

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.

5. Lease Serial No. NMSF078773
6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well <input type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		7. If Unit of CA/Agreement, Name and/or No. NMNM78407E
2. Name of Operator LOGOS OPERATING, LLC		8. Well Name and No. ROSA UNIT 746H
3a. Address 2010 AFTON PLACE, FARMINGTON, NM 87401	3b. Phone No. (include area code) (505) 278-8720	9. API Well No. 30-039-31416
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) SEC 33 T31N R05W, NENW (C) 363' FNL 1685' FWL		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				
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off	
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity	
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other	
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon		
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> 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 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 surface-hole location from 378' FNL & 1686' FWL to new **surface-hole location 363' FNL & 1685' FWL**

Original bottom-hole location from 1882' FNL & 1668' FEL to new **bottom-hole location 1900' FNL & 64' FEL**

Original TD @ 14,600' MD 7,082' TVD to new **TD @ 20,904' MD 7,107' TVD.**

Geology tops have been updated per changes.

Original KOP @ 6,567' MD 6,412' TVD to new **KOP @ 6,647' MD 6,500' TVD**

Original Landing point @ 7,613' MD 7,077' TVD to new **Landing point @ 7,629' MD 7,102' TVD**

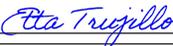
Original 9.625" casing Intermediate @ 6,479' MD to new **Intermediate @ 6,495' MD 6,376' TVD**

Additional 13.375" casing Intermediate @ 3,667' MD 3,621' TVD

Original 5.5" casing Production @ 14,600' MD to new **Production @ 20,904' MD 7,107' TVD**

The 13.375", 9.625" Intermediate casings & 5.5" production cementing bbls and sacks have been update per casing depth changes.

Attached: New C102, Operations plan (based on KB) and Directional Drill plan (based on GL).

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)	
Etta Trujillo	Title Regulatory Specialist
Signature 	Date 2/15/2023

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 33 / NENW /	County or Parish/State:
Well Number: 746H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF0078773	Unit or CA Name:	Unit or CA Number: MNM078407E
US Well Number: 3003931416	Well Status: Approved Application for Permit to Drill	Operator: LOGOS OPERATING LLC

Notice of Intent

Sundry ID: 2715988

Type of Submission: Notice of Intent

Type of Action: Other

Date Sundry Submitted: 02/15/2023

Time Sundry Submitted: 12:42

Date proposed operation will begin: 04/01/2023

Procedure Description: LOGOS Operating request a change in plans for the following: Original surface-hole location from 378' FNL & 1686' FWL to new surface-hole location 363' FNL & 1685' FWL Original bottom-hole location from 1882' FNL & 1668' FEL to new bottom-hole location 1900' FNL & 64' FEL Original TD @ 14,600' MD 7,082' TVD to new TD @ 20,904' MD 7,107' TVD. Geology tops have been updated per changes. Original KOP @ 6,567' MD 6,412' TVD to new KOP @ 6,647' MD 6,500' TVD Original Landing point @ 7,613' MD 7,077' TVD to new Landing point @ 7,629' MD 7,102' TVD Original 9.625" casing Intermediate @ 6,479' MD to new Intermediate @ 6,495' MD 6,376' TVD Additional 13.375" casing Intermediate @ 3,667' MD 3,621' TVD Original 5.5" casing Production @ 14,600' MD to new Production @ 20,904' MD 7,107' TVD The 13.375", 9.625" Intermediate casings & 5.5" production cementing bbls and sacks have been update per casing depth changes. Attached: New C102, Operations plan (based on KB) and Directional Drill plan (based on GL).

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

3160_5_Rosa_Unit_746H_Change_in_Plan_7__20230215_20230215124035.pdf

Well Name: ROSA UNIT

Well Location: T31N / R5W / SEC 33 / NENW /

County or Parish/State:

Well Number: 746H

Type of Well: CONVENTIONAL GAS WELL

Allottee or Tribe Name:

Lease Number: NMSF0078773

Unit or CA Name:

Unit or CA Number: NMNM078407E

US Well Number: 3003931416

Well Status: Approved Application for Permit to Drill

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: FEB 15, 2023 12:42 PM

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: 02/21/2023

Signature: Kenneth Rennick

Received by OCD: 2/21/2023 4:15:04 PM
 1625 N. French Drive, Hobbs, NM 88240
 Phone: (575) 393-6161 Fax: (575) 393-0720

State of New Mexico
 Energy, Minerals & Natural Resources Department

Form C-102
 Revised August 1, 2011

Submit one copy to
 Appropriate District Office

17 OPERATOR CERTIFICATION Page 4 of 30
 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 1/13/2023
 Signature Date
 Etta Trujillo
 Printed Name
 etrujillo@logosresourcesllc.com
 E-mail Address

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

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number		² Pool Code	³ Pool Name
		97232	BASIN MANCOS
⁴ Property Code	⁵ Property Name		⁶ Well Number
320608	ROSA UNIT		746H
⁷ OGRID No.	⁸ Operator Name		⁹ Elevation
289408	LOGOS OPERATING, LLC		6492'

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: JANUARY 12, 2023
 Date of Survey: APRIL 21, 2016
 Signature and Seal of Professional Surveyor



¹⁰ Surface Location

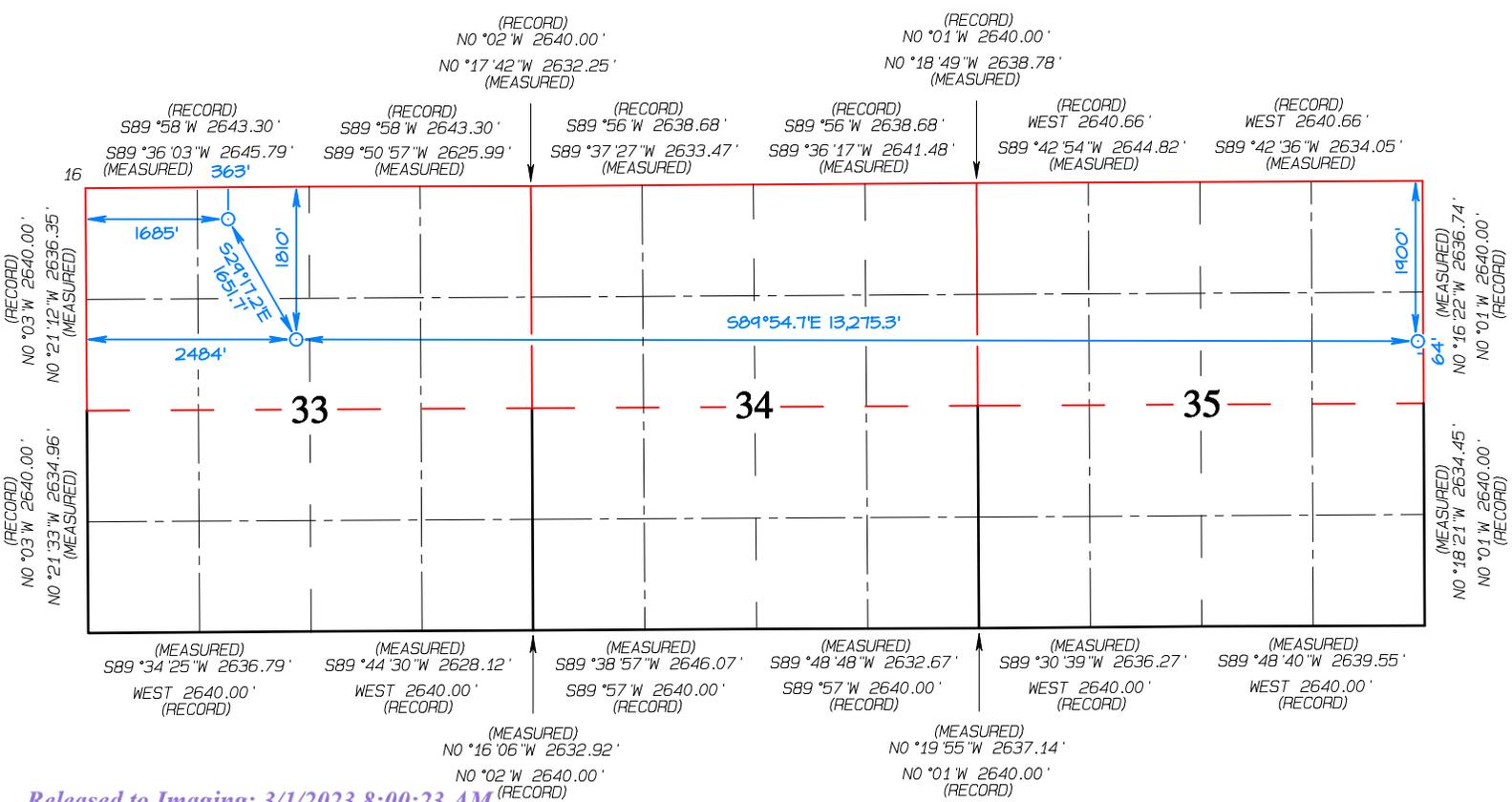
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	33	31N	5W		363	NORTH	1685	WEST	RIO ARRIBA

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	35	31N	5W		1900	NORTH	64	EAST	RIO ARRIBA
¹² Dedicated Acres					¹³ Joint or Infill		¹⁴ Consolidation Code		¹⁵ Order No.
960.00					N/2 - Section 33 N/2 - Section 34 N/2 - Section 35				R-13457

NO ALLOWANCE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

<p>SURFACE LOCATION 363' FNL 1685' FWL SEC 33, T31N, R5W LAT: 36.862353°N LONG: 107.370309°W DATUM: NAD1927</p> <p>LAT: 36.862359°N LONG: 107.370911°W DATUM: NAD1983</p>	<p>S29°17.2'E 1651.7'</p>	<p>FIRST TAKE POINT 1810' FNL 2484' FWL SEC 33, T31N, R5W LAT: 36.858385°N LONG: 107.367571°W DATUM: NAD1927</p> <p>LAT: 36.858392°N LONG: 107.368173°W DATUM: NAD1983</p>	<p>S89°54.7'E 13,275.3'</p>	<p>LAST TAKE POINT 1900' FNL 64' FEL SEC 35, T31N, R5W LAT: 36.858143°N LONG: 107.322196°W DATUM: NAD1927</p> <p>LAT: 36.858150°N LONG: 107.322797°W DATUM: NAD1983</p>
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LOGOS Operating, LLC Operations Plan

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

Date:	January 26, 2023	Pool:	Basin Mancos
Well Name:	Rosa Unit 746H	GL Elevation:	6,492'
Surface Location:	Sec 33, T31N, R5W 363 FNL, 1685 FWL (36.862359° N, 107.370911° W – NAD83)	Measured Depth:	20,904' (MD)
Bottom Hole Location:	Sec 35, T31N, R5W 1900 FNL, 64 FEL (36.858150° N, 107.322797° W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF078773, CA Serial # NMNM78407E

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2717	2671	*POINT LOOKOUT	5926	5797
KIRTLAND	2847	2798	*MANCOS	6420	6278
*FRUITLAND	3322	3261	KICKOFF POINT	6647	6500
*PICTURED CLIFFS	3617	3548			
LEWIS	3721	3649	POINT OF ENTRY	7629	7102
CHACRA	4837	4736			
*CLIFF HOUSE	5789	5566			
MENEFEE	5722	5598	TD	20,904	7107

* 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 the Tour book and on morning reports.

