

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 – 039-31410	⁵ Pool Name Basin Mancos		⁶ Pool Code 97232
⁷ Property Code 320608	⁸ Property Name Rosa Unit		⁹ Well Number 649H

II. ¹⁰ Surface Location

UL or lot no. C	Section 19	Township 31N	Range 5W	Lot Idn 1	Feet from the 965	North/South Line North	Feet from the 480	East/West line West	County Rio Arriba
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¹¹ Bottom Hole Location

UL or lot no. H	Section 21	Township 31N	Range 5W	Lot Idn	Feet from the 1717	North/South line North	Feet from the 171	East/West line East	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

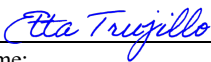
¹⁸ Transporter OGRID	¹⁹ Transporter Name and Address	²⁰ O/G/W
373888	Harvest Four Corners, LLC 1755 Arroyo Dr. Bloomfield, NM 87413	G

IV. Well Completion Data

²¹ Spud Date 4/9/2022	²² Ready Date ~10/19/2023	²³ TD 20,638’ MD / 7,188’ TVD	²⁴ PBTD 20,538’ MD / 7,187’ TVD	²⁵ Perforations 7,600’ MD / ~20,439’ MD 7,204’ TVD / ~7,185’ TVD	²⁶ DHC, MC R-13457
²⁷ Hole Size		²⁸ Casing & Tubing Size	²⁹ Depth Set		³⁰ Sacks Cement
17.5”		13-3/8”, 54.5#, J-55	322’		395sx (81bbbls, 454cf)
12.5”		9-5/8”, 47#, L-80	6221’		5976sx (2343bbbls, 12,834cf) DV tool @ 4621’ & 3085’
8.5”		5.5”, 20#, HCP-110 (sidetrack)	20,614’		2876sx (823bbbls, 4629cf) TOC @ 1720’
		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: 		OIL CONSERVATION DIVISION	
Printed name: Etta Trujillo		Approved by: PATRICIA MARTINEZ	
Title: Regulatory Specialist		Title: PETROLEUM SPECIALIST	
E-mail Address: etrujillo@logosresourcesllc.com		Approval Date: 10/19/2023	
Date: 10/18/2023	Phone: (505) 324-4154	RT EXPIRES 1/19/2024	

Submit one copy to
Appropriate District OfficeOIL CONSERVATION DIVISION
1220 South St. Francis Drive
Santa Fe, NM 87505☐ AMENDED REPORT

AS-DRILLED WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-31410	² Pool Code 97232	³ Pool Name BASIN MANCOS
⁴ Property Code 320608	⁵ Property Name ROSA UNIT	⁶ Well Number 649H ST1
⁷ GRID No. 289408	⁸ Operator Name LOGOS OPERATING, LLC	⁹ Elevation 6305'

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	19	31N	5W	1	965	NORTH	480	WEST	RIO ARriba

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	21	31N	5W		1717	NORTH	171	EAST	RIO ARriba
¹² Dedicated Acres 872.01	N/2 - Sections 19, 20, 21, T31N, R5W				¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-13457		

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

17 OPERATOR CERTIFICATION
I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom-hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

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 and that the same is true and correct to the best of my belief.

Date Revised: OCTOBER 17, 2023
Date of Survey: JANUARY 2, 2015

Signature and Seal of Professional Surveyor



JASON C. EDWARDS
Certificate Number 15269

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

S68°35.2'E
T75.5'

FIRST TAKE POINT (B)
1252' FNL 2621' FEL
SECTION 19, T31N, R5W
LAT 36.8888864°N
LONG -107.4030684°W
DATUM: NAD1927

LAT 36.8888924°N
LONG -107.4036713°W
DATUM: NAD1983

S88°10.5'E
12804.6'

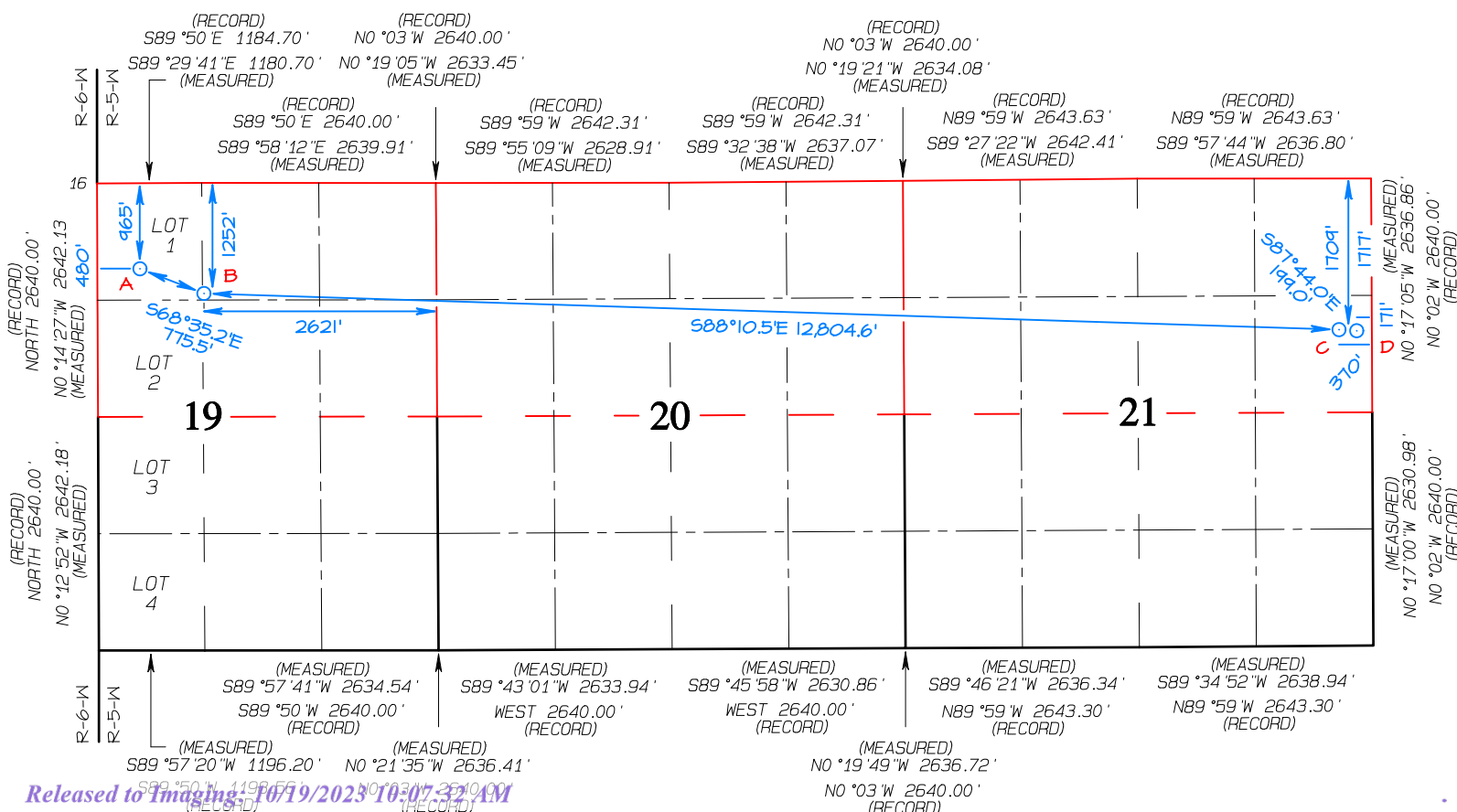
FIRST PERFORATION (C)
1709' FNL 370' FEL
SECTION 21, T31N, R5W
LAT 36.8875999°N
LONG -107.3593137°W
DATUM: NAD1927

