

Form 3160-5
(June 2019)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM 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.5. Lease Serial No.
NMSF078769
6. If Indian, Allottee or Tribe Name**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other

2. Name of Operator

LOGOS OPERATING, LLC

3a. Address 2010 AFTON PLACE
FARMINGTON, NM 874013b. Phone No. (include area code)
(505) 278-8720

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SEC 19 T31N R05W NENW (C) 965 FNL 480 FWL

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

NMNM78407E

8. Well Name and No.

ROSA UNIT 649H

9. API Well No.

30-039-31410

10. Field and Pool or Exploratory Area

BASIN MANCOS

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 recompleat 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 recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

LOGOS Operating request a change in plans for the following:

Original TD @ 20,308' MD 6,964' TVD to new **TD @ 20,574' MD 6,964' TVD**

Geology tops have been updated per changes.

Original Landing point @ 7,324' MD 6,942' TVD to new **Landing point @ 7,888' MD 7,200' TVD**Original 5.5" casing Production @ 20,308' MD to new **Production 5.5" casing @ 20,574' MD 6964' 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 3/08/2023

THE SPACE FOR FEDERAL OR STATE OFFICE 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 any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)

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-MANCOS PA	Unit or CA Number: NMNM78407E
US Well Number: 300393141000X1	Well Status: Drilling Well	Operator: LOGOS OPERATING LLC

Notice of Intent

Sundry ID: 2719641

Type of Submission: Notice of Intent

Type of Action: Other

Date Sundry Submitted: 03/08/2023

Time Sundry Submitted: 10:29

Date proposed operation will begin: 04/03/2023

Procedure Description: LOGOS Operating request a change in plans for the following: Original TD @ 20,308' MD 6,964' TVD to new TD @ 20,574' MD 6,964' TVD Geology tops have been updated per changes. Original Landing point @ 7,324' MD 6,942' TVD to new Landing point @ 7,888' MD 7,200' TVD TVD Original 5.5" casing Production @ 20,308' MD to new Production 5.5" casing @ 20,574' MD 6964' 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_4__20230308_20230308102431.pdf

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-MANCOS PA	Unit or CA Number: NMNM78407E
US Well Number: 300393141000X1	Well Status: Drilling Well	Operator: LOGOS OPERATING LLC

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: MAR 08, 2023 10:25 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: KENNETH G RENNICK
BLM POC Title: Petroleum Engineer
BLM POC Phone: 5055647742
BLM POC Email Address: krennick@blm.gov
Disposition: Approved
Disposition Date: 03/09/2023
Signature: Kenneth Rennick

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

Form C-102
Revised August 1, 2011

Submit one copy to
Appropriate District Office

OIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505

☒ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-31410	² Pool Code 97232	³ Pool Name BASIN MANCOS
⁴ Property Code 320608	⁵ Property Name ROSA UNIT	⁶ Well Number 649H ST1
⁷ GRID No. 289408	⁸ Operator Name LOGOS OPERATING, LLC	⁹ Elevation 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		1620	NORTH	217	EAST	RIO ARriba
¹² Dedicated Acres 872.01	N/2 - Sections 19, 20, 21, T31N, R5W					¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. 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 12/19/2022
Signature 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: DECEMBER 16, 2022
Date of Survey: JANUARY 2, 2015

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

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

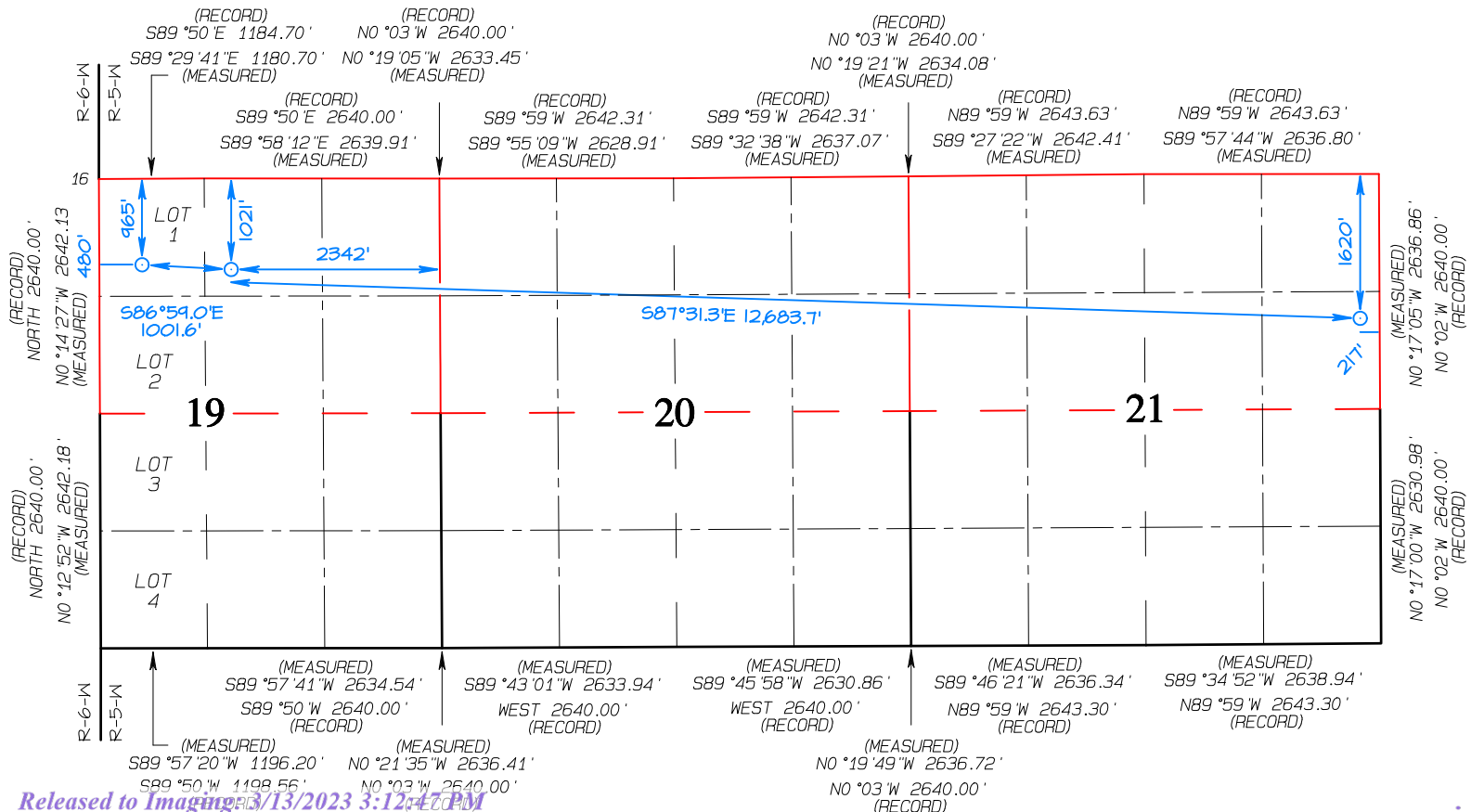
FIRST TAKE POINT
1021' FNL 2342' FEL
SECTION 19, T31N, R5W
LAT: 36.889516°N
LONG: 107.402114°W
DATUM: NAD1927