II. DRILLING

A. MUD PROGRAM: LSND mud (WBM) will be used to drill the 24" or 26" surface hole, 17-1/2" and 12-1/4" directional / vertical hole. An LSND (WBM) or (OBM) system 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.

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 of. Any leaks, spills, or other undesirable events will be reported in accordance with BLM NTL 3A. Rig crews will monitor the tanks at all

ROSA UNIT 746H



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 anticipated geohazards
- D. **Maximum Anticipated Pressure:** 7107' TVD x 0.43 = 3056 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)	KB DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	24" or 26"	320'	20"	94 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	17.5"	3,667'	13.375"	61 LBS	N-80 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,495'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	20904'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

NOTE: All casing depths are approximate, based on KB elevation 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:** 13-3/8" 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) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,000ft., 1,500 ft., 1,000 ft., and 500ft.
The casing will remain fluid filled while running.
3. **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) joints and one standard centralizer every (3) joints to 3,600 ft. Run (1) centralizer at 3,000' and 2,500 ft. Optional use of DV Tools will be strategically placed above loss circulation zones anticipated in the Mesaverde. Optional cancelation plugs for DV tools may be used

ROSA UNIT 746H



if losses while cementing are not encountered.

4. **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. The 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. 381 sks of 15.8 ppg Type Neat G, 1.18 cuft/sk yield or equivalent 323 sks of 14.6 ppg Type III with 1.39 cuft/sk yield, 30% excess. (Assuming 24" hole).
2. **INTERMEDIATE 1:** Intermediate casing shall be kept fluid-filled while running into the hole to meet BLM minimum collapse requirements. The intermediate casing will be cemented in 1 stage. If cement does not circulate to surface, a CBL will be run to determine TOC.

Intermediate 1 -13-3/8"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	3,067	600	0.6947	1.3	575	102	1.15	500	15.8
Stage 1 Lead - OH	320	2,747	0.6947	1.3	2,481	442	1.97	1259	12.4
Stage 2 Lead - Cased	-	320	1.019	1	326	58	1.97	166	12.4
					3,382	602		1925	

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

3. **INTERMEDIATE 2:** Intermediate casing shall be kept fluid-filled while running into the hole to meet BLM minimum collapse requirements. The intermediate casing will be cemented in 1 or 2 stages using a DV/STAGE tool to reduce cement losses and maximize cement coverage. The operator proposes optional DV tools above anticipated loss circulation zones in the Mesaverde. If losses are not observed, a cancellation plug will be pumped, and the remaining cement will be pumped during stage 2. Top of cement is planned at 100' above the base of the 13-3/8" casing (100' of overlap). If cement does not circulate to the DV tool or to the 13-3/8" casing, a CBL will be run to determine TOC.

Intermediate 2 -9-5/8"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	5,995	500	0.3132	1.3	220	39	1.15	191	15.8
Stage 1 Lead	4,912	1,083	0.3132	1.3	441	79	1.97	224	12.4
					661	118		415	
Stage 2 Tail	4,312	600	0.3132	1.3	244	44	1.65	148	13.2
Stage 2 Lead	3,667	645	0.3132	1.3	263	47	1.97	133	12.4
Stage 2 Lead - Cased	3,567	100	0.3627	1	36	6	1.97	18	12.4
Stage 2 Totals					543	97		300	
Int 2 Totals					1,204	214		715	

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

ROSA UNIT 746H



4. **PRODUCTION:** Production casing will be cemented in 1 stage with 100' of cement overlap above the 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	6,395	100	0.2531	1	25	5	1.56	16	13.2
Open Hole Lead	6,495	14,409	0.2291	1.15	3,801	677	1.56	2,437	13.2
					3,827	682		2,453	

Calculations based on 15% excess for the open hole and 100' overlap into the 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 the cement top if cement is not circulated.

B. **PRESSURE TEST**

- C. Pressure test 5-1/2" casing to 1564 psi (0.22 psi/ft * 7,107' TVD) for 30 minutes. Increase pressure to Open Toe sleeves.

D. **STIMULATION**

Stimulate with sand and water. Isolate stages with flow-through or dissolvable frac plugs. Drill out frac plugs as required and flow back lateral.

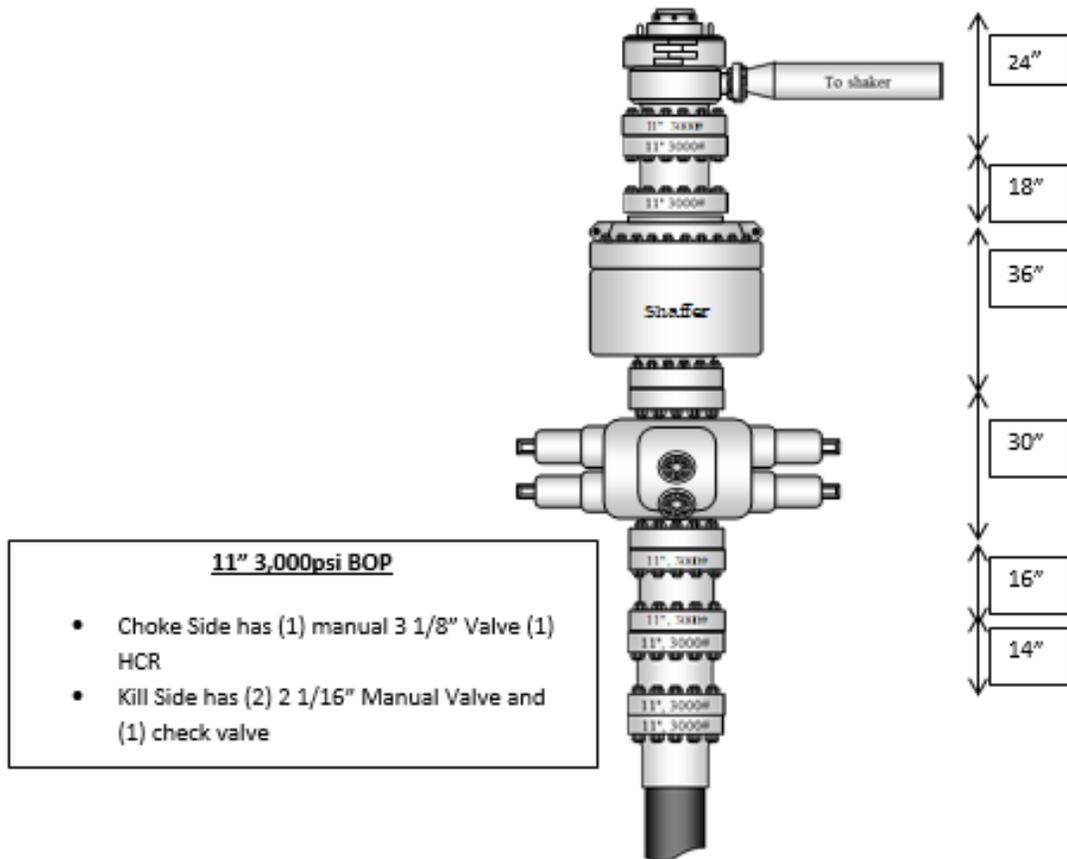
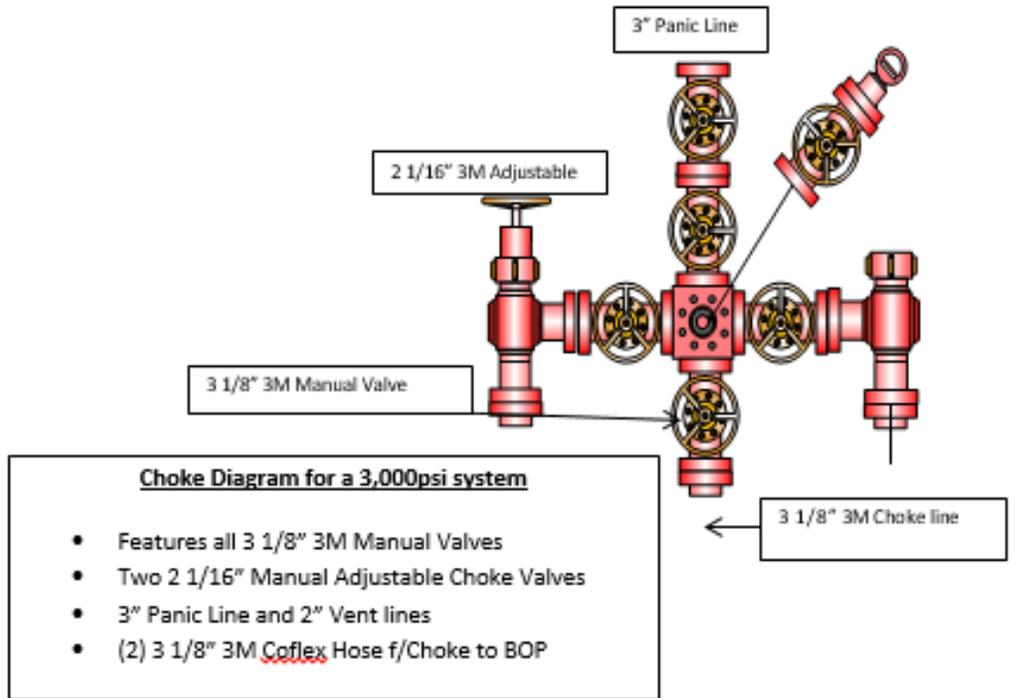
E. **PRODUCTION TUBING**

