

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Rd., Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Submit one copy to appropriate District Office

☐ AMENDED REPORT

I. REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT

¹ Operator name and Address LOGOS Operating, LLC 2010 Afton Place Farmington, NM 87401		² OGRID Number 289408	
		³ Reason for Filing Code/ Effective Date RT - Test Allowable	
⁴ API Number 30 – 039-31430	⁵ Pool Name Basin Mancos		⁶ Pool Code 97232
⁷ Property Code 320608	⁸ Property Name Rosa Unit		⁹ Well Number 644H

II. ¹⁰ Surface Location

UL or lot no. C	Section 19	Township 31N	Range 5W	Lot Idn 1	Feet from the 956	North/South Line North	Feet from the 482	East/West line West	County Rio Arriba
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¹¹ Bottom Hole Location

UL or lot no. L	Section 23	Township 31N	Range 6W	Lot Idn	Feet from the 1825	North/South line South	Feet from the 1140	East/West line West	County Rio Arriba
¹² Lse Code F	¹³ Producing Method Code F		¹⁴ Gas Connection Date		¹⁵ C-129 Permit Number		¹⁶ C-129 Effective Date		¹⁷ C-129 Expiration Date

III. Oil and Gas Transporters

¹⁸ Transporter OGRID	¹⁹ Transporter Name and Address	²⁰ O/G/W
373888	Harvest Four Corners, LLC 1755 Arroyo Dr. Bloomfield, NM 87413	G

IV. Well Completion Data

²¹ Spud Date 6/7/2023	²² Ready Date ~10/19/2023	²³ TD 15,698’ MD / 6,900’ TVD	²⁴ PBTD 15,586’ MD / 6,900’ TVD	²⁵ Perforations 7,626’ MD / 15,500’ MD 6,936’ TVD / 6,901’ TVD	²⁶ DHC, MC R-13457	
²⁷ Hole Size		²⁸ Casing & Tubing Size		²⁹ Depth Set		³⁰ Sacks Cement
26”		20”, 94#, J-55		381’		1902sx (371bbbs, 2113cf)
17.5”		13-3/8”, 61#, J-55		3519’		2673sx (832bbbs, 4672cf)
12.5”		9-5/8”, 43.5#, L-80		6476’		2591 2597sx (797bbbs, 4467cf) DV tool @ 4834’ & 3578’
8.5”		5.5”, 20#, HCP-110		15,680’		2426sx (696bbbs, 4115cf) Circ 27bbbs to surface
		2-7/8”, 6.5#, J-55		pending		

V. Well Test Data

³¹ Date New Oil	³² Gas Delivery Date ~10/19/2023	³³ Test Date	³⁴ Test Length	³⁵ Tbg. Pressure	³⁶ Csg. Pressure
³⁷ Choke Size	³⁸ Oil	³⁹ Water	⁴⁰ Gas		⁴¹ Test Method

⁴² I hereby certify that the rules of the Oil Conservation Division have been complied with and that the information given above is true and complete to the best of my knowledge and belief. Signature: <i>Etta Trujillo</i>		OIL CONSERVATION DIVISION	
		Approved by: <i>PATRICIA MARTINEZ</i>	
Printed name: Etta Trujillo		Title: <i>PETROLEUM SPECIALIST</i>	
Title: Regulatory Specialist		Approval Date: <i>10/19/2023</i>	
E-mail Address: etrujillo@logosresourcesllc.com		<i>RT EXPIRES 1/19/2024</i>	
Date: 10/18/2023	Phone: (505) 324-4154		

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

☐ AMENDED REPORT

AS-DRILLED WELL LOCATION AND ACREAGE DEDICATION PLAT

Table with 3 columns: API Number, Pool Code, Pool Name, Property Code, Property Name, Well Number, OGRID No., Operator Name, Elevation.

Table with 10 columns: UL or lot no., Section, Township, Range, Lot Idn, Feet from the, North/South line, Feet from the, East/West line, County.

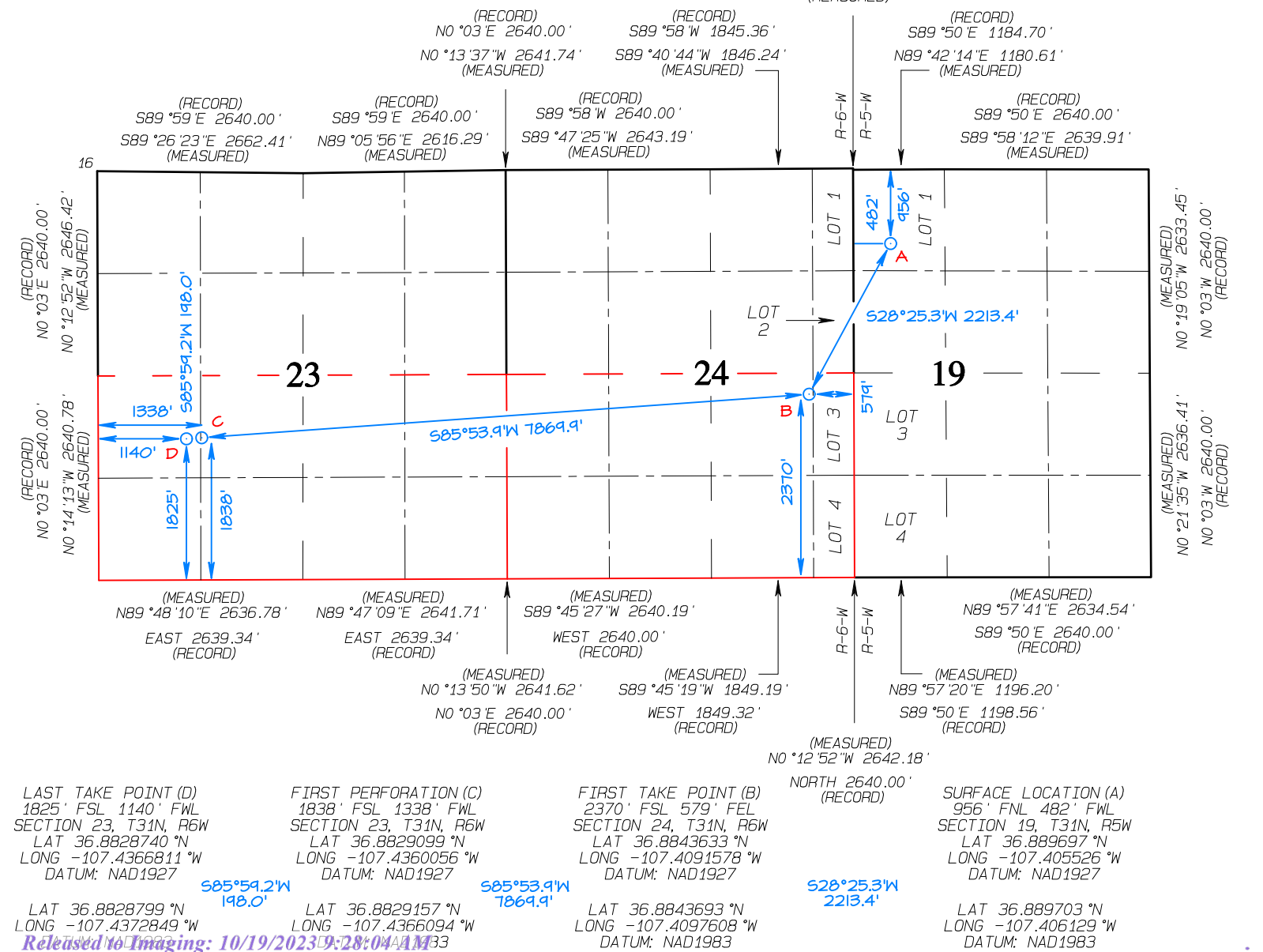
Table with 10 columns: UL or lot no., Section, Township, Range, Lot Idn, Feet from the, North/South line, Feet from the, East/West line, County.

Table with 3 columns: Dedicated Acres, Joint or Infill, Consolidation Code, Order No.

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

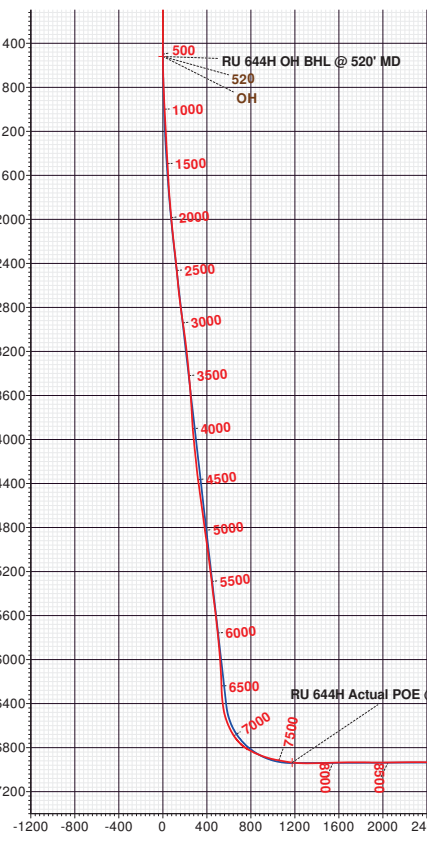
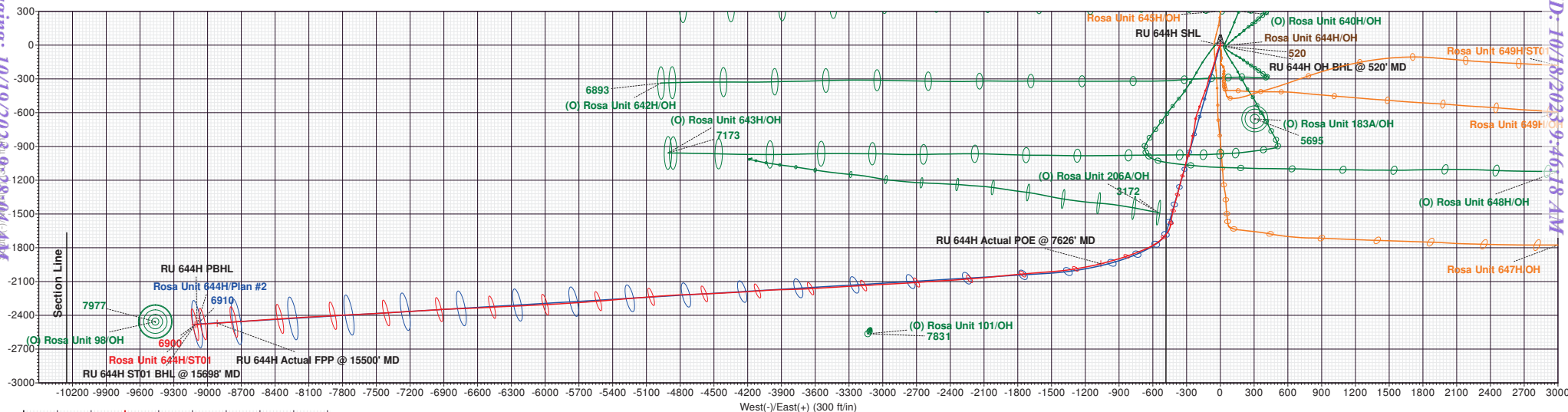
17 OPERATOR CERT
 I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief...
 Signature: Etta Trujillo
 Date: 10/18/2023
 Printed Name: Etta Trujillo
 E-mail Address: etrujillo@logosresourcesllc.com