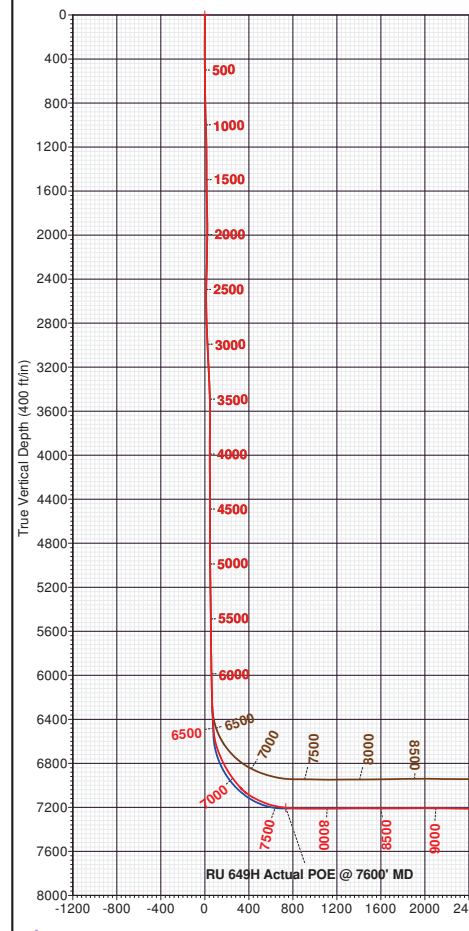
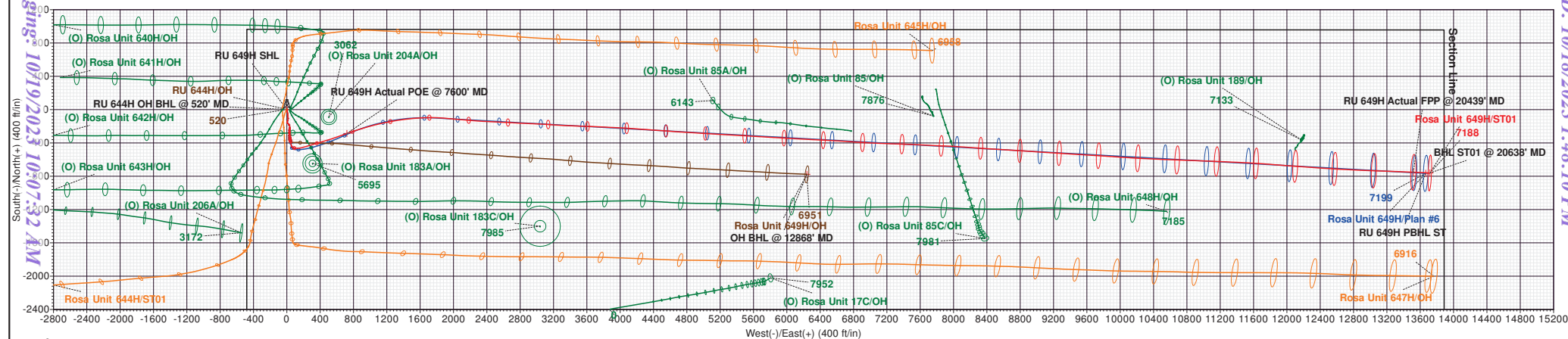
LAT 36.8876062°N
LONG -107.3599155°W
DATUM: NAD1983

S87°44.0'E
199.0'

LAST TAKE POINT (D)
1717' FNL 171' FEL
SECTION 21, T31N, R5W
LAT 36.8875756°N
LONG -107.3586340°W
DATUM: NAD1927

LAT 36.8875818°N
LONG -107.3592357°W
DATUM: NAD1983

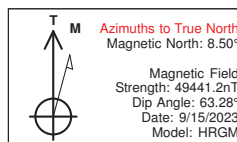




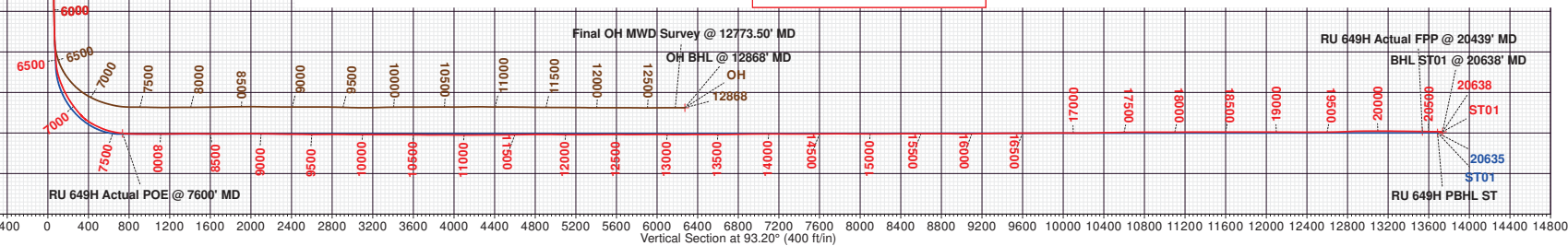
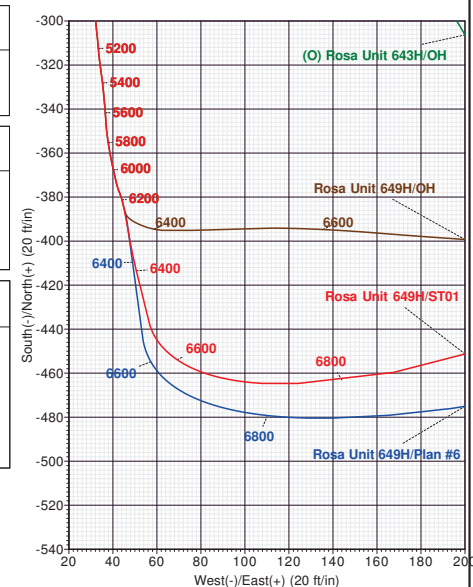
Original Hole - ANNOTATIONS							
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure
12773.50	89.83	92.38	6950.68	-772.51	6145.95	1742.86	6525.13
12868.00	89.83	92.38	6950.96	-776.43	6240.36	1761.79	6619.63

Sidetrack 01 - ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation	
7600.00	84.30	70.66	7203.82	-286.37	720.76	735.62	1163.19	RU 649H Actual POE @ 7600' MD	
20439.00	89.03	92.14	7185.30	-751.39	13516.89	13537.76	14001.28	RU 649H Actual FPP @ 20439' MD	
20569.00	89.43	92.55	7187.00	-757.08	13646.75	13667.73	14131.27	Final ST01 MWD Survey @ 20569' MD	
20638.00	89.43	92.55	7187.69	-760.15	13715.68	13736.73	14200.26	BHL ST01 @ 20638' MD	

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
RU 649H SHL	0.00	0.00	0.00	2143448.37	2848017.09	36.8896790	-107.4061360
RU 649H OH BHL	6950.96	-776.43	6240.36	2142699.88	2854260.85	36.8875444	-107.3847973
RU 649H Actual FPP	7185.30	-751.39	13516.89	2142757.49	2861537.18	36.8876062	-107.3599155
RU 649H ST01 BHL	7187.69	-760.15	13715.68	2142749.62	2861736.00	36.8875818	-107.3592357
RU 649H PBHL ST	7198.93	-765.34	13665.67	2142744.21	2861686.02	36.8875676	-107.3594067
RU 649H Actual POE	7203.82	-286.37	720.76	2143165.23	2848739.12	36.8889924	-107.4036713



TOTAL CORRECTION: 8.50°



Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 649H

OH

Design: OH

Standard Survey Report

05 October, 2023

SDT
Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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 649H					
Well Position	+N/-S	0.00 ft	Northing:	2,143,448.37 usft	Latitude:	36.8896790
	+E/-W	0.00 ft	Easting:	2,848,017.09 usft	Longitude:	-107.4061360
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft
Grid Convergence:		0.26 °				

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	User Defined	8/6/2022	8.58	63.33	46,569.00000000

Design	OH				
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	170.82	

Survey Program	Date	10/5/2023			
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
74.20	1,001.80	Survey #1 - Gyro (OH)	A020Ga_GYRO-NS	OWSG Gyrocompass Gyro	
1,082.50	1,400.50	Survey #2 - Corrected Run 2 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
1,495.50	6,225.50	Survey #3 - Corrected Run 3 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
6,296.50	12,773.50	Survey #4 - Corrected Run 4 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
12,868.00	12,868.00	Survey #5 - Projection (OH)	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	
74.20	0.26	333.90	74.20	0.15	-0.07	-0.16	0.35	0.35	0.00	
165.36	0.38	329.11	165.36	0.60	-0.32	-0.64	0.13	0.13	-5.25	
256.40	0.32	328.79	256.40	1.07	-0.61	-1.16	0.07	-0.07	-0.35	
347.59	0.35	27.94	347.59	1.54	-0.61	-1.61	0.36	0.03	64.86	
440.15	0.40	100.75	440.14	1.73	-0.16	-1.73	0.48	0.05	78.66	