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



ROSA UNIT 746H



Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 31

Rosa Unit #746H

OH

Plan #7

Anticollision Summary Report

09 January, 2023





Lonestar Consulting, LLC
Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6492' @ 6492.00ft
Reference Site:	Rosa Unit 31	MD Reference:	GL 6492' @ 6492.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #7	Offset TVD Reference:	Offset Datum

Reference	Plan #7		
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	1/9/2023		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	20,878.80	Plan #7 (OH)	MWD+HDGM	OWSG MWD + HDGM

Site Name	Reference	Offset	Distance		Separation Factor	Warning
	Measured Depth (ft)	Measured Depth (ft)	Between Centres (ft)	Between Ellipses (ft)		
Offset Well - Wellbore - Design						
Rosa Unit 31						
Rosa Unit #740H - OH - Plan #8	500.00	500.00	45.14	41.55	12.592	CC, ES
Rosa Unit #740H - OH - Plan #8	800.00	801.22	57.77	52.13	10.231	SF
Rosa Unit #742H - OH - Plan #8	500.00	500.00	30.33	26.75	8.461	CC, ES
Rosa Unit #742H - OH - Plan #8	600.00	599.98	32.08	27.79	7.485	SF
Rosa Unit #744H - OH - Plan #7	500.00	500.00	15.33	11.75	4.278	CC, ES
Rosa Unit #744H - OH - Plan #7	20,878.80	20,859.41	1,281.28	437.52	1.519	SF
Rosa Unit #745H - OH - Plan #3	1,143.46	1,140.54	12.90	4.73	1.579	CC
Rosa Unit #745H - OH - Plan #3	20,878.80	21,228.12	752.69	-38.89	0.951	Level 1, ES, SF
RU 147 - OH - OH	4,179.45	4,084.59	98.91	-43.56	0.694	Level 1, CC
RU 147 - OH - OH	4,200.00	4,104.61	99.02	-44.16	0.692	Level 1, ES, SF
RU 56 - OH - OH	16,545.00	7,287.15	633.54	336.38	2.132	CC, ES
RU 56 - OH - OH	16,600.00	7,286.55	635.92	337.04	2.128	SF

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



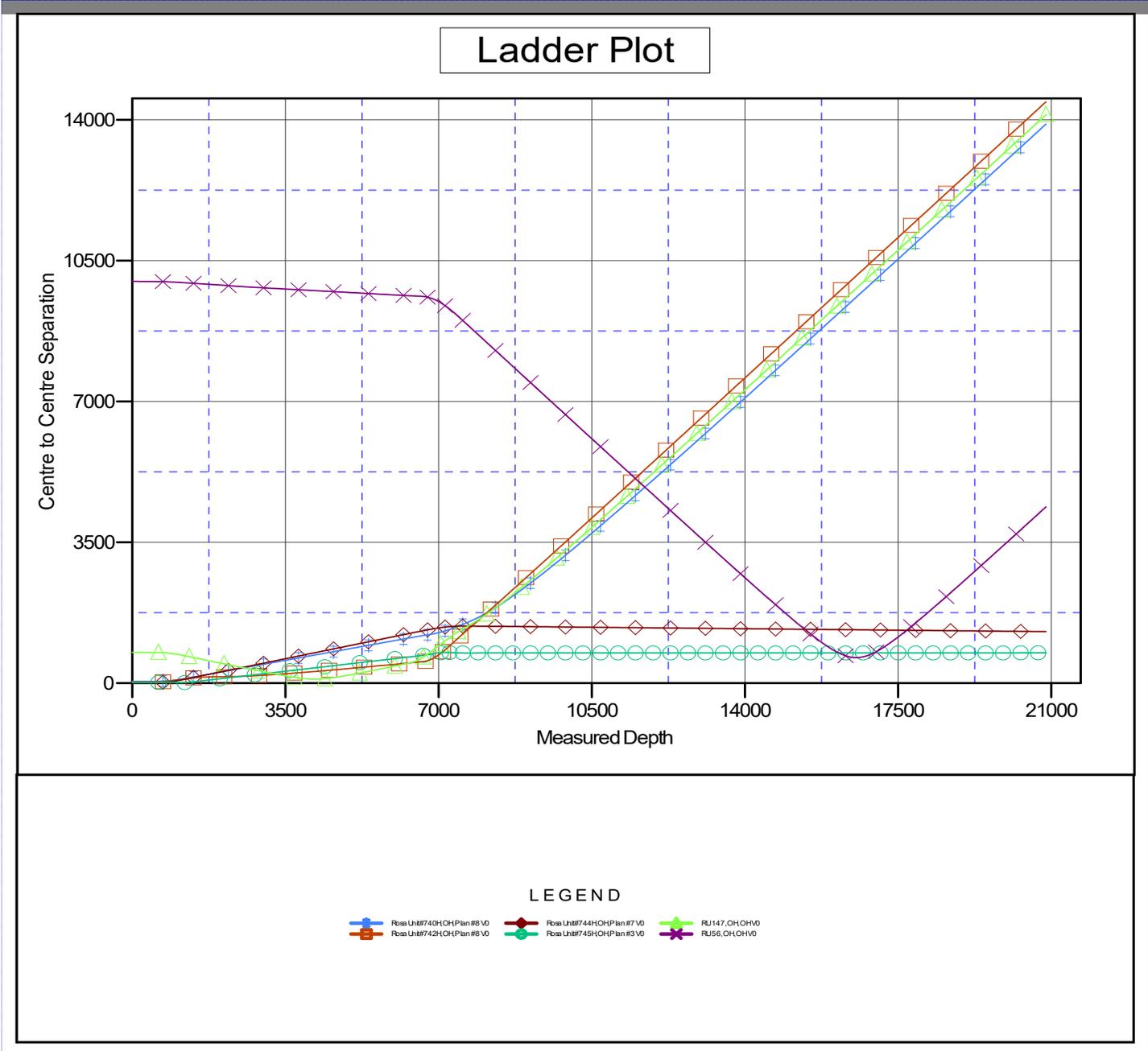
Lonestar Consulting, LLC
Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6492' @ 6492.00ft
Reference Site:	Rosa Unit 31	MD Reference:	GL 6492' @ 6492.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #7	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6492' @ 6492.00ft
 Offset Depths are relative to Offset Datum
 Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit #746H - Slot A4
 Coordinate System is US State Plane 1983, New Mexico Western Zone
 Grid Convergence at Surface is: 0.28°



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



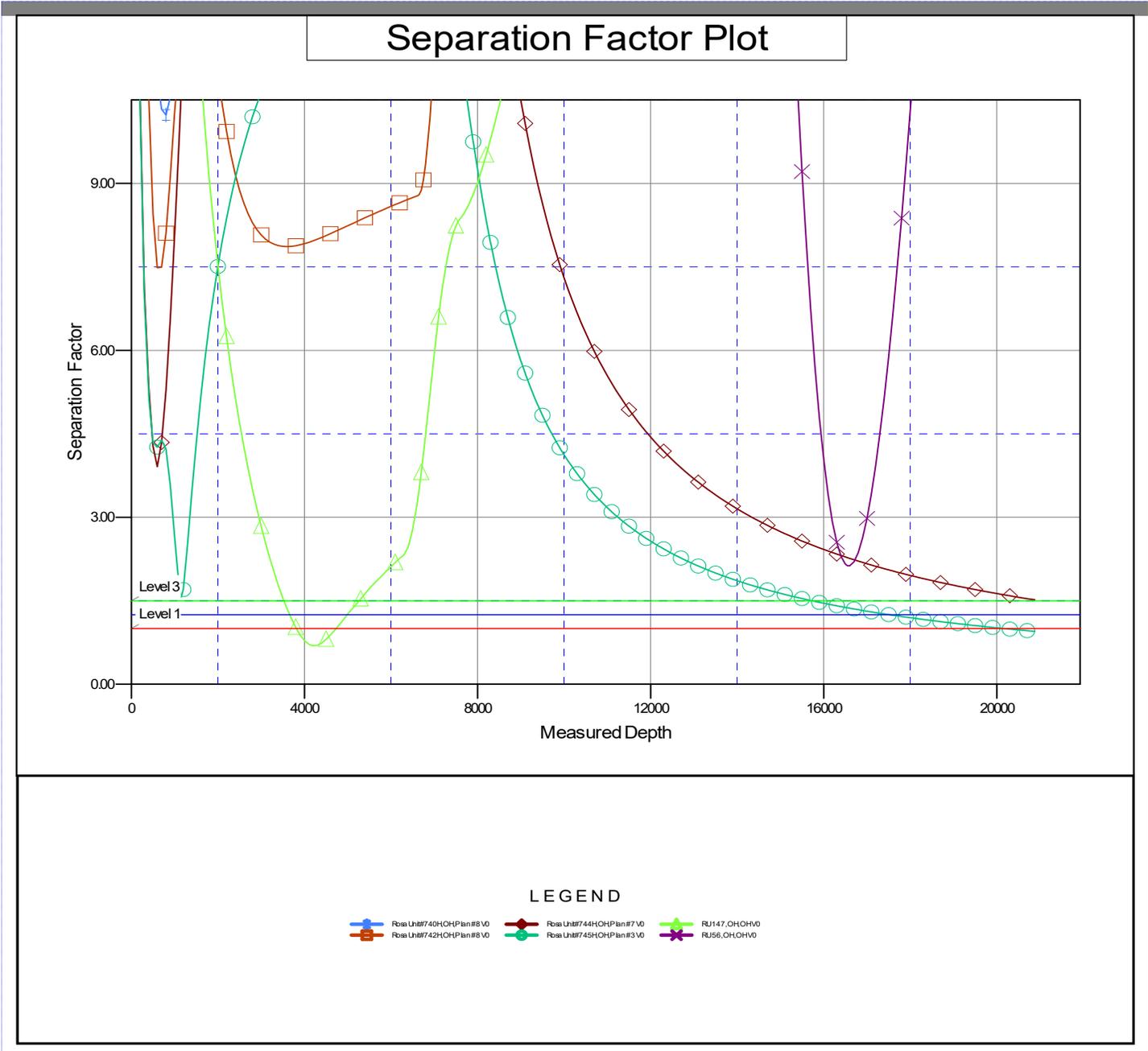
Lonestar Consulting, LLC
Anticollision Summary Report



Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6492' @ 6492.00ft
Reference Site:	Rosa Unit 31	MD Reference:	GL 6492' @ 6492.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #7	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6492' @ 6492.00ft
 Offset Depths are relative to Offset Datum
 Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit #746H - Slot A4
 Coordinate System is US State Plane 1983, New Mexico Western Zone
 Grid Convergence at Surface is: 0.28°



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

Released to Imaging: 3/1/2023 8:00:23 AM



Company: Logos Operating LLC
 Project: Rio Arriba, NM NAD83
 Site: Rosa Unit 31
 Well: Rosa Unit #746H
 Wellbore: OH
 Design: Plan #7

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



Received by OCD: 5/21/23 11:53:04 PM

WELL DETAILS: Rosa Unit #746H

GL 6492' @ 6492.00ft
 +N/-S 0.00 +E/-W 0.00 Northing 2133550.1375 Easting 2858366.1633 Latitude 36.8623590 Longitude -107.3709110 A4

Plan: Plan #7 (Rosa Unit #746H/OH)

Created By: Janie Collins Date: 15:35, January 09 2023



Azimuths to True North:
 Magnetic North: 8

Magnetic Field
 Strength: 49534.0
 Dip Angle: 63.83°
 Date: 10/19/2022
 Model: HDGM2022

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
746H POE Rev 3	7077.00	-1444.30	801.10	2132109.7395	2859174.2493	36.8583919	-107.3681727
746H BHL Rev 3	7082.00	-1528.89	14076.14	2132089.4242	2872449.5111	36.8581498	-107.3227968

SECTION DETAILS

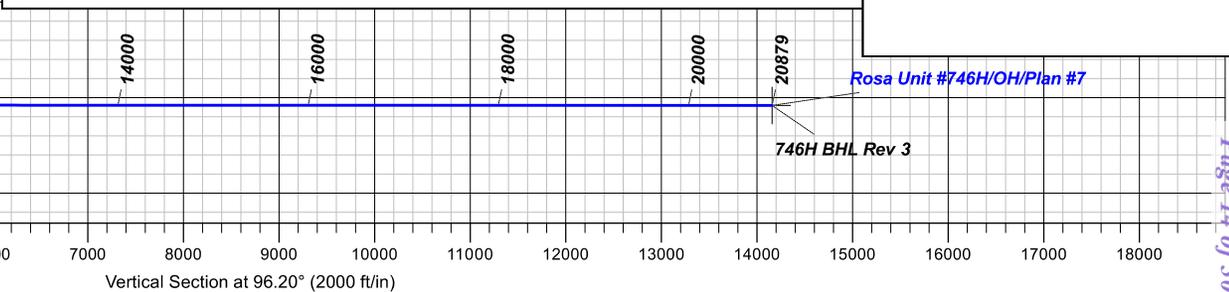
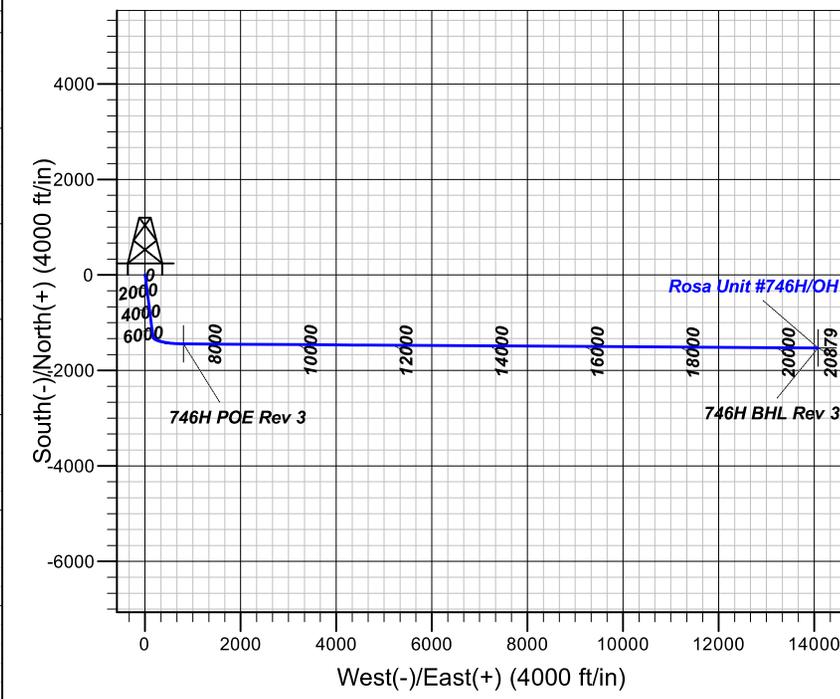
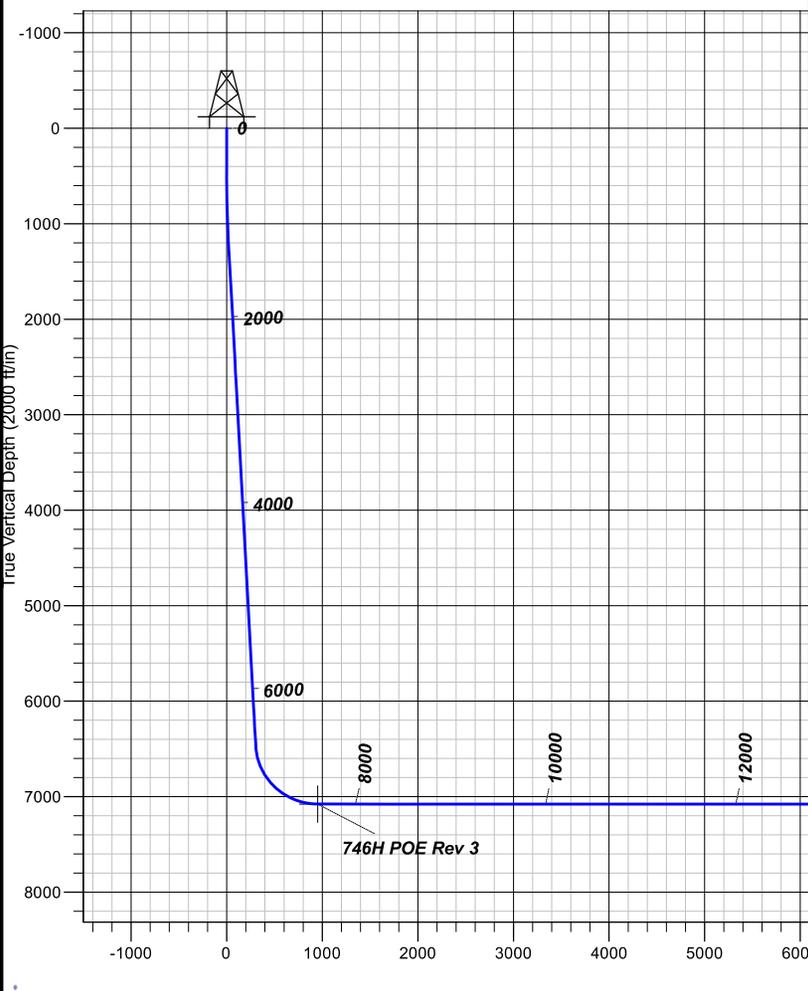
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00
1154.13	13.08	172.74	1148.46	-73.76	9.40	2.00	172.74	17.31
6622.86	13.08	172.74	6475.25	-1301.70	165.90	0.00	0.00	305.49
7603.50	89.98	90.37	7077.00	-1444.30	801.10	9.00	-82.57	952.38
20878.80	89.98	90.37	7082.00	-1528.89	14076.14	0.00	0.00	14158.93

CASING DETAILS

No casing data is available

FORMATION DETAILS

TVDPath	MDPath	Formation
2646.00	2691.57	Ojo Alamo
2773.00	2821.96	Kirtland
3236.00	3297.30	Fruitland
3523.00	3591.94	Pictured Cliffs
3624.00	3695.63	Lewis
4711.00	4811.60	Chacra
5541.00	5663.72	Cliff House
5573.00	5696.57	Menefee
5772.00	5900.87	Point Lookout
6253.00	6394.69	Mancos



Page 14 of 30



Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 31

Rosa Unit #746H - Slot A4

OH

Plan: Plan #7

Standard Planning Report

25 January, 2023





Lonestar Consulting, LLC
Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6492' @ 6492.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6492' @ 6492.00ft
Site:	Rosa Unit 31	North Reference:	True
Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #7		

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 31				
Site Position:		Northing:	2,133,595.0680 usft	Latitude:	36.8624824
From:	Map	Easting:	2,858,361.8390 usft	Longitude:	-107.3709251
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in		

Well	Rosa Unit #746H - Slot A4					
Well Position	+N/-S	0.00 ft	Northing:	2,133,550.1375 usft	Latitude:	36.8623590
	+E/-W	0.00 ft	Easting:	2,858,366.1633 usft	Longitude:	-107.3709110
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,492.00 ft
Grid Convergence:		0.28 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	HDGM2022	10/19/2022	8.53	63.30	49,534.10000000

Design	Plan #7			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	96.20

Plan Survey Tool Program	Date	1/25/2023		
Depth From	Depth To	Survey (Wellbore)	Tool Name	Remarks
(ft)	(ft)			
1	0.00	20,878.80 Plan #7 (OH)	MWD+HDGM	
			OWSG MWD + HDGM	