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...
 Date Revised: OCTOBER 17, 2023
 Date of Survey: JANUARY 4, 2017
 Signature and Seal of Professional Surveyor
 JASON C. EDWARDS
 NEW MEXICO
 15269
 REGISTERED PROFESSIONAL SURVEYOR
 Certificate Number 15269





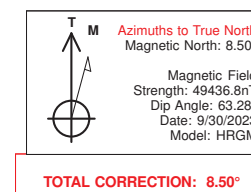
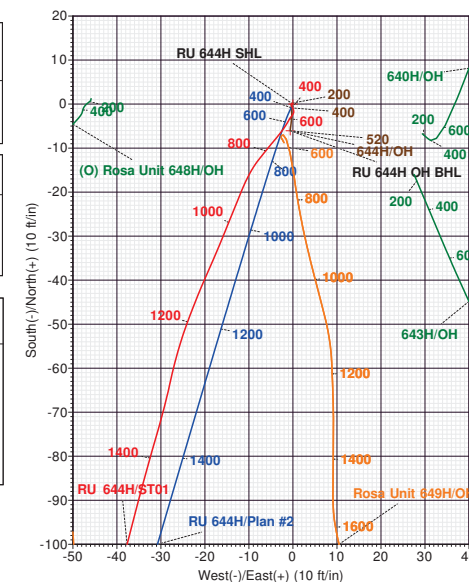
County: Rio Arriba, NM NAD83
 Site: Rosa Unit 27
 Well: Rosa Unit 644H
 Depth Reference: 6305+30 @ 6335.00ft (H&P 530)
 Rig: H&P 530
 Plan: ST01
 Job #: 16946



OH - ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation	
520.00	4.12	186.63	519.85	-6.06	-0.61	0.97	6.73	RU 644H OH BHL @ 520' MD	

ST01 - ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure	Annotation	
7626.00	83.61	255.94	6935.82	-1941.81	-1062.16	1175.77	2402.80	RU 644H Actual POE @ 7626' MD	
15500.00	90.32	266.34	6901.22	-2469.60	-8914.31	9045.42	10275.87	RU 644H Actual FPP @ 15500' MD	
15698.00	90.20	265.94	6900.16	-2482.57	-9111.88	9243.42	10473.87	RU 644H ST01 BHL @ 15698' MD	

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
RU 644H SHL	0.00	0.00	0.00	2143457.12	2848019.08	36.8897030	-107.4061290
RU 644H OH BHL	519.85	-6.06	-0.61	2143451.06	2848018.50	36.8896864	-107.4061311
RU 644H ST01 BHL	6900.16	-2482.57	-9111.88	2140933.79	2838918.42	36.8828799	-107.4372849
RU 644H Actual FPP	6901.22	-2469.60	-8914.31	2140947.65	2839115.93	36.8829157	-107.4366094
RU 644H PBHL	6910.00	-2478.03	-9093.49	2140938.42	2838936.80	36.8828924	-107.4372220
RU 644H Actual POE	6935.82	-1941.81	-1062.16	2141510.58	2846965.63	36.8843693	-107.4097608



TOTAL CORRECTION: 8.50°

Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 644H

OH

Design: OH

Standard Survey Report

15 October, 2023

SDT
Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000 Multi User Db

Project	Rio Arriba, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	Rosa Unit 27				
Site Position:		Northing:	2,143,451.58 usft	Latitude:	36.8896880
From:	Lat/Long	Easting:	2,848,002.44 usft	Longitude:	-107.4061860
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "		

Well	Rosa Unit 644H					
Well Position	+N/-S	0.00 ft	Northing:	2,143,457.12 usft	Latitude:	36.8897030
	+E/-W	0.00 ft	Easting:	2,848,019.09 usft	Longitude:	-107.4061290
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft
Grid Convergence:		0.26 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HRGM	8/14/2023	8.51	63.28	49,450.71348643

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	266.59	

Survey Program	Date	10/15/2023			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
76.55	495.00	Survey #1 (OH)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
520.00	520.00	Survey #2 (OH)	Project	Projection	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
76.55	0.21	354.42	76.55	0.14	-0.01	0.01	0.27	0.27	0.00	
107.06	0.09	288.53	107.06	0.20	-0.04	0.03	0.63	-0.39	-215.96	
198.10	0.00	262.70	198.10	0.23	-0.11	0.10	0.10	-0.10	0.00	
289.29	0.17	228.82	289.29	0.14	-0.21	0.20	0.19	0.19	0.00	
350.26	0.52	197.41	350.26	-0.19	-0.36	0.37	0.63	0.57	-51.52	
444.00	1.49	171.01	443.98	-1.80	-0.30	0.41	1.12	1.03	-28.16	
495.00	4.12	186.63	494.92	-4.27	-0.41	0.66	5.32	5.16	30.63	
520.00	4.12	186.63	519.85	-6.06	-0.61	0.97	0.00	0.00	0.00	

SDT
Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
RU 644H OH BHL	0.00	0.00	519.85	-6.06	-0.61	2,143,451.06	2,848,018.50	36.8896863	-107.4061311
- actual wellpath hits target center									
- Point									

Checked By: _____

Approved By: _____

Date: _____

Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 644H

OH

Design: OH

Survey Report - Geographic

15 October, 2023

SDT
Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000 Multi User Db

Project	Rio Arriba, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	Rosa Unit 27							
Site Position:		Northing:	2,143,451.58	usft	Latitude:	36.8896880		
From:	Lat/Long	Easting:	2,848,002.44	usft	Longitude:	-107.4061860		
Position Uncertainty:	0.00	ft	Slot Radius:	13-3/16	"	Grid Convergence:	0.26	°

Well	Rosa Unit 644H					
Well Position	+N/-S	0.00 ft	Northing:	2,143,457.12 usft	Latitude:	36.8897030
	+E/-W	0.00 ft	Easting:	2,848,019.09 usft	Longitude:	-107.4061290
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HRGM	8/14/2023	8.51	63.28	49,450.71348643

Design	OH				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	266.59	

Survey Program	Date	10/15/2023			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
76.55	495.00	Survey #1 (OH)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
520.00	520.00	Survey #2 (OH)	Project	Projection	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	2,143,457.12	2,848,019.09	36.8897030	-107.4061290	
76.55	0.21	354.42	76.55	0.14	-0.01	2,143,457.26	2,848,019.07	36.8897034	-107.4061291	
107.06	0.09	288.53	107.06	0.20	-0.04	2,143,457.32	2,848,019.04	36.8897035	-107.4061292	
198.10	0.00	262.70	198.10	0.23	-0.11	2,143,457.34	2,848,018.98	36.8897036	-107.4061294	
289.29	0.17	228.82	289.29	0.14	-0.21	2,143,457.25	2,848,018.88	36.8897033	-107.4061298	
350.26	0.52	197.41	350.26	-0.19	-0.36	2,143,456.93	2,848,018.73	36.8897025	-107.4061303	
444.00	1.49	171.01	443.98	-1.80	-0.30	2,143,455.32	2,848,018.80	36.8896980	-107.4061301	
495.00	4.12	186.63	494.92	-4.27	-0.41	2,143,452.85	2,848,018.70	36.8896912	-107.4061304	
520.00	4.12	186.63	519.85	-6.06	-0.61	2,143,451.06	2,848,018.50	36.8896863	-107.4061311	

SDT
Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	OH	Database:	EDM 5000 Multi User Db

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)		
RU 644H OH BHL	0.00	0.00	519.85	-6.06	-0.61	2,143,451.06	2,848,018.50	36.8896863	-107.4061311
- actual wellpath hits target center									
- Point									

Checked By: _____

Approved By: _____

Date: _____

Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 644H

ST01

Design: ST01

Standard Survey Report

16 October, 2023

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Project	Rio Arriba, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	Rosa Unit 27				
Site Position:		Northing:	2,143,451.58 usft	Latitude:	36.8896880
From:	Lat/Long	Easting:	2,848,002.44 usft	Longitude:	-107.4061860
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "		

Well		Rosa Unit 644H				
Well Position	+N/-S	0.00 ft	Northing:	2,143,457.12 usft	Latitude:	36.8897030
	+E/-W	0.00 ft	Easting:	2,848,019.09 usft	Longitude:	-107.4061290
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft
Grid Convergence:		0.26 °				

