Form 3160-5
(June 2019)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE *- Other instructions on page 2*

5. Lease Serial No.: NMSF78769

6. If Indian, Allottee or Tribe Name:

7. If Unit of CA/Agreement, Name and/or No.: NMNM78407E

1. Type of Well: ☐ Oil Well ☒ Gas Well ☐ Other

8. Well Name and No.: ROSA UNIT 649H

2. Name of Operator: LOGOS OPERATING, LLC

9. API Well No.: 30-039-31410

3a. Address: 2010 AFTON PLACE, FARMINGTON, NM 87401

3b. Phone No. *(include area code)*: (505) 278-8720

10. Field and Pool or Exploratory Area: BASIN MANCOS

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)*: SEC 19 T31N R05W NENW (C) 965 FNL 480 FWL

11. Country or Parish, State: RIO ARRIBA COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

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

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

LOGOS Operating request a change in plans for the following:

Original TD @ 20,574' MD 6,964' TVD to new **TD @ 20,634' MD 7,199' TVD**

Geology tops have been updated per changes.

Original Landing point @ 7,888' MD 7,200' TVD to new **Landing point @ 7,612' MD 7,210' TVD**

Original 5.5" casing Production @ 20,574' MD to new **Production 5.5" casing @ 20,634' MD 7199' TVD**

The production cementing bbls and sacks have been update per casing depth changes.

Attached: New C102, Operation and Directional Drill plans.

14. I hereby certify that the foregoing is true and correct. Name *(Printed/Typed)*: Etta Trujillo

Title: Regulatory Specialist

Signature: Etta Trujillo

Date: 8/25/2023

THE SPACE FOR FEDERAL OR STATE OFICE USE

Approved by	Title	Date
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office	

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

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Sundry Print Report
08/28/2023

Well Name: ROSA UNIT	**Well Location:** T31N / R5W / SEC 19 / NENW / 36.889673 / -107.405533	**County or Parish/State:** RIO ARRIBA / NM
Well Number: 649H	**Type of Well:** CONVENTIONAL GAS WELL	**Allottee or Tribe Name:**
Lease Number: NMSF078769	**Unit or CA Name:** ROSA UNIT	**Unit or CA Number:** NMNM78407E
US Well Number: 300393141000X1	**Well Status:** Drilling Well	**Operator:** LOGOS OPERATING LLC

Notice of Intent

Sundry ID: 2748167

Type of Submission: Notice of Intent

Type of Action: Drilling Operations

Date Sundry Submitted: 08/28/2023

Time Sundry Submitted: 07:54

Date proposed operation will begin: 08/28/2023

Procedure Description: LOGOS Operating request a change in plans for the following: Original TD @ 20,574' MD 6,964' TVD to new TD @ 20,634' MD 7,199' TVD Geology tops have been updated per changes. Original Landing point @ 7,888' MD 7,200' TVD to new Landing point @ 7,612' MD 7,210' TVDTVD Original 5.5" casing Production @ 20,574' MD to new Production 5.5" casing @ 20,634' MD 7199' TVD The production cementing bbls and sacks have been update per casing depth changes. Attached: New C102, Operation and Directional Drill plans.

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

3160_5_Rosa_Unit_649H_Change_in_Plans_ST1_Plan_5_20230825_20230828075334.pdf

CONFIDENTIAL

Well Name: ROSA UNIT	**Well Location:** T31N / R5W / SEC 19 / NENW / 36.889673 / -107.405533	**County or Parish/State:** RIO ARRIBA / NM
Well Number: 649H	**Type of Well:** CONVENTIONAL GAS WELL	**Allottee or Tribe Name:**
Lease Number: NMSF078769	**Unit or CA Name:** ROSA UNIT	**Unit or CA Number:** NMNM78407E
US Well Number: 300393141000X1	**Well Status:** Drilling Well	**Operator:** LOGOS OPERATING LLC

Conditions of Approval

Specialist Review

LOGOS_Rosa_Unit_649H_BHL_change_2748167_MHK_20230828094039.pdf

Operator

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

Operator Electronic Signature: ETTA TRUJILLO

Signed on: AUG 28, 2023 07:54 AM

Name: LOGOS OPERATING LLC

Title: Regulatory Specialist

Street Address: 2010 AFTON PLACE

City: Farmington **State:** NM

Phone: (505) 324-4154

Email address: ETRUJILLO@LOGOSRESOURCESLLC.COM

Field

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

BLM Point of Contact

BLM POC Name: MATTHEW H KADE

BLM POC Title: Petroleum Engineer

BLM POC Phone: 5055647736

BLM POC Email Address: MKADE@BLM.GOV

Disposition: Approved

Disposition Date: 08/28/2023

Signature: Matthew Kade

CONFIDENTIAL

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First Street, 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 Drive, 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 Drive
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

[X] AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-039-31410	97232	BASIN MANCOS

[4] Property Code	[5] Property Name	[6] Well Number
320608	ROSA UNIT	649H ST1

[7] OGRID No.	[8] Operator Name	[9] Elevation
289408	LOGOS OPERATING, LLC	6305'

[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
C	19	31N	5W	1	965	NORTH	480	WEST	RIO ARRIBA

[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
H	21	31N	5W		1723	NORTH	221	EAST	RIO ARRIBA

[12] Dedicated Acres		[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
872.01	N/2 - Sections 19, 20, 21, T31N, R5W			R-13457

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.

Etta Trujillo — Signature — 8/25/2023 — Date

Etta Trujillo
Printed Name

etrujillo@logosresourcesllc.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.

Date Revised: AUGUST 18, 2023
Date of Survey: JANUARY 2, 2015

Signature and Seal of Professional Surveyor

JASON C. EDWARDS
NEW MEXICO
15269
REGISTERED PROFESSIONAL SURVEYOR

JASON C. EDWARDS
Certificate Number 15269

A
SURFACE LOCATION
965' FNL 480' FWL
SECTION 19, T31N, R5W
LAT 36.889673 °N
LONG -107.405533 °W
DATUM: NAD1927
LAT 36.889679 °N
LONG -107.406136 °W
DATUM: NAD1983

S66°09.2'E 759.5'

B
FIRST TAKE POINT
1276' FNL 1174' FWL
SECTION 19, T31N, R5W
LAT 36.888821 °N
LONG -107.403162 °W
DATUM: NAD1927
LAT 36.888827 °N
LONG -107.403765 °W
DATUM: NAD1983

N78°53.7'E 1112.9'