LAT: 36.889679°N
LONG: 107.406136°W
DATUM: NAD1983

LAT: 36.889522°N
LONG: 107.402716°W
DATUM: NAD1983

LAST TAKE POINT
1620' FNL 217' FEL
SECTION 21, T31N, R5W
LAT: 36.887844°N
LONG: 107.358793°W
DATUM: NAD1927

LAT: 36.887851°N
LONG: 107.359394°W
DATUM: NAD1983





LOGOS Operating, LLC Operations Plan

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

Date:	March 3, 2023	Pool:	Basin Mancos
Well Name:	Rosa Unit 649H	GL Elevation:	6,305'
Surface Location:	Sec 19, T31N, R5W 965 FNL, 480 FWL (36.889679° N, 107.406136° W – NAD83)	Measured Depth:	20,574' (KB)
Bottom Hole Location:	Sec 21, T31N, R5W 1620 FNL, 217 FEL (36.887851° N, 107.359394° W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF078769, CA Serial #NMNM78407E

I. GEOLOGY

A. Prognosis Formation Tops (Based on 25' KB Elevation): Estimated top of important geological markers:
SURFACE FORMATION – NACIMIENTO

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2447	2441	*POINT LOOKOUT	5637	5623
KIRTLAND	2547	2541	*MANCOS	6151	6137
*FRUITLAND	3015	3009	KICKOFF POINT	6323	6308
*PICTURED CLIFFS	3363	3355	LANDING POINT	7888	7200
LEWIS	3472	3464			
CHACRA	4580	4570			
*CLIFF HOUSE	5393	5380			
MENEFEE	5443	5430	TD	20574	6964

* 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 NMOC 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 was set 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. The lateral will be re-drilled to total depth and run and cement 5.5" casing +/- 20,574'.

ROSA UNIT 649H



- 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 6.5-13 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 to **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 each tour. BOP equipment will be tested 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 or but not more than once a day. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE. **All tests and inspections will be recorded and logged with time and results.** A full BOP test will be conducted when initially 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 first full test.
- C. **GeoHazards:** There are no Geohazards
- D. **Maximum Anticipated Pressure:** 7200' TVD x 0.43 = 3096 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	OHSIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	17.5"	322'	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,221'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	20,574'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

NOTE: All casing depths are approximate, based on KB elevation (25') 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:** 13-3/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (3) joints of Surface Casing.
2. **INTERMEDIATE CASING:** 9-5/8" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3)

ROSA UNIT 649H



joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. Optional use of DV Tools (2) will be strategically placed above loss circulation zones anticipated in the Mesaverde and Fruitland Coal. Optional use of cancellation plugs for DV tools may be used if losses while cementing are not encountered.

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:** Casing shall be set at ~ 320' and cemented to surface. TOC at Surface. 263 sks of 15.8 ppg Type Neat G, 1.18 cuft/sk yield or equivalent 223 sks of 14.6 ppg Type III with 1.39 cuft/sk yield, 30% excess.

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

2. **INTERMEDIATE:** Intermediate casing shall be kept fluid filled while running in to the hole to meet BLM minimum collapse requirements. The intermediate casing will be cemented in 2 or 3 stages using DV/STAGE tools in order to reduce cement losses and maximize cement coverage. Operator proposes optional DV tools above anticipated loss circulation zones in the Mesaverde and in the Fruitland coal. If losses are not observed during the second stage a cancellation plug will be pumped and the remaining cement will be pumped during stage 2. If cement does not circulate to the DV tool(s) or to surface, a CBL will be run to determine TOC.

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

	Top (ft)	Footage (ft)	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	5,820	471	0.31318	1.3	209	37	1.15	182	15.8
Stage 1 Lead	4,621	1,199	0.31318	1.3	488	87	2.30	212	12.0
					698	124		394	
Stage 2 Tail	3,871	750	0.31318	1.3	305	54	1.73	177	13.2
Stage 2 Lead	3,086	785	0.31318	1.3	320	57	2.30	139	12.0
					625	111		315	
Stage 3 Tail	2,636	450	0.31318	1.3	183	33	1.73	106	13.2
Stage 3 Lead	320	2,316	0.31318	1.3	943	168	2.30	410	12.0
Stage 3 Lead	-	320	0.36268	1	116	21	2.30	50	12.0
					1,242	221		566	
All Stage Totals					2,565	457		1,276	

Calculations based on 30% excess for open hole and cement to surface. Actual excess pumped will be determined by well conditions.

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 (ft ³ /ft) Annular Capacity	Excess (15%)	Total (ft ³)	Total (bbl)	Slurry Yield (ft ³ /sk)	Sacks Cement	Density (PPG)
Cased Lead	6,121	100	0.2531	1	25	5	1.53	17	13
Open Hole Lead	6,221	14,353	0.2291	1.15	3,792	675	1.53	2,478	13
					3,817	680		2,495	

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 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 service provider selected. Cement yields may change depending on 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 1584 psi (0.22 psi/ft * 7200' 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.

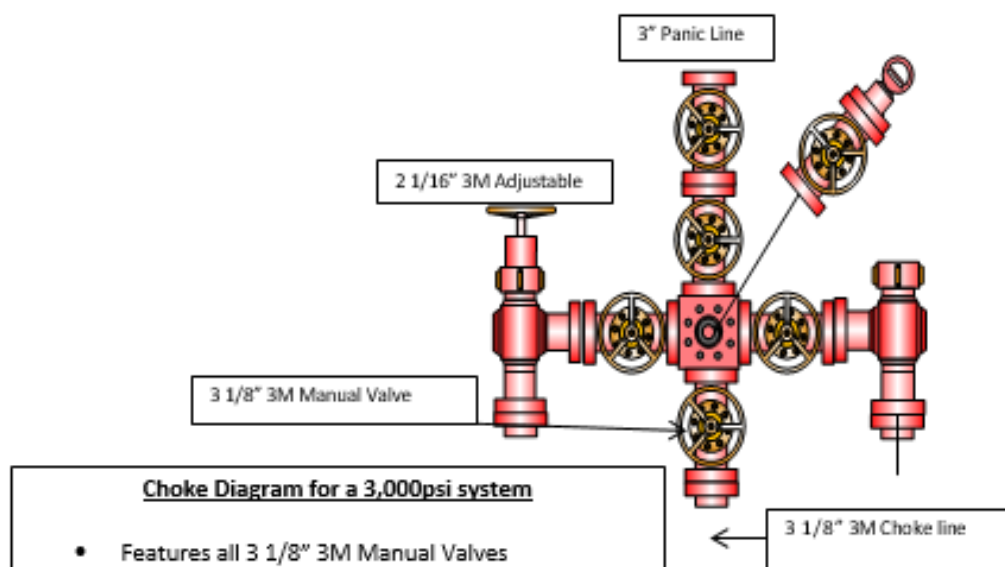
E. PRODUCTION TUBING

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.

