances:

1. During an emergency or malfunction
2. To unload or clean-up liquid holdup in a well to atmospheric pressure, provided
   a) Novo does not vent after the well achieves a stabilized rate and pressure
   b) Novo will remain present on-site during liquids unloaded by manual purging and takes all reasonable actions to achieve a stabilized rate and pressure at the earliest practical time
   c) Novo will optimize the system to minimize natural gas venting on any well equipped with a plunger lift or auto control system
   d) Best management practices will be used during downhole well maintenance.
3. During the first year of production from an exploratory well provided
   a) Novo receives approval from the NMOCD
   b) Novo remains in compliance with NM gas capture requirements
   c) Novo submits an updated C-129 from to the NMOCD.
4. During the following activities unless prohibited
   a) Gauging or sampling a storage tank or low-pressure production vessel
   b) Loading out liquids from a storage tank
   c) Repair and maintenance
   d) Normal operation of a gas-activated pneumatic controller or pump
   e) Normal operation of a storage tank but not including venting from a thief hatch
   f) Normal operation of dehydration units
   g) Normal operations of compressors, compressor engines, turbines, valves, flanges, and connectors
   h) During a bradenhead, packer leakage test, or production test lasting less than 24 hours
   i) When natural gas does not meet the gathering pipeline specifications
   j) Commissioning of pipelines, equipment, or facilities only for as long as necessary to purge introduced impurities.

In order to comply with these laws, see **Appendix B** for details on Novo Venting and Flaring.

19.15.27.8 (E) Performance standards

1. Novo has utilized process simulations with a safety factor to design all separation and storage equipment. The equipment is routed to a vapor recovery system and utilizes as a flare as back up for periods of startup, shutdown, maintenance or malfunction of the VRU system.
2. Novo will install a flare that designed to handle the full volume of vapors from the facility in case of VRU failure and it is designed with an auto-ignition system.
3. Flare stacks will be appropriately sized and designed to ensure proper combustion efficiency
    a) Flare stacks installed or replaced will be equipped with an automatic ignitor or continuous pilot
    b) Previously installed flare stacks will be retrofitted with an automatic ignitor, continuous pilot , or technology that alerts Novo of flare malfunction within 18 months after May 25, 2021.
    c) Flare stacks replaced after May 25, 2021 will be equipped with an automatic ignitor or continuous pilot if located at a well or facility with an average daily production of 60,000 cubic feet of natural gas or less.
    d) Flare stacks will be located at least 100 feet from well and storage tanks and securely anchored
4. Novo will conduct an AVO inspection on all components for leaks and defects at least weekly.
5. Novo will make and keep records of AVO inspections available to the NMOCD for at least 5 years.
6. Novo may use a remote or automated monitoring technology to detect leaks and releases in lieu of AVO inspections with prior NMOCD approval.
7. Facilities will be designed to minimize waste.
8. Novo will resolve emergencies as promptly as possible.

19.15.27.8 (F) Measurement or estimation of vented and flared natural gas

1. Novo will have meters on both the low pressure and high pressure sides of the flares and the volumes are recorded in the SCADA system.
2. Novo will install equipment to measure the volume of flared natural gas that has an average daily production of 60,000 cubic feet or greater of natural gas.
3. Novo's measuring equipment will conform to an industry standards.
4. The measurement system is designed such that it cannot be bypassed except for inspections and servicing the meters.
5. Novo will estimate the volume of vented or flared natural gas using a methodology that can be independently verified if metering is not practicable due to low flow rate or pressure.

6. Novo will estimate the volume of vented and flared natural gas based on the results of an annual GOR test for wells that do not require measuring equipment reported on form C-116.
7. Novo will install measuring equipment whenever the NMOCD determines that metering is necessary.

APPENDIX A

Separation Equipment

Novo Oil & Gas Northern Delaware, LLC (Novo) has pulled representative pressurized samples from wells in the same producing formation. Novo has utilized these samples in process simulations to determine the amount of gas anticipated in each stage of the process and utilized this information with a safety factor to size the equipment listed below:

- Separation equipment will be set as follows:
  - Individual 3 Phase separators will be set for each individual well.
    - The separators will be sized based on the anticipated volume of the well and the pressure of the lines utilized for oil, gas, and water takeaway.
  - Individual Heater treaters will be set for each individual well.
    - The heater treaters are sized based on the anticipated combined volume of oil and water predicted to come from the initial 3 phase separator.
    - Oil will be separated from the water and water will be sent to its respective tanks
    - The combined oil and natural gas stream is routed to the Vapor Recovery Tower.
  - The oil and water tanks utilize a closed vent capture system to ensure all breathing, working and flashing losses are routed to the Vapor Recovery Tower (VRT) and Vapor Recovery Unit (VRU)
  - The Vapor Recovery Tower has been sized, based on the anticipated volume of gas from the heater treater and oil and water tanks. A VRU is then utilized to push the recovered gas into the sales pipeline.
    - The VRU will be sized based on the anticipated gas volume and the gas pressure for the line utilized for takeaway.

All equipment has been sized based on the modeled projected need and a safety factor of at least 10%. This is ensuring that the capture of methane gas and VOC will minimize flaring below 50mcf/d per facility.