Wellbore	ST01				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	HRGM	9/30/2023	8.50	63.28	49,436.82958917

Design	ST01				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	266.59	

Survey Program	Date	10/16/2023			
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
76.55	353.00	Survey #1 (OH)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
391.00	1,299.00	Survey #1-ST01 (ST01)	B001Mb_MWD+HRGM	OWSG MWD + HRGM	
1,371.00	2,128.00	Survey #2-ST01-Corrected Run 1 (ST01)	MWD+HDGM+SAG+MS	MWD + HDGM + Sag Correction + Multi Station Correc	
2,237.00	3,466.00	Survey #3-ST01-Corrected Run 2 (ST01)	MWD+HDGM+SAG+MS	MWD + HDGM + Sag Correction + Multi Station Correc	
3,570.00	5,997.00	Survey #4-ST01-Corrected Run 3 (ST01)	MWD+HDGM+SAG+MS	MWD + HDGM + Sag Correction + Multi Station Correc	
6,083.00	6,489.00	Survey #5-ST01 (ST01)	A020Ga_GYRO-NS	OWSG Gyrocompass Gyro	
6,532.00	15,628.00	Survey #6-ST01-Corrected Run 4 (ST01)	MWD+HDGM+SAG+MS	MWD + HDGM + Sag Correction + Multi Station Correc	
15,698.00	15,698.00	Survey #7-ST01 (ST01)	Project	Projection	

Survey										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Vertical	Dogleg	Build	Turn	
Depth	(°)	(°)	Depth	(ft)	(ft)	Section	Rate	Rate	Rate	
(ft)			(ft)			(ft)	(°/100usft)	(°/100usft)	(°/100usft)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
76.55	0.21	354.42	76.55	0.14	-0.01	0.01	0.27	0.27	0.00	
107.06	0.09	288.53	107.06	0.20	-0.04	0.03	0.63	-0.39	-215.96	
198.10	0.00	262.70	198.10	0.23	-0.11	0.10	0.10	-0.10	0.00	

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
289.29	0.17	228.82	289.29	0.14	-0.21	0.20	0.19	0.19	0.00	
350.26	0.52	197.41	350.26	-0.19	-0.36	0.37	0.63	0.57	-51.52	
398.00	0.97	140.36	398.00	-0.70	-0.17	0.21	1.71	0.94	-119.50	
411.08	0.79	148.62	411.07	-0.87	-0.05	0.10	1.68	-1.38	63.15	
432.00	0.88	164.00	431.99	-1.14	0.07	0.00	1.15	0.43	73.52	
442.53	0.79	162.69	442.52	-1.29	0.11	-0.03	0.87	-0.85	-12.44	
451.96	0.79	168.57	451.95	-1.42	0.14	-0.06	0.86	0.00	62.35	
461.46	0.62	174.11	461.45	-1.53	0.16	-0.07	1.93	-1.79	58.32	
469.17	0.53	170.95	469.16	-1.61	0.17	-0.08	1.24	-1.17	-40.99	
508.00	0.44	194.68	507.99	-1.93	0.16	-0.05	0.56	-0.23	61.11	
544.00	1.06	208.74	543.98	-2.36	-0.03	0.17	1.78	1.72	39.06	
579.00	1.23	221.66	578.98	-2.92	-0.44	0.61	0.88	0.49	36.91	
610.00	1.76	209.36	609.97	-3.58	-0.89	1.10	1.99	1.71	-39.68	
635.00	2.20	210.94	634.95	-4.33	-1.33	1.58	1.77	1.76	6.32	
744.00	2.82	220.52	743.85	-8.16	-4.15	4.62	0.68	0.57	8.79	
838.00	4.22	218.14	837.67	-12.64	-7.78	8.52	1.50	1.49	-2.53	
929.00	5.98	202.24	928.31	-19.66	-11.65	12.80	2.46	1.93	-17.47	
1,020.00	6.60	202.06	1,018.76	-28.90	-15.40	17.10	0.68	0.68	-0.20	
1,112.00	6.77	203.99	1,110.14	-38.75	-19.60	21.87	0.31	0.18	2.10	
1,204.00	7.92	200.30	1,201.38	-49.65	-24.00	26.91	1.35	1.25	-4.01	
1,299.00	8.97	192.30	1,295.35	-63.03	-27.85	31.55	1.66	1.11	-8.42	
1,371.00	10.13	196.19	1,366.35	-74.59	-30.81	35.19	1.84	1.61	5.40	
1,466.00	10.43	194.73	1,459.83	-90.93	-35.32	40.67	0.42	0.32	-1.54	
1,561.00	10.35	194.08	1,553.27	-107.53	-39.59	45.91	0.15	-0.08	-0.68	
1,655.00	10.49	193.00	1,645.72	-124.05	-43.57	50.87	0.26	0.15	-1.15	
1,749.00	11.06	195.75	1,738.06	-141.07	-47.94	56.25	0.82	0.61	2.93	
1,844.00	12.71	199.88	1,831.03	-159.67	-53.97	63.37	1.95	1.74	4.35	
1,938.00	13.21	197.08	1,922.63	-179.66	-60.64	71.22	0.85	0.53	-2.98	
2,033.00	14.54	196.63	2,014.86	-201.47	-67.24	79.10	1.40	1.40	-0.47	
2,128.00	14.85	199.78	2,106.75	-224.35	-74.77	87.98	0.90	0.33	3.32	
2,237.00	14.96	201.33	2,212.08	-250.60	-84.62	99.37	0.38	0.10	1.42	
2,332.00	15.39	200.84	2,303.77	-273.80	-93.56	109.68	0.47	0.45	-0.52	
2,426.00	16.81	196.46	2,394.08	-298.49	-101.85	119.42	1.99	1.51	-4.66	
2,521.00	17.19	195.42	2,484.93	-325.20	-109.48	128.62	0.51	0.40	-1.09	
2,616.00	16.14	192.98	2,575.94	-351.60	-116.17	136.88	1.33	-1.11	-2.57	
2,710.00	16.73	199.29	2,666.11	-377.11	-123.58	145.79	2.00	0.63	6.71	
2,805.00	17.92	199.28	2,756.80	-403.81	-132.92	156.71	1.25	1.25	-0.01	
2,900.00	18.87	200.97	2,846.94	-431.95	-143.25	168.68	1.15	1.00	1.78	
2,994.00	19.36	201.50	2,935.76	-460.64	-154.40	181.52	0.55	0.52	0.56	
3,089.00	19.52	199.85	3,025.34	-490.22	-165.56	194.42	0.60	0.17	-1.74	
3,183.00	18.53	198.54	3,114.21	-519.15	-175.64	206.21	1.15	-1.05	-1.39	
3,278.00	16.43	198.88	3,204.82	-546.18	-184.79	216.95	2.21	-2.21	0.36	
3,372.00	14.31	199.14	3,295.45	-569.74	-192.90	226.45	2.26	-2.26	0.28	

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,466.00	13.04	199.55	3,386.78	-590.70	-200.26	235.04	1.35	-1.35	0.44	
3,570.00	12.14	200.53	3,488.28	-612.00	-208.02	244.05	0.89	-0.87	0.94	
3,665.00	12.93	195.01	3,581.02	-631.62	-214.27	251.46	1.51	0.83	-5.81	
3,759.00	15.46	190.37	3,672.15	-654.11	-219.25	257.77	2.95	2.69	-4.94	
3,854.00	17.24	187.03	3,763.30	-680.54	-223.26	263.34	2.12	1.87	-3.52	
3,949.00	18.97	186.87	3,853.59	-709.84	-226.83	268.65	1.82	1.82	-0.17	
4,043.00	21.23	190.74	3,941.87	-741.74	-231.83	275.54	2.79	2.40	4.12	
4,138.00	20.60	191.69	4,030.61	-775.01	-238.42	284.09	0.75	-0.66	1.00	
4,232.00	21.49	192.46	4,118.34	-808.01	-245.48	293.11	0.99	0.95	0.82	
4,327.00	21.95	191.02	4,206.59	-842.43	-252.63	302.29	0.74	0.48	-1.52	
4,421.00	22.94	191.14	4,293.47	-877.65	-259.53	311.27	1.05	1.05	0.13	
4,516.00	23.05	196.24	4,380.93	-913.68	-268.31	322.18	2.10	0.12	5.37	
4,611.00	21.68	197.08	4,468.78	-948.31	-278.66	334.58	1.48	-1.44	0.88	
4,705.00	21.49	196.14	4,556.19	-981.44	-288.55	346.42	0.42	-0.20	-1.00	
4,799.00	24.83	194.82	4,642.60	-1,017.07	-298.39	358.36	3.60	3.55	-1.40	
4,894.00	23.32	193.84	4,729.34	-1,054.62	-307.99	370.17	1.64	-1.59	-1.03	
4,988.00	23.43	194.40	4,815.62	-1,090.78	-317.09	381.41	0.26	0.12	0.60	
5,083.00	23.36	196.75	4,902.82	-1,127.11	-327.21	393.67	0.98	-0.07	2.47	
5,177.00	21.43	196.14	4,989.72	-1,161.46	-337.36	405.84	2.07	-2.05	-0.65	
5,272.00	20.71	196.20	5,078.37	-1,194.26	-346.87	417.29	0.76	-0.76	0.06	
5,367.00	22.20	195.18	5,166.79	-1,227.71	-356.26	428.65	1.62	1.57	-1.07	
5,461.00	22.15	194.44	5,253.83	-1,262.01	-365.32	439.74	0.30	-0.05	-0.79	
5,556.00	20.92	192.71	5,342.20	-1,295.90	-373.52	449.94	1.46	-1.29	-1.82	
5,650.00	20.93	194.87	5,430.00	-1,328.50	-381.52	459.87	0.82	0.01	2.30	
5,713.00	20.82	196.70	5,488.87	-1,350.10	-387.63	467.25	1.05	-0.17	2.90	
5,808.00	19.91	195.85	5,577.93	-1,381.83	-396.90	478.39	1.01	-0.96	-0.89	
5,903.00	19.45	194.65	5,667.38	-1,412.70	-405.32	488.63	0.64	-0.48	-1.26	
5,997.00	19.11	193.85	5,756.11	-1,442.78	-412.96	498.04	0.46	-0.36	-0.85	
6,083.00	18.22	193.29	5,837.58	-1,469.53	-419.42	506.08	1.06	-1.03	-0.65	
6,178.00	17.55	192.71	5,927.99	-1,497.96	-425.98	514.33	0.73	-0.71	-0.61	
6,272.00	16.36	190.19	6,017.91	-1,524.81	-431.44	521.38	1.49	-1.27	-2.68	
6,367.00	14.76	189.62	6,109.42	-1,549.92	-435.83	527.25	1.69	-1.68	-0.60	
6,461.00	13.32	186.45	6,200.61	-1,572.48	-439.05	531.81	1.74	-1.53	-3.37	
6,489.00	13.33	181.58	6,227.86	-1,578.91	-439.50	532.64	4.01	0.04	-17.39	
6,532.00	10.83	187.86	6,269.91	-1,587.87	-440.19	533.86	6.56	-5.81	14.60	
6,626.00	16.49	195.59	6,361.22	-1,609.49	-444.99	539.94	6.31	6.02	8.22	
6,721.00	20.31	203.03	6,451.36	-1,637.67	-455.07	551.67	4.71	4.02	7.83	
6,816.00	27.42	216.19	6,538.24	-1,670.56	-474.47	573.00	9.31	7.48	13.85	
6,910.00	32.53	223.42	6,619.67	-1,706.42	-504.65	605.26	6.65	5.44	7.69	
7,005.00	38.93	231.89	6,696.79	-1,743.45	-545.76	648.50	8.50	6.74	8.92	
7,100.00	49.09	240.13	6,765.09	-1,779.88	-600.57	705.37	12.26	10.69	8.67	
7,194.00	61.83	247.76	6,818.33	-1,813.42	-670.07	776.75	15.10	13.55	8.12	
7,289.00	67.96	248.81	6,858.61	-1,845.22	-749.96	858.39	6.53	6.45	1.11	