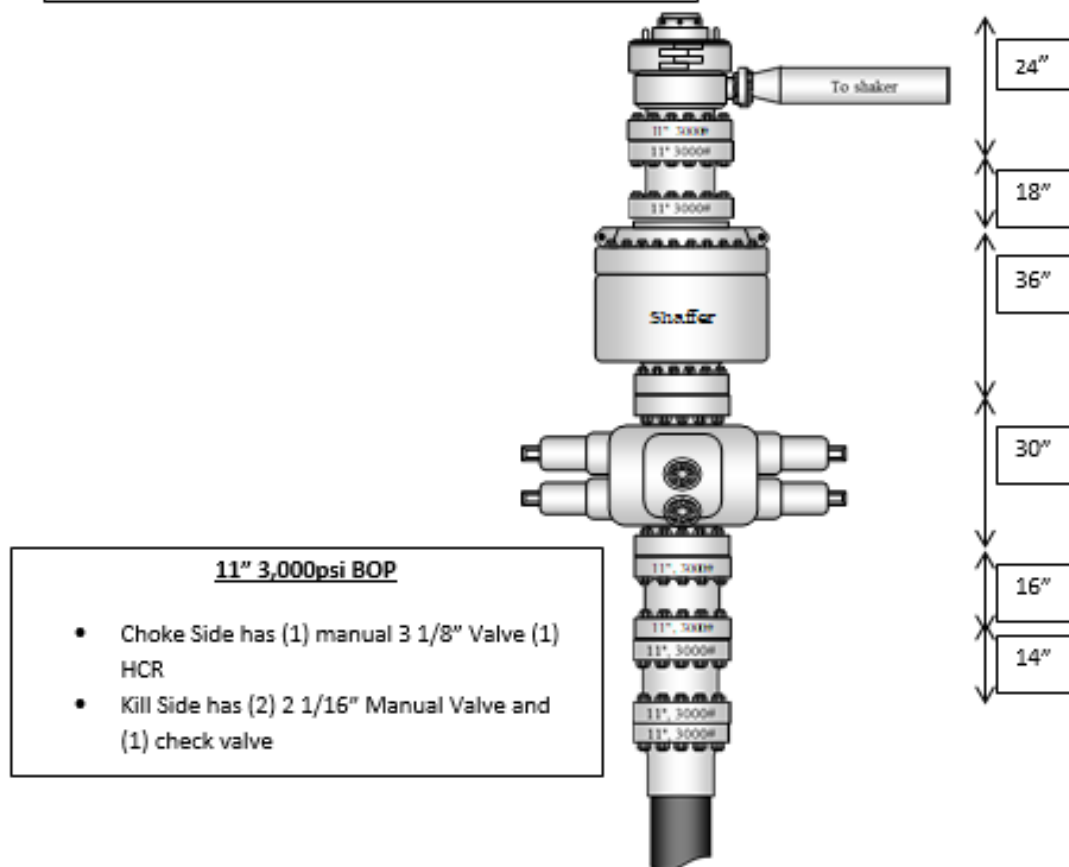


3M 11" B.O.P.E Diagram



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



ROSA UNIT 649H



Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 649H

ST1

Plan #4

Anticollision Summary Report

14 December, 2022





Lonestar Consulting, LLC

Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Reference Site:	Rosa Unit 27	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	ST1	Database:	Grand Junction
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Reference	Plan #4		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum centre distance of 15,000.00ft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	12/14/2022		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
393.00	6,220.00	Survey #1 - Surface MWD Survey (OH (M	MWD+HDGM	OWSG MWD + HDGM	
6,291.00	6,373.00	Survey #2 - Curve MWD Survey (MagCom	MWD+HDGM+AX	OWSG MWD + HDGM + Axial Correction	
6,373.00	20,573.53	Plan #4 (ST1)	MWD+HDGM+AX	OWSG MWD + HDGM + Axial Correction	

Summary						
Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Rosa Unit 27						
Rosa Unit 183A - OH - OH	5,712.00	5,659.00	401.38	209.61	2.093	SF
Rosa Unit 183A - OH - OH	5,724.93	5,659.00	401.17	209.56	2.094	CC, ES
Rosa Unit 183C - OH - OH	9,988.75	7,159.21	1,243.77	712.90	2.343	CC
Rosa Unit 183C - OH - OH	10,100.00	7,157.14	1,248.73	704.38	2.294	ES
Rosa Unit 183C - OH - OH	10,200.00	7,155.28	1,261.57	707.43	2.277	SF
Rosa Unit 189 - OH - OH	19,065.05	7,276.39	228.04	-1,353.47	0.144	Level 1, CC, ES, SF
Rosa Unit 640H - OH - OH	0.00	0.51	31.38			
Rosa Unit 640H - OH - OH	393.00	393.22	32.63	31.18	22.443	ES
Rosa Unit 640H - OH - OH	673.00	671.69	38.16	35.44	14.036	SF
Rosa Unit 641H - OH - OH	398.85	399.10	45.15	43.67	30.581	CC, ES
Rosa Unit 641H - OH - OH	7,300.00	7,013.01	616.94	580.57	16.963	SF
Rosa Unit 642H - OH - OH	0.00	0.51	45.06			
Rosa Unit 642H - OH - OH	6,959.15	6,969.40	81.75	53.16	2.859	SF
Rosa Unit 643H - OH - OH	393.00	393.43	27.11	25.66	18.733	CC, ES
Rosa Unit 643H - OH - OH	1,077.00	1,072.38	57.92	52.82	11.356	SF
Rosa Unit 644H - OH - Plan #1	428.19	428.18	7.30	5.07	3.273	CC
Rosa Unit 644H - OH - Plan #1	483.00	482.99	7.63	5.01	2.915	ES, SF
Rosa Unit 645H - OH - OH	434.13	434.52	59.99	58.44	38.714	CC
Rosa Unit 645H - OH - OH	483.00	483.35	60.09	58.20	31.791	ES
Rosa Unit 645H - OH - OH	14,700.00	14,415.00	1,295.82	123.42	1.105	Level 2, SF
Rosa Unit 646H - OH - Plan #2	613.82	614.68	13.36	9.83	3.787	CC
Rosa Unit 646H - OH - Plan #2	14,204.45	14,981.00	624.12	-470.74	0.570	Level 1, ES, SF
Rosa Unit 647H - OH - OH	713.20	714.39	57.47	53.88	16.021	CC
Rosa Unit 647H - OH - OH	20,573.53	20,463.90	1,274.00	-892.72	0.588	Level 1, ES, SF
Rosa Unit 648H - OH - OH	0.00	0.51	44.94			
Rosa Unit 648H - OH - OH	17,500.00	18,294.04	602.28	-961.74	0.385	Level 1, SF
Rosa Unit 648H - OH - OH	17,504.45	18,294.04	602.38	-961.90	0.385	Level 1, ES
Rosa Unit 649H - OH (MagComp) - OH	6,677.42	6,663.71	51.83	45.48	8.166	CC
Rosa Unit 649H - OH (MagComp) - OH	13,125.14	12,828.00	274.46	-444.15	0.382	Level 1, ES, SF
Rosa Unit 85 - OH - OH	14,635.76	7,204.23	325.25	-635.73	0.338	Level 1, CC, ES, SF
Rosa Unit 85A - OH - OH	12,000.00	6,702.00	1,050.89	824.84	4.649	CC
Rosa Unit 85A - OH - OH	12,100.00	6,702.00	1,055.03	823.87	4.564	ES