SDT Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)
534.77	1.18	158.75	534.76	0.76	0.52	-0.66	1.08	0.82	61.30
629.29	2.63	166.70	629.22	-2.26	1.37	2.45	1.56	1.53	8.41
723.92	3.85	172.54	723.70	-7.52	2.28	7.79	1.33	1.29	6.17
818.59	4.68	170.06	818.11	-14.48	3.36	14.83	0.90	0.88	-2.62
912.85	5.33	167.20	912.01	-22.54	5.00	23.05	0.74	0.69	-3.03
1,001.80	6.13	165.28	1,000.51	-31.16	7.12	31.90	0.92	0.90	-2.16
1,082.50	6.42	165.87	1,080.73	-39.70	9.31	40.68	0.37	0.36	0.73
1,177.50	6.11	177.33	1,175.16	-49.90	10.85	50.99	1.35	-0.33	12.06
1,305.50	5.25	179.24	1,302.53	-62.56	11.24	63.56	0.69	-0.67	1.49
1,400.50	5.71	181.19	1,397.10	-71.63	11.20	72.50	0.52	0.48	2.05
1,495.50	4.64	179.55	1,491.71	-80.20	11.13	80.95	1.14	-1.13	-1.73
1,591.50	3.14	170.72	1,587.49	-86.68	11.59	87.42	1.68	-1.56	-9.20
1,686.50	3.21	165.89	1,682.34	-91.83	12.66	92.67	0.29	0.07	-5.08
1,781.50	4.23	160.16	1,777.14	-97.70	14.49	98.76	1.14	1.07	-6.03
1,877.50	3.94	173.07	1,872.90	-104.31	16.09	105.54	1.00	-0.30	13.45
1,971.50	3.29	189.53	1,966.71	-110.17	16.04	111.32	1.30	-0.69	17.51
2,066.50	3.08	195.75	2,061.57	-115.32	14.89	116.22	0.43	-0.22	6.55
2,161.50	3.51	198.47	2,156.41	-120.53	13.28	121.11	0.48	0.45	2.86
2,257.50	4.55	200.21	2,252.17	-126.89	11.03	127.03	1.09	1.08	1.81
2,352.50	4.84	202.09	2,346.85	-134.14	8.22	133.74	0.35	0.31	1.98
2,447.50	4.51	198.79	2,441.54	-141.39	5.51	140.46	0.45	-0.35	-3.47
2,542.50	3.88	190.41	2,536.28	-148.09	3.73	146.79	0.92	-0.66	-8.82
2,637.50	3.21	167.84	2,631.10	-153.85	3.71	152.47	1.62	-0.71	-23.76
2,733.50	2.49	149.26	2,726.99	-158.27	5.34	157.10	1.21	-0.75	-19.35
2,828.50	2.66	129.79	2,821.89	-161.46	8.09	160.68	0.93	0.18	-20.49
2,923.50	2.92	127.14	2,916.78	-164.33	11.71	164.09	0.31	0.27	-2.79
3,018.50	3.42	137.77	3,011.64	-167.89	15.54	168.22	0.81	0.53	11.19
3,114.50	3.93	143.60	3,107.44	-172.66	19.42	173.54	0.66	0.53	6.07
3,209.50	4.37	137.46	3,202.19	-177.94	23.80	179.46	0.66	0.46	-6.46
3,304.50	4.99	149.61	3,296.87	-184.17	28.34	186.34	1.23	0.65	12.79
3,400.50	5.34	162.96	3,392.49	-192.05	31.76	194.65	1.30	0.36	13.91
3,495.50	6.12	165.01	3,487.01	-201.17	34.36	204.07	0.85	0.82	2.16
3,590.50	4.91	174.78	3,581.57	-210.11	36.04	213.17	1.61	-1.27	10.28
3,685.50	3.93	191.15	3,676.29	-217.35	35.78	220.27	1.67	-1.03	17.23
3,780.50	4.10	196.79	3,771.06	-223.79	34.17	226.38	0.45	0.18	5.94
3,876.50	3.06	193.45	3,866.87	-229.57	32.59	231.83	1.10	-1.08	-3.48
3,971.50	2.66	185.04	3,961.75	-234.23	31.80	236.31	0.61	-0.42	-8.85
4,066.50	2.57	179.51	4,056.66	-238.56	31.63	240.55	0.28	-0.09	-5.82
4,161.50	2.56	170.83	4,151.56	-242.78	31.98	244.78	0.41	-0.01	-9.14
4,256.50	2.92	180.95	4,246.45	-247.30	32.28	249.28	0.63	0.38	10.65
4,352.50	3.27	183.78	4,342.31	-252.48	32.06	254.36	0.40	0.36	2.95
4,447.50	3.46	178.99	4,437.15	-258.05	31.93	259.84	0.36	0.20	-5.04
4,541.50	3.63	183.58	4,530.97	-263.85	31.80	265.55	0.35	0.18	4.88
4,637.50	3.78	184.40	4,626.77	-270.04	31.36	271.59	0.17	0.16	0.85

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)
4,732.50	3.75	180.15	4,721.56	-276.27	31.12	277.69	0.30	-0.03	-4.47
4,826.50	4.11	178.92	4,815.34	-282.71	31.17	284.06	0.39	0.38	-1.31
4,921.50	4.24	176.26	4,910.09	-289.62	31.46	290.93	0.25	0.14	-2.80
5,016.50	4.28	176.43	5,004.83	-296.66	31.91	297.95	0.04	0.04	0.18
5,114.50	4.65	173.50	5,102.53	-304.26	32.59	305.56	0.44	0.38	-2.99
5,209.50	5.01	175.40	5,197.19	-312.22	33.36	313.54	0.41	0.38	2.00
5,304.50	4.65	172.07	5,291.86	-320.17	34.22	321.53	0.48	-0.38	-3.51
5,368.50	4.07	172.44	5,355.67	-324.99	34.88	326.39	0.91	-0.91	0.58
5,463.50	3.87	174.59	5,450.44	-331.52	35.63	332.96	0.26	-0.21	2.26
5,526.50	3.95	174.25	5,513.30	-335.80	36.04	337.25	0.13	0.13	-0.54
5,590.50	3.83	175.41	5,577.15	-340.12	36.44	341.58	0.22	-0.19	1.81
5,653.50	4.00	176.52	5,640.00	-344.41	36.74	345.86	0.30	0.27	1.76
5,717.50	3.98	175.08	5,703.85	-348.85	37.06	350.30	0.16	-0.03	-2.25
5,781.50	3.84	171.79	5,767.70	-353.19	37.56	354.66	0.41	-0.22	-5.14
5,844.50	3.39	170.23	5,830.57	-357.11	38.18	358.63	0.73	-0.71	-2.48
5,908.50	3.56	169.95	5,894.45	-360.93	38.85	362.51	0.27	0.27	-0.44
5,971.50	3.72	167.90	5,957.33	-364.86	39.62	366.50	0.33	0.25	-3.25
6,035.50	3.88	167.25	6,021.19	-369.00	40.53	370.74	0.26	0.25	-1.02
6,098.50	4.02	167.15	6,084.04	-373.23	41.49	375.07	0.22	0.22	-0.16
6,162.50	4.18	158.16	6,147.87	-377.58	42.86	379.58	1.03	0.25	-14.05
6,225.50	4.32	165.49	6,210.70	-382.01	44.31	384.19	0.89	0.22	11.63
6,296.50	4.15	165.45	6,281.51	-387.09	45.62	389.41	0.24	-0.24	-0.06
6,391.50	10.07	110.43	6,375.82	-393.32	54.28	396.95	8.84	6.23	-57.92
6,486.50	17.67	85.59	6,468.06	-395.12	76.49	402.26	9.99	8.00	-26.15
6,582.50	26.12	90.25	6,557.06	-394.09	112.22	406.94	8.98	8.80	4.85
6,677.50	35.17	94.56	6,638.72	-396.36	160.51	416.89	9.80	9.53	4.54
6,772.50	42.64	93.57	6,712.59	-400.54	219.98	430.50	7.89	7.86	-1.04
6,868.50	51.52	90.55	6,777.91	-402.93	290.16	444.06	9.53	9.25	-3.15
6,963.50	59.97	91.66	6,831.33	-404.49	368.59	458.10	8.95	8.89	1.17
7,058.50	66.70	89.98	6,873.95	-405.66	453.42	472.79	7.26	7.08	-1.77
7,153.50	73.70	90.70	6,906.11	-406.21	542.75	487.57	7.40	7.37	0.76
7,249.50	78.26	93.98	6,929.36	-410.03	635.77	506.19	5.79	4.75	3.42
7,344.50	86.24	96.04	6,942.17	-418.26	729.46	529.25	8.67	8.40	2.17
7,439.50	90.20	94.72	6,945.12	-427.16	823.98	553.11	4.39	4.17	-1.39
7,534.50	89.33	94.96	6,945.51	-435.18	918.64	576.12	0.95	-0.92	0.25
7,630.50	88.56	94.73	6,947.27	-443.29	1,014.28	599.38	0.84	-0.80	-0.24
7,725.50	90.03	94.63	6,948.44	-451.04	1,108.95	622.13	1.55	1.55	-0.11
7,819.50	90.77	94.89	6,947.79	-458.84	1,202.62	644.77	0.83	0.79	0.28
7,914.50	90.40	94.70	6,946.82	-466.78	1,297.29	667.71	0.44	-0.39	-0.20
8,009.50	89.70	94.22	6,946.73	-474.16	1,392.00	690.11	0.89	-0.74	-0.51
8,104.50	91.01	94.14	6,946.14	-481.09	1,486.74	712.06	1.38	1.38	-0.08
8,218.50	90.30	94.83	6,944.84	-490.00	1,600.38	738.98	0.87	-0.62	0.61
8,313.50	91.11	93.62	6,943.67	-497.00	1,695.12	761.00	1.53	0.85	-1.27