APPENDIX B

Venting and Flaring

Novo Oil & Gas Northern Delaware, LLC (Novo) has a natural gas system available prior to startup of completion operations. Novo utilizes a VRU system and sells all gas except during periods of startup, shutdown, maintenance, or malfunction for the gas capturing equipment, including the VRT, VRU, storage tanks, and pipelines.

Currently, Novo utilizes the following from list A-I of Section 3 for its operations to minimize flaring:

a) Novo Oil & Gas utilizes Natural Gas (NG) powered generators to power it's leases where grid power isn't available.
b) When electrical grid power is unavailable, NG generators will be used for major equipment onsite.
c) Novo Oil & Gas compression in service will be NG powered.
d) Should liquids removal – such as dehydration – be required, units will be powered by NG.

Additionally, Novo Oil & Gas will only flare gas during the following times:

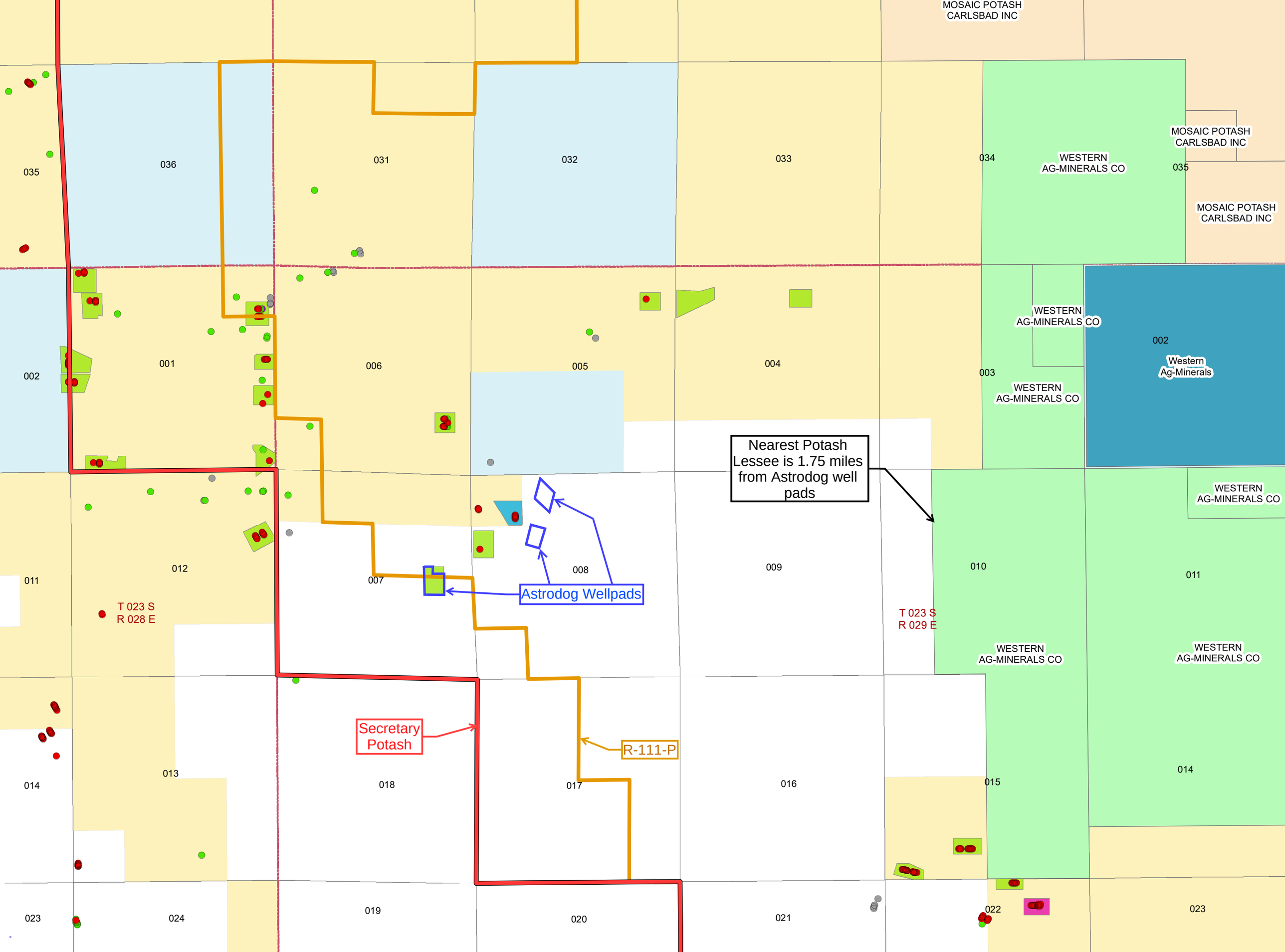
- Scheduled maintenance for gas capturing equipment including:
  - VRT
  - VRU
  - Storage tanks
  - Pipelines
- Emergency flaring

Best Management Practices

Novo Oil & Gas Northern Delaware, LLC (Novo) utilizes the following best management practices to minimize venting during active and planned maintenance.

Novo has a closed vent capture system to route emissions from the heater treater, tanks and vapor recovery to the VRU with a flare for backup. The system is designed such that if the VRU is taken out of service for any reason, the vapors will be routed to the flare for combustion.

Novo will isolate and attempt to route all vapors to the VRU or flare prior to opening any lines for maintenance to minimize venting from the equipment. Not limited to: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Nearest Potash Lessee is 1.75 miles from Astrodog well pads
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