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



Lonestar Consulting, LLC Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Reference Site:	Rosa Unit 27	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	ST1	Database:	Grand Junction
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Summary						
Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Rosa Unit 27						
Rosa Unit 85A - OH - OH	12,200.00	6,702.00	1,068.55	834.12	4.558	SF
Rosa Unit 85C - OH - OH	15,300.00	7,733.30	1,101.51	25.56	1.024	Level 2, CC
Rosa Unit 85C - OH - OH	15,400.00	7,733.60	1,105.59	19.07	1.018	Level 2, ES, SF



Lonestar Consulting, LLC

Anticollision Summary Report

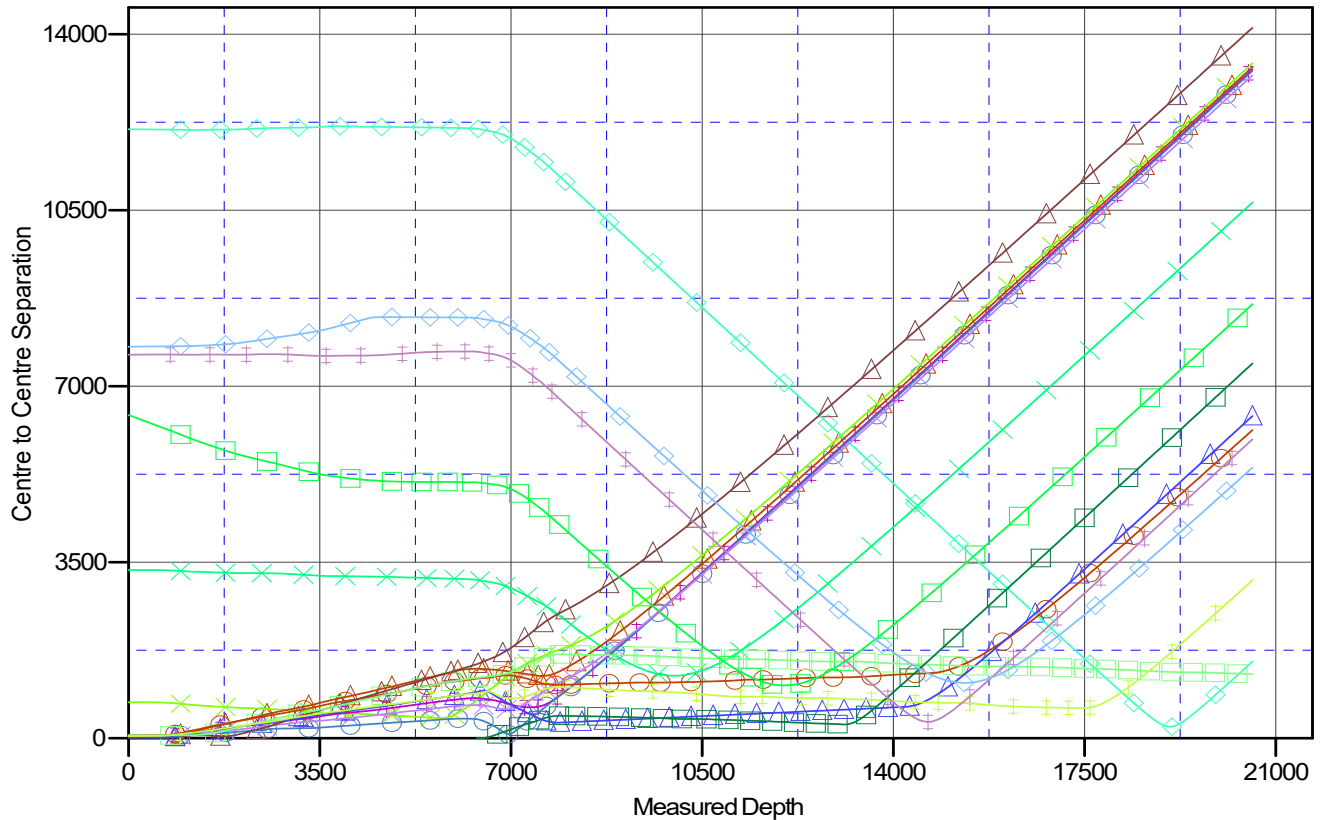


Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Reference Site:	Rosa Unit 27	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	ST1	Database:	Grand Junction
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6305' & RKB 24.5' @ 6329.50ft (E)
 Offset Depths are relative to Offset Datum
 Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit 649H - Slot A4
 Coordinate System is US State Plane 1983, New Mexico Western Zone
 Grid Convergence at Surface is: 0.26°

Ladder Plot



LEGEND

Rosa Unit183A/OH/OH V0	Rosa Unit643H/OH/OH V0	Rosa Unit649H/OH(MagComp)/OH V0
Rosa Unit183C/OH/OH V0	Rosa Unit645H/OH/OH V0	Rosa Unit855/OH/OH V0
Rosa Unit189/OH/OH V0	Rosa Unit646H/OH/Pe n#1 V0	Rosa Unit85A/OH/OH V0
Rosa Unit640H/OH/OH V0	Rosa Unit646H/OH/Pe n#2 V0	Rosa Unit85C/OH/OH V0
Rosa Unit641H/OH/OH V0	Rosa Unit647H/OH/OH V0	
Rosa Unit642H/OH/OH V0	Rosa Unit648H/OH/OH V0	