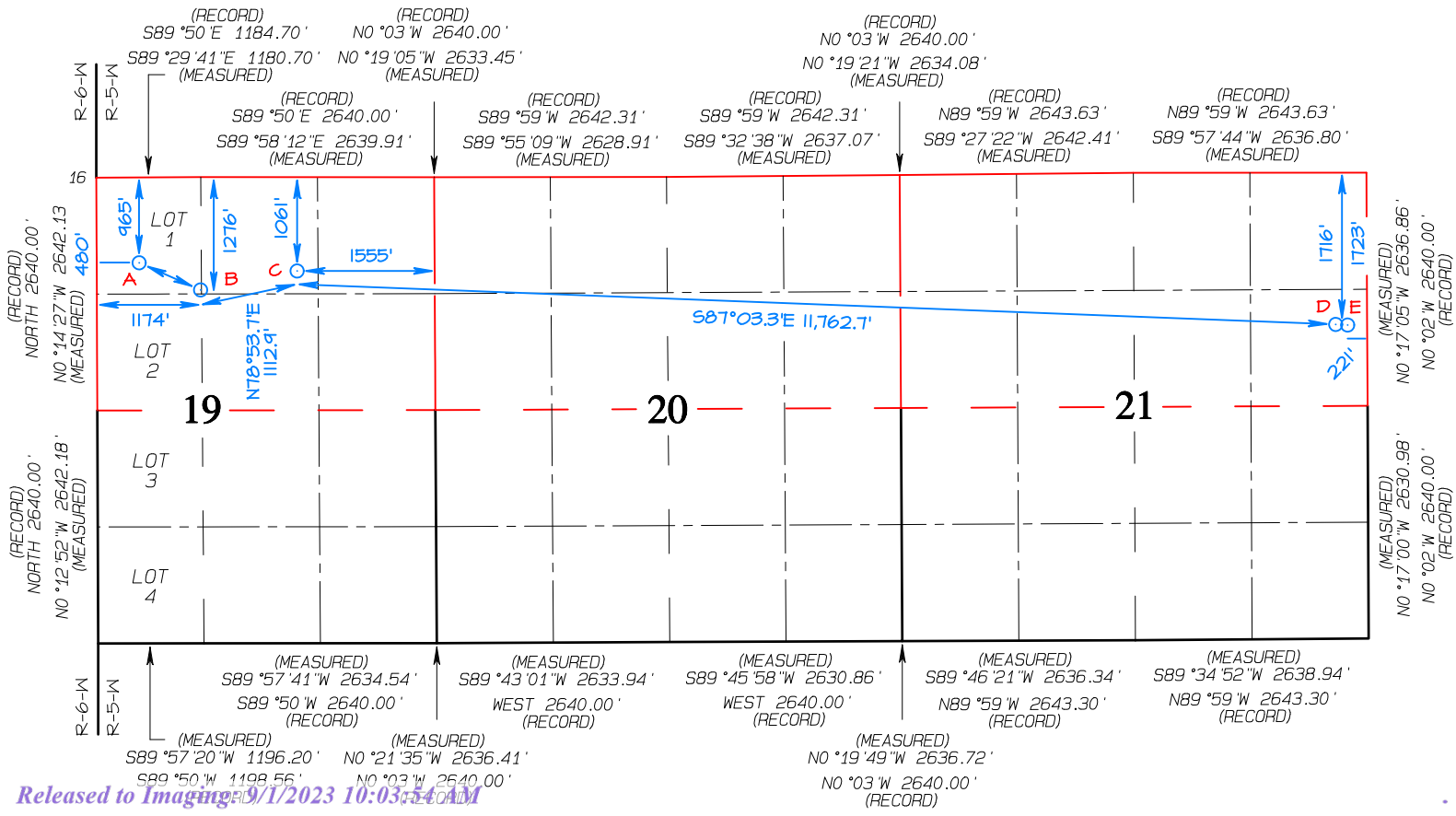
C
INFLECTION POINT (1)
1061' FNL 1555' FEL
SECTION 19, T31N, R5W
LAT 36.889396 °N
LONG -107.399425 °W
DATUM: NAD1927
LAT 36.889402 °N
LONG -107.400028 °W
DATUM: NAD1983

S87°03.3'E 11,762.7'

D
FIRST PERF
1716' FNL 356' FEL
SECTION 21, T31N, R5W
LAT 36.887582 °N
LONG -107.359267 °W
DATUM: NAD1927
LAT 36.887589 °N
LONG -107.359868 °W
DATUM: NAD1983

S87°03.3'E 135.2'

E
LAST TAKE POINT
1723' FNL 221' FEL
SECTION 21, T31N, R5W
LAT 36.887561 °N
LONG -107.358805 °W
DATUM: NAD1927
LAT 36.887568 °N
LONG -107.359407 °W
DATUM: NAD1983



LOGOS Operating, LLC
Operations Plan

Note: This procedure will be adjusted onsite based upon actual conditions

Date:	August 25, 2023	Pool:	Basin Mancos
Well Name:	**Rosa Unit 649H**	GL Elevation:	6,305'
Surface Location:	Sec 19, T31N, R5W 965 FNL, 480 FWL (36.889679º N, 107.406136º W – NAD83)	Measured Depth:	20,634' (KB)
Bottom Hole Location:	Sec 21, T31N, R5W 1723 FNL, 221 FEL (36.887568º N, -107.359407º W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF78769, CA Serial #NMNM78407E

I. GEOLOGY

A. Prognosis Formation Tops (Based on 30' KB Elevation): Estimated top of important geological markers:
SURFACE FORMATION – NACIMIENTO

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2452	2446	*POINT LOOKOUT	5641	5628
KIRTLAND	2552	2546	*MANCOS	6157	6142
*FRUITLAND	3021	3014	KICKOFF POINT	6296	6281
*PICTURED CLIFFS	3368	3360	LANDING POINT	7612	7210
LEWIS	3477	3469			
CHACRA	4586	4575			
*CLIFF HOUSE	5398	5385			
MENEFEE	5448	5435	TD	20634	7199

* indicates depth at which anticipated water, oil, gas or other mineral bearing formations are expected to be encountered.

B. **MUD LOGGING PROGRAM:** Mudlogger on location from KOP to TD.

C. **LOGGING PROGRAM:** LWD GR from surface casing to TD.

D. **NATURAL GAUGES:** Gauge any noticeable increases in gas flow. Record all gauges in Tour book and on morning reports.

II. DRILLING

Drilling Comments: This well was originally drilled in 2022. Surface and intermediate casing was successfully run and cemented per BLM and NMOCD requirements. While drilling the horizontal lateral. The drill pipe and BHA became stuck in the hole. Attempts to retrieve the drill pipe was unsuccessful. The well was temporarily abandoned by setting a cement plug from the top of the fish @ 6373' to 5923' (298' inside of the 9-5/8" casing). The plug was tagged with DP. A bridge plug at 5490' This work was performed on 9/25/22 – 9/26/22.

The proposed work for 2023, is to re-enter the well and sidetrack it above the top of the existing fish. Re-drill the lateral well to total depth and run and cement 5.5" casing +- 20,634'.

A. **MUD PROGRAM:** LSND mud (WBM) will be used to drill the 17-1/2" surface hole as well as the 12-1/4" directional vertical hole. A LSND (WBM) or (OBM) will be used to drill the 8-1/2" curve and lateral portion of the wellbore. Treat for lost circulation as necessary. Obtain returns prior to cementing. Notify Engineering of any mud losses. Mud weights of 8.3-13 ppg will be used as necessary to maintain sufficient overbalance of reservoir pressure.

Above ground steel pits will be used for fluid and cuttings while drilling. In the unlikely event that a tank develops a leak, upon immediate visual discovery, the fluid would be transferred to another tank and contaminated soil would be removed and disposed. Any leaks, spills or other undesirable events will be reported in accordance with BLM NTL 3A. Rig crews will monitor the tanks at all times.

B. **BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes.** Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing strings to one-third of internal yield pressure not to exceed **1500 psi for 30 minutes.** Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested on each tour. BOP equipment will be tested a minimum of every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure. Annular preventers will be functionally operated at least once per week. Pipe and blind rams shall be activated each trip but not more than once daily. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of the BOPE. **All tests and inspections will be recorded and logged with time and results.** A full BOP test will be conducted when installed for the first well on the pad or if seals subject to test pressure are broken, following related repairs and at a minimum of 30-day intervals. A BOPE Shell Test only will be conducted for subsequent wells on the pad when seals subject to pressure have not been broken or repaired and fall within the 30-day interval of the first full test.

C. **GeoHazards:** There are no Geohazards

D. **Maximum Anticipated Pressure:** 7210' TVD x 0.43 = 3122 psi

E. **H2S Concerns:** – There is no record of any naturally occurring H2S in any formation in the Rosa Unit. No H2S is anticipated in this formation or this well.

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OH SIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	17.5"	322'	13.375"	54.5 LBS	J-55	BTC
INTERMEDIATE	12.25"	6,221'	9.625"	47.0 LBS	L-80	BTC
PRODUCTION	8.5"	20,634'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

NOTE: All casing depths are approximate, based on KB elevation (30') and will be based on drilling conditions +/- 50'. Weights, grades and connections will be based on availability and may vary but will be equivalent or greater.

B. FLOAT EQUIPMENT:

1. SURFACE CASING: Already Set.
2. INTERMEDIATE CASING: Already Set.
3. PRODUCTION CASING: Run 5-1/2" casing with cement nose guide Float Shoe, 5-1/2"

full or pup joints as necessary, Landing Collar, 5-1/2" full or pup joints as necessary, at least (1) one Toe Sleeve (Sliding Sleeve) positioned inside the applicable production area. Centralizer program will be determined by wellbore conditions. Production casing to be pressure tested during completion operations with frac stack installed.

C. CEMENTING:

(Note: Cement type and volumes may be adjusted onsite due to actual conditions and availability)

1. SURFACE: Already Cemented.

   Note: The surface casing was ran cemented in 2022. Cement was circulated to surface.