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,383.00	73.23	251.08	6,889.84	-1,875.58	-833.22	943.31	6.05	5.61	2.41
7,478.00	79.90	254.07	6,911.90	-1,903.20	-921.33	1,032.90	7.66	7.02	3.15
7,573.00	80.17	254.59	6,928.34	-1,928.47	-1,011.42	1,124.33	0.61	0.28	0.55
7,626.00	83.61	255.94	6,935.82	-1,941.81	-1,062.16	1,175.77	6.96	6.49	2.56
RU 644H Actual POE @ 7626' MD									
7,667.00	86.27	256.98	6,939.43	-1,951.37	-1,101.86	1,215.97	6.96	6.49	2.52
7,762.00	89.36	259.64	6,943.06	-1,970.60	-1,194.80	1,309.90	4.29	3.25	2.80
7,856.00	92.05	260.26	6,941.90	-1,987.00	-1,287.34	1,403.25	2.94	2.86	0.66
7,951.00	91.92	263.27	6,938.61	-2,000.59	-1,381.29	1,497.85	3.17	-0.14	3.17
8,045.00	92.22	265.46	6,935.21	-2,009.82	-1,474.77	1,591.71	2.35	0.32	2.33
8,140.00	89.83	265.44	6,933.51	-2,017.35	-1,569.45	1,686.67	2.52	-2.52	-0.02
8,234.00	90.17	265.40	6,933.51	-2,024.86	-1,663.15	1,780.65	0.36	0.36	-0.04
8,329.00	88.32	265.19	6,934.77	-2,032.65	-1,757.82	1,875.61	1.96	-1.95	-0.22
8,423.00	90.27	264.44	6,935.92	-2,041.14	-1,851.42	1,969.55	2.22	2.07	-0.80
8,518.00	90.71	264.17	6,935.11	-2,050.57	-1,945.95	2,064.47	0.54	0.46	-0.28
8,612.00	91.21	264.06	6,933.54	-2,060.21	-2,039.44	2,158.37	0.54	0.53	-0.12
8,707.00	89.90	265.52	6,932.61	-2,068.83	-2,134.04	2,253.32	2.06	-1.38	1.54
8,802.00	89.90	265.62	6,932.78	-2,076.17	-2,228.76	2,348.30	0.11	0.00	0.11
8,896.00	89.80	265.48	6,933.03	-2,083.46	-2,322.47	2,442.29	0.18	-0.11	-0.15
8,990.00	90.27	266.65	6,932.97	-2,089.91	-2,416.25	2,536.28	1.34	0.50	1.24
9,085.00	90.34	266.47	6,932.46	-2,095.61	-2,511.08	2,631.28	0.20	0.07	-0.19
9,179.00	90.00	266.30	6,932.18	-2,101.54	-2,604.89	2,725.28	0.40	-0.36	-0.18
9,274.00	89.80	265.81	6,932.35	-2,108.08	-2,699.66	2,820.27	0.56	-0.21	-0.52
9,368.00	90.74	266.85	6,931.91	-2,114.09	-2,793.47	2,914.27	1.49	1.00	1.11
9,463.00	90.71	266.80	6,930.71	-2,119.36	-2,888.31	3,009.26	0.06	-0.03	-0.05
9,557.00	90.37	266.94	6,929.82	-2,124.49	-2,982.17	3,103.25	0.39	-0.36	0.15
9,652.00	90.27	266.37	6,929.29	-2,130.03	-3,077.00	3,198.25	0.61	-0.11	-0.60
9,746.00	90.34	266.81	6,928.79	-2,135.62	-3,170.84	3,292.25	0.47	0.07	0.47
9,840.00	90.34	267.03	6,928.23	-2,140.67	-3,264.70	3,386.25	0.23	0.00	0.23
9,935.00	90.00	266.68	6,927.95	-2,145.88	-3,359.56	3,481.25	0.51	-0.36	-0.37
10,029.00	90.03	266.49	6,927.92	-2,151.48	-3,453.39	3,575.25	0.20	0.03	-0.20
10,124.00	90.13	266.45	6,927.79	-2,157.33	-3,548.21	3,670.25	0.11	0.11	-0.04
10,218.00	90.00	266.39	6,927.68	-2,163.20	-3,642.02	3,764.24	0.15	-0.14	-0.06
10,313.00	91.01	268.17	6,926.85	-2,167.71	-3,736.91	3,859.23	2.15	1.06	1.87
10,407.00	91.21	268.46	6,925.03	-2,170.47	-3,830.85	3,953.17	0.37	0.21	0.31
10,501.00	91.48	268.45	6,922.82	-2,173.01	-3,924.79	4,047.09	0.29	0.29	-0.01
10,595.00	90.94	266.43	6,920.84	-2,177.20	-4,018.67	4,141.06	2.22	-0.57	-2.15
10,690.00	89.83	265.81	6,920.20	-2,183.63	-4,113.45	4,236.05	1.34	-1.17	-0.65
10,785.00	90.07	266.02	6,920.28	-2,190.40	-4,208.21	4,331.04	0.34	0.25	0.22
10,879.00	89.97	267.11	6,920.25	-2,196.03	-4,302.04	4,425.04	1.16	-0.11	1.16
10,974.00	89.56	266.81	6,920.64	-2,201.07	-4,396.90	4,520.04	0.53	-0.43	-0.32
11,068.00	90.91	267.57	6,920.25	-2,205.68	-4,490.78	4,614.03	1.65	1.44	0.81
11,163.00	90.50	267.74	6,919.08	-2,209.57	-4,585.70	4,709.01	0.47	-0.43	0.18
11,258.00	90.30	267.59	6,918.42	-2,213.44	-4,680.62	4,803.99	0.26	-0.21	-0.16