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(ft)	(ft)	Rate	Rate	Rate	(°)	
(ft)			(ft)			(°/100ft)	(°/100ft)	(°/100ft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,154.13	13.08	172.74	1,148.46	-73.76	9.40	2.00	2.00	0.00	172.74	
6,622.86	13.08	172.74	6,475.25	-1,301.70	165.90	0.00	0.00	0.00	0.00	
7,603.50	89.98	90.37	7,077.00	-1,444.30	801.10	9.00	7.84	-8.40	-82.57	746H POE Rev 3
20,878.80	89.98	90.37	7,082.00	-1,528.89	14,076.14	0.00	0.00	0.00	0.00	746H BHL Rev 3



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6492' @ 6492.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6492' @ 6492.00ft
Site:	Rosa Unit 31	North Reference:	True
Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #7		

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	2.00	172.74	599.98	-1.73	0.22	0.41	2.00	2.00	0.00
700.00	4.00	172.74	699.84	-6.92	0.88	1.62	2.00	2.00	0.00
800.00	6.00	172.74	799.45	-15.57	1.98	3.65	2.00	2.00	0.00
900.00	8.00	172.74	898.70	-27.66	3.52	6.49	2.00	2.00	0.00
1,000.00	10.00	172.74	997.47	-43.17	5.50	10.13	2.00	2.00	0.00
1,100.00	12.00	172.74	1,095.62	-62.10	7.91	14.57	2.00	2.00	0.00
1,154.13	13.08	172.74	1,148.46	-73.76	9.40	17.31	2.00	2.00	0.00
1,200.00	13.08	172.74	1,193.14	-84.06	10.71	19.73	0.00	0.00	0.00
1,300.00	13.08	172.74	1,290.54	-106.51	13.58	25.00	0.00	0.00	0.00
1,400.00	13.08	172.74	1,387.95	-128.97	16.44	30.27	0.00	0.00	0.00
1,500.00	13.08	172.74	1,485.35	-151.42	19.30	35.54	0.00	0.00	0.00
1,600.00	13.08	172.74	1,582.76	-173.87	22.16	40.81	0.00	0.00	0.00
1,700.00	13.08	172.74	1,680.16	-196.33	25.02	46.08	0.00	0.00	0.00
1,800.00	13.08	172.74	1,777.57	-218.78	27.88	51.34	0.00	0.00	0.00
1,900.00	13.08	172.74	1,874.97	-241.24	30.75	56.61	0.00	0.00	0.00
2,000.00	13.08	172.74	1,972.38	-263.69	33.61	61.88	0.00	0.00	0.00
2,100.00	13.08	172.74	2,069.78	-286.14	36.47	67.15	0.00	0.00	0.00
2,200.00	13.08	172.74	2,167.19	-308.60	39.33	72.42	0.00	0.00	0.00
2,300.00	13.08	172.74	2,264.59	-331.05	42.19	77.69	0.00	0.00	0.00
2,400.00	13.08	172.74	2,361.99	-353.51	45.05	82.96	0.00	0.00	0.00
2,500.00	13.08	172.74	2,459.40	-375.96	47.92	88.23	0.00	0.00	0.00
2,600.00	13.08	172.74	2,556.80	-398.41	50.78	93.50	0.00	0.00	0.00
2,700.00	13.08	172.74	2,654.21	-420.87	53.64	98.77	0.00	0.00	0.00
2,800.00	13.08	172.74	2,751.61	-443.32	56.50	104.04	0.00	0.00	0.00
2,900.00	13.08	172.74	2,849.02	-465.77	59.36	109.31	0.00	0.00	0.00
3,000.00	13.08	172.74	2,946.42	-488.23	62.22	114.58	0.00	0.00	0.00
3,100.00	13.08	172.74	3,043.83	-510.68	65.09	119.85	0.00	0.00	0.00
3,200.00	13.08	172.74	3,141.23	-533.14	67.95	125.12	0.00	0.00	0.00
3,300.00	13.08	172.74	3,238.63	-555.59	70.81	130.39	0.00	0.00	0.00
3,400.00	13.08	172.74	3,336.04	-578.04	73.67	135.66	0.00	0.00	0.00
3,500.00	13.08	172.74	3,433.44	-600.50	76.53	140.93	0.00	0.00	0.00
3,600.00	13.08	172.74	3,530.85	-622.95	79.39	146.20	0.00	0.00	0.00
3,700.00	13.08	172.74	3,628.25	-645.40	82.26	151.47	0.00	0.00	0.00
3,800.00	13.08	172.74	3,725.66	-667.86	85.12	156.74	0.00	0.00	0.00
3,900.00	13.08	172.74	3,823.06	-690.31	87.98	162.01	0.00	0.00	0.00
4,000.00	13.08	172.74	3,920.47	-712.77	90.84	167.28	0.00	0.00	0.00
4,100.00	13.08	172.74	4,017.87	-735.22	93.70	172.55	0.00	0.00	0.00
4,200.00	13.08	172.74	4,115.28	-757.67	96.57	177.81	0.00	0.00	0.00
4,300.00	13.08	172.74	4,212.68	-780.13	99.43	183.08	0.00	0.00	0.00
4,400.00	13.08	172.74	4,310.08	-802.58	102.29	188.35	0.00	0.00	0.00
4,500.00	13.08	172.74	4,407.49	-825.04	105.15	193.62	0.00	0.00	0.00
4,600.00	13.08	172.74	4,504.89	-847.49	108.01	198.89	0.00	0.00	0.00
4,700.00	13.08	172.74	4,602.30	-869.94	110.87	204.16	0.00	0.00	0.00
4,800.00	13.08	172.74	4,699.70	-892.40	113.74	209.43	0.00	0.00	0.00
4,900.00	13.08	172.74	4,797.11	-914.85	116.60	214.70	0.00	0.00	0.00
5,000.00	13.08	172.74	4,894.51	-937.30	119.46	219.97	0.00	0.00	0.00
5,100.00	13.08	172.74	4,991.92	-959.76	122.32	225.24	0.00	0.00	0.00
5,200.00	13.08	172.74	5,089.32	-982.21	125.18	230.51	0.00	0.00	0.00



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6492' @ 6492.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6492' @ 6492.00ft
Site:	Rosa Unit 31	North Reference:	True
Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #7		

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)
5,300.00	13.08	172.74	5,186.72	-1,004.67	128.04	235.78	0.00	0.00	0.00
5,400.00	13.08	172.74	5,284.13	-1,027.12	130.91	241.05	0.00	0.00	0.00
5,500.00	13.08	172.74	5,381.53	-1,049.57	133.77	246.32	0.00	0.00	0.00
5,600.00	13.08	172.74	5,478.94	-1,072.03	136.63	251.59	0.00	0.00	0.00
5,700.00	13.08	172.74	5,576.34	-1,094.48	139.49	256.86	0.00	0.00	0.00
5,800.00	13.08	172.74	5,673.75	-1,116.94	142.35	262.13	0.00	0.00	0.00
5,900.00	13.08	172.74	5,771.15	-1,139.39	145.21	267.40	0.00	0.00	0.00
6,000.00	13.08	172.74	5,868.56	-1,161.84	148.08	272.67	0.00	0.00	0.00
6,100.00	13.08	172.74	5,965.96	-1,184.30	150.94	277.94	0.00	0.00	0.00
6,200.00	13.08	172.74	6,063.37	-1,206.75	153.80	283.21	0.00	0.00	0.00
6,300.00	13.08	172.74	6,160.77	-1,229.20	156.66	288.48	0.00	0.00	0.00
6,400.00	13.08	172.74	6,258.17	-1,251.66	159.52	293.75	0.00	0.00	0.00
6,500.00	13.08	172.74	6,355.58	-1,274.11	162.38	299.01	0.00	0.00	0.00
6,600.00	13.08	172.74	6,452.98	-1,296.57	165.25	304.28	0.00	0.00	0.00
6,622.86	13.08	172.74	6,475.25	-1,301.70	165.90	305.49	0.00	0.00	0.00
6,700.00	15.56	146.19	6,550.07	-1,318.98	172.77	314.18	9.00	3.21	-34.41
6,800.00	21.79	125.54	6,644.86	-1,340.95	195.38	339.03	9.00	6.23	-20.65
6,900.00	29.44	114.44	6,735.01	-1,361.95	232.93	378.64	9.00	7.65	-11.09
7,000.00	37.65	107.73	6,818.31	-1,381.46	284.51	432.01	9.00	8.21	-6.72
7,100.00	46.12	103.16	6,892.71	-1,399.00	348.83	497.85	9.00	8.47	-4.57
7,200.00	54.73	99.74	6,956.37	-1,414.14	424.31	574.53	9.00	8.61	-3.42
7,300.00	63.42	96.98	7,007.72	-1,426.50	509.11	660.16	9.00	8.69	-2.76
7,400.00	72.15	94.61	7,045.50	-1,435.78	601.12	752.64	9.00	8.73	-2.36
7,500.00	80.90	92.47	7,068.78	-1,441.76	698.08	849.68	9.00	8.76	-2.14
7,600.00	89.67	90.44	7,076.99	-1,444.27	797.61	948.90	9.00	8.77	-2.04
7,603.50	89.98	90.37	7,077.00	-1,444.30	801.10	952.38	9.00	8.77	-2.02
7,700.00	89.98	90.37	7,077.04	-1,444.91	897.60	1,048.38	0.00	0.00	0.00
7,800.00	89.98	90.37	7,077.07	-1,445.55	997.60	1,147.86	0.00	0.00	0.00
7,900.00	89.98	90.37	7,077.11	-1,446.19	1,097.60	1,247.34	0.00	0.00	0.00
8,000.00	89.98	90.37	7,077.15	-1,446.82	1,197.60	1,346.82	0.00	0.00	0.00
8,100.00	89.98	90.37	7,077.19	-1,447.46	1,297.60	1,446.31	0.00	0.00	0.00
8,200.00	89.98	90.37	7,077.22	-1,448.10	1,397.59	1,545.79	0.00	0.00	0.00
8,300.00	89.98	90.37	7,077.26	-1,448.74	1,497.59	1,645.27	0.00	0.00	0.00
8,400.00	89.98	90.37	7,077.30	-1,449.37	1,597.59	1,744.75	0.00	0.00	0.00
8,500.00	89.98	90.37	7,077.34	-1,450.01	1,697.59	1,844.24	0.00	0.00	0.00
8,600.00	89.98	90.37	7,077.38	-1,450.65	1,797.59	1,943.72	0.00	0.00	0.00
8,700.00	89.98	90.37	7,077.41	-1,451.28	1,897.58	2,043.20	0.00	0.00	0.00
8,800.00	89.98	90.37	7,077.45	-1,451.92	1,997.58	2,142.68	0.00	0.00	0.00
8,900.00	89.98	90.37	7,077.49	-1,452.56	2,097.58	2,242.16	0.00	0.00	0.00
9,000.00	89.98	90.37	7,077.53	-1,453.20	2,197.58	2,341.65	0.00	0.00	0.00
9,100.00	89.98	90.37	7,077.56	-1,453.83	2,297.58	2,441.13	0.00	0.00	0.00
9,200.00	89.98	90.37	7,077.60	-1,454.47	2,397.57	2,540.61	0.00	0.00	0.00
9,300.00	89.98	90.37	7,077.64	-1,455.11	2,497.57	2,640.09	0.00	0.00	0.00
9,400.00	89.98	90.37	7,077.68	-1,455.74	2,597.57	2,739.57	0.00	0.00	0.00
9,500.00	89.98	90.37	7,077.71	-1,456.38	2,697.57	2,839.06	0.00	0.00	0.00
9,600.00	89.98	90.37	7,077.75	-1,457.02	2,797.57	2,938.54	0.00	0.00	0.00
9,700.00	89.98	90.37	7,077.79	-1,457.66	2,897.56	3,038.02	0.00	0.00	0.00
9,800.00	89.98	90.37	7,077.83	-1,458.29	2,997.56	3,137.50	0.00	0.00	0.00
9,900.00	89.98	90.37	7,077.87	-1,458.93	3,097.56	3,236.98	0.00	0.00	0.00
10,000.00	89.98	90.37	7,077.90	-1,459.57	3,197.56	3,336.47	0.00	0.00	0.00
10,100.00	89.98	90.37	7,077.94	-1,460.21	3,297.56	3,435.95	0.00	0.00	0.00
10,200.00	89.98	90.37	7,077.98	-1,460.84	3,397.55	3,535.43	0.00	0.00	0.00
10,300.00	89.98	90.37	7,078.02	-1,461.48	3,497.55	3,634.91	0.00	0.00	0.00
10,400.00	89.98	90.37	7,078.05	-1,462.12	3,597.55	3,734.39	0.00	0.00	0.00