2. INTERMEDIATE: Already Cemented.

   Note: The Intermediate casing ran and cemented in 2022. Remedial cement work was performed per BLM and NMOCD requirements on 9/10/2022.

3. PRODUCTION: Production casing will be cemented in 1 stage with 100' of cement overlap above intermediate shoe. A CBL, or alternatively, a Temperature Survey will be used to determine TOC.

	Top	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased Lead	6,126	100	0.2531	1	25	5	1.59	16	13.2
Open Hole Lead	6,226	14,408	0.2291	1.15	3,806	678	1.59	2,394	13.2
					3,832	682		2,410	

Calculations based on 15% excess for open hole and 100' overlap into intermediate casing. Actual volumes will vary.

Cement calculations are used for volume estimation. Well conditions will dictate the final cement job design. Actual volumes will be calculated and determined by conditions onsite. All cement slurries will meet or exceed minimum BLM and New Mexico Oil Conservation Division requirements. Slurries used will be the slurries listed above or equivalent slurries, depending on the service provider selected. Cement yields may change depending on the slurries selected. All waiting on cement times shall be a minimum of 8 hours or adequate to achieve a minimum of 500 psi compressive strength at the casing shoe prior to drilling out.

IV. COMPLETION

A. CBL

CBLs and/or Temperature Surveys will be performed as needed or required to determine cement top if cement is not circulated.

B. PRESSURE TEST

C. Pressure test 5-1/2" casing to 1586 psi (0.22 psi/ft * 7210' TVD) for 30 minutes. Increase pressure as required to open toe sleeves.

D. STIMULATION

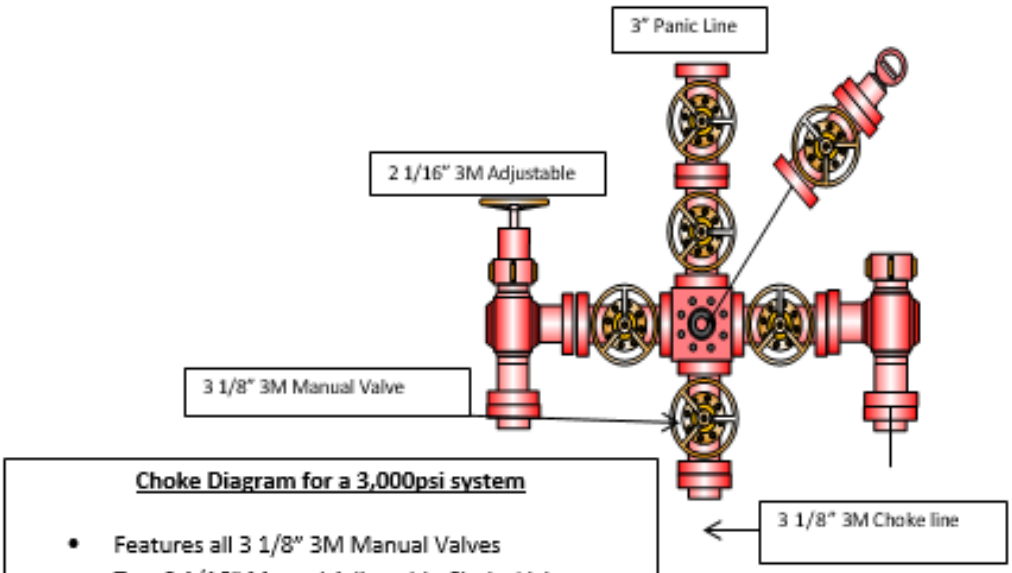
Stimulate with sand and water. Isolate stages with flow through or dissolvable frac plugs. Drill out frac plugs and flowback lateral.

E. PRODUCTION TUBING

2-7/8", 6.5#, J-55 or L-80, EUE tubing will be run once volumes and pressures dictate. Due to the extremely high initial flow rates and pressures seen in offset wells, tubing will be installed once it is safe to do so, typically 12-18 months after completion.

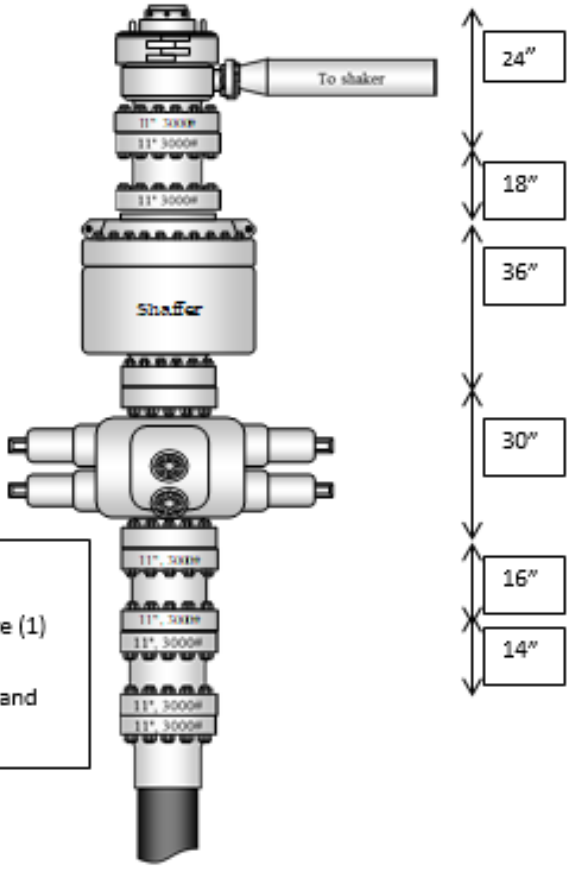
*NOTE: Although this horizontal well may be drilled past the applicable setbacks, an unorthodox location application is not required because the completed interval in this well, as defined by 19.15.16.7 8(1) NMAC, will be entirely within the applicable setbacks. This approach complies with all applicable rules, including 19.15.16.14 A(3) NMAC, 19.15.16.14 8(2) NMAC, 19.15.16.15 8(2)NMAC, and 19.15.16.15. 8(4) NMAC.

3M 11" B.O.P.E Diagram



Choke Diagram for a 3,000psi system

- Features all 3 1/8" 3M Manual Valves
- Two 2 1/16" Manual Adjustable Choke Valves
- 3" Panic Line and 2" Vent lines
- (2) 3 1/8" 3M Coflex Hose f/Choke to BOP



11" 3,000psi BOP

- Choke Side has (1) manual 3 1/8" Valve (1) HCR
- Kill Side has (2) 2 1/16" Manual Valve and (1) check valve

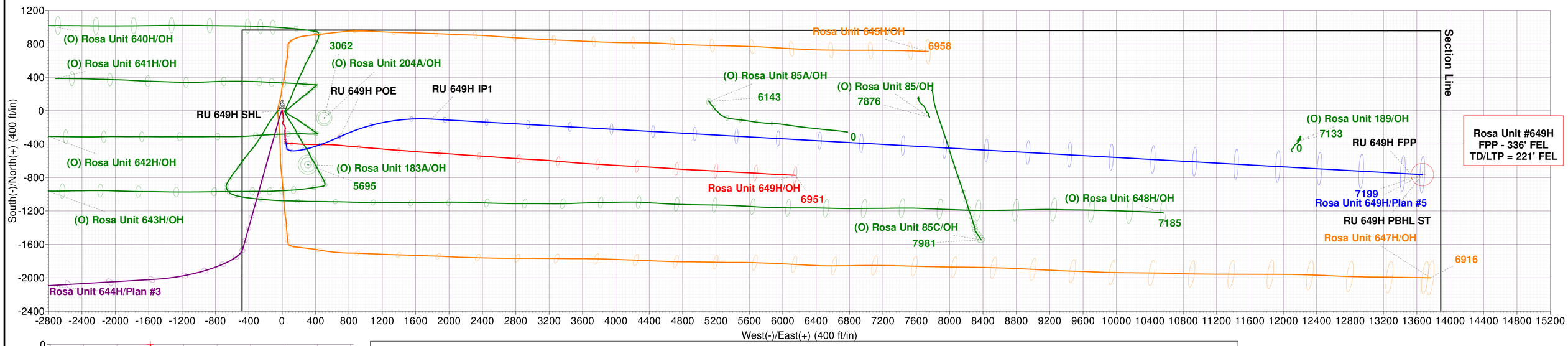
ROSA UNIT 649H

Received by OCD: 8/28/2023 9:57:14 AM

LOGOS ENERGY

County: Rio Arriba, NM NAD83
Site: Rosa Unit 27
Well: Rosa Unit 649H
Depth Reference: 6305+30 @ 6335.00ft (H&P 530)
Rig: H&P 530
Plan: Plan #5
Job #: Prelim