SDT Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,352.00	89.83	267.89	6,918.31	-2,217.14	-4,774.54	4,897.97	0.59	-0.50	0.32
11,447.00	90.94	266.31	6,917.67	-2,221.95	-4,869.41	4,992.96	2.03	1.17	-1.66
11,541.00	90.97	265.96	6,916.11	-2,228.28	-4,963.19	5,086.94	0.37	0.03	-0.37
11,636.00	90.84	265.31	6,914.61	-2,235.51	-5,057.90	5,181.91	0.70	-0.14	-0.68
11,730.00	90.87	265.64	6,913.20	-2,242.93	-5,151.60	5,275.89	0.35	0.03	0.35
11,824.00	90.67	265.30	6,911.94	-2,250.35	-5,245.29	5,369.86	0.42	-0.21	-0.36
11,919.00	90.20	265.10	6,911.22	-2,258.30	-5,339.96	5,464.83	0.54	-0.49	-0.21
12,013.00	90.17	265.08	6,910.92	-2,266.35	-5,433.61	5,558.80	0.04	-0.03	-0.02
12,108.00	89.66	265.46	6,911.06	-2,274.18	-5,528.29	5,653.77	0.67	-0.54	0.40
12,203.00	89.46	265.89	6,911.79	-2,281.34	-5,623.01	5,748.75	0.50	-0.21	0.45
12,297.00	90.03	266.33	6,912.20	-2,287.72	-5,716.80	5,842.75	0.77	0.61	0.47
12,392.00	89.87	266.20	6,912.29	-2,293.91	-5,811.59	5,937.75	0.22	-0.17	-0.14
12,487.00	89.36	266.36	6,912.93	-2,300.07	-5,906.39	6,032.74	0.56	-0.54	0.17
12,581.00	90.81	267.45	6,912.79	-2,305.15	-6,000.25	6,126.74	1.93	1.54	1.16
12,676.00	90.17	267.23	6,911.97	-2,309.56	-6,095.14	6,221.73	0.71	-0.67	-0.23
12,770.00	89.90	267.03	6,911.92	-2,314.26	-6,189.03	6,315.72	0.36	-0.29	-0.21
12,864.00	91.81	267.42	6,910.51	-2,318.81	-6,282.90	6,409.70	2.07	2.03	0.41
12,959.00	91.51	267.34	6,907.76	-2,323.15	-6,377.76	6,504.65	0.33	-0.32	-0.08
13,053.00	91.18	267.08	6,905.56	-2,327.73	-6,471.62	6,598.62	0.45	-0.35	-0.28
13,147.00	90.03	266.92	6,904.56	-2,332.65	-6,565.49	6,692.61	1.24	-1.22	-0.17
13,242.00	89.83	267.51	6,904.68	-2,337.26	-6,660.38	6,787.61	0.66	-0.21	0.62
13,336.00	89.50	267.98	6,905.23	-2,340.96	-6,754.30	6,881.58	0.61	-0.35	0.50
13,430.00	89.09	267.98	6,906.39	-2,344.28	-6,848.24	6,975.55	0.44	-0.44	0.00
13,525.00	89.76	266.30	6,907.34	-2,349.02	-6,943.11	7,070.54	1.90	0.71	-1.77
13,619.00	89.80	266.37	6,907.70	-2,355.02	-7,036.92	7,164.53	0.09	0.04	0.07
13,714.00	89.80	266.54	6,908.03	-2,360.90	-7,131.73	7,259.53	0.18	0.00	0.18
13,808.00	89.60	266.38	6,908.52	-2,366.70	-7,225.55	7,353.53	0.27	-0.21	-0.17
13,903.00	91.04	266.28	6,907.99	-2,372.78	-7,320.35	7,448.53	1.52	1.52	-0.11
13,997.00	90.97	266.56	6,906.34	-2,378.65	-7,414.16	7,542.51	0.31	-0.07	0.30
14,092.00	90.50	267.00	6,905.13	-2,383.99	-7,509.00	7,637.50	0.68	-0.49	0.46
14,186.00	90.00	267.05	6,904.72	-2,388.87	-7,602.87	7,731.50	0.53	-0.53	0.05
14,281.00	89.70	267.29	6,904.96	-2,393.56	-7,697.75	7,826.49	0.40	-0.32	0.25
14,376.00	90.00	266.83	6,905.21	-2,398.43	-7,792.63	7,921.49	0.58	0.32	-0.48
14,470.00	89.80	266.93	6,905.38	-2,403.54	-7,886.49	8,015.49	0.24	-0.21	0.11
14,565.00	91.01	266.81	6,904.71	-2,408.73	-7,981.34	8,110.48	1.28	1.27	-0.13
14,659.00	90.60	266.92	6,903.38	-2,413.87	-8,075.19	8,204.47	0.45	-0.44	0.12
14,754.00	90.47	266.72	6,902.50	-2,419.14	-8,170.04	8,299.47	0.25	-0.14	-0.21
14,848.00	90.27	266.03	6,901.89	-2,425.08	-8,263.85	8,393.47	0.76	-0.21	-0.73
14,942.00	89.80	266.27	6,901.83	-2,431.40	-8,357.64	8,487.46	0.56	-0.50	0.26
15,037.00	89.29	266.62	6,902.59	-2,437.29	-8,452.45	8,582.46	0.65	-0.54	0.37
15,131.00	90.47	265.76	6,902.78	-2,443.53	-8,546.24	8,676.45	1.55	1.26	-0.91
15,226.00	90.20	266.01	6,902.23	-2,450.35	-8,641.00	8,771.44	0.39	-0.28	0.26
15,289.00	90.17	266.16	6,902.03	-2,454.65	-8,703.85	8,834.44	0.24	-0.05	0.24

SDT Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,352.00	90.30	265.64	6,901.77	-2,459.16	-8,766.69	8,897.44	0.85	0.21	-0.83
15,383.00	90.13	265.87	6,901.65	-2,461.45	-8,797.60	8,928.43	0.92	-0.55	0.74
15,446.00	90.20	265.92	6,901.47	-2,465.96	-8,860.44	8,991.43	0.14	0.11	0.08
15,500.00	90.32	266.34	6,901.22	-2,469.60	-8,914.31	9,045.43	0.81	0.22	0.78
RU 644H Actual FPP @ 15500' MD									
15,509.00	90.34	266.41	6,901.17	-2,470.17	-8,923.30	9,054.42	0.81	0.22	0.78
15,572.00	90.47	266.64	6,900.73	-2,473.99	-8,986.18	9,117.42	0.42	0.21	0.37
15,628.00	90.20	265.94	6,900.40	-2,477.62	-9,042.06	9,173.42	1.34	-0.48	-1.25
15,698.00	90.20	265.94	6,900.16	-2,482.57	-9,111.88	9,243.42	0.00	0.00	0.00
RU 644H ST01 BHL @ 15698' MD									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
RU 644H SHL - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	2,143,457.12	2,848,019.09	36.8897030	-107.4061290
RU 644H OH BHL - actual wellpath misses target center by 4.09ft at 519.92ft MD (519.91 TVD, -2.04 N, 0.13 E) - Point	0.00	0.00	519.85	-6.06	-0.61	2,143,451.06	2,848,018.50	36.8896863	-107.4061311
RU 644H ST01 BHL - actual wellpath hits target center - Point	0.00	0.00	6,900.16	-2,482.57	-9,111.88	2,140,933.79	2,838,918.42	36.8828799	-107.4372850
RU 644H Actual FPP - actual wellpath hits target center - Point	0.00	0.00	6,901.22	-2,469.60	-8,914.31	2,140,947.64	2,839,115.93	36.8829157	-107.4366094
RU 644H PBHL - actual wellpath misses target center by 10.30ft at 15679.30ft MD (6900.22 TVD, -2481.25 N, -9093.23 E) - Point	0.00	0.00	6,910.00	-2,478.03	-9,093.49	2,140,938.41	2,838,936.80	36.8828924	-107.4372221
RU 644H Actual POE - actual wellpath hits target center - Point	0.00	0.00	6,935.82	-1,941.81	-1,062.16	2,141,510.58	2,846,965.64	36.8843693	-107.4097609

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,626.00	6,935.82	-1,941.81	-1,062.16	RU 644H Actual POE @ 7626' MD
15,500.00	6,901.22	-2,469.60	-8,914.31	RU 644H Actual FPP @ 15500' MD
15,698.00	6,900.16	-2,482.57	-9,111.88	RU 644H ST01 BHL @ 15698' MD

Checked By: _____ Approved By: _____ Date: _____

Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 644H

ST01

Design: ST01

Survey Report - Geographic

16 October, 2023

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Project	Rio Arriba, NM NAD83		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Western Zone		

Site	Rosa Unit 27				
Site Position:		Northing:	2,143,451.58 usft	Latitude:	36.8896880
From:	Lat/Long	Easting:	2,848,002.44 usft	Longitude:	-107.4061860
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.26 °

Well	Rosa Unit 644H					
Well Position	+N/-S	0.00 ft	Northing:	2,143,457.12 usft	Latitude:	36.8897030
	+E/-W	0.00 ft	Easting:	2,848,019.09 usft	Longitude:	-107.4061290
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft

Wellbore	ST01				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HRGM	9/30/2023	8.50	63.28	49,436.82958917

Design	ST01				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	266.59	

Survey Program	Date	10/16/2023			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
76.55	353.00	Survey #1 (OH)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
391.00	1,299.00	Survey #1-ST01 (ST01)	B001Mb_MWD+HRGM	OWSG MWD + HRGM	
1,371.00	2,128.00	Survey #2-ST01-Corrected Run 1 (ST01)	MWD+HDGM+SAG+MS	MWD + HDGM + Sag Correction + Multi Station Correc	
2,237.00	3,466.00	Survey #3-ST01-Corrected Run 2 (ST01)	MWD+HDGM+SAG+MS	MWD + HDGM + Sag Correction + Multi Station Correc	
3,570.00	5,997.00	Survey #4-ST01-Corrected Run 3 (ST01)	MWD+HDGM+SAG+MS	MWD + HDGM + Sag Correction + Multi Station Correc	
6,083.00	6,489.00	Survey #5-ST01 (ST01)	A020Ga_GYRO-NS	OWSG Gyrocompass Gyro	
6,532.00	15,628.00	Survey #6-ST01-Corrected Run 4 (ST01)	MWD+HDGM+SAG+MS	MWD + HDGM + Sag Correction + Multi Station Correc	
15,698.00	15,698.00	Survey #7-ST01 (ST01)	Project	Projection	

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
0.00	0.00	0.00	0.00	0.00	0.00	2,143,457.12	2,848,019.09	36.8897030	-107.4061290	
76.55	0.21	354.42	76.55	0.14	-0.01	2,143,457.26	2,848,019.07	36.8897034	-107.4061291	
107.06	0.09	288.53	107.06	0.20	-0.04	2,143,457.32	2,848,019.04	36.8897035	-107.4061292	
198.10	0.00	262.70	198.10	0.23	-0.11	2,143,457.34	2,848,018.98	36.8897036	-107.4061294	
289.29	0.17	228.82	289.29	0.14	-0.21	2,143,457.25	2,848,018.88	36.8897033	-107.4061298	