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



Lonestar Consulting, LLC

Anticollision Summary Report

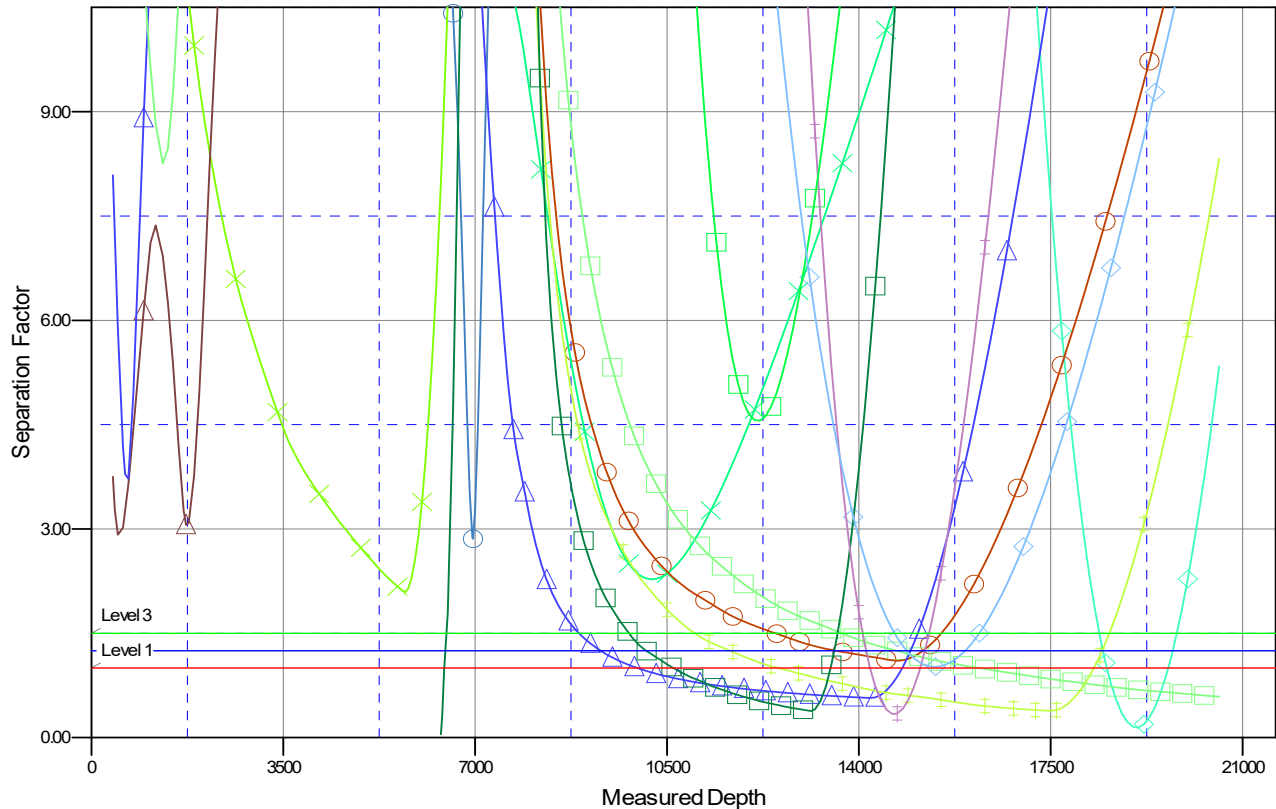


Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Reference Site:	Rosa Unit 27	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	ST1	Database:	Grand Junction
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6305' & RKB 24.5' @ 6329.50ft (E)
 Offset Depths are relative to Offset Datum
 Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit 649H - Slot A4
 Coordinate System is US State Plane 1983, New Mexico Western Zone
 Grid Convergence at Surface is: 0.26°

Separation Factor Plot



LEGEND

Rosa Unit183A/OH/OH V0	Rosa Unit643H/OH/OH V0	Rosa Unit649H(OH/MagComp)/OH V0
Rosa Unit183C/OH/OH V0	Rosa Unit645H/OH/OH V0	Rosa Unit655 OH/OH V0
Rosa Unit185 OH/OH V0	Rosa Unit644H/OH/Pa n#1 V0	Rosa Unit655A/OH/OH V0
Rosa Unit640H/OH/OH V0	Rosa Unit646H/OH/Pa n#2 V0	Rosa Unit65C/OH/OH V0
Rosa Unit641H/OH/OH V0	Rosa Unit647H/OH/OH V0	
Rosa Unit642H/OH/OH V0	Rosa Unit648H/OH/OH V0	

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

Released to Imaging: 3/13/2023 3:12:47 PM



Company: Logos Operating LLC
Project: Rio Arriba, NM NAD83
Site: Rosa Unit 27
Well: Rosa Unit 649H
Wellbore: ST1
Design: Plan #4

PROJECT DETAILS: Rio Arriba, NM NAD83

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



WELL DETAILS: Rosa Unit 649H

GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	2143448.3700	2848017.0870	36.8896790	-107.4061360	A4

Plan: Plan #4 (Rosa Unit 649H/ST1)

Created By: Janie Collins Date: 10:44, December 14 2022



Azimuths to True North
Magnetic North: 8.2°

Magnetic Field
Strength: 49628.8 nT
Dip Angle: 63.37°
Date: 12/31/2021
Model: HDGM2021_FIE

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
649H ST1 POE	7200.00	-57.21	1000.00	2143395.6348	2849017.3311	36.8895218	-107.4027164
649H BHL Rev 4	6964.00	-662.34	13669.27	2142847.2214	2861689.1573	36.8878505	-107.3593943

SECTION DETAILS

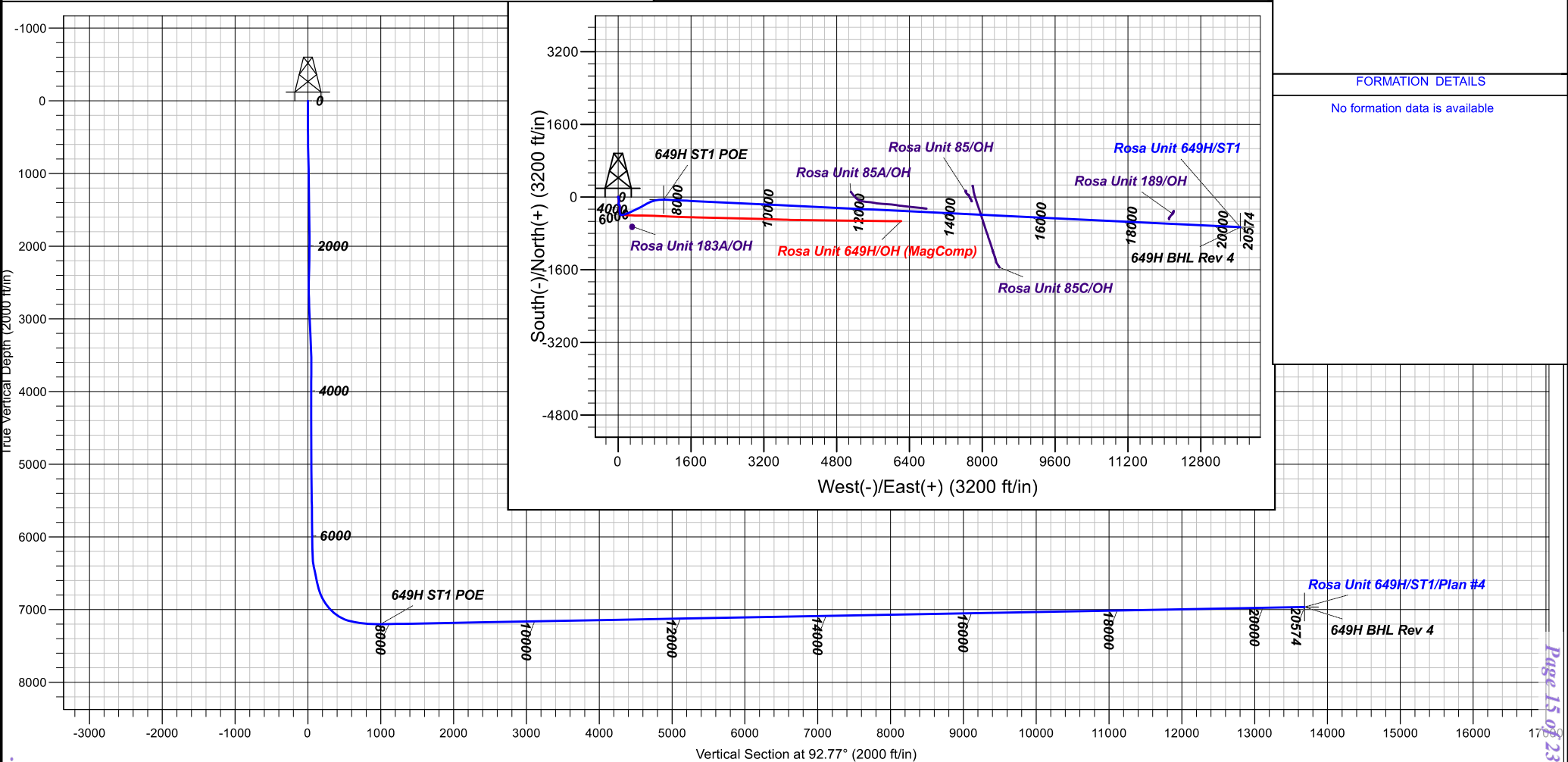
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
6373.00	9.00	113.85	6357.56	-392.70	52.95	0.00	0.00	71.89
6435.74	12.00	85.00	6419.29	-394.12	63.95	9.50	-75.02	82.95
6677.42	12.00	85.00	6655.68	-389.74	114.00	0.00	0.00	132.73
7451.38	80.58	61.13	7161.42	-170.71	588.37	9.00	-25.20	595.94
7519.97	80.58	61.13	7172.49	-138.51	646.76	0.00	0.00	652.70
7887.62	91.07	92.73	7200.00	-57.21	1000.00	9.00	73.25	1001.60
20573.53	91.07	92.73	6964.00	-662.34	13669.27	0.00	0.00	13685.31