SCOUT DRILLING TECHNOLOGIES



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	6296.50	4.15	165.45	6281.54	-387.49	46.69	0.00	0.00	68.25	Start DLS 15.00 TFO 10.00
2	6356.50	13.11	172.33	6340.80	-396.35	48.15	15.00	10.00	70.20	Start 211.85 hold at 6356.50 MD
3	6568.35	13.11	172.33	6547.13	-443.96	54.56	0.00	0.00	79.26	Start DLS 9.00 TFO -106.80
4	7611.69	90.05	65.10	7210.28	-310.18	693.34	9.00	-106.80	709.57	Start DLS 2.50 TFO 89.99
5	8735.78	90.05	93.20	7209.28	-100.72	1786.30	2.50	89.99	1789.14	Start 11762.76 hold at 8735.78 MD
6	20498.53	90.05	93.20	7199.05	-757.78	13530.69	0.00	0.00	13551.89	FPP @ 336' FEL
7	20633.73	90.05	93.20	7198.93	-765.33	13665.67	0.00	0.00	13687.09	TD at 20633.73 @ 221' FEL

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
RU 649H SHL	0.00	0.00	0.00	2143448.37	2848017.09	36.8896790	-107.4061360
TOF 649H	6363.03	-392.93	53.35	2143055.69	2848072.20	36.8885997	-107.4059535
RU 649H PBHL ST	7198.93	-765.33	13665.67	2142744.21	2861686.02	36.8875677	-107.3594067
RU 649H FPP	7199.05	-757.78	13530.69	2142751.16	2861551.01	36.8875886	-107.3598683
RU 649H IP1	7209.28	-100.72	1786.30	2143355.65	2849803.82	36.8894022	-107.4000276
RU 649H POE	7210.28	-310.18	693.34	2143141.30	2848711.81	36.8888270	-107.4037651

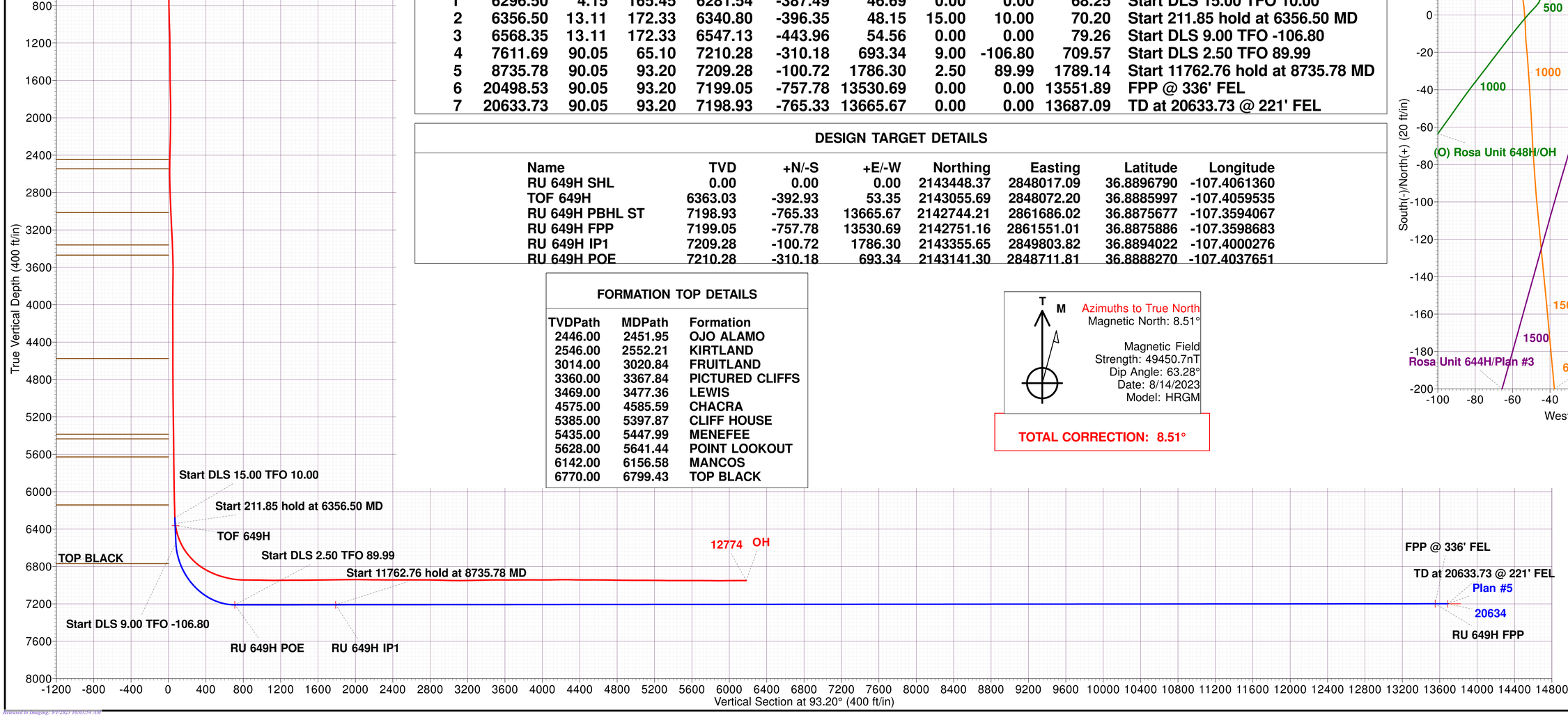
FORMATION TOP DETAILS

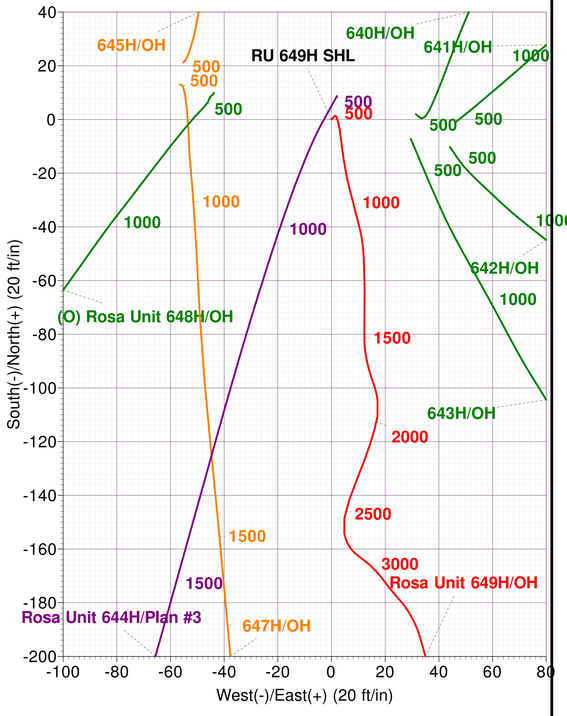
TVDPath	MDPath	Formation
2446.00	2451.95	OJO ALAMO
2546.00	2552.21	KIRTLAND
3014.00	3020.84	FRUITLAND
3360.00	3367.84	PICTURED CLIFFS
3469.00	3477.36	LEWIS
4575.00	4585.59	CHACRA
5385.00	5397.87	CLIFF HOUSE
5435.00	5447.99	MENEFEE
5628.00	5641.44	POINT LOOKOUT
6142.00	6156.58	MANCOS
6770.00	6799.43	TOP BLACK

Azimuths to True North
Magnetic North: 8.51°

Magnetic Field
Strength: 49450.7nT
Dip Angle: 63.28°
Date: 8/14/2023
Model: HRGM

TOTAL CORRECTION: 8.51°





Logos Operating LLC

Rio Arriba, NM NAD83
Rosa Unit 27
Rosa Unit 649H

ST01

Plan: Plan #5

Standard Planning Report

11 August, 2023

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 649H
Company:	Logos Operating LLC	**TVD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Project:	Rio Arriba, NM NAD83	**MD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	**North Reference:**	True
Well:	Rosa Unit 649H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ST01		
Design:	Plan #5		