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
350.26	0.52	197.41	350.26	-0.19	-0.36	2,143,456.93	2,848,018.73	36.8897025	-107.4061303
398.00	0.97	140.36	398.00	-0.70	-0.17	2,143,456.41	2,848,018.92	36.8897010	-107.4061296
411.08	0.79	148.62	411.07	-0.87	-0.05	2,143,456.25	2,848,019.04	36.8897006	-107.4061292
432.00	0.88	164.00	431.99	-1.14	0.07	2,143,455.97	2,848,019.16	36.8896998	-107.4061288
442.53	0.79	162.69	442.52	-1.29	0.11	2,143,455.83	2,848,019.20	36.8896994	-107.4061287
451.96	0.79	168.57	451.95	-1.42	0.14	2,143,455.70	2,848,019.24	36.8896991	-107.4061286
461.46	0.62	174.11	461.45	-1.53	0.16	2,143,455.59	2,848,019.26	36.8896988	-107.4061285
469.17	0.53	170.95	469.16	-1.61	0.17	2,143,455.51	2,848,019.27	36.8896985	-107.4061285
508.00	0.44	194.68	507.99	-1.93	0.16	2,143,455.19	2,848,019.26	36.8896977	-107.4061285
544.00	1.06	208.74	543.98	-2.36	-0.03	2,143,454.76	2,848,019.07	36.8896965	-107.4061292
579.00	1.23	221.66	578.98	-2.92	-0.44	2,143,454.20	2,848,018.66	36.8896949	-107.4061305
610.00	1.76	209.36	609.97	-3.58	-0.89	2,143,453.53	2,848,018.21	36.8896931	-107.4061321
635.00	2.20	210.94	634.95	-4.33	-1.33	2,143,452.78	2,848,017.78	36.8896911	-107.4061336
744.00	2.82	220.52	743.85	-8.16	-4.15	2,143,448.94	2,848,014.98	36.8896805	-107.4061432
838.00	4.22	218.14	837.67	-12.64	-7.78	2,143,444.44	2,848,011.36	36.8896682	-107.4061557
929.00	5.98	202.24	928.31	-19.66	-11.65	2,143,437.40	2,848,007.53	36.8896490	-107.4061689
1,020.00	6.60	202.06	1,018.76	-28.90	-15.40	2,143,428.15	2,848,003.81	36.8896236	-107.4061817
1,112.00	6.77	203.99	1,110.14	-38.75	-19.60	2,143,418.28	2,847,999.67	36.8895965	-107.4061961
1,204.00	7.92	200.30	1,201.38	-49.65	-24.00	2,143,407.36	2,847,995.31	36.8895666	-107.4062111
1,299.00	8.97	192.30	1,295.35	-63.03	-27.85	2,143,393.97	2,847,991.52	36.8895298	-107.4062243
1,371.00	10.13	196.19	1,366.35	-74.59	-30.81	2,143,382.39	2,847,988.61	36.8894981	-107.4062344
1,466.00	10.43	194.73	1,459.83	-90.93	-35.32	2,143,366.03	2,847,984.17	36.8894532	-107.4062498
1,561.00	10.35	194.08	1,553.27	-107.53	-39.59	2,143,349.42	2,847,979.98	36.8894076	-107.4062644
1,655.00	10.49	193.00	1,645.72	-124.05	-43.57	2,143,332.87	2,847,976.08	36.8893622	-107.4062780
1,749.00	11.06	195.75	1,738.06	-141.07	-47.94	2,143,315.84	2,847,971.78	36.8893155	-107.4062930
1,844.00	12.71	199.88	1,831.03	-159.67	-53.97	2,143,297.21	2,847,965.84	36.8892644	-107.4063136
1,938.00	13.21	197.08	1,922.63	-179.66	-60.64	2,143,277.19	2,847,959.25	36.8892095	-107.4063364
2,033.00	14.54	196.63	2,014.86	-201.47	-67.24	2,143,255.36	2,847,952.75	36.8891496	-107.4063590
2,128.00	14.85	199.78	2,106.75	-224.35	-74.77	2,143,232.44	2,847,945.32	36.8890867	-107.4063847
2,237.00	14.96	201.33	2,212.08	-250.60	-84.62	2,143,206.15	2,847,935.59	36.8890146	-107.4064184
2,332.00	15.39	200.84	2,303.77	-273.80	-93.56	2,143,182.90	2,847,926.75	36.8889509	-107.4064490
2,426.00	16.81	196.46	2,394.08	-298.49	-101.85	2,143,158.17	2,847,918.57	36.8888831	-107.4064773
2,521.00	17.19	195.42	2,484.93	-325.20	-109.48	2,143,131.43	2,847,911.07	36.8888097	-107.4065034
2,616.00	16.14	192.98	2,575.94	-351.60	-116.17	2,143,105.00	2,847,904.49	36.8887372	-107.4065263
2,710.00	16.73	199.29	2,666.11	-377.11	-123.58	2,143,079.47	2,847,897.20	36.8886672	-107.4065516
2,805.00	17.92	199.28	2,756.80	-403.81	-132.92	2,143,052.72	2,847,887.97	36.8885938	-107.4065836
2,900.00	18.87	200.97	2,846.94	-431.95	-143.25	2,143,024.53	2,847,877.78	36.8885165	-107.4066189
2,994.00	19.36	201.50	2,935.76	-460.64	-154.40	2,142,995.79	2,847,866.76	36.8884377	-107.4066570
3,089.00	19.52	199.85	3,025.34	-490.22	-165.56	2,142,966.17	2,847,855.73	36.8883565	-107.4066952
3,183.00	18.53	198.54	3,114.21	-519.15	-175.64	2,142,937.19	2,847,845.77	36.8882770	-107.4067296
3,278.00	16.43	198.88	3,204.82	-546.18	-184.79	2,142,910.12	2,847,836.75	36.8882028	-107.4067609
3,372.00	14.31	199.14	3,295.45	-569.74	-192.90	2,142,886.53	2,847,828.74	36.8881381	-107.4067887
3,466.00	13.04	199.55	3,386.78	-590.70	-200.26	2,142,865.53	2,847,821.48	36.8880805	-107.4068138
3,570.00	12.14	200.53	3,488.28	-612.00	-208.02	2,142,844.19	2,847,813.81	36.8880220	-107.4068404
3,665.00	12.93	195.01	3,581.02	-631.62	-214.27	2,142,824.54	2,847,807.64	36.8879681	-107.4068618
3,759.00	15.46	190.37	3,672.15	-654.11	-219.25	2,142,802.03	2,847,802.76	36.8879063	-107.4068788
3,854.00	17.24	187.03	3,763.30	-680.54	-223.26	2,142,775.59	2,847,798.88	36.8878337	-107.4068925
3,949.00	18.97	186.87	3,853.59	-709.84	-226.83	2,142,746.27	2,847,795.44	36.8877532	-107.4069047
4,043.00	21.23	190.74	3,941.87	-741.74	-231.83	2,142,714.35	2,847,790.58	36.8876656	-107.4069218
4,138.00	20.60	191.69	4,030.61	-775.01	-238.42	2,142,681.06	2,847,784.14	36.8875742	-107.4069443
4,232.00	21.49	192.46	4,118.34	-808.01	-245.48	2,142,648.02	2,847,777.22	36.8874836	-107.4069685
4,327.00	21.95	191.02	4,206.59	-842.43	-252.63	2,142,613.57	2,847,770.23	36.8873890	-107.4069929
4,421.00	22.94	191.14	4,293.47	-877.65	-259.53	2,142,578.32	2,847,763.49	36.8872923	-107.4070165
4,516.00	23.05	196.24	4,380.93	-913.68	-268.31	2,142,542.25	2,847,754.87	36.8871933	-107.4070465
4,611.00	21.68	197.08	4,468.78	-948.31	-278.66	2,142,507.58	2,847,744.67	36.8870982	-107.4070819