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6492' @ 6492.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6492' @ 6492.00ft
Site:	Rosa Unit 31	North Reference:	True
Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #7		

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)	
10,500.00	89.98	90.37	7,078.09	-1,462.75	3,697.55	3,833.88	0.00	0.00	0.00	
10,600.00	89.98	90.37	7,078.13	-1,463.39	3,797.55	3,933.36	0.00	0.00	0.00	
10,700.00	89.98	90.37	7,078.17	-1,464.03	3,897.54	4,032.84	0.00	0.00	0.00	
10,800.00	89.98	90.37	7,078.20	-1,464.67	3,997.54	4,132.32	0.00	0.00	0.00	
10,900.00	89.98	90.37	7,078.24	-1,465.30	4,097.54	4,231.81	0.00	0.00	0.00	
11,000.00	89.98	90.37	7,078.28	-1,465.94	4,197.54	4,331.29	0.00	0.00	0.00	
11,100.00	89.98	90.37	7,078.32	-1,466.58	4,297.53	4,430.77	0.00	0.00	0.00	
11,200.00	89.98	90.37	7,078.35	-1,467.21	4,397.53	4,530.25	0.00	0.00	0.00	
11,300.00	89.98	90.37	7,078.39	-1,467.85	4,497.53	4,629.73	0.00	0.00	0.00	
11,400.00	89.98	90.37	7,078.43	-1,468.49	4,597.53	4,729.22	0.00	0.00	0.00	
11,500.00	89.98	90.37	7,078.47	-1,469.13	4,697.53	4,828.70	0.00	0.00	0.00	
11,600.00	89.98	90.37	7,078.51	-1,469.76	4,797.52	4,928.18	0.00	0.00	0.00	
11,700.00	89.98	90.37	7,078.54	-1,470.40	4,897.52	5,027.66	0.00	0.00	0.00	
11,800.00	89.98	90.37	7,078.58	-1,471.04	4,997.52	5,127.14	0.00	0.00	0.00	
11,900.00	89.98	90.37	7,078.62	-1,471.68	5,097.52	5,226.63	0.00	0.00	0.00	
12,000.00	89.98	90.37	7,078.66	-1,472.31	5,197.52	5,326.11	0.00	0.00	0.00	
12,100.00	89.98	90.37	7,078.69	-1,472.95	5,297.51	5,425.59	0.00	0.00	0.00	
12,200.00	89.98	90.37	7,078.73	-1,473.59	5,397.51	5,525.07	0.00	0.00	0.00	
12,300.00	89.98	90.37	7,078.77	-1,474.22	5,497.51	5,624.55	0.00	0.00	0.00	
12,400.00	89.98	90.37	7,078.81	-1,474.86	5,597.51	5,724.04	0.00	0.00	0.00	
12,500.00	89.98	90.37	7,078.84	-1,475.50	5,697.51	5,823.52	0.00	0.00	0.00	
12,600.00	89.98	90.37	7,078.88	-1,476.14	5,797.50	5,923.00	0.00	0.00	0.00	
12,700.00	89.98	90.37	7,078.92	-1,476.77	5,897.50	6,022.48	0.00	0.00	0.00	
12,800.00	89.98	90.37	7,078.96	-1,477.41	5,997.50	6,121.96	0.00	0.00	0.00	
12,900.00	89.98	90.37	7,079.00	-1,478.05	6,097.50	6,221.45	0.00	0.00	0.00	
13,000.00	89.98	90.37	7,079.03	-1,478.68	6,197.50	6,320.93	0.00	0.00	0.00	
13,100.00	89.98	90.37	7,079.07	-1,479.32	6,297.49	6,420.41	0.00	0.00	0.00	
13,200.00	89.98	90.37	7,079.11	-1,479.96	6,397.49	6,519.89	0.00	0.00	0.00	
13,300.00	89.98	90.37	7,079.15	-1,480.60	6,497.49	6,619.38	0.00	0.00	0.00	
13,400.00	89.98	90.37	7,079.18	-1,481.23	6,597.49	6,718.86	0.00	0.00	0.00	
13,500.00	89.98	90.37	7,079.22	-1,481.87	6,697.49	6,818.34	0.00	0.00	0.00	
13,600.00	89.98	90.37	7,079.26	-1,482.51	6,797.48	6,917.82	0.00	0.00	0.00	
13,700.00	89.98	90.37	7,079.30	-1,483.15	6,897.48	7,017.30	0.00	0.00	0.00	
13,800.00	89.98	90.37	7,079.33	-1,483.78	6,997.48	7,116.79	0.00	0.00	0.00	
13,900.00	89.98	90.37	7,079.37	-1,484.42	7,097.48	7,216.27	0.00	0.00	0.00	
14,000.00	89.98	90.37	7,079.41	-1,485.06	7,197.48	7,315.75	0.00	0.00	0.00	
14,100.00	89.98	90.37	7,079.45	-1,485.69	7,297.47	7,415.23	0.00	0.00	0.00	
14,200.00	89.98	90.37	7,079.48	-1,486.33	7,397.47	7,514.71	0.00	0.00	0.00	
14,300.00	89.98	90.37	7,079.52	-1,486.97	7,497.47	7,614.20	0.00	0.00	0.00	
14,400.00	89.98	90.37	7,079.56	-1,487.61	7,597.47	7,713.68	0.00	0.00	0.00	
14,500.00	89.98	90.37	7,079.60	-1,488.24	7,697.47	7,813.16	0.00	0.00	0.00	
14,600.00	89.98	90.37	7,079.64	-1,488.88	7,797.46	7,912.64	0.00	0.00	0.00	
14,700.00	89.98	90.37	7,079.67	-1,489.52	7,897.46	8,012.12	0.00	0.00	0.00	
14,800.00	89.98	90.37	7,079.71	-1,490.16	7,997.46	8,111.61	0.00	0.00	0.00	
14,900.00	89.98	90.37	7,079.75	-1,490.79	8,097.46	8,211.09	0.00	0.00	0.00	
15,000.00	89.98	90.37	7,079.79	-1,491.43	8,197.46	8,310.57	0.00	0.00	0.00	
15,100.00	89.98	90.37	7,079.82	-1,492.07	8,297.45	8,410.05	0.00	0.00	0.00	
15,200.00	89.98	90.37	7,079.86	-1,492.70	8,397.45	8,509.53	0.00	0.00	0.00	
15,300.00	89.98	90.37	7,079.90	-1,493.34	8,497.45	8,609.02	0.00	0.00	0.00	
15,400.00	89.98	90.37	7,079.94	-1,493.98	8,597.45	8,708.50	0.00	0.00	0.00	
15,500.00	89.98	90.37	7,079.97	-1,494.62	8,697.45	8,807.98	0.00	0.00	0.00	
15,600.00	89.98	90.37	7,080.01	-1,495.25	8,797.44	8,907.46	0.00	0.00	0.00	
15,700.00	89.98	90.37	7,080.05	-1,495.89	8,897.44	9,006.95	0.00	0.00	0.00	
15,800.00	89.98	90.37	7,080.09	-1,496.53	8,997.44	9,106.43	0.00	0.00	0.00	



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6492' @ 6492.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6492' @ 6492.00ft
Site:	Rosa Unit 31	North Reference:	True
Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #7		