Project Rio Arriba, NM NAD83

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

Site Rosa Unit 27

Site Position:		**Northing:**	2,143,451.58 usft	**Latitude:**	36.8896880
From:	Lat/Long	**Easting:**	2,848,002.44 usft	**Longitude:**	-107.4061860
Position Uncertainty:	0.00 ft	**Slot Radius:**	13-3/16 "		

Well Rosa Unit 649H

Well Position	**+N/-S**	0.00 ft	**Northing:**	2,143,448.37 usft	**Latitude:**	36.8896790
	+E/-W	0.00 ft	**Easting:**	2,848,017.09 usft	**Longitude:**	-107.4061360
Position Uncertainty		0.00 ft	**Wellhead Elevation:**	ft	**Ground Level:**	6,305.00 ft
Grid Convergence:		0.26 °				

Wellbore ST01

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HRGM	8/14/2023	8.51	63.28	49,450.70078844

Design Plan #5

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	6,296.50

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	93.20

Plan Survey Tool Program **Date** 8/11/2023

	Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	6,296.50	20,633.73	Plan #5 (ST01)	MWD+HRGM+MS	
				MWD + HRGM + Multi-Station	

Plan Sections

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
6,296.50	4.15	165.45	6,281.54	-387.49	46.69	0.00	0.00	0.00	0.00	
6,356.50	13.11	172.33	6,340.80	-396.35	48.15	15.00	14.93	11.47	10.00	
6,568.35	13.11	172.33	6,547.13	-443.96	54.56	0.00	0.00	0.00	0.00	
7,611.69	90.05	65.10	7,210.28	-310.18	693.34	9.00	7.37	-10.28	-106.80	
8,735.78	90.05	93.20	7,209.28	-100.72	1,786.30	2.50	0.00	2.50	89.99	
20,633.73	90.05	93.20	7,198.93	-765.33	13,665.67	0.00	0.00	0.00	0.00	RU 649H PBHL ST

SDT

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Company:	Logos Operating LLC	**TVD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Project:	Rio Arriba, NM NAD83	**MD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	**North Reference:**	True
Well:	Rosa Unit 649H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ST01		
Design:	Plan #5		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	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
398.50	0.53	40.97	398.49	1.39	1.21	1.13	0.13	0.13	0.00
488.50	0.80	152.46	488.49	1.15	1.77	1.71	1.23	0.30	123.88
583.50	2.12	166.00	583.46	-1.14	2.50	2.56	1.43	1.39	14.25
678.50	3.36	172.64	678.35	-5.61	3.29	3.59	1.35	1.31	6.99
770.50	4.16	172.29	770.15	-11.59	4.08	4.72	0.87	0.87	-0.38
860.50	4.94	170.05	859.86	-18.64	5.19	6.22	0.89	0.87	-2.49
957.50	5.65	165.31	956.45	-27.38	7.12	8.64	0.86	0.73	-4.89
1,082.50	6.42	165.87	1,080.76	-40.10	10.39	12.61	0.62	0.62	0.45
1,177.50	6.11	177.33	1,175.19	-50.31	11.92	14.71	1.35	-0.33	12.06
1,305.50	5.25	179.24	1,302.56	-62.97	12.31	15.81	0.69	-0.67	1.49
1,400.50	5.71	181.19	1,397.13	-72.04	12.27	16.27	0.52	0.48	2.05
1,495.50	4.64	179.55	1,491.74	-80.61	12.20	16.68	1.14	-1.13	-1.73
1,591.50	3.14	170.72	1,587.52	-87.08	12.66	17.50	1.68	-1.56	-9.20
1,686.50	3.21	165.89	1,682.37	-92.23	13.73	18.85	0.29	0.07	-5.08
1,781.50	4.23	160.16	1,777.17	-98.11	15.56	21.02	1.14	1.07	-6.03
1,877.50	3.94	173.07	1,872.93	-104.71	17.16	22.98	1.00	-0.30	13.45
1,971.50	3.29	189.53	1,966.74	-110.58	17.11	23.25	1.30	-0.69	17.51
2,066.50	3.08	195.75	2,061.60	-115.72	15.96	22.40	0.43	-0.22	6.55
2,161.50	3.51	198.47	2,156.44	-120.94	14.35	21.08	0.48	0.45	2.86
2,257.50	4.55	200.21	2,252.20	-127.30	12.10	19.19	1.09	1.08	1.81
2,352.50	4.84	202.09	2,346.88	-134.55	9.29	16.79	0.35	0.31	1.98
2,447.50	4.51	198.79	2,441.57	-141.80	6.58	14.49	0.45	-0.35	-3.47
2,542.50	3.88	190.41	2,536.31	-148.49	4.80	13.08	0.92	-0.66	-8.82
2,637.50	3.21	167.84	2,631.14	-154.26	4.78	13.38	1.62	-0.71	-23.76
2,733.50	2.49	149.26	2,727.02	-158.68	6.41	15.26	1.21	-0.75	-19.35
2,828.50	2.66	129.79	2,821.92	-161.86	9.16	18.18	0.93	0.18	-20.49
2,923.50	2.92	127.14	2,916.81	-164.73	12.78	21.96	0.31	0.27	-2.79
3,018.50	3.42	137.77	3,011.67	-168.29	16.62	25.98	0.81	0.53	11.19
3,114.50	3.93	143.60	3,107.47	-173.06	20.49	30.12	0.66	0.53	6.07
3,209.50	4.37	137.46	3,202.22	-178.35	24.87	34.79	0.66	0.46	-6.46
3,304.50	4.99	149.61	3,296.91	-184.58	29.41	39.67	1.23	0.65	12.79
3,400.50	5.34	162.96	3,392.52	-192.45	32.83	43.52	1.30	0.36	13.91
3,495.50	6.12	165.01	3,487.04	-201.57	35.44	46.63	0.85	0.82	2.16
3,590.50	4.91	174.78	3,581.60	-210.51	37.11	48.81	1.61	-1.27	10.28
3,685.50	3.93	191.15	3,676.32	-217.75	36.86	48.95	1.67	-1.03	17.23
3,780.50	4.10	196.79	3,771.09	-224.20	35.24	47.70	0.45	0.18	5.94
3,876.50	3.06	193.45	3,866.90	-229.98	33.66	46.44	1.10	-1.08	-3.48
3,971.50	2.66	185.04	3,961.78	-234.64	32.87	45.92	0.61	-0.42	-8.85
4,066.50	2.57	179.51	4,056.69	-238.96	32.70	45.99	0.28	-0.09	-5.82
4,161.50	2.56	170.83	4,151.59	-243.19	33.05	46.58	0.41	-0.01	-9.14
4,256.50	2.92	180.95	4,246.48	-247.70	33.35	47.13	0.63	0.38	10.65
4,352.50	3.27	183.78	4,342.34	-252.88	33.13	47.20	0.40	0.36	2.95
4,447.50	3.46	178.99	4,437.18	-258.45	33.00	47.38	0.36	0.20	-5.04
4,541.50	3.63	183.58	4,531.00	-264.25	32.87	47.57	0.35	0.18	4.88
4,637.50	3.78	184.40	4,626.80	-270.44	32.44	47.48	0.17	0.16	0.85
4,732.50	3.75	180.15	4,721.59	-276.67	32.19	47.58	0.30	-0.03	-4.47
4,826.50	4.11	178.92	4,815.37	-283.11	32.24	48.00	0.39	0.38	-1.31
4,921.50	4.24	176.26	4,910.12	-290.02	32.54	48.67	0.25	0.14	-2.80
5,016.50	4.28	176.43	5,004.86	-297.06	32.99	49.52	0.04	0.04	0.18
5,114.50	4.65	173.50	5,102.56	-304.66	33.66	50.62	0.44	0.38	-2.99
5,209.50	5.01	175.40	5,197.22	-312.62	34.43	51.83	0.41	0.38	2.00
5,304.50	4.65	172.07	5,291.89	-320.57	35.30	53.14	0.48	-0.38	-3.51
5,368.50	4.07	172.44	5,355.70	-325.39	35.95	54.06	0.91	-0.91	0.58