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
4,705.00	21.49	196.14	4,556.19	-981.44	-288.55	2,142,474.40	2,847,734.93	36.8870072	-107.4071157
4,799.00	24.83	194.82	4,642.60	-1,017.07	-298.39	2,142,438.72	2,847,725.26	36.8869093	-107.4071494
4,894.00	23.32	193.84	4,729.34	-1,054.62	-307.99	2,142,401.14	2,847,715.82	36.8868062	-107.4071822
4,988.00	23.43	194.40	4,815.62	-1,090.78	-317.09	2,142,364.93	2,847,706.89	36.8867069	-107.4072133
5,083.00	23.36	196.75	4,902.82	-1,127.11	-327.21	2,142,328.56	2,847,696.92	36.8866071	-107.4072479
5,177.00	21.43	196.14	4,989.72	-1,161.46	-337.36	2,142,294.17	2,847,686.93	36.8865128	-107.4072826
5,272.00	20.71	196.20	5,078.37	-1,194.26	-346.87	2,142,261.32	2,847,677.57	36.8864227	-107.4073151
5,367.00	22.20	195.18	5,166.79	-1,227.71	-356.26	2,142,227.83	2,847,668.33	36.8863308	-107.4073472
5,461.00	22.15	194.44	5,253.83	-1,262.01	-365.32	2,142,193.49	2,847,659.42	36.8862366	-107.4073782
5,556.00	20.92	192.71	5,342.20	-1,295.90	-373.52	2,142,159.56	2,847,651.37	36.8861435	-107.4074063
5,650.00	20.93	194.87	5,430.00	-1,328.50	-381.52	2,142,126.93	2,847,643.52	36.8860539	-107.4074336
5,713.00	20.82	196.70	5,488.87	-1,350.10	-387.63	2,142,105.30	2,847,637.51	36.8859946	-107.4074545
5,808.00	19.91	195.85	5,577.93	-1,381.83	-396.90	2,142,073.53	2,847,628.38	36.8859074	-107.4074862
5,903.00	19.45	194.65	5,667.38	-1,412.70	-405.32	2,142,042.62	2,847,620.10	36.8858227	-107.4075150
5,997.00	19.11	193.85	5,756.11	-1,442.78	-412.96	2,142,012.51	2,847,612.59	36.8857400	-107.4075411
6,083.00	18.22	193.29	5,837.58	-1,469.53	-419.42	2,141,985.73	2,847,606.25	36.8856666	-107.4075632
6,178.00	17.55	192.71	5,927.99	-1,497.96	-425.98	2,141,957.27	2,847,599.81	36.8855885	-107.4075856
6,272.00	16.36	190.19	6,017.91	-1,524.81	-431.44	2,141,930.39	2,847,594.47	36.8855147	-107.4076043
6,367.00	14.76	189.62	6,109.42	-1,549.92	-435.83	2,141,905.27	2,847,590.20	36.8854458	-107.4076193
6,461.00	13.32	186.45	6,200.61	-1,572.48	-439.05	2,141,882.69	2,847,587.08	36.8853838	-107.4076303
6,489.00	13.33	181.58	6,227.86	-1,578.91	-439.50	2,141,876.26	2,847,586.66	36.8853661	-107.4076319
6,532.00	10.83	187.86	6,269.91	-1,587.87	-440.19	2,141,867.29	2,847,586.01	36.8853415	-107.4076342
6,626.00	16.49	195.59	6,361.22	-1,609.49	-444.99	2,141,845.66	2,847,581.31	36.8852821	-107.4076506
6,721.00	20.31	203.03	6,451.36	-1,637.67	-455.07	2,141,817.44	2,847,571.35	36.8852047	-107.4076851
6,816.00	27.42	216.19	6,538.24	-1,670.56	-474.47	2,141,784.46	2,847,552.10	36.8851144	-107.4077514
6,910.00	32.53	223.42	6,619.67	-1,706.42	-504.65	2,141,748.46	2,847,522.08	36.8850159	-107.4078546
7,005.00	38.93	231.89	6,696.79	-1,743.45	-545.76	2,141,711.24	2,847,481.13	36.8849142	-107.4079952
7,100.00	49.09	240.13	6,765.09	-1,779.88	-600.57	2,141,674.57	2,847,426.49	36.8848141	-107.4081826
7,194.00	61.83	247.76	6,818.33	-1,813.42	-670.07	2,141,640.72	2,847,357.14	36.8847220	-107.4084203
7,289.00	67.96	248.81	6,858.61	-1,845.22	-749.96	2,141,608.57	2,847,277.39	36.8846346	-107.4086934
7,383.00	73.23	251.08	6,889.84	-1,875.58	-833.22	2,141,577.83	2,847,194.27	36.8845512	-107.4089781
7,478.00	79.90	254.07	6,911.90	-1,903.20	-921.33	2,141,549.82	2,847,106.29	36.8844753	-107.4092794
7,573.00	80.17	254.59	6,928.34	-1,928.47	-1,011.42	2,141,524.14	2,847,016.31	36.8844059	-107.4095874
7,626.00	83.61	255.94	6,935.82	-1,941.81	-1,062.16	2,141,510.58	2,846,965.64	36.8843693	-107.4097609
RU 644H Actual POE @ 7626' MD									
7,667.00	86.27	256.98	6,939.43	-1,951.37	-1,101.86	2,141,500.84	2,846,925.98	36.8843430	-107.4098966
7,762.00	89.36	259.64	6,943.06	-1,970.60	-1,194.80	2,141,481.20	2,846,833.12	36.8842902	-107.4102144
7,856.00	92.05	260.26	6,941.90	-1,987.00	-1,287.34	2,141,464.38	2,846,740.66	36.8842451	-107.4105309
7,951.00	91.92	263.27	6,938.61	-2,000.59	-1,381.29	2,141,450.37	2,846,646.76	36.8842078	-107.4108521
8,045.00	92.22	265.46	6,935.21	-2,009.82	-1,474.77	2,141,440.72	2,846,553.33	36.8841824	-107.4111718
8,140.00	89.83	265.44	6,933.51	-2,017.35	-1,569.45	2,141,432.77	2,846,458.68	36.8841617	-107.4114955
8,234.00	90.17	265.40	6,933.51	-2,024.86	-1,663.15	2,141,424.84	2,846,365.02	36.8841411	-107.4118159
8,329.00	88.32	265.19	6,934.77	-2,032.65	-1,757.82	2,141,416.63	2,846,270.39	36.8841197	-107.4121396
8,423.00	90.27	264.44	6,935.92	-2,041.14	-1,851.42	2,141,407.71	2,846,176.82	36.8840963	-107.4124596
8,518.00	90.71	264.17	6,935.11	-2,050.57	-1,945.95	2,141,397.86	2,846,082.34	36.8840704	-107.4127828
8,612.00	91.21	264.06	6,933.54	-2,060.21	-2,039.44	2,141,387.81	2,845,988.89	36.8840439	-107.4131025
8,707.00	89.90	265.52	6,932.61	-2,068.83	-2,134.04	2,141,378.76	2,845,894.33	36.8840202	-107.4134260
8,802.00	89.90	265.62	6,932.78	-2,076.17	-2,228.76	2,141,371.00	2,845,799.65	36.8840000	-107.4137498
8,896.00	89.80	265.48	6,933.03	-2,083.46	-2,322.47	2,141,363.29	2,845,705.97	36.8839800	-107.4140703
8,990.00	90.27	266.65	6,932.97	-2,089.91	-2,416.25	2,141,356.42	2,845,612.22	36.8839622	-107.4143909
9,085.00	90.34	266.47	6,932.46	-2,095.61	-2,511.08	2,141,350.29	2,845,517.42	36.8839466	-107.4147152
9,179.00	90.00	266.30	6,932.18	-2,101.54	-2,604.89	2,141,343.94	2,845,423.64	36.8839303	-107.4150359
9,274.00	89.80	265.81	6,932.35	-2,108.08	-2,699.66	2,141,336.98	2,845,328.89	36.8839123	-107.4153600
9,368.00	90.74	266.85	6,931.91	-2,114.09	-2,793.47	2,141,330.55	2,845,235.12	36.8838957	-107.4156807
9,463.00	90.71	266.80	6,930.71	-2,119.36	-2,888.31	2,141,324.86	2,845,140.30	36.8838813	-107.4160051