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)	
15,900.00	89.98	90.37	7,080.12	-1,497.16	9,097.44	9,205.91	0.00	0.00	0.00	
16,000.00	89.98	90.37	7,080.16	-1,497.80	9,197.44	9,305.39	0.00	0.00	0.00	
16,100.00	89.98	90.37	7,080.20	-1,498.44	9,297.43	9,404.87	0.00	0.00	0.00	
16,200.00	89.98	90.37	7,080.24	-1,499.08	9,397.43	9,504.36	0.00	0.00	0.00	
16,300.00	89.98	90.37	7,080.28	-1,499.71	9,497.43	9,603.84	0.00	0.00	0.00	
16,400.00	89.98	90.37	7,080.31	-1,500.35	9,597.43	9,703.32	0.00	0.00	0.00	
16,500.00	89.98	90.37	7,080.35	-1,500.99	9,697.43	9,802.80	0.00	0.00	0.00	
16,600.00	89.98	90.37	7,080.39	-1,501.63	9,797.42	9,902.28	0.00	0.00	0.00	
16,700.00	89.98	90.37	7,080.43	-1,502.26	9,897.42	10,001.77	0.00	0.00	0.00	
16,800.00	89.98	90.37	7,080.46	-1,502.90	9,997.42	10,101.25	0.00	0.00	0.00	
16,900.00	89.98	90.37	7,080.50	-1,503.54	10,097.42	10,200.73	0.00	0.00	0.00	
17,000.00	89.98	90.37	7,080.54	-1,504.17	10,197.41	10,300.21	0.00	0.00	0.00	
17,100.00	89.98	90.37	7,080.58	-1,504.81	10,297.41	10,399.69	0.00	0.00	0.00	
17,200.00	89.98	90.37	7,080.61	-1,505.45	10,397.41	10,499.18	0.00	0.00	0.00	
17,300.00	89.98	90.37	7,080.65	-1,506.09	10,497.41	10,598.66	0.00	0.00	0.00	
17,400.00	89.98	90.37	7,080.69	-1,506.72	10,597.41	10,698.14	0.00	0.00	0.00	
17,500.00	89.98	90.37	7,080.73	-1,507.36	10,697.40	10,797.62	0.00	0.00	0.00	
17,600.00	89.98	90.37	7,080.77	-1,508.00	10,797.40	10,897.10	0.00	0.00	0.00	
17,700.00	89.98	90.37	7,080.80	-1,508.63	10,897.40	10,996.59	0.00	0.00	0.00	
17,800.00	89.98	90.37	7,080.84	-1,509.27	10,997.40	11,096.07	0.00	0.00	0.00	
17,900.00	89.98	90.37	7,080.88	-1,509.91	11,097.40	11,195.55	0.00	0.00	0.00	
18,000.00	89.98	90.37	7,080.92	-1,510.55	11,197.39	11,295.03	0.00	0.00	0.00	
18,100.00	89.98	90.37	7,080.95	-1,511.18	11,297.39	11,394.52	0.00	0.00	0.00	
18,200.00	89.98	90.37	7,080.99	-1,511.82	11,397.39	11,494.00	0.00	0.00	0.00	
18,300.00	89.98	90.37	7,081.03	-1,512.46	11,497.39	11,593.48	0.00	0.00	0.00	
18,400.00	89.98	90.37	7,081.07	-1,513.10	11,597.39	11,692.96	0.00	0.00	0.00	
18,500.00	89.98	90.37	7,081.10	-1,513.73	11,697.38	11,792.44	0.00	0.00	0.00	
18,600.00	89.98	90.37	7,081.14	-1,514.37	11,797.38	11,891.93	0.00	0.00	0.00	
18,700.00	89.98	90.37	7,081.18	-1,515.01	11,897.38	11,991.41	0.00	0.00	0.00	
18,800.00	89.98	90.37	7,081.22	-1,515.64	11,997.38	12,090.89	0.00	0.00	0.00	
18,900.00	89.98	90.37	7,081.25	-1,516.28	12,097.38	12,190.37	0.00	0.00	0.00	
19,000.00	89.98	90.37	7,081.29	-1,516.92	12,197.37	12,289.85	0.00	0.00	0.00	
19,100.00	89.98	90.37	7,081.33	-1,517.56	12,297.37	12,389.34	0.00	0.00	0.00	
19,200.00	89.98	90.37	7,081.37	-1,518.19	12,397.37	12,488.82	0.00	0.00	0.00	
19,300.00	89.98	90.37	7,081.41	-1,518.83	12,497.37	12,588.30	0.00	0.00	0.00	
19,400.00	89.98	90.37	7,081.44	-1,519.47	12,597.37	12,687.78	0.00	0.00	0.00	
19,500.00	89.98	90.37	7,081.48	-1,520.11	12,697.36	12,787.26	0.00	0.00	0.00	
19,600.00	89.98	90.37	7,081.52	-1,520.74	12,797.36	12,886.75	0.00	0.00	0.00	
19,700.00	89.98	90.37	7,081.56	-1,521.38	12,897.36	12,986.23	0.00	0.00	0.00	
19,800.00	89.98	90.37	7,081.59	-1,522.02	12,997.36	13,085.71	0.00	0.00	0.00	
19,900.00	89.98	90.37	7,081.63	-1,522.65	13,097.36	13,185.19	0.00	0.00	0.00	
20,000.00	89.98	90.37	7,081.67	-1,523.29	13,197.35	13,284.67	0.00	0.00	0.00	
20,100.00	89.98	90.37	7,081.71	-1,523.93	13,297.35	13,384.16	0.00	0.00	0.00	
20,200.00	89.98	90.37	7,081.74	-1,524.57	13,397.35	13,483.64	0.00	0.00	0.00	
20,300.00	89.98	90.37	7,081.78	-1,525.20	13,497.35	13,583.12	0.00	0.00	0.00	
20,400.00	89.98	90.37	7,081.82	-1,525.84	13,597.35	13,682.60	0.00	0.00	0.00	
20,500.00	89.98	90.37	7,081.86	-1,526.48	13,697.34	13,782.09	0.00	0.00	0.00	
20,600.00	89.98	90.37	7,081.90	-1,527.11	13,797.34	13,881.57	0.00	0.00	0.00	
20,700.00	89.98	90.37	7,081.93	-1,527.75	13,897.34	13,981.05	0.00	0.00	0.00	
20,800.00	89.98	90.37	7,081.97	-1,528.39	13,997.34	14,080.53	0.00	0.00	0.00	
20,878.80	89.98	90.37	7,082.00	-1,528.89	14,076.14	14,158.93	0.00	0.00	0.00	



Lonestar Consulting, LLC
Planning Report



Database:	Grand Junction	Local Co-ordinate Reference:	Well Rosa Unit #746H - Slot A4
Company:	Logos Operating LLC	TVD Reference:	GL 6492' @ 6492.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6492' @ 6492.00ft
Site:	Rosa Unit 31	North Reference:	True
Well:	Rosa Unit #746H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #7		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
- Shape									
746H POE Rev 3 - plan hits target center - Point	0.00	0.00	7,077.00	-1,444.30	801.10	2,132,109.7395	2,859,174.2494	36.8583918	-107.3681727
746H BHL Rev 3 - plan hits target center - Point	0.00	0.00	7,082.00	-1,528.89	14,076.14	2,132,089.4242	2,872,449.5111	36.8581498	-107.3227969

Formations					
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction
(ft)	(ft)			(°)	(°)
2,691.57	2,646.00	Ojo Alamo		0.00	0.00
2,821.96	2,773.00	Kirtland		0.00	0.00
3,297.30	3,236.00	Fruitland		0.00	0.00
3,591.94	3,523.00	Pictured Cliffs		0.00	0.00
3,695.63	3,624.00	Lewis		0.00	0.00
4,811.60	4,711.00	Chacra		0.00	0.00
5,663.72	5,541.00	Cliff House		0.00	0.00
5,696.57	5,573.00	Menefee		0.00	0.00
5,900.87	5,772.00	Point Lookout		0.00	0.00
6,394.69	6,253.00	Mancos		0.00	0.00

Plan Annotations				
Measured Depth	Vertical Depth	Local Coordinates		Comment
(ft)	(ft)	+N/-S (ft)	+E/-W (ft)	
500.00	500.00	0.00	0.00	Start Build 2.00
1,154.13	1,148.46	-73.76	9.40	Start 5468.74 hold at 1154.13 MD
6,622.86	6,475.25	-1,301.70	165.90	Start DLS 9.00 TFO -82.57
7,603.50	7,077.00	-1,444.30	801.10	POE @ 7603' MD
7,603.50	7,077.00	-1,444.30	801.11	36.8583919 / -107.3681727
20,878.80	7,082.00	-1,528.89	14,076.14	TD at 20878.80

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

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

Section 1 – Plan Description Effective May 25, 2021

I. Operator: LOGOS Operating, LLC **OGRID:** 289408 **Date:** 1 / 25 / 2023

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

If Other, please describe: _____

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

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Rosa Unit 740H	30-039-31364	C-33-T31N-R5W	319FNL, 1681FWL	N/A	14,176	504
Rosa Unit 742H	30-039-31419	C-33-T31N-R5W	334FNL, 1682FWL	N/A	14,696	470
Rosa Unit 744H	30-039-31423	C-33-T31N-R5W	349FNL, 1683FWL	N/A	20,068	649
Rosa Unit 745H	30-039-pending	C-33-T31N-R5W	368FNL, 1686FWL	N/A	20,804	671
Rosa Unit 746H	30-039-31416	C-33-T31N-R5W	363FNL, 1685FWL	N/A	20,804	671

IV. Central Delivery Point Name: Harvest Gathering System [See 19.15.27.9(D)(1) NMAC]

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

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Rosa Unit 740H	30-039-31364	8/25/2021	Pending	Pending	Pending	Pending
Rosa Unit 742H	30-039-31419	Pending	Pending	Pending	Pending	Pending
Rosa Unit 744H	30-039-31423	Pending	Pending	Pending	Pending	Pending
Rosa Unit 745H	30-039-pending	Pending	Pending	Pending	Pending	Pending
Rosa Unit 746H	30-039-31416	Pending	Pending	Pending	Pending	Pending

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

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

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

Section 2 – Enhanced Plan
EFFECTIVE APRIL 1, 2022

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

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

IX. Anticipated Natural Gas Production:

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

X. Natural Gas Gathering System (NGGS):

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

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

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

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

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

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

Section 3 - Certifications

Effective May 25, 2021

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

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

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

If Operator checks this box, Operator will select one of the following:

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

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

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

Section 4 - Notices

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

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

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

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

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

Signature:
Printed Name: Etta Trujillo
Title: Regulatory Specialist
E-mail Address: etrujillo@logosresourcesllc.com
Date: 1/23/2023
Phone: 505-324-4154
OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)
Approved By:
Title:
Approval Date:
Conditions of Approval:

VI. Separation Equipment

The operator will select separation equipment for the maximum anticipated throughput and pressure to optimize gas capture. Separation equipment is sized according to manufacturer's design specifications. Separation vessels are built following the A.S.M.E. section VII division 1 codes for pressure vessel design, fabrication, inspection, testing and certification. Anticipated well pressures and production rates are evaluated to select separation equipment according to the equipment's designed operating pressure and throughput.