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)	
8,408.50	90.91	93.66	6,942.00	-503.03	1,789.91	782.07	0.21	-0.21	0.04	
8,504.50	90.54	93.46	6,940.78	-508.99	1,885.72	803.24	0.44	-0.39	-0.21	
8,598.50	90.13	93.34	6,940.23	-514.57	1,979.55	823.70	0.45	-0.44	-0.13	
8,693.50	88.59	95.09	6,941.29	-521.55	2,074.28	845.71	2.45	-1.62	1.84	
8,789.50	89.80	94.10	6,942.64	-529.24	2,169.96	868.56	1.63	1.26	-1.03	
8,883.50	89.40	93.45	6,943.30	-535.43	2,263.75	889.63	0.81	-0.43	-0.69	
8,978.50	90.13	93.57	6,943.69	-541.24	2,358.57	910.49	0.78	0.77	0.13	
9,072.50	89.53	93.98	6,943.97	-547.43	2,452.37	931.56	0.77	-0.64	0.44	
9,168.50	90.57	94.60	6,943.88	-554.61	2,548.10	953.92	1.26	1.08	0.65	
9,263.50	89.97	93.92	6,943.44	-561.67	2,642.83	975.99	0.95	-0.63	-0.72	
9,358.50	89.46	93.97	6,943.91	-568.20	2,737.60	997.56	0.54	-0.54	0.05	
9,453.50	88.69	93.64	6,945.44	-574.51	2,832.38	1,018.90	0.88	-0.81	-0.35	
9,548.50	88.05	93.34	6,948.14	-580.29	2,927.17	1,039.72	0.74	-0.67	-0.32	
9,643.50	89.09	92.73	6,950.52	-585.32	3,022.00	1,059.81	1.27	1.09	-0.64	
9,738.50	90.37	93.37	6,950.96	-590.37	3,116.86	1,079.93	1.51	1.35	0.67	
9,833.50	91.91	94.74	6,949.07	-597.09	3,211.60	1,101.67	2.17	1.62	1.44	
9,928.50	91.34	95.11	6,946.38	-605.24	3,306.21	1,124.81	0.72	-0.60	0.39	
10,023.50	90.67	94.91	6,944.71	-613.53	3,400.84	1,148.09	0.74	-0.71	-0.21	
10,118.50	90.13	94.75	6,944.05	-621.53	3,495.50	1,171.09	0.59	-0.57	-0.17	
10,213.50	89.40	94.46	6,944.44	-629.16	3,590.19	1,193.72	0.83	-0.77	-0.31	
10,308.50	90.77	93.30	6,944.30	-635.59	3,684.97	1,215.18	1.89	1.44	-1.22	
10,403.50	89.77	93.02	6,943.85	-640.82	3,779.82	1,235.48	1.09	-1.05	-0.29	
10,498.50	90.10	93.99	6,943.96	-646.63	3,874.64	1,256.34	1.08	0.35	1.02	
10,593.50	89.46	93.18	6,944.32	-652.57	3,969.45	1,277.32	1.09	-0.67	-0.85	
10,688.50	91.51	93.33	6,943.52	-657.97	4,064.29	1,297.77	2.16	2.16	0.16	
10,783.50	90.94	92.75	6,941.49	-663.00	4,159.13	1,317.87	0.86	-0.60	-0.61	
10,877.50	88.83	92.65	6,941.68	-667.43	4,253.02	1,337.22	2.25	-2.24	-0.11	
10,971.50	88.99	92.75	6,943.46	-671.86	4,346.90	1,356.56	0.20	0.17	0.11	
11,066.50	90.37	93.75	6,944.00	-677.24	4,441.74	1,377.00	1.79	1.45	1.05	
11,161.50	89.73	93.72	6,943.91	-683.43	4,536.54	1,398.23	0.67	-0.67	-0.03	
11,256.50	89.30	94.18	6,944.72	-689.98	4,631.31	1,419.81	0.66	-0.45	0.48	
11,351.50	88.96	94.28	6,946.16	-696.98	4,726.04	1,441.83	0.37	-0.36	0.11	
11,444.50	89.73	93.03	6,947.22	-702.91	4,818.85	1,462.49	1.58	0.83	-1.34	
11,539.50	89.23	92.76	6,948.08	-707.71	4,913.72	1,482.36	0.60	-0.53	-0.28	
11,634.50	90.44	92.40	6,948.36	-711.98	5,008.62	1,501.71	1.33	1.27	-0.38	
11,728.50	89.66	93.27	6,948.28	-716.63	5,102.50	1,521.28	1.24	-0.83	0.93	
11,823.50	89.46	93.09	6,949.01	-721.90	5,197.36	1,541.61	0.28	-0.21	-0.19	
11,918.50	88.82	93.27	6,950.43	-727.17	5,292.20	1,561.94	0.70	-0.67	0.19	
12,013.50	90.30	93.58	6,951.16	-732.85	5,387.02	1,582.66	1.59	1.56	0.33	
12,108.50	90.27	92.61	6,950.69	-737.98	5,481.88	1,602.86	1.02	-0.03	-1.02	
12,203.50	89.93	92.72	6,950.52	-742.39	5,576.78	1,622.35	0.38	-0.36	0.12	
12,298.50	89.66	93.35	6,950.86	-747.42	5,671.64	1,642.45	0.72	-0.28	0.66	
12,393.50	89.23	93.89	6,951.78	-753.42	5,766.45	1,663.49	0.73	-0.45	0.57	

SDT
Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)	
12,488.50	89.93	93.16	6,952.48	-759.26	5,861.27	1,684.38	1.06	0.74	-0.77	
12,582.50	90.87	92.86	6,951.82	-764.20	5,955.13	1,704.22	1.05	1.00	-0.32	
12,677.50	90.34	92.37	6,950.82	-768.53	6,050.03	1,723.64	0.76	-0.56	-0.52	
12,773.50	89.83	92.38	6,950.68	-772.51	6,145.95	1,742.86	0.53	-0.53	0.01	
Final OH MWD Survey @ 12773.50' MD										
12,868.00	89.83	92.38	6,950.96	-776.43	6,240.36	1,761.79	0.00	0.00	0.00	
OH BHL @ 12868' MD										

Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting		
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(usft)	(usft)	Latitude	Longitude
RU 649H OH BHL	0.00	0.00	6,950.96	-776.43	6,240.36	2,142,699.87	2,854,260.85	36.8875444	-107.3847973
- actual wellpath hits target center									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
12,773.50	6,950.68	-772.51	6,145.95	Final OH MWD Survey @ 12773.50' MD	
12,868.00	6,950.96	-776.43	6,240.36	OH BHL @ 12868' MD	

Checked By:	_____	Approved By:	_____	Date:	_____
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Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 649H

OH

Design: OH

Survey Report - Geographic

16 October, 2023

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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 649H				
Well Position	+N/-S	0.00 ft	Northing:	2,143,448.37 usft	Latitude:	36.8896790
	+E/-W	0.00 ft	Easting:	2,848,017.09 usft	Longitude:	-107.4061360
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	8/6/2022	8.58	63.33	46,569.00000000

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	170.82	

Survey Program	Date	10/5/2023			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
74.20	1,001.80	Survey #1 - Gyro (OH)	A020Ga_GYRO-NS	OWSG Gyrocompass Gyro	
1,082.50	1,400.50	Survey #2 - Corrected Run 2 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
1,495.50	6,225.50	Survey #3 - Corrected Run 3 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
6,296.50	12,773.50	Survey #4 - Corrected Run 4 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
12,868.00	12,868.00	Survey #5 - Projection (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	2,143,448.37	2,848,017.09	36.8896790	-107.4061360	
74.20	0.26	333.90	74.20	0.15	-0.07	2,143,448.52	2,848,017.02	36.8896794	-107.4061363	
165.36	0.38	329.11	165.36	0.60	-0.32	2,143,448.96	2,848,016.77	36.8896806	-107.4061371	
256.40	0.32	328.79	256.40	1.07	-0.61	2,143,449.44	2,848,016.48	36.8896819	-107.4061381	
347.59	0.35	27.94	347.59	1.54	-0.61	2,143,449.90	2,848,016.48	36.8896832	-107.4061381	
440.15	0.40	100.75	440.14	1.73	-0.16	2,143,450.09	2,848,016.92	36.8896837	-107.4061365	
534.77	1.18	158.75	534.76	0.76	0.52	2,143,449.13	2,848,017.61	36.8896810	-107.4061342	
629.29	2.63	166.70	629.22	-2.26	1.37	2,143,446.11	2,848,018.47	36.8896727	-107.4061313	

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
723.92	3.85	172.54	723.70	-7.52	2.28	2,143,440.85	2,848,019.41	36.8896583	-107.4061282	
818.59	4.68	170.06	818.11	-14.48	3.36	2,143,433.90	2,848,020.52	36.8896392	-107.4061245	
912.85	5.33	167.20	912.01	-22.54	5.00	2,143,425.85	2,848,022.19	36.8896171	-107.4061189	
1,001.80	6.13	165.28	1,000.51	-31.16	7.12	2,143,417.24	2,848,024.35	36.8895934	-107.4061117	
1,082.50	6.42	165.87	1,080.73	-39.70	9.31	2,143,408.71	2,848,026.58	36.8895699	-107.4061042	
1,177.50	6.11	177.33	1,175.16	-49.90	10.85	2,143,398.51	2,848,028.16	36.8895419	-107.4060989	
1,305.50	5.25	179.24	1,302.53	-62.56	11.24	2,143,385.86	2,848,028.61	36.8895071	-107.4060976	
1,400.50	5.71	181.19	1,397.10	-71.63	11.20	2,143,376.78	2,848,028.61	36.8894822	-107.4060977	
1,495.50	4.64	179.55	1,491.71	-80.20	11.13	2,143,368.22	2,848,028.58	36.8894587	-107.4060979	
1,591.50	3.14	170.72	1,587.49	-86.68	11.59	2,143,361.74	2,848,029.07	36.8894409	-107.4060964	
1,686.50	3.21	165.89	1,682.34	-91.83	12.66	2,143,356.60	2,848,030.16	36.8894267	-107.4060927	
1,781.50	4.23	160.16	1,777.14	-97.70	14.49	2,143,350.73	2,848,032.02	36.8894106	-107.4060864	
1,877.50	3.94	173.07	1,872.90	-104.31	16.09	2,143,344.13	2,848,033.65	36.8893925	-107.4060810	
1,971.50	3.29	189.53	1,966.71	-110.17	16.04	2,143,338.27	2,848,033.62	36.8893763	-107.4060812	
2,066.50	3.08	195.75	2,061.57	-115.32	14.89	2,143,333.12	2,848,032.50	36.8893622	-107.4060851	
2,161.50	3.51	198.47	2,156.41	-120.53	13.28	2,143,327.90	2,848,030.91	36.8893479	-107.4060906	
2,257.50	4.55	200.21	2,252.17	-126.89	11.03	2,143,321.53	2,848,028.69	36.8893304	-107.4060983	
2,352.50	4.84	202.09	2,346.85	-134.14	8.22	2,143,314.26	2,848,025.91	36.8893105	-107.4061079	
2,447.50	4.51	198.79	2,441.54	-141.39	5.51	2,143,307.00	2,848,023.24	36.8892906	-107.4061172	
2,542.50	3.88	190.41	2,536.28	-148.09	3.73	2,143,300.30	2,848,021.48	36.8892722	-107.4061233	
2,637.50	3.21	167.84	2,631.10	-153.85	3.71	2,143,294.53	2,848,021.49	36.8892564	-107.4061233	
2,733.50	2.49	149.26	2,726.99	-158.27	5.34	2,143,290.12	2,848,023.14	36.8892442	-107.4061177	
2,828.50	2.66	129.79	2,821.89	-161.46	8.09	2,143,286.95	2,848,025.90	36.8892355	-107.4061083	
2,923.50	2.92	127.14	2,916.78	-164.33	11.71	2,143,284.09	2,848,029.54	36.8892276	-107.4060960	
3,018.50	3.42	137.77	3,011.64	-167.89	15.54	2,143,280.55	2,848,033.39	36.8892178	-107.4060829	
3,114.50	3.93	143.60	3,107.44	-172.66	19.42	2,143,275.80	2,848,037.28	36.8892047	-107.4060696	
3,209.50	4.37	137.46	3,202.19	-177.94	23.80	2,143,270.53	2,848,041.69	36.8891902	-107.4060546	
3,304.50	4.99	149.61	3,296.87	-184.17	28.34	2,143,264.32	2,848,046.25	36.8891731	-107.4060391	
3,400.50	5.34	162.96	3,392.49	-192.05	31.76	2,143,256.47	2,848,049.71	36.8891515	-107.4060274	
3,495.50	6.12	165.01	3,487.01	-201.17	34.36	2,143,247.36	2,848,052.35	36.8891264	-107.4060185	
3,590.50	4.91	174.78	3,581.57	-210.11	36.04	2,143,238.43	2,848,054.07	36.8891019	-107.4060128	
3,685.50	3.93	191.15	3,676.29	-217.35	35.78	2,143,231.18	2,848,053.85	36.8890820	-107.4060136	
3,780.50	4.10	196.79	3,771.06	-223.79	34.17	2,143,224.73	2,848,052.27	36.8890643	-107.4060191	
3,876.50	3.06	193.45	3,866.87	-229.57	32.59	2,143,218.94	2,848,050.70	36.8890484	-107.4060246	
3,971.50	2.66	185.04	3,961.75	-234.23	31.80	2,143,214.28	2,848,049.94	36.8890356	-107.4060273	
4,066.50	2.57	179.51	4,056.66	-238.56	31.63	2,143,209.95	2,848,049.79	36.8890237	-107.4060279	
4,161.50	2.56	170.83	4,151.56	-242.78	31.98	2,143,205.73	2,848,050.16	36.8890121	-107.4060266	
4,256.50	2.92	180.95	4,246.45	-247.30	32.28	2,143,201.22	2,848,050.48	36.8889997	-107.4060256	
4,352.50	3.27	183.78	4,342.31	-252.48	32.06	2,143,196.04	2,848,050.28	36.8889855	-107.4060264	
4,447.50	3.46	178.99	4,437.15	-258.05	31.93	2,143,190.47	2,848,050.18	36.8889702	-107.4060268	
4,541.50	3.63	183.58	4,530.97	-263.85	31.80	2,143,184.66	2,848,050.07	36.8889542	-107.4060273	
4,637.50	3.78	184.40	4,626.77	-270.04	31.36	2,143,178.47	2,848,049.66	36.8889372	-107.4060288	
4,732.50	3.75	180.15	4,721.56	-276.27	31.12	2,143,172.24	2,848,049.44	36.8889201	-107.4060296	
4,826.50	4.11	178.92	4,815.34	-282.71	31.17	2,143,165.80	2,848,049.53	36.8889024	-107.4060294	
4,921.50	4.24	176.26	4,910.09	-289.62	31.46	2,143,158.89	2,848,049.85	36.8888835	-107.4060284	
5,016.50	4.28	176.43	5,004.83	-296.66	31.91	2,143,151.85	2,848,050.33	36.8888641	-107.4060269	
5,114.50	4.65	173.50	5,102.53	-304.26	32.59	2,143,144.26	2,848,051.04	36.8888432	-107.4060246	
5,209.50	5.01	175.40	5,197.19	-312.22	33.36	2,143,136.30	2,848,051.85	36.8888214	-107.4060219	
5,304.50	4.65	172.07	5,291.86	-320.17	34.22	2,143,128.36	2,848,052.75	36.8887995	-107.4060190	
5,368.50	4.07	172.44	5,355.67	-324.99	34.88	2,143,123.54	2,848,053.43	36.8887863	-107.4060167	
5,463.50	3.87	174.59	5,450.44	-331.52	35.63	2,143,117.01	2,848,054.20	36.8887684	-107.4060142	
5,526.50	3.95	174.25	5,513.30	-335.80	36.04	2,143,112.74	2,848,054.64	36.8887566	-107.4060128	
5,590.50	3.83	175.41	5,577.15	-340.12	36.44	2,143,108.41	2,848,055.05	36.8887447	-107.4060114	
5,653.50	4.00	176.52	5,640.00	-344.41	36.74	2,143,104.12	2,848,055.37	36.8887329	-107.4060104	
5,717.50	3.98	175.08	5,703.85	-348.85	37.06	2,143,099.69	2,848,055.72	36.8887208	-107.4060093	