CASING DETAILS

No casing data is available

FORMATION DETAILS

No formation data is available



Received by OCB: 3/13/2023 3:12:47 PM

Page 15 of 23



Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 649H - Slot A4

ST1

Plan: Plan #4

Standard Planning Report

14 December, 2022





Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST1		
Design:	Plan #4		

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: From: Position Uncertainty:	Lat/Long	0.00	ft	Northing: Easting: Slot Radius:	2,143,451.5859 usft 2,848,002.4398 usft 13.200 in	Latitude: Longitude:	36.8896880 -107.4061860

Well	Rosa Unit 649H - Slot A4					
Well Position	+N/-S	0.00 ft	Northing:	2,143,448.3700 usft	Latitude:	36.8896790
	+E/-W	0.00 ft	Easting:	2,848,017.0870 usft	Longitude:	-107.4061360
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft
Grid Convergence:		0.26 °				

Wellbore	ST1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2021_FILE	12/31/2021	8.63	63.37	49,628.80000000

Design	Plan #4				
Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	6,373.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	92.77	

Plan Survey Tool Program	Date	12/14/2022			
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	6,373.00	20,573.53	Plan #4 (ST1)	MWD+HDGM+AX	
				OWSG MWD + HDGM + Axial	



Lonestar Consulting, LLC
Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST1		
Design:	Plan #4		

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
6,373.00	9.00	113.85	6,357.56	-392.70	52.95	0.00	0.00	0.00	0.00	
6,435.74	12.00	85.00	6,419.29	-394.12	63.95	9.50	4.78	-45.98	-75.02	
6,677.42	12.00	85.00	6,655.68	-389.74	114.00	0.00	0.00	0.00	0.00	
7,451.38	80.58	61.13	7,161.42	-170.71	588.37	9.00	8.86	-3.08	-25.20	
7,518.97	80.58	61.13	7,172.49	-138.51	646.76	0.00	0.00	0.00	0.00	
7,887.62	91.07	92.73	7,200.00	-57.21	1,000.00	9.00	2.84	8.57	73.25	649H ST1 POE
20,573.53	91.07	92.73	6,964.00	-662.34	13,669.27	0.00	0.00	0.00	0.00	649H BHL Rev 4



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST1		
Design:	Plan #4		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
6,373.00	9.00	113.85	6,357.56	-392.70	52.95	71.89	0.00	0.00	0.00
6,400.00	9.97	99.39	6,384.19	-393.94	57.19	76.19	9.50	3.60	-53.54
6,435.74	12.00	85.00	6,419.29	-394.12	63.95	82.95	9.50	5.67	-40.27
6,500.00	12.00	85.00	6,482.14	-392.95	77.25	96.18	0.00	0.00	0.00
6,600.00	12.00	85.00	6,579.95	-391.14	97.97	116.78	0.00	0.00	0.00
6,677.42	12.00	85.00	6,655.68	-389.74	114.00	132.73	0.00	0.00	0.00
6,700.00	13.87	81.39	6,677.69	-389.13	119.02	137.71	9.00	8.26	-16.00
6,800.00	22.47	72.69	6,772.63	-381.63	149.17	167.46	9.00	8.61	-8.70
6,900.00	31.29	68.69	6,861.74	-366.48	191.70	209.21	9.00	8.82	-4.00
7,000.00	40.19	66.32	6,942.83	-344.04	245.55	261.91	9.00	8.89	-2.37
7,100.00	49.11	64.69	7,013.91	-314.86	309.40	324.28	9.00	8.93	-1.63
7,200.00	58.06	63.46	7,073.21	-279.67	381.68	394.77	9.00	8.95	-1.24
7,300.00	67.01	62.44	7,119.28	-239.33	460.61	471.65	9.00	8.95	-1.02
7,400.00	75.97	61.55	7,150.99	-194.83	544.24	553.03	9.00	8.96	-0.89
7,451.38	80.58	61.13	7,161.42	-170.71	588.37	595.94	9.00	8.96	-0.83
7,500.00	80.58	61.13	7,169.38	-147.55	630.37	636.77	0.00	0.00	0.00
7,518.97	80.58	61.13	7,172.49	-138.51	646.76	652.70	0.00	0.00	0.00
7,600.00	82.75	68.16	7,184.25	-104.22	719.16	723.37	9.00	2.67	8.69
7,700.00	85.56	76.76	7,194.45	-74.29	813.92	816.57	9.00	2.82	8.59
7,800.00	88.48	85.28	7,199.65	-58.73	912.47	914.24	9.00	2.92	8.53
7,887.62	91.07	92.73	7,200.00	-57.21	1,000.00	1,001.60	9.00	2.95	8.50
7,900.00	91.07	92.73	7,199.77	-57.80	1,012.37	1,013.98	0.00	0.00	0.00
8,000.00	91.07	92.73	7,197.91	-62.57	1,112.24	1,113.96	0.00	0.00	0.00
8,100.00	91.07	92.73	7,196.05	-67.34	1,212.10	1,213.94	0.00	0.00	0.00
8,200.00	91.07	92.73	7,194.19	-72.11	1,311.97	1,313.93	0.00	0.00	0.00
8,300.00	91.07	92.73	7,192.33	-76.88	1,411.84	1,413.91	0.00	0.00	0.00
8,400.00	91.07	92.73	7,190.47	-81.65	1,511.71	1,513.89	0.00	0.00	0.00
8,500.00	91.07	92.73	7,188.61	-86.42	1,611.58	1,613.87	0.00	0.00	0.00
8,600.00	91.07	92.73	7,186.75	-91.19	1,711.45	1,713.86	0.00	0.00	0.00
8,700.00	91.07	92.73	7,184.89	-95.96	1,811.32	1,813.84	0.00	0.00	0.00
8,800.00	91.07	92.73	7,183.03	-100.73	1,911.19	1,913.82	0.00	0.00	0.00
8,900.00	91.07	92.73	7,181.17	-105.50	2,011.05	2,013.80	0.00	0.00	0.00
9,000.00	91.07	92.73	7,179.31	-110.27	2,110.92	2,113.79	0.00	0.00	0.00
9,100.00	91.07	92.73	7,177.45	-115.04	2,210.79	2,213.77	0.00	0.00	0.00
9,200.00	91.07	92.73	7,175.59	-119.81	2,310.66	2,313.75	0.00	0.00	0.00
9,300.00	91.07	92.73	7,173.73	-124.58	2,410.53	2,413.73	0.00	0.00	0.00
9,400.00	91.07	92.73	7,171.86	-129.35	2,510.40	2,513.72	0.00	0.00	0.00
9,500.00	91.07	92.73	7,170.00	-134.12	2,610.27	2,613.70	0.00	0.00	0.00
9,600.00	91.07	92.73	7,168.14	-138.89	2,710.14	2,713.68	0.00	0.00	0.00
9,700.00	91.07	92.73	7,166.28	-143.66	2,810.01	2,813.67	0.00	0.00	0.00
9,800.00	91.07	92.73	7,164.42	-148.43	2,909.87	2,913.65	0.00	0.00	0.00
9,900.00	91.07	92.73	7,162.56	-153.20	3,009.74	3,013.63	0.00	0.00	0.00
10,000.00	91.07	92.73	7,160.70	-157.97	3,109.61	3,113.61	0.00	0.00	0.00
10,100.00	91.07	92.73	7,158.84	-162.74	3,209.48	3,213.60	0.00	0.00	0.00
10,200.00	91.07	92.73	7,156.98	-167.51	3,309.35	3,313.58	0.00	0.00	0.00
10,300.00	91.07	92.73	7,155.12	-172.28	3,409.22	3,413.56	0.00	0.00	0.00
10,400.00	91.07	92.73	7,153.26	-177.05	3,509.09	3,513.54	0.00	0.00	0.00
10,500.00	91.07	92.73	7,151.40	-181.82	3,608.96	3,613.53	0.00	0.00	0.00
10,600.00	91.07	92.73	7,149.54	-186.59	3,708.82	3,713.51	0.00	0.00	0.00
10,700.00	91.07	92.73	7,147.68	-191.36	3,808.69	3,813.49	0.00	0.00	0.00
10,800.00	91.07	92.73	7,145.82	-196.13	3,908.56	3,913.47	0.00	0.00	0.00
10,900.00	91.07	92.73	7,143.96	-200.90	4,008.43	4,013.46	0.00	0.00	0.00