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Project:	Rio Arriba, NM NAD83	**MD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	**North Reference:**	True
Well:	Rosa Unit 649H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ST01		
Design:	Plan #5		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,463.50	3.87	174.59	5,450.47	-331.93	36.70	55.17	0.26	-0.21	2.26
5,526.50	3.95	174.25	5,513.33	-336.20	37.12	55.83	0.13	0.13	-0.54
5,590.50	3.83	175.41	5,577.18	-340.52	37.51	56.46	0.22	-0.19	1.81
5,653.50	4.00	176.52	5,640.03	-344.82	37.81	57.00	0.30	0.27	1.76
5,717.50	3.98	175.08	5,703.88	-349.26	38.14	57.57	0.16	-0.03	-2.25
5,781.50	3.84	171.79	5,767.73	-353.59	38.63	58.31	0.41	-0.22	-5.14
5,844.50	3.39	170.23	5,830.60	-357.51	39.25	59.14	0.73	-0.71	-2.48
5,908.50	3.56	169.95	5,894.48	-361.34	39.92	60.03	0.27	0.27	-0.44
5,971.50	3.72	167.90	5,957.36	-365.26	40.69	61.01	0.33	0.25	-3.25
6,035.50	3.88	167.25	6,021.22	-369.40	41.60	62.16	0.26	0.25	-1.02
6,098.50	4.02	167.15	6,084.07	-373.63	42.56	63.35	0.22	0.22	-0.16
6,162.50	4.18	158.16	6,147.90	-377.99	43.93	64.96	1.03	0.25	-14.05
6,225.50	4.32	165.49	6,210.73	-382.41	45.38	66.65	0.89	0.22	11.63
6,296.50	4.15	165.45	6,281.54	-387.49	46.69	68.25	0.24	-0.24	-0.06
Start DLS 15.00 TFO 10.00									
6,300.00	4.67	166.57	6,285.03	-387.75	46.76	68.33	15.00	14.80	32.01
6,325.00	8.39	170.54	6,309.86	-390.54	47.29	69.02	15.00	14.90	15.87
6,350.00	12.13	172.07	6,334.46	-394.94	47.96	69.93	15.00	14.96	6.14
6,356.50	13.11	172.33	6,340.80	-396.35	48.15	70.20	15.00	14.98	3.95
Start 211.85 hold at 6356.50 MD									
6,400.00	13.11	172.33	6,383.17	-406.13	49.47	72.06	0.00	0.00	0.00
6,500.00	13.11	172.33	6,480.56	-428.60	52.49	76.33	0.00	0.00	0.00
6,568.35	13.11	172.33	6,547.13	-443.96	54.56	79.26	0.00	0.00	0.00
Start DLS 9.00 TFO -106.80									
6,600.00	12.58	159.71	6,577.99	-450.75	56.23	81.31	9.00	-1.67	-39.87
6,650.00	13.01	139.38	6,626.78	-460.13	61.79	87.38	9.00	0.86	-40.66
6,700.00	14.84	122.19	6,675.33	-467.82	70.88	96.88	9.00	3.66	-34.37
6,750.00	17.63	109.51	6,723.34	-473.76	83.44	109.75	9.00	5.59	-25.37
6,799.43	20.97	100.58	6,770.00	-477.89	99.20	125.72	9.00	6.75	-18.08
TOP BLACK									
6,800.00	21.01	100.49	6,770.53	-477.93	99.40	125.92	9.00	7.16	-15.22
6,850.00	24.74	93.97	6,816.60	-480.29	118.66	145.29	9.00	7.45	-13.04
6,900.00	28.67	89.11	6,861.26	-480.82	141.10	167.72	9.00	7.87	-9.73
6,950.00	32.75	85.34	6,904.24	-479.54	166.59	193.10	9.00	8.14	-7.53
7,000.00	36.91	82.34	6,945.28	-476.44	194.96	221.25	9.00	8.32	-6.01
7,050.00	41.13	79.87	6,984.12	-471.54	226.04	252.01	9.00	8.45	-4.94
7,100.00	45.40	77.78	7,020.53	-464.87	259.64	285.19	9.00	8.54	-4.17
7,150.00	49.70	75.98	7,054.27	-456.48	295.55	320.58	9.00	8.60	-3.60
7,200.00	54.02	74.40	7,085.14	-446.42	333.56	357.96	9.00	8.65	-3.16
7,250.00	58.37	72.99	7,112.96	-434.75	373.42	397.10	9.00	8.69	-2.83
7,300.00	62.72	71.70	7,137.54	-421.53	414.89	437.77	9.00	8.72	-2.58
7,350.00	67.09	70.50	7,158.74	-406.86	457.72	479.71	9.00	8.74	-2.38
7,400.00	71.47	69.39	7,176.43	-390.82	501.63	522.67	9.00	8.75	-2.23
7,450.00	75.85	68.32	7,190.49	-373.51	546.37	566.37	9.00	8.77	-2.12
7,500.00	80.24	67.30	7,200.84	-355.04	591.65	610.55	9.00	8.78	-2.04
7,550.00	84.63	66.31	7,207.42	-335.53	637.20	654.93	9.00	8.78	-1.99
7,600.00	89.02	65.33	7,210.19	-315.08	682.73	699.25	9.00	8.78	-1.96
7,611.69	90.05	65.10	7,210.28	-310.18	693.34	709.57	9.00	8.79	-1.95
Start DLS 2.50 TFO 89.99									
7,700.00	90.05	67.31	7,210.21	-274.55	774.14	788.26	2.50	0.00	2.50
7,800.00	90.05	69.81	7,210.12	-238.00	867.21	879.14	2.50	0.00	2.50
7,900.00	90.05	72.31	7,210.03	-205.54	961.79	971.76	2.50	0.00	2.50
8,000.00	90.05	74.81	7,209.94	-177.24	1,057.69	1,065.93	2.50	0.00	2.50