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,781.50	3.84	171.79	5,767.70	-353.19	37.56	2,143,095.35	2,848,056.23	36.8887088	-107.4060076	
5,844.50	3.39	170.23	5,830.57	-357.11	38.18	2,143,091.43	2,848,056.87	36.8886981	-107.4060055	
5,908.50	3.56	169.95	5,894.45	-360.93	38.85	2,143,087.61	2,848,057.55	36.8886876	-107.4060032	
5,971.50	3.72	167.90	5,957.33	-364.86	39.62	2,143,083.69	2,848,058.34	36.8886768	-107.4060005	
6,035.50	3.88	167.25	6,021.19	-369.00	40.53	2,143,079.56	2,848,059.27	36.8886654	-107.4059974	
6,098.50	4.02	167.15	6,084.04	-373.23	41.49	2,143,075.33	2,848,060.25	36.8886538	-107.4059941	
6,162.50	4.18	158.16	6,147.87	-377.58	42.86	2,143,070.98	2,848,061.64	36.8886418	-107.4059895	
6,225.50	4.32	165.49	6,210.70	-382.01	44.31	2,143,066.56	2,848,063.11	36.8886297	-107.4059845	
6,296.50	4.15	165.45	6,281.51	-387.09	45.62	2,143,061.49	2,848,064.44	36.8886157	-107.4059800	
6,391.50	10.07	110.43	6,375.82	-393.32	54.28	2,143,055.29	2,848,073.13	36.8885986	-107.4059504	
6,486.50	17.67	85.59	6,468.06	-395.12	76.49	2,143,053.60	2,848,095.35	36.8885937	-107.4058744	
6,582.50	26.12	90.25	6,557.06	-394.09	112.22	2,143,054.79	2,848,131.07	36.8885965	-107.4057523	
6,677.50	35.17	94.56	6,638.72	-396.36	160.51	2,143,052.73	2,848,179.37	36.8885903	-107.4055871	
6,772.50	42.64	93.57	6,712.59	-400.54	219.98	2,143,048.81	2,848,238.86	36.8885788	-107.4053838	
6,868.50	51.52	90.55	6,777.91	-402.93	290.16	2,143,046.74	2,848,309.05	36.8885722	-107.4051438	
6,963.50	59.97	91.66	6,831.33	-404.49	368.59	2,143,045.54	2,848,387.49	36.8885679	-107.4048756	
7,058.50	66.70	89.98	6,873.95	-405.66	453.42	2,143,044.74	2,848,472.33	36.8885647	-107.4045855	
7,153.50	73.70	90.70	6,906.11	-406.21	542.75	2,143,044.60	2,848,561.65	36.8885632	-107.4042801	
7,249.50	78.26	93.98	6,929.36	-410.03	635.77	2,143,041.18	2,848,654.69	36.8885527	-107.4039620	
7,344.50	86.24	96.04	6,942.17	-418.26	729.46	2,143,033.37	2,848,748.42	36.8885301	-107.4036416	
7,439.50	90.20	94.72	6,945.12	-427.16	823.98	2,143,024.90	2,848,842.97	36.8885056	-107.4033184	
7,534.50	89.33	94.96	6,945.51	-435.18	918.64	2,143,017.31	2,848,937.67	36.8884836	-107.4029947	
7,630.50	88.56	94.73	6,947.27	-443.29	1,014.28	2,143,009.63	2,849,033.34	36.8884613	-107.4026677	
7,725.50	90.03	94.63	6,948.44	-451.04	1,108.95	2,143,002.30	2,849,128.05	36.8884400	-107.4023439	
7,819.50	90.77	94.89	6,947.79	-458.84	1,202.62	2,142,994.92	2,849,221.75	36.8884186	-107.4020236	
7,914.50	90.40	94.70	6,946.82	-466.78	1,297.29	2,142,987.40	2,849,316.45	36.8883968	-107.4016999	
8,009.50	89.70	94.22	6,946.73	-474.16	1,392.00	2,142,980.44	2,849,411.19	36.8883765	-107.4013761	
8,104.50	91.01	94.14	6,946.14	-481.09	1,486.74	2,142,973.94	2,849,505.97	36.8883574	-107.4010521	
8,218.50	90.30	94.83	6,944.84	-490.00	1,600.38	2,142,965.54	2,849,619.65	36.8883329	-107.4006635	
8,313.50	91.11	93.62	6,943.67	-497.00	1,695.12	2,142,958.96	2,849,714.41	36.8883137	-107.4003396	
8,408.50	90.91	93.66	6,942.00	-503.03	1,789.91	2,142,953.36	2,849,809.23	36.8882971	-107.4000154	
8,504.50	90.54	93.46	6,940.78	-508.99	1,885.72	2,142,947.82	2,849,905.06	36.8882807	-107.3996878	
8,598.50	90.13	93.34	6,940.23	-514.57	1,979.55	2,142,942.67	2,849,998.92	36.8882654	-107.3993669	
8,693.50	88.59	95.09	6,941.29	-521.55	2,074.28	2,142,936.11	2,850,093.68	36.8882462	-107.3990430	
8,789.50	89.80	94.10	6,942.64	-529.24	2,169.96	2,142,928.85	2,850,189.39	36.8882251	-107.3987158	
8,883.50	89.40	93.45	6,943.30	-535.43	2,263.75	2,142,923.08	2,850,283.21	36.8882080	-107.3983951	
8,978.50	90.13	93.57	6,943.69	-541.24	2,358.57	2,142,917.69	2,850,378.06	36.8881920	-107.3980709	
9,072.50	89.53	93.98	6,943.97	-547.43	2,452.37	2,142,911.92	2,850,471.88	36.8881750	-107.3977502	
9,168.50	90.57	94.60	6,943.88	-554.61	2,548.10	2,142,905.17	2,850,567.64	36.8881553	-107.3974228	
9,263.50	89.97	93.92	6,943.44	-561.67	2,642.83	2,142,898.54	2,850,662.40	36.8881359	-107.3970989	
9,358.50	89.46	93.97	6,943.91	-568.20	2,737.60	2,142,892.42	2,850,757.21	36.8881179	-107.3967748	
9,453.50	88.69	93.64	6,945.44	-574.51	2,832.38	2,142,886.55	2,850,852.01	36.8881005	-107.3964507	
9,548.50	88.05	93.34	6,948.14	-580.29	2,927.17	2,142,881.19	2,850,946.82	36.8880846	-107.3961266	
9,643.50	89.09	92.73	6,950.52	-585.32	3,022.00	2,142,876.59	2,851,041.68	36.8880708	-107.3958023	
9,738.50	90.37	93.37	6,950.96	-590.37	3,116.86	2,142,871.96	2,851,136.56	36.8880569	-107.3954779	
9,833.50	91.91	94.74	6,949.07	-597.09	3,211.60	2,142,865.66	2,851,231.33	36.8880384	-107.3951540	
9,928.50	91.34	95.11	6,946.38	-605.24	3,306.21	2,142,857.93	2,851,325.97	36.8880160	-107.3948305	
10,023.50	90.67	94.91	6,944.71	-613.53	3,400.84	2,142,850.06	2,851,420.63	36.8879932	-107.3945069	
10,118.50	90.13	94.75	6,944.05	-621.53	3,495.50	2,142,842.49	2,851,515.33	36.8879712	-107.3941832	
10,213.50	89.40	94.46	6,944.44	-629.16	3,590.19	2,142,835.29	2,851,610.05	36.8879502	-107.3938594	
10,308.50	90.77	93.30	6,944.30	-635.59	3,684.97	2,142,829.28	2,851,704.86	36.8879325	-107.3935353	
10,403.50	89.77	93.02	6,943.85	-640.82	3,779.82	2,142,824.47	2,851,799.73	36.8879181	-107.3932110	
10,498.50	90.10	93.99	6,943.96	-646.63	3,874.64	2,142,819.09	2,851,894.58	36.8879021	-107.3928868	
10,593.50	89.46	93.18	6,944.32	-652.57	3,969.45	2,142,813.57	2,851,989.42	36.8878857	-107.3925626	
10,688.50	91.51	93.33	6,943.52	-657.97	4,064.29	2,142,808.60	2,852,084.28	36.8878709	-107.3922383	