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST1		
Design:	Plan #4		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
11,000.00	91.07	92.73	7,142.10	-205.68	4,108.30	4,113.44	0.00	0.00	0.00
11,100.00	91.07	92.73	7,140.24	-210.45	4,208.17	4,213.42	0.00	0.00	0.00
11,200.00	91.07	92.73	7,138.38	-215.22	4,308.04	4,313.41	0.00	0.00	0.00
11,300.00	91.07	92.73	7,136.52	-219.99	4,407.91	4,413.39	0.00	0.00	0.00
11,400.00	91.07	92.73	7,134.66	-224.76	4,507.78	4,513.37	0.00	0.00	0.00
11,500.00	91.07	92.73	7,132.80	-229.53	4,607.64	4,613.35	0.00	0.00	0.00
11,600.00	91.07	92.73	7,130.94	-234.30	4,707.51	4,713.34	0.00	0.00	0.00
11,700.00	91.07	92.73	7,129.08	-239.07	4,807.38	4,813.32	0.00	0.00	0.00
11,800.00	91.07	92.73	7,127.22	-243.84	4,907.25	4,913.30	0.00	0.00	0.00
11,900.00	91.07	92.73	7,125.36	-248.61	5,007.12	5,013.28	0.00	0.00	0.00
12,000.00	91.07	92.73	7,123.50	-253.38	5,106.99	5,113.27	0.00	0.00	0.00
12,100.00	91.07	92.73	7,121.64	-258.15	5,206.86	5,213.25	0.00	0.00	0.00
12,200.00	91.07	92.73	7,119.78	-262.92	5,306.73	5,313.23	0.00	0.00	0.00
12,300.00	91.07	92.73	7,117.92	-267.69	5,406.60	5,413.21	0.00	0.00	0.00
12,400.00	91.07	92.73	7,116.05	-272.46	5,506.46	5,513.20	0.00	0.00	0.00
12,500.00	91.07	92.73	7,114.19	-277.23	5,606.33	5,613.18	0.00	0.00	0.00
12,600.00	91.07	92.73	7,112.33	-282.00	5,706.20	5,713.16	0.00	0.00	0.00
12,700.00	91.07	92.73	7,110.47	-286.77	5,806.07	5,813.15	0.00	0.00	0.00
12,800.00	91.07	92.73	7,108.61	-291.54	5,905.94	5,913.13	0.00	0.00	0.00
12,900.00	91.07	92.73	7,106.75	-296.31	6,005.81	6,013.11	0.00	0.00	0.00
13,000.00	91.07	92.73	7,104.89	-301.08	6,105.68	6,113.09	0.00	0.00	0.00
13,100.00	91.07	92.73	7,103.03	-305.85	6,205.55	6,213.08	0.00	0.00	0.00
13,200.00	91.07	92.73	7,101.17	-310.62	6,305.41	6,313.06	0.00	0.00	0.00
13,300.00	91.07	92.73	7,099.31	-315.39	6,405.28	6,413.04	0.00	0.00	0.00
13,400.00	91.07	92.73	7,097.45	-320.16	6,505.15	6,513.02	0.00	0.00	0.00
13,500.00	91.07	92.73	7,095.59	-324.93	6,605.02	6,613.01	0.00	0.00	0.00
13,600.00	91.07	92.73	7,093.73	-329.70	6,704.89	6,712.99	0.00	0.00	0.00
13,700.00	91.07	92.73	7,091.87	-334.47	6,804.76	6,812.97	0.00	0.00	0.00
13,800.00	91.07	92.73	7,090.01	-339.24	6,904.63	6,912.96	0.00	0.00	0.00
13,900.00	91.07	92.73	7,088.15	-344.01	7,004.50	7,012.94	0.00	0.00	0.00
14,000.00	91.07	92.73	7,086.29	-348.78	7,104.37	7,112.92	0.00	0.00	0.00
14,100.00	91.07	92.73	7,084.43	-353.55	7,204.23	7,212.90	0.00	0.00	0.00
14,200.00	91.07	92.73	7,082.57	-358.32	7,304.10	7,312.89	0.00	0.00	0.00
14,300.00	91.07	92.73	7,080.71	-363.09	7,403.97	7,412.87	0.00	0.00	0.00
14,400.00	91.07	92.73	7,078.85	-367.86	7,503.84	7,512.85	0.00	0.00	0.00
14,500.00	91.07	92.73	7,076.99	-372.63	7,603.71	7,612.83	0.00	0.00	0.00
14,600.00	91.07	92.73	7,075.13	-377.40	7,703.58	7,712.82	0.00	0.00	0.00
14,700.00	91.07	92.73	7,073.27	-382.17	7,803.45	7,812.80	0.00	0.00	0.00
14,800.00	91.07	92.73	7,071.41	-386.94	7,903.32	7,912.78	0.00	0.00	0.00
14,900.00	91.07	92.73	7,069.55	-391.71	8,003.19	8,012.76	0.00	0.00	0.00
15,000.00	91.07	92.73	7,067.69	-396.48	8,103.05	8,112.75	0.00	0.00	0.00
15,100.00	91.07	92.73	7,065.83	-401.25	8,202.92	8,212.73	0.00	0.00	0.00
15,200.00	91.07	92.73	7,063.97	-406.02	8,302.79	8,312.71	0.00	0.00	0.00
15,300.00	91.07	92.73	7,062.11	-410.79	8,402.66	8,412.70	0.00	0.00	0.00
15,400.00	91.07	92.73	7,060.24	-415.56	8,502.53	8,512.68	0.00	0.00	0.00
15,500.00	91.07	92.73	7,058.38	-420.33	8,602.40	8,612.66	0.00	0.00	0.00
15,600.00	91.07	92.73	7,056.52	-425.10	8,702.27	8,712.64	0.00	0.00	0.00
15,700.00	91.07	92.73	7,054.66	-429.87	8,802.14	8,812.63	0.00	0.00	0.00
15,800.00	91.07	92.73	7,052.80	-434.64	8,902.00	8,912.61	0.00	0.00	0.00
15,900.00	91.07	92.73	7,050.94	-439.41	9,001.87	9,012.59	0.00	0.00	0.00
16,000.00	91.07	92.73	7,049.08	-444.18	9,101.74	9,112.57	0.00	0.00	0.00
16,100.00	91.07	92.73	7,047.22	-448.95	9,201.61	9,212.56	0.00	0.00	0.00