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,557.00	90.37	266.94	6,929.82	-2,124.49	-2,982.17	2,141,319.31	2,845,046.46	36.8838671	-107.4163260
9,652.00	90.27	266.37	6,929.29	-2,130.03	-3,077.00	2,141,313.34	2,844,951.65	36.8838519	-107.4166502
9,746.00	90.34	266.81	6,928.79	-2,135.62	-3,170.84	2,141,307.33	2,844,857.85	36.8838365	-107.4169711
9,840.00	90.34	267.03	6,928.23	-2,140.67	-3,264.70	2,141,301.86	2,844,764.01	36.8838226	-107.4172920
9,935.00	90.00	266.68	6,927.95	-2,145.88	-3,359.56	2,141,296.22	2,844,669.18	36.8838082	-107.4176164
10,029.00	90.03	266.49	6,927.92	-2,151.48	-3,453.39	2,141,290.20	2,844,575.37	36.8837928	-107.4179372
10,124.00	90.13	266.45	6,927.79	-2,157.33	-3,548.21	2,141,283.93	2,844,480.58	36.8837767	-107.4182614
10,218.00	90.00	266.39	6,927.68	-2,163.20	-3,642.02	2,141,277.64	2,844,386.79	36.8837606	-107.4185822
10,313.00	91.01	268.17	6,926.85	-2,167.71	-3,736.91	2,141,272.71	2,844,291.93	36.8837482	-107.4189066
10,407.00	91.21	268.46	6,925.03	-2,170.47	-3,830.85	2,141,269.52	2,844,198.00	36.8837405	-107.4192279
10,501.00	91.48	268.45	6,922.82	-2,173.01	-3,924.79	2,141,266.57	2,844,104.07	36.8837335	-107.4195491
10,595.00	90.94	266.43	6,920.84	-2,177.20	-4,018.67	2,141,261.95	2,844,010.21	36.8837220	-107.4198701
10,690.00	89.83	265.81	6,920.20	-2,183.63	-4,113.45	2,141,255.10	2,843,915.46	36.8837043	-107.4201941
10,785.00	90.07	266.02	6,920.28	-2,190.40	-4,208.21	2,141,247.91	2,843,820.74	36.8836856	-107.4205181
10,879.00	89.97	267.11	6,920.25	-2,196.03	-4,302.04	2,141,241.86	2,843,726.93	36.8836701	-107.4208390
10,974.00	89.56	266.81	6,920.64	-2,201.07	-4,396.90	2,141,236.39	2,843,632.09	36.8836563	-107.4211633
11,068.00	90.91	267.57	6,920.25	-2,205.68	-4,490.78	2,141,231.37	2,843,538.23	36.8836436	-107.4214844
11,163.00	90.50	267.74	6,919.08	-2,209.57	-4,585.70	2,141,227.05	2,843,443.33	36.8836328	-107.4218089
11,258.00	90.30	267.59	6,918.42	-2,213.44	-4,680.62	2,141,222.76	2,843,348.43	36.8836222	-107.4221334
11,352.00	89.83	267.89	6,918.31	-2,217.14	-4,774.54	2,141,218.63	2,843,254.53	36.8836119	-107.4224546
11,447.00	90.94	266.31	6,917.67	-2,221.95	-4,869.41	2,141,213.40	2,843,159.68	36.8835987	-107.4227790
11,541.00	90.97	265.96	6,916.11	-2,228.28	-4,963.19	2,141,206.65	2,843,065.93	36.8835812	-107.4230996
11,636.00	90.84	265.31	6,914.61	-2,235.51	-5,057.90	2,141,198.99	2,842,971.25	36.8835613	-107.4234235
11,730.00	90.87	265.64	6,913.20	-2,242.93	-5,151.60	2,141,191.16	2,842,877.59	36.8835409	-107.4237438
11,824.00	90.67	265.30	6,911.94	-2,250.35	-5,245.29	2,141,183.32	2,842,783.93	36.8835205	-107.4240642
11,919.00	90.20	265.10	6,911.22	-2,258.30	-5,339.96	2,141,174.94	2,842,689.30	36.8834986	-107.4243879
12,013.00	90.17	265.08	6,910.92	-2,266.35	-5,433.61	2,141,166.48	2,842,595.68	36.8834765	-107.4247081
12,108.00	89.66	265.46	6,911.06	-2,274.18	-5,528.29	2,141,158.22	2,842,501.04	36.8834549	-107.4250318
12,203.00	89.46	265.89	6,911.79	-2,281.34	-5,623.01	2,141,150.63	2,842,406.35	36.8834352	-107.4253557
12,297.00	90.03	266.33	6,912.20	-2,287.72	-5,716.80	2,141,143.84	2,842,312.60	36.8834176	-107.4256764
12,392.00	89.87	266.20	6,912.29	-2,293.91	-5,811.59	2,141,137.22	2,842,217.83	36.8834005	-107.4260005
12,487.00	89.36	266.36	6,912.93	-2,300.07	-5,906.39	2,141,130.64	2,842,123.06	36.8833836	-107.4263247
12,581.00	90.81	267.45	6,912.79	-2,305.15	-6,000.25	2,141,125.14	2,842,029.23	36.8833696	-107.4266456
12,676.00	90.17	267.23	6,911.97	-2,309.56	-6,095.14	2,141,120.31	2,841,934.35	36.8833574	-107.4269701
12,770.00	89.90	267.03	6,911.92	-2,314.26	-6,189.03	2,141,115.18	2,841,840.49	36.8833444	-107.4272911
12,864.00	91.81	267.42	6,910.51	-2,318.81	-6,282.90	2,141,110.21	2,841,746.64	36.8833319	-107.4276120
12,959.00	91.51	267.34	6,907.76	-2,323.15	-6,377.76	2,141,105.45	2,841,651.80	36.8833199	-107.4279364
13,053.00	91.18	267.08	6,905.56	-2,327.73	-6,471.62	2,141,100.45	2,841,557.96	36.8833072	-107.4282573
13,147.00	90.03	266.92	6,904.56	-2,332.65	-6,565.49	2,141,095.11	2,841,464.12	36.8832937	-107.4285783
13,242.00	89.83	267.51	6,904.68	-2,337.26	-6,660.38	2,141,090.07	2,841,369.25	36.8832809	-107.4289027
13,336.00	89.50	267.98	6,905.23	-2,340.96	-6,754.30	2,141,085.95	2,841,275.35	36.8832707	-107.4292239
13,430.00	89.09	267.98	6,906.39	-2,344.28	-6,848.24	2,141,082.22	2,841,181.43	36.8832615	-107.4295451
13,525.00	89.76	266.30	6,907.34	-2,349.02	-6,943.11	2,141,077.05	2,841,086.58	36.8832485	-107.4298694
13,619.00	89.80	266.37	6,907.70	-2,355.02	-7,036.92	2,141,070.63	2,840,992.80	36.8832319	-107.4301902
13,714.00	89.80	266.54	6,908.03	-2,360.90	-7,131.73	2,141,064.33	2,840,898.01	36.8832157	-107.4305144
13,808.00	89.60	266.38	6,908.52	-2,366.70	-7,225.55	2,141,058.10	2,840,804.22	36.8831997	-107.4308352
13,903.00	91.04	266.28	6,907.99	-2,372.78	-7,320.35	2,141,051.60	2,840,709.44	36.8831829	-107.4311593
13,997.00	90.97	266.56	6,906.34	-2,378.65	-7,414.16	2,141,045.31	2,840,615.67	36.8831667	-107.4314801
14,092.00	90.50	267.00	6,905.13	-2,383.99	-7,509.00	2,141,039.55	2,840,520.85	36.8831520	-107.4318044
14,186.00	90.00	267.05	6,904.72	-2,388.87	-7,602.87	2,141,034.25	2,840,427.00	36.8831385	-107.4321253
14,281.00	89.70	267.29	6,904.96	-2,393.56	-7,697.75	2,141,029.14	2,840,332.14	36.8831256	-107.4324497
14,376.00	90.00	266.83	6,905.21	-2,398.43	-7,792.63	2,141,023.84	2,840,237.29	36.8831121	-107.4327741
14,470.00	89.80	266.93	6,905.38	-2,403.54	-7,886.49	2,141,018.30	2,840,143.45	36.8830980	-107.4330951
14,565.00	91.01	266.81	6,904.71	-2,408.73	-7,981.34	2,141,012.69	2,840,048.62	36.8830837	-107.4334194
14,659.00	90.60	266.92	6,903.38	-2,413.87	-8,075.19	2,141,007.13	2,839,954.80	36.8830695	-107.4337403

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
14,754.00	90.47	266.72	6,902.50	-2,419.14	-8,170.04	2,141,001.44	2,839,859.97	36.8830549	-107.4340646	
14,848.00	90.27	266.03	6,901.89	-2,425.08	-8,263.85	2,140,995.07	2,839,766.19	36.8830385	-107.4343854	
14,942.00	89.80	266.27	6,901.83	-2,431.40	-8,357.64	2,140,988.34	2,839,672.43	36.8830211	-107.4347060	
15,037.00	89.29	266.62	6,902.59	-2,437.29	-8,452.45	2,140,982.03	2,839,577.65	36.8830049	-107.4350302	
15,131.00	90.47	265.76	6,902.78	-2,443.53	-8,546.24	2,140,975.36	2,839,483.89	36.8829876	-107.4353509	
15,226.00	90.20	266.01	6,902.23	-2,450.35	-8,641.00	2,140,968.12	2,839,389.16	36.8829688	-107.4356749	
15,289.00	90.17	266.16	6,902.03	-2,454.65	-8,703.85	2,140,963.54	2,839,326.33	36.8829570	-107.4358898	
15,352.00	90.30	265.64	6,901.77	-2,459.16	-8,766.69	2,140,958.75	2,839,263.51	36.8829445	-107.4361047	
15,383.00	90.13	265.87	6,901.65	-2,461.45	-8,797.60	2,140,956.32	2,839,232.61	36.8829382	-107.4362104	
15,446.00	90.20	265.92	6,901.47	-2,465.96	-8,860.44	2,140,951.53	2,839,169.79	36.8829258	-107.4364252	
15,500.00	90.32	266.34	6,901.22	-2,469.60	-8,914.31	2,140,947.64	2,839,115.93	36.8829157	-107.4366094	
RU 644H Actual FPP @ 15500' MD										
15,509.00	90.34	266.41	6,901.17	-2,470.17	-8,923.30	2,140,947.03	2,839,106.95	36.8829141	-107.4366401	
15,572.00	90.47	266.64	6,900.73	-2,473.99	-8,986.18	2,140,942.93	2,839,044.09	36.8829036	-107.4368551	
15,628.00	90.20	265.94	6,900.40	-2,477.62	-9,042.06	2,140,939.06	2,838,988.23	36.8828936	-107.4370462	
15,698.00	90.20	265.94	6,900.16	-2,482.57	-9,111.88	2,140,933.79	2,838,918.42	36.8828799	-107.4372850	
RU 644H ST01 BHL @ 15698' MD										

Design Targets										
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
RU 644H SHL - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	2,143,457.12	2,848,019.09	36.8897030	-107.4061290	
RU 644H OH BHL - actual wellpath misses target center by 4.09ft at 519.92ft MD (519.91 TVD, -2.04 N, 0.13 E) - Point	0.00	0.00	519.85	-6.06	-0.61	2,143,451.06	2,848,018.50	36.8896863	-107.4061311	
RU 644H ST01 BHL - actual wellpath hits target center - Point	0.00	0.00	6,900.16	-2,482.57	-9,111.88	2,140,933.79	2,838,918.42	36.8828799	-107.4372850	
RU 644H Actual FPP - actual wellpath hits target center - Point	0.00	0.00	6,901.22	-2,469.60	-8,914.31	2,140,947.64	2,839,115.93	36.8829157	-107.4366094	
RU 644H PBHL - actual wellpath misses target center by 10.30ft at 15679.30ft MD (6900.22 TVD, -2481.25 N, -9093.23 E) - Point	0.00	0.00	6,910.00	-2,478.03	-9,093.49	2,140,938.41	2,838,936.80	36.8828924	-107.4372221	
RU 644H Actual POE - actual wellpath hits target center - Point	0.00	0.00	6,935.82	-1,941.81	-1,062.16	2,141,510.58	2,846,965.64	36.8843693	-107.4097609	

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
7,626.00	6,935.82	-1,941.81	-1,062.16	RU 644H Actual POE @ 7626' MD	
15,500.00	6,901.22	-2,469.60	-8,914.31	RU 644H Actual FPP @ 15500' MD	
15,698.00	6,900.16	-2,482.57	-9,111.88	RU 644H ST01 BHL @ 15698' MD	

SDT
Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 644H
Project:	Rio Arriba, NM NAD83	TVD Reference:	6305+30 @ 6335.00ft (H&P 530)
Site:	Rosa Unit 27	MD Reference:	6305+30 @ 6335.00ft (H&P 530)
Well:	Rosa Unit 644H	North Reference:	True
Wellbore:	ST01	Survey Calculation Method:	Minimum Curvature
Design:	ST01	Database:	EDM 5000 Multi User Db

Checked By:	_____	Approved By:	_____	Date:	_____
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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

ACKNOWLEDGMENTS

Action 276871

ACKNOWLEDGMENTS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 276871
	Action Type: [C-104] Completion Packet (C-104C)

ACKNOWLEDGMENTS

☒	I hereby certify that the required Water Use Report has been, or will be, submitted for this wells completion.
☒	I hereby certify that the required FracFocus disclosure has been, or will be, submitted for this wells completion.

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CONDITIONS

Action 276871

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 276871
	Action Type: [C-104] Completion Packet (C-104C)

CONDITIONS

Created By	Condition	Condition Date
plmartinez	RT EXPIRES 1/19/2024.	10/19/2023