SDT
Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,783.50	90.94	92.75	6,941.49	-663.00	4,159.13	2,142,803.99	2,852,179.14	36.8878570	-107.3919139
10,877.50	88.83	92.65	6,941.68	-667.43	4,253.02	2,142,799.98	2,852,273.05	36.8878448	-107.3915929
10,971.50	88.99	92.75	6,943.46	-671.86	4,346.90	2,142,795.97	2,852,366.95	36.8878326	-107.3912719
11,066.50	90.37	93.75	6,944.00	-677.24	4,441.74	2,142,791.01	2,852,461.81	36.8878178	-107.3909476
11,161.50	89.73	93.72	6,943.91	-683.43	4,536.54	2,142,785.25	2,852,556.64	36.8878007	-107.3906234
11,256.50	89.30	94.18	6,944.72	-689.98	4,631.31	2,142,779.13	2,852,651.44	36.8877827	-107.3902994
11,351.50	88.96	94.28	6,946.16	-696.98	4,726.04	2,142,772.55	2,852,746.20	36.8877634	-107.3899754
11,444.50	89.73	93.03	6,947.22	-702.91	4,818.85	2,142,767.04	2,852,839.02	36.8877471	-107.3896581
11,539.50	89.23	92.76	6,948.08	-707.71	4,913.72	2,142,762.66	2,852,933.92	36.8877339	-107.3893337
11,634.50	90.44	92.40	6,948.36	-711.98	5,008.62	2,142,758.81	2,853,028.84	36.8877221	-107.3890092
11,728.50	89.66	93.27	6,948.28	-716.63	5,102.50	2,142,754.58	2,853,122.74	36.8877093	-107.3886881
11,823.50	89.46	93.09	6,949.01	-721.90	5,197.36	2,142,749.74	2,853,217.61	36.8876948	-107.3883638
11,918.50	88.82	93.27	6,950.43	-727.17	5,292.20	2,142,744.89	2,853,312.48	36.8876802	-107.3880395
12,013.50	90.30	93.58	6,951.16	-732.85	5,387.02	2,142,739.64	2,853,407.33	36.8876646	-107.3877153
12,108.50	90.27	92.61	6,950.69	-737.98	5,481.88	2,142,734.94	2,853,502.21	36.8876505	-107.3873909
12,203.50	89.93	92.72	6,950.52	-742.39	5,576.78	2,142,730.94	2,853,597.13	36.8876383	-107.3870664
12,298.50	89.66	93.35	6,950.86	-747.42	5,671.64	2,142,726.34	2,853,692.01	36.8876244	-107.3867420
12,393.50	89.23	93.89	6,951.78	-753.42	5,766.45	2,142,720.77	2,853,786.84	36.8876079	-107.3864178
12,488.50	89.93	93.16	6,952.48	-759.26	5,861.27	2,142,715.35	2,853,881.68	36.8875918	-107.3860936
12,582.50	90.87	92.86	6,951.82	-764.20	5,955.13	2,142,710.83	2,853,975.57	36.8875782	-107.3857726
12,677.50	90.34	92.37	6,950.82	-768.53	6,050.03	2,142,706.92	2,854,070.49	36.8875662	-107.3854482
12,773.50	89.83	92.38	6,950.68	-772.51	6,145.95	2,142,703.38	2,854,166.42	36.8875552	-107.3851202
Final OH MWD Survey @ 12773.50' MD									
12,868.00	89.83	92.38	6,950.96	-776.43	6,240.36	2,142,699.87	2,854,260.85	36.8875444	-107.3847973
OH BHL @ 12868' MD									

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 649H OH BHL	0.00	0.00	6,950.96	-776.43	6,240.36	2,142,699.87	2,854,260.85	36.8875444	-107.3847973
- actual wellpath hits target center									
- Point									

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
12,773.50	6,950.68	-772.51	6,145.95	Final OH MWD Survey @ 12773.50' MD	
12,868.00	6,950.96	-776.43	6,240.36	OH BHL @ 12868' MD	

Checked By: _____	Approved By: _____	Date: _____
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Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 649H

ST01

Design: ST01

Standard Survey Report

17 October, 2023

SDT
Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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 649H					
Well Position	+N/-S	0.00 ft	Northing:	2,143,448.37 usft	Latitude:	36.8896790
	+E/-W	0.00 ft	Easting:	2,848,017.09 usft	Longitude:	-107.4061360
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft
Grid Convergence:		0.26 °				

Wellbore	ST01				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	HRGM	9/15/2023	8.50	63.28	49,441.24817656

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	93.20	

Survey Program	Date	10/17/2023			
From	To	Survey (Wellbore)	Tool Name	Description	
(ft)	(ft)				
74.20	1,001.80	Survey #1 - Gyro (OH)	A020Ga_GYRO-NS	OWSG Gyrocompass Gyro	
1,082.50	1,400.50	Survey #2 - Corrected Run 2 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
1,495.50	6,225.50	Survey #3 - Corrected Run 3 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
6,337.00	6,621.00	Survey #1 - ST01/Gyro (ST01)	A020Ga_GYRO-NS	OWSG Gyrocompass Gyro	
6,698.00	6,887.00	Survey #2 - ST01/Corrected Run 2 (ST01)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
7,006.00	20,569.00	Survey #3 - ST01/Corrected Run 3 (ST01)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
20,638.00	20,638.00	Survey #4 - ST01/Projection (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)	(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	
74.20	0.26	333.90	74.20	0.15	-0.07	-0.08	0.35	0.35	0.00	
165.36	0.38	329.11	165.36	0.60	-0.32	-0.35	0.13	0.13	-5.25	
256.40	0.32	328.79	256.40	1.07	-0.61	-0.67	0.07	-0.07	-0.35	
347.59	0.35	27.94	347.59	1.54	-0.61	-0.69	0.36	0.03	64.86	