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST1		
Design:	Plan #4		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
16,200.00	91.07	92.73	7,045.36	-453.72	9,301.48	9,312.54	0.00	0.00	0.00
16,300.00	91.07	92.73	7,043.50	-458.49	9,401.35	9,412.52	0.00	0.00	0.00
16,400.00	91.07	92.73	7,041.64	-463.26	9,501.22	9,512.50	0.00	0.00	0.00
16,500.00	91.07	92.73	7,039.78	-468.03	9,601.09	9,612.49	0.00	0.00	0.00
16,600.00	91.07	92.73	7,037.92	-472.80	9,700.96	9,712.47	0.00	0.00	0.00
16,700.00	91.07	92.73	7,036.06	-477.57	9,800.82	9,812.45	0.00	0.00	0.00
16,800.00	91.07	92.73	7,034.20	-482.34	9,900.69	9,912.44	0.00	0.00	0.00
16,900.00	91.07	92.73	7,032.34	-487.11	10,000.56	10,012.42	0.00	0.00	0.00
17,000.00	91.07	92.73	7,030.48	-491.88	10,100.43	10,112.40	0.00	0.00	0.00
17,100.00	91.07	92.73	7,028.62	-496.65	10,200.30	10,212.38	0.00	0.00	0.00
17,200.00	91.07	92.73	7,026.76	-501.42	10,300.17	10,312.37	0.00	0.00	0.00
17,300.00	91.07	92.73	7,024.90	-506.19	10,400.04	10,412.35	0.00	0.00	0.00
17,400.00	91.07	92.73	7,023.04	-510.96	10,499.91	10,512.33	0.00	0.00	0.00
17,500.00	91.07	92.73	7,021.18	-515.73	10,599.78	10,612.31	0.00	0.00	0.00
17,600.00	91.07	92.73	7,019.32	-520.50	10,699.64	10,712.30	0.00	0.00	0.00
17,700.00	91.07	92.73	7,017.46	-525.27	10,799.51	10,812.28	0.00	0.00	0.00
17,800.00	91.07	92.73	7,015.60	-530.04	10,899.38	10,912.26	0.00	0.00	0.00
17,900.00	91.07	92.73	7,013.74	-534.81	10,999.25	11,012.24	0.00	0.00	0.00
18,000.00	91.07	92.73	7,011.88	-539.58	11,099.12	11,112.23	0.00	0.00	0.00
18,100.00	91.07	92.73	7,010.02	-544.35	11,198.99	11,212.21	0.00	0.00	0.00
18,200.00	91.07	92.73	7,008.16	-549.12	11,298.86	11,312.19	0.00	0.00	0.00
18,300.00	91.07	92.73	7,006.30	-553.89	11,398.73	11,412.18	0.00	0.00	0.00
18,400.00	91.07	92.73	7,004.43	-558.66	11,498.59	11,512.16	0.00	0.00	0.00
18,500.00	91.07	92.73	7,002.57	-563.43	11,598.46	11,612.14	0.00	0.00	0.00
18,600.00	91.07	92.73	7,000.71	-568.20	11,698.33	11,712.12	0.00	0.00	0.00
18,700.00	91.07	92.73	6,998.85	-572.97	11,798.20	11,812.11	0.00	0.00	0.00
18,800.00	91.07	92.73	6,996.99	-577.74	11,898.07	11,912.09	0.00	0.00	0.00
18,900.00	91.07	92.73	6,995.13	-582.51	11,997.94	12,012.07	0.00	0.00	0.00
19,000.00	91.07	92.73	6,993.27	-587.28	12,097.81	12,112.05	0.00	0.00	0.00
19,100.00	91.07	92.73	6,991.41	-592.05	12,197.68	12,212.04	0.00	0.00	0.00
19,200.00	91.07	92.73	6,989.55	-596.82	12,297.55	12,312.02	0.00	0.00	0.00
19,300.00	91.07	92.73	6,987.69	-601.59	12,397.41	12,412.00	0.00	0.00	0.00
19,400.00	91.07	92.73	6,985.83	-606.36	12,497.28	12,511.98	0.00	0.00	0.00
19,500.00	91.07	92.73	6,983.97	-611.13	12,597.15	12,611.97	0.00	0.00	0.00
19,600.00	91.07	92.73	6,982.11	-615.90	12,697.02	12,711.95	0.00	0.00	0.00
19,700.00	91.07	92.73	6,980.25	-620.67	12,796.89	12,811.93	0.00	0.00	0.00
19,800.00	91.07	92.73	6,978.39	-625.44	12,896.76	12,911.92	0.00	0.00	0.00
19,900.00	91.07	92.73	6,976.53	-630.21	12,996.63	13,011.90	0.00	0.00	0.00
20,000.00	91.07	92.73	6,974.67	-634.98	13,096.50	13,111.88	0.00	0.00	0.00
20,100.00	91.07	92.73	6,972.81	-639.75	13,196.37	13,211.86	0.00	0.00	0.00
20,200.00	91.07	92.73	6,970.95	-644.52	13,296.23	13,311.85	0.00	0.00	0.00
20,300.00	91.07	92.73	6,969.09	-649.29	13,396.10	13,411.83	0.00	0.00	0.00
20,400.00	91.07	92.73	6,967.23	-654.06	13,495.97	13,511.81	0.00	0.00	0.00
20,500.00	91.07	92.73	6,965.37	-658.83	13,595.84	13,611.79	0.00	0.00	0.00
20,573.53	91.07	92.73	6,964.00	-662.34	13,669.27	13,685.31	0.00	0.00	0.00



Lonestar Consulting, LLC
Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit 649H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6305' & RKB 24.5' @ 6329.50ft (Ensign T223)
Site:	Rosa Unit 27	North Reference:	True
Well:	Rosa Unit 649H	Survey Calculation Method:	Minimum Curvature
Wellbore:	ST1		
Design:	Plan #4		

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
649H BHL Rev 4 - plan hits target center - Point	0.00	0.00	6,964.00	-662.34	13,669.27	2,142,847.2215	2,861,689.1573	36.8878505	-107.3593943
649H ST1 POE - plan hits target center - Point	0.00	0.00	7,200.00	-57.21	1,000.00	2,143,395.6348	2,849,017.3310	36.8895218	-107.4027165

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 195527

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 195527
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
kpickford	Adhere to previous NMOCD Conditions of Approval	3/13/2023