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Project:	Rio Arriba, NM NAD83	**MD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	**North Reference:**	True
Well:	Rosa Unit 649H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ST01		
Design:	Plan #5		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,100.00	90.05	77.31	7,209.85	-153.14	1,154.73	1,161.48	2.50	0.00	2.50
8,200.00	90.05	79.81	7,209.76	-133.31	1,252.74	1,258.23	2.50	0.00	2.50
8,300.00	90.05	82.31	7,209.67	-117.77	1,351.52	1,355.98	2.50	0.00	2.50
8,400.00	90.05	84.81	7,209.58	-106.55	1,450.88	1,454.56	2.50	0.00	2.50
8,500.00	90.05	87.31	7,209.49	-99.67	1,550.63	1,553.78	2.50	0.00	2.50
8,600.00	90.05	89.81	7,209.40	-97.15	1,650.59	1,653.44	2.50	0.00	2.50
8,700.00	90.05	92.31	7,209.32	-99.00	1,750.57	1,753.36	2.50	0.00	2.50
8,735.78	90.05	93.20	7,209.28	-100.72	1,786.30	1,789.14	2.50	0.00	2.50
Start 11897.95 hold at 8735.78 MD									
8,800.00	90.05	93.20	7,209.23	-104.31	1,850.43	1,853.36	0.00	0.00	0.00
8,900.00	90.05	93.20	7,209.14	-109.89	1,950.27	1,953.36	0.00	0.00	0.00
9,000.00	90.05	93.20	7,209.05	-115.48	2,050.11	2,053.36	0.00	0.00	0.00
9,100.00	90.05	93.20	7,208.97	-121.07	2,149.96	2,153.36	0.00	0.00	0.00
9,200.00	90.05	93.20	7,208.88	-126.65	2,249.80	2,253.36	0.00	0.00	0.00
9,300.00	90.05	93.20	7,208.79	-132.24	2,349.64	2,353.36	0.00	0.00	0.00
9,400.00	90.05	93.20	7,208.71	-137.82	2,449.49	2,453.36	0.00	0.00	0.00
9,500.00	90.05	93.20	7,208.62	-143.41	2,549.33	2,553.36	0.00	0.00	0.00
9,600.00	90.05	93.20	7,208.53	-149.00	2,649.18	2,653.36	0.00	0.00	0.00
9,700.00	90.05	93.20	7,208.45	-154.58	2,749.02	2,753.36	0.00	0.00	0.00
9,800.00	90.05	93.20	7,208.36	-160.17	2,848.86	2,853.36	0.00	0.00	0.00
9,900.00	90.05	93.20	7,208.27	-165.75	2,948.71	2,953.36	0.00	0.00	0.00
10,000.00	90.05	93.20	7,208.18	-171.34	3,048.55	3,053.36	0.00	0.00	0.00
10,100.00	90.05	93.20	7,208.10	-176.93	3,148.40	3,153.36	0.00	0.00	0.00
10,200.00	90.05	93.20	7,208.01	-182.51	3,248.24	3,253.36	0.00	0.00	0.00
10,300.00	90.05	93.20	7,207.92	-188.10	3,348.08	3,353.36	0.00	0.00	0.00
10,400.00	90.05	93.20	7,207.84	-193.68	3,447.93	3,453.36	0.00	0.00	0.00
10,500.00	90.05	93.20	7,207.75	-199.27	3,547.77	3,553.36	0.00	0.00	0.00
10,600.00	90.05	93.20	7,207.66	-204.85	3,647.61	3,653.36	0.00	0.00	0.00
10,700.00	90.05	93.20	7,207.57	-210.44	3,747.46	3,753.36	0.00	0.00	0.00
10,800.00	90.05	93.20	7,207.49	-216.03	3,847.30	3,853.36	0.00	0.00	0.00
10,900.00	90.05	93.20	7,207.40	-221.61	3,947.15	3,953.36	0.00	0.00	0.00
11,000.00	90.05	93.20	7,207.31	-227.20	4,046.99	4,053.36	0.00	0.00	0.00
11,100.00	90.05	93.20	7,207.23	-232.78	4,146.83	4,153.36	0.00	0.00	0.00
11,200.00	90.05	93.20	7,207.14	-238.37	4,246.68	4,253.36	0.00	0.00	0.00
11,300.00	90.05	93.20	7,207.05	-243.96	4,346.52	4,353.36	0.00	0.00	0.00
11,400.00	90.05	93.20	7,206.97	-249.54	4,446.37	4,453.36	0.00	0.00	0.00
11,500.00	90.05	93.20	7,206.88	-255.13	4,546.21	4,553.36	0.00	0.00	0.00
11,600.00	90.05	93.20	7,206.79	-260.71	4,646.05	4,653.36	0.00	0.00	0.00
11,700.00	90.05	93.20	7,206.70	-266.30	4,745.90	4,753.36	0.00	0.00	0.00
11,800.00	90.05	93.20	7,206.62	-271.89	4,845.74	4,853.36	0.00	0.00	0.00
11,900.00	90.05	93.20	7,206.53	-277.47	4,945.58	4,953.36	0.00	0.00	0.00
12,000.00	90.05	93.20	7,206.44	-283.06	5,045.43	5,053.36	0.00	0.00	0.00
12,100.00	90.05	93.20	7,206.36	-288.64	5,145.27	5,153.36	0.00	0.00	0.00
12,200.00	90.05	93.20	7,206.27	-294.23	5,245.12	5,253.36	0.00	0.00	0.00
12,300.00	90.05	93.20	7,206.18	-299.82	5,344.96	5,353.36	0.00	0.00	0.00
12,400.00	90.05	93.20	7,206.10	-305.40	5,444.80	5,453.36	0.00	0.00	0.00
12,500.00	90.05	93.20	7,206.01	-310.99	5,544.65	5,553.36	0.00	0.00	0.00
12,600.00	90.05	93.20	7,205.92	-316.57	5,644.49	5,653.36	0.00	0.00	0.00
12,700.00	90.05	93.20	7,205.83	-322.16	5,744.33	5,753.36	0.00	0.00	0.00
12,800.00	90.05	93.20	7,205.75	-327.75	5,844.18	5,853.36	0.00	0.00	0.00
12,900.00	90.05	93.20	7,205.66	-333.33	5,944.02	5,953.36	0.00	0.00	0.00
13,000.00	90.05	93.20	7,205.57	-338.92	6,043.87	6,053.36	0.00	0.00	0.00
13,100.00	90.05	93.20	7,205.49	-344.50	6,143.71	6,153.36	0.00	0.00	0.00
13,200.00	90.05	93.20	7,205.40	-350.09	6,243.55	6,253.36	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 649H
Company:	Logos Operating LLC	**TVD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Project:	Rio Arriba, NM NAD83	**MD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	**North Reference:**	True
Well:	Rosa Unit 649H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ST01		
Design:	Plan #5		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,300.00	90.05	93.20	7,205.31	-355.68	6,343.40	6,353.36	0.00	0.00	0.00
13,400.00	90.05	93.20	7,205.23	-361.26	6,443.24	6,453.36	0.00	0.00	0.00
13,500.00	90.05	93.20	7,205.14	-366.85	6,543.09	6,553.36	0.00	0.00	0.00
13,600.00	90.05	93.20	7,205.05	-372.43	6,642.93	6,653.36	0.00	0.00	0.00
13,700.00	90.05	93.20	7,204.96	-378.02	6,742.77	6,753.36	0.00	0.00	0.00
13,800.00	90.05	93.20	7,204.88	-383.60	6,842.62	6,853.36	0.00	0.00	0.00
13,900.00	90.05	93.20	7,204.79	-389.19	6,942.46	6,953.36	0.00	0.00	0.00
14,000.00	90.05	93.20	7,204.70	-394.78	7,042.30	7,053.36	0.00	0.00	0.00
14,100.00	90.05	93.20	7,204.62	-400.36	7,142.15	7,153.36	0.00	0.00	0.00
14,200.00	90.05	93.20	7,204.53	-405.95	7,241.99	7,253.36	0.00	0.00	0.00
14,300.00	90.05	93.20	7,204.44	-411.53	7,341.84	7,353.36	0.00	0.00	0.00
14,400.00	90.05	93.20	7,204.35	-417.12	7,441.68	7,453.36	0.00	0.00	0.00
14,500.00	90.05	93.20	7,204.27	-422.71	7,541.52	7,553.36	0.00	0.00	0.00
14,600.00	90.05	93.20	7,204.18	-428.29	7,641.37	7,653.36	0.00	0.00	0.00
14,700.00	90.05	93.20	7,204.09	-433.88	7,741.21	7,753.36	0.00	0.00	0.00
14,800.00	90.05	93.20	7,204.01	-439.46	7,841.06	7,853.36	0.00	0.00	0.00
14,900.00	90.05	93.20	7,203.92	-445.05	7,940.90	7,953.36	0.00	0.00	0.00
15,000.00	90.05	93.20	7,203.83	-450.64	8,040.74	8,053.36	0.00	0.00	0.00
15,100.00	90.05	93.20	7,203.75	-456.22	8,140.59	8,153.36	0.00	0.00	0.00
15,200.00	90.05	93.20	7,203.66	-461.81	8,240.43	8,253.36	0.00	0.00	0.00
15,300.00	90.05	93.20	7,203.57	-467.39	8,340.27	8,353.36	0.00	0.00	0.00
15,400.00	90.05	93.20	7,203.48	-472.98	8,440.12	8,453.36	0.00	0.00	0.00
15,500.00	90.05	93.20	7,203.40	-478.57	8,539.96	8,553.36	0.00	0.00	0.00
15,600.00	90.05	93.20	7,203.31	-484.15	8,639.81	8,653.36	0.00	0.00	0.00
15,700.00	90.05	93.20	7,203.22	-489.74	8,739.65	8,753.36	0.00	0.00	0.00
15,800.00	90.05	93.20	7,203.14	-495.32	8,839.49	8,853.36	0.00	0.00	0.00
15,900.00	90.05	93.20	7,203.05	-500.91	8,939.34	8,953.36	0.00	0.00	0.00
16,000.00	90.05	93.20	7,202.96	-506.50	9,039.18	9,053.36	0.00	0.00	0.00
16,100.00	90.05	93.20	7,202.88	-512.08	9,139.03	9,153.36	0.00	0.00	0.00
16,200.00	90.05	93.20	7,202.79	-517.67	9,238.87	9,253.36	0.00	0.00	0.00
16,300.00	90.05	93.20	7,202.70	-523.25	9,338.71	9,353.36	0.00	0.00	0.00
16,400.00	90.05	93.20	7,202.61	-528.84	9,438.56	9,453.36	0.00	0.00	0.00
16,500.00	90.05	93.20	7,202.53	-534.43	9,538.40	9,553.36	0.00	0.00	0.00
16,600.00	90.05	93.20	7,202.44	-540.01	9,638.24	9,653.36	0.00	0.00	0.00
16,700.00	90.05	93.20	7,202.35	-545.60	9,738.09	9,753.36	0.00	0.00	0.00
16,800.00	90.05	93.20	7,202.27	-551.18	9,837.93	9,853.36	0.00	0.00	0.00
16,900.00	90.05	93.20	7,202.18	-556.77	9,937.78	9,953.36	0.00	0.00	0.00
17,000.00	90.05	93.20	7,202.09	-562.36	10,037.62	10,053.36	0.00	0.00	0.00
17,100.00	90.05	93.20	7,202.01	-567.94	10,137.46	10,153.36	0.00	0.00	0.00
17,200.00	90.05	93.20	7,201.92	-573.53	10,237.31	10,253.36	0.00	0.00	0.00
17,300.00	90.05	93.20	7,201.83	-579.11	10,337.15	10,353.36	0.00	0.00	0.00
17,400.00	90.05	93.20	7,201.74	-584.70	10,436.99	10,453.36	0.00	0.00	0.00
17,500.00	90.05	93.20	7,201.66	-590.28	10,536.84	10,553.36	0.00	0.00	0.00
17,600.00	90.05	93.20	7,201.57	-595.87	10,636.68	10,653.36	0.00	0.00	0.00
17,700.00	90.05	93.20	7,201.48	-601.46	10,736.53	10,753.36	0.00	0.00	0.00
17,800.00	90.05	93.20	7,201.40	-607.04	10,836.37	10,853.36	0.00	0.00	0.00
17,900.00	90.05	93.20	7,201.31	-612.63	10,936.21	10,953.36	0.00	0.00	0.00
18,000.00	90.05	93.20	7,201.22	-618.21	11,036.06	11,053.36	0.00	0.00	0.00
18,100.00	90.05	93.20	7,201.14	-623.80	11,135.90	11,153.36	0.00	0.00	0.00
18,200.00	90.05	93.20	7,201.05	-629.39	11,235.75	11,253.36	0.00	0.00	0.00
18,300.00	90.05	93.20	7,200.96	-634.97	11,335.59	11,353.36	0.00	0.00	0.00
18,400.00	90.05	93.20	7,200.87	-640.56	11,435.43	11,453.36	0.00	0.00	0.00
18,500.00	90.05	93.20	7,200.79	-646.14	11,535.28	11,553.36	0.00	0.00	0.00
18,600.00	90.05	93.20	7,200.70	-651.73	11,635.12	11,653.36	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 649H
Company:	Logos Operating LLC	**TVD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Project:	Rio Arriba, NM NAD83	**MD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	**North Reference:**	True
Well:	Rosa Unit 649H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ST01		
Design:	Plan #5		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,700.00	90.05	93.20	7,200.61	-657.32	11,734.96	11,753.36	0.00	0.00	0.00
18,800.00	90.05	93.20	7,200.53	-662.90	11,834.81	11,853.36	0.00	0.00	0.00
18,900.00	90.05	93.20	7,200.44	-668.49	11,934.65	11,953.36	0.00	0.00	0.00
19,000.00	90.05	93.20	7,200.35	-674.07	12,034.50	12,053.36	0.00	0.00	0.00
19,100.00	90.05	93.20	7,200.26	-679.66	12,134.34	12,153.36	0.00	0.00	0.00
19,200.00	90.05	93.20	7,200.18	-685.25	12,234.18	12,253.36	0.00	0.00	0.00
19,300.00	90.05	93.20	7,200.09	-690.83	12,334.03	12,353.36	0.00	0.00	0.00
19,400.00	90.05	93.20	7,200.00	-696.42	12,433.87	12,453.36	0.00	0.00	0.00
19,500.00	90.05	93.20	7,199.92	-702.00	12,533.72	12,553.36	0.00	0.00	0.00
19,600.00	90.05	93.20	7,199.83	-707.59	12,633.56	12,653.36	0.00	0.00	0.00
19,700.00	90.05	93.20	7,199.74	-713.18	12,733.40	12,753.36	0.00	0.00	0.00
19,800.00	90.05	93.20	7,199.66	-718.76	12,833.25	12,853.36	0.00	0.00	0.00
19,900.00	90.05	93.20	7,199.57	-724.35	12,933.09	12,953.36	0.00	0.00	0.00
20,000.00	90.05	93.20	7,199.48	-729.93	13,032.93	13,053.36	0.00	0.00	0.00
20,100.00	90.05	93.20	7,199.39	-735.52	13,132.78	13,153.36	0.00	0.00	0.00
20,200.00	90.05	93.20	7,199.31	-741.11	13,232.62	13,253.36	0.00	0.00	0.00
20,300.00	90.05	93.20	7,199.22	-746.69	13,332.47	13,353.36	0.00	0.00	0.00
20,400.00	90.05	93.20	7,199.13	-752.28	13,432.31	13,453.36	0.00	0.00	0.00
20,500.00	90.05	93.20	7,199.05	-757.86	13,532.15	13,553.36	0.00	0.00	0.00
20,600.00	90.05	93.20	7,198.96	-763.45	13,632.00	13,653.36	0.00	0.00	0.00
20,633.73	90.05	93.20	7,198.93	-765.33	13,665.67	13,687.09	0.00	0.00	0.00
TD at 20633.73									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
RU 649H SHL - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	2,143,448.37	2,848,017.09	36.8896790	-107.4061360
TOF 649H - plan misses target center by 9.51ft at 6377.54ft MD (6361.29 TVD, -401.08 N, 48.79 E) - Point	0.00	0.00	6,363.03	-392.93	53.35	2,143,055.69	2,848,072.20	36.8885997	-107.4059536
RU 649H PBHL ST - plan hits target center - Point	0.00	0.00	7,198.93	-765.33	13,665.67	2,142,744.21	2,861,686.03	36.8875676	-107.3594068
RU 649H POE - plan misses target center by 131.08ft at 7978.64ft MD (7209.96 TVD, -182.93 N, 1037.10 E) - Point	0.00	0.00	7,210.00	-57.21	1,000.00	2,143,395.63	2,849,017.33	36.8895218	-107.4027165