After completion, the operator utilizes flowback equipment, including separators, to manage wellbore fluids and solids during the initial separation period. After the initial flowback period is complete the operator utilizes iterative facility separation equipment to ensure that optimal separation is achieved.

VII. Operational Practices 19.15.27.8 NMAC A through F

- A. The operator will maximize the recovery of natural gas and minimize the amount of gas vented or flared when technically and safely feasible as further described and detailed within the following subsections (B-F of 19.15.27.8). In all cases where natural gas venting and flaring requires regulatory reporting, reporting will be submitted accurately and within the required time frames.
- B. Venting and flaring during drilling operations:
 - a. New Drill HZ Oil Wells: The operator drills wells in the area by utilizing a balanced mud to safely drill the wellbore. This technique prevents gas from coming to surface during the drilling process. If there is an emergency or malfunction and natural gas does come to surface the natural gas will be captured or combusted, with an appropriately sized and located flare stack, if technically and safely feasible.
 - b. New Drill HZ Gas Wells: The operator drills wells in the area by balancing the mud weight to safely drill the wellbore with as minimal flaring as possible. When gas kicks enter the wellbore, sometimes it is necessary to circulate it out of the wellbore to an appropriately sized and located flare stack. The operator will estimate the volume flared and appropriately report.
- C. Venting and flaring during completion or recompletion operations:
 - a. New Drill HZ Oil Wells: The operator's facilities are designed to handle the maximum throughput and pressures from the newly drilled and completed wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. During initial flowback and initial separation flowback the operator will utilize contracted flowback equipment, including separators, to manage wellbore fluids and solids. The initial flowback period will be minimized and flow will be sent to separation equipment as soon as possible to reduce the amount of gas that is vented to atmosphere. During the separation flowback period natural gas will be routed to a properly sized and located flare until the natural gas is of pipeline quality (less than 60 days). The natural gas will also be utilized on site as needed for fuel gas or injection gas.
 - b. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from the newly drilled and completed wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. During initial flowback and initial separation flowback the operator will utilize contracted flowback equipment, including separators, to manage wellbore fluids and solids. The initial flowback period will be minimized and flow will be sent to separation equipment as soon as possible to reduce the amount of gas that is vented to atmosphere. The natural gas will be utilized on site as needed for fuel gas and natural gas will be sold. Venting and flaring during production operations:
- D. Venting and flaring during production operations:

- a. New Drill HZ Oil Wells: The operator's facilities are designed to handle the maximum throughput and pressures from producing wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible. This facility will operate under a notice of intent (NOI) from the New Mexico Environment Department (NMED).

Operations will effectively manage the following scenarios to minimize the quantity of natural gas that is vented or flared:

- (a) If there is an emergency or malfunction, vented or flared natural gas will be reported, if required, and the emergency or malfunction will be resolved as soon as technically and safely feasible.
- (b) If the wellbore requires liquids to be unloaded to atmosphere, the operator will not vent the well after the well has achieved a stabilized rate and pressure. The operator will remain on site during unloading. Plunger lift systems will be optimized to reduce the amount of natural gas venting. Downhole maintenance, such as workovers, swabbing, etc. will only be conducted as needed and best management practices will be utilized to reduce venting of natural gas.
- (c) The operator will minimize the amount of time that natural gas is vented to atmosphere from gauging and sampling a storage tank or low-pressure vessel, automatic tank gauges will be the primary means of gauging with minor exceptions.
- (d) The operator will reduce the amount of time needed for loading out liquids from a storage tanks or other low-pressure vessels whenever feasible. Operations will utilize a LACT system when available to minimize gas vented during oil tank loading.
- (e) Equipment will be repaired and maintained routinely to minimize the venting or flaring of natural gas. Repairs and maintenance will be conducted in a manner that minimizes the amount of natural gas vented to atmosphere through the isolation of the equipment that is being repaired or maintained.
- (f) Electric controllers and pumps will be installed to replace pneumatic controllers whenever feasible. Pneumatic controllers and pumps will be inspected frequently to ensure that no excess gas is vented to atmosphere.
- (g) Storage tanks and other low-pressure vessel normal operational venting will be minimized during the early life of the well with the installation of a vapor recovery unit to limit the flash and working and breathing emissions to atmosphere.
- (h) No dehydration or amine units are anticipated to be set on location.
- (i) Compressors, compressor engines, turbines, flanges, connectors, valves, and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operation.
- (j) Regulatory required testing, such as bradenhead and packer testing will be performed in a manner that minimizes the amount of natural gas vented to atmosphere.
- (k) When natural gas does not meet gathering pipeline specifications, for example high nitrogen content after a nearby frac, gas samples will be collected twice per week to determine when pipeline specification gas content has been achieved. During this time frame gas will be flared and not vented to atmosphere. Natural gas that meets pipeline specifications will be sold via pipeline and natural gas that can be utilized for fuel gas will be used during this time.
- (l) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.

- b. New Drill HZ Gas Wells: The operator's facilities are designed to handle the maximum throughput and pressures from producing wellbores. The amount of gas vented and flared will be minimized when technically and safely feasible.

Operations will effectively manage the following scenarios to minimize the quantity of natural gas that is vented or flared:

- (a) If there is an emergency or malfunction vented or flared natural gas will be reported, if required, and the emergency or malfunction will be resolved as soon as technically and safely feasible.
- (b) If the wellbore needs to be unloaded to atmosphere the operator will not vent the well after the well has achieved a stabilized rate and pressure. The operator will remain on site during unloading. Plunger lift systems will be optimized to reduce the amount of natural gas venting. Downhole maintenance, such as workovers, swabbing, etc. will only be conducted as needed and best management practices will be utilized to reduce venting of natural gas.
- (c) The operator will minimize the amount of time that natural gas is vented to atmosphere from gauging and sampling a storage tank or low-pressure vessel, automatic tank gauges will be the primary means of gauging. The formation is only anticipated to produce water and therefore tank emissions are anticipated to be negligible.
- (d) The operator will reduce the amount of time needed for loading out liquids from a storage tanks or other low-pressure vessels whenever feasible. Operations will always utilize the water transfer systems when available. Water loading emissions are anticipated to be negligible.
- (e) Equipment will be repaired and maintained routinely to minimize the venting or flaring of natural gas. Repairs and maintenance will be conducted in a manner that minimizes the amount of natural gas vented to atmosphere through the isolation of the equipment that is being repaired or maintained.
- (f) Electric controllers and pumps, or instrument air, will be installed to replace pneumatic controllers whenever feasible. Pneumatic controllers and pumps will be inspected frequently to ensure that no excess gas is vented to atmosphere.
- (g) No dehydration or amine units are anticipated to be set on location.
- (h) Compressors, compressor engines, turbines, flanges, connectors, valves, storage tanks, and other low-pressure vessels and flanges will be routinely inspected to ensure that no excess venting occurs outside of normal operations.
- (i) Regulatory required testing, such as bradenhead and packer testing will be performed in a manner that minimizes the amount of natural gas vented to atmosphere.
- (j) If natural gas does not meet gathering pipeline specifications gas samples will be collected twice per week to determine when pipeline specification gas content has been achieved. During this time frame gas will be flared and not vented to atmosphere. Natural gas that meets pipeline specifications will be sold via pipeline and natural gas that can be utilized for fuel gas will be used during this time.
- (k) If pipeline, equipment, or facilities need purged of impurities gas losses will be minimized as much as technically and safely feasible.

E. Performance standards:

- a. The production facilities are designed to handle the maximum throughput and pressures from producing wellbores and will be designed to minimize waste. The amount of gas vented and flared will be minimized when technically and safely feasible.

- b. All tanks that are routed to a control device that is installed after 5/25/2021 will have an automatic gauging system to minimize the amount of vented natural gas.
 - c. If a flare stack is installed or replaced after 5/25/2021 it will be equipped with an automatic ignitor or continuous pilot. The flare stack will be properly sized and designed to ensure proper combustion efficiency. The flare stack will be located 100 feet away from the nearest wellhead or storage tank.
 - d. AVO inspections will be conducted weekly for the year after completion and for all wells producing greater than 60,000 cubic feet of natural gas daily. The AVO inspection will include all components, including flare stacks, thief hatches, closed vent systems, pumps, compressors, pressure relief devices, valves, lines, flanges, connectors, and associated pipeline to identify any leaks and releases by comprehensive auditory, visual, and olfactory inspection. The AVO inspection records will be maintained for 5 years which will be available at the department's request. Identified leaks will be repaired as soon as feasible to minimize the amount of vented natural gas.
- F. Measurement or estimation of vented and flared natural gas.
- a. The volume of natural gas that is vented, flared or consumed for beneficial use will be measured when possible, or estimated, during drilling, completions, or production operations.
 - b. Equipment will be installed to measure the volume of natural gas flared for all APD's issued after 5/25/2021 on facilities that will have an average daily gas rate greater than 60,000 cubic feet of natural gas. Measurement equipment will conform to API MPMS Chapter 14.10 regulations. The measurement equipment will not have a manifold that allows the diversion of natural gas around the metering element except for the sole purpose of inspecting and servicing the measurement equipment. If metering is not practical, then the volume of gas will be estimated

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

CONDITIONS

Action 188960

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 188960
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
kpickford	Adhere to previous NMOCD Conditions of Approval	3/1/2023