SDT

Planning Report

Database:	EDM 5000 Multi User Db	**Local Co-ordinate Reference:**	Well Rosa Unit 649H
Company:	Logos Operating LLC	**TVD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Project:	Rio Arriba, NM NAD83	**MD Reference:**	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	**North Reference:**	True
Well:	Rosa Unit 649H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	ST01		
Design:	Plan #5		

Formations

Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,451.95	2,446.00	OJO ALAMO			
2,552.21	2,546.00	KIRTLAND			
3,020.84	3,014.00	FRUITLAND			
3,367.84	3,360.00	PICTURED CLIFFS			
3,477.36	3,469.00	LEWIS			
4,585.59	4,575.00	CHACRA			
5,397.87	5,385.00	CLIFF HOUSE			
5,447.99	5,435.00	MENEFEE			
5,641.44	5,628.00	POINT LOOKOUT			
6,156.58	6,142.00	MANCOS			
6,799.43	6,770.00	TOP BLACK			

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
6,296.50	6,281.54	-387.49	46.69	Start DLS 15.00 TFO 10.00
6,356.50	6,340.80	-396.35	48.15	Start 211.85 hold at 6356.50 MD
6,568.35	6,547.13	-443.96	54.56	Start DLS 9.00 TFO -106.80
7,611.69	7,210.28	-310.18	693.34	Start DLS 2.50 TFO 89.99
8,735.78	7,209.28	-100.72	1,786.30	Start 11897.95 hold at 8735.78 MD
20,633.73	7,198.93	-765.33	13,665.67	TD at 20633.73

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

CONDITIONS

Action 258126

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 258126
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	NM OCD will require a 200' overlap for the TOC inside the production/intermediate casing annulus.	9/1/2023
ward.rikala	As drilled survey, GR, and CBL must be submitted to NM OCD.	9/1/2023