SDT Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)
440.15	0.40	100.75	440.14	1.73	-0.16	-0.25	0.48	0.05	78.66
534.77	1.18	158.75	534.76	0.76	0.52	0.48	1.08	0.82	61.30
629.29	2.63	166.70	629.22	-2.26	1.37	1.49	1.56	1.53	8.41
723.92	3.85	172.54	723.70	-7.52	2.28	2.70	1.33	1.29	6.17
818.59	4.68	170.06	818.11	-14.48	3.36	4.17	0.90	0.88	-2.62
912.85	5.33	167.20	912.01	-22.54	5.00	6.25	0.74	0.69	-3.03
1,001.80	6.13	165.28	1,000.51	-31.16	7.12	8.85	0.92	0.90	-2.16
1,082.50	6.42	165.87	1,080.73	-39.70	9.31	11.52	0.37	0.36	0.73
1,177.50	6.11	177.33	1,175.16	-49.90	10.85	13.62	1.35	-0.33	12.06
1,305.50	5.25	179.24	1,302.53	-62.56	11.24	14.72	0.69	-0.67	1.49
1,400.50	5.71	181.19	1,397.10	-71.63	11.20	15.18	0.52	0.48	2.05
1,495.50	4.64	179.55	1,491.71	-80.20	11.13	15.59	1.14	-1.13	-1.73
1,591.50	3.14	170.72	1,587.49	-86.68	11.59	16.41	1.68	-1.56	-9.20
1,686.50	3.21	165.89	1,682.34	-91.83	12.66	17.76	0.29	0.07	-5.08
1,781.50	4.23	160.16	1,777.14	-97.70	14.49	19.92	1.14	1.07	-6.03
1,877.50	3.94	173.07	1,872.90	-104.31	16.09	21.89	1.00	-0.30	13.45
1,971.50	3.29	189.53	1,966.71	-110.17	16.04	22.16	1.30	-0.69	17.51
2,066.50	3.08	195.75	2,061.57	-115.32	14.89	21.31	0.43	-0.22	6.55
2,161.50	3.51	198.47	2,156.41	-120.53	13.28	19.99	0.48	0.45	2.86
2,257.50	4.55	200.21	2,252.17	-126.89	11.03	18.10	1.09	1.08	1.81
2,352.50	4.84	202.09	2,346.85	-134.14	8.22	15.70	0.35	0.31	1.98
2,447.50	4.51	198.79	2,441.54	-141.39	5.51	13.40	0.45	-0.35	-3.47
2,542.50	3.88	190.41	2,536.28	-148.09	3.73	11.99	0.92	-0.66	-8.82
2,637.50	3.21	167.84	2,631.10	-153.85	3.71	12.29	1.62	-0.71	-23.76
2,733.50	2.49	149.26	2,726.99	-158.27	5.34	14.17	1.21	-0.75	-19.35
2,828.50	2.66	129.79	2,821.89	-161.46	8.09	17.09	0.93	0.18	-20.49
2,923.50	2.92	127.14	2,916.78	-164.33	11.71	20.87	0.31	0.27	-2.79
3,018.50	3.42	137.77	3,011.64	-167.89	15.54	24.89	0.81	0.53	11.19
3,114.50	3.93	143.60	3,107.44	-172.66	19.42	29.03	0.66	0.53	6.07
3,209.50	4.37	137.46	3,202.19	-177.94	23.80	33.70	0.66	0.46	-6.46
3,304.50	4.99	149.61	3,296.87	-184.17	28.34	38.57	1.23	0.65	12.79
3,400.50	5.34	162.96	3,392.49	-192.05	31.76	42.43	1.30	0.36	13.91
3,495.50	6.12	165.01	3,487.01	-201.17	34.36	45.54	0.85	0.82	2.16
3,590.50	4.91	174.78	3,581.57	-210.11	36.04	47.72	1.61	-1.27	10.28
3,685.50	3.93	191.15	3,676.29	-217.35	35.78	47.86	1.67	-1.03	17.23
3,780.50	4.10	196.79	3,771.06	-223.79	34.17	46.61	0.45	0.18	5.94
3,876.50	3.06	193.45	3,866.87	-229.57	32.59	45.35	1.10	-1.08	-3.48
3,971.50	2.66	185.04	3,961.75	-234.23	31.80	44.83	0.61	-0.42	-8.85
4,066.50	2.57	179.51	4,056.66	-238.56	31.63	44.89	0.28	-0.09	-5.82
4,161.50	2.56	170.83	4,151.56	-242.78	31.98	45.49	0.41	-0.01	-9.14
4,256.50	2.92	180.95	4,246.45	-247.30	32.28	46.04	0.63	0.38	10.65
4,352.50	3.27	183.78	4,342.31	-252.48	32.06	46.10	0.40	0.36	2.95
4,447.50	3.46	178.99	4,437.15	-258.05	31.93	46.29	0.36	0.20	-5.04

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)
4,541.50	3.63	183.58	4,530.97	-263.85	31.80	46.48	0.35	0.18	4.88
4,637.50	3.78	184.40	4,626.77	-270.04	31.36	46.39	0.17	0.16	0.85
4,732.50	3.75	180.15	4,721.56	-276.27	31.12	46.49	0.30	-0.03	-4.47
4,826.50	4.11	178.92	4,815.34	-282.71	31.17	46.90	0.39	0.38	-1.31
4,921.50	4.24	176.26	4,910.09	-289.62	31.46	47.58	0.25	0.14	-2.80
5,016.50	4.28	176.43	5,004.83	-296.66	31.91	48.42	0.04	0.04	0.18
5,114.50	4.65	173.50	5,102.53	-304.26	32.59	49.53	0.44	0.38	-2.99
5,209.50	5.01	175.40	5,197.19	-312.22	33.36	50.74	0.41	0.38	2.00
5,304.50	4.65	172.07	5,291.86	-320.17	34.22	52.04	0.48	-0.38	-3.51
5,368.50	4.07	172.44	5,355.67	-324.99	34.88	52.97	0.91	-0.91	0.58
5,463.50	3.87	174.59	5,450.44	-331.52	35.63	54.08	0.26	-0.21	2.26
5,526.50	3.95	174.25	5,513.30	-335.80	36.04	54.73	0.13	0.13	-0.54
5,590.50	3.83	175.41	5,577.15	-340.12	36.44	55.37	0.22	-0.19	1.81
5,653.50	4.00	176.52	5,640.00	-344.41	36.74	55.91	0.30	0.27	1.76
5,717.50	3.98	175.08	5,703.85	-348.85	37.06	56.48	0.16	-0.03	-2.25
5,781.50	3.84	171.79	5,767.70	-353.19	37.56	57.22	0.41	-0.22	-5.14
5,844.50	3.39	170.23	5,830.57	-357.11	38.18	58.05	0.73	-0.71	-2.48
5,908.50	3.56	169.95	5,894.45	-360.93	38.85	58.93	0.27	0.27	-0.44
5,971.50	3.72	167.90	5,957.33	-364.86	39.62	59.92	0.33	0.25	-3.25
6,035.50	3.88	167.25	6,021.19	-369.00	40.53	61.06	0.26	0.25	-1.02
6,098.50	4.02	167.15	6,084.04	-373.23	41.49	62.26	0.22	0.22	-0.16
6,162.50	4.18	158.16	6,147.87	-377.58	42.86	63.87	1.03	0.25	-14.05
6,225.50	4.32	165.49	6,210.70	-382.01	44.31	65.56	0.89	0.22	11.63
6,337.00	11.35	170.24	6,321.09	-396.91	47.22	69.30	6.33	6.30	4.26
6,432.00	13.20	165.94	6,413.92	-416.64	51.44	74.62	2.17	1.95	-4.53
6,527.00	12.23	166.20	6,506.59	-436.94	56.48	80.78	1.02	-1.02	0.27
6,621.00	14.96	124.98	6,598.15	-453.60	68.82	94.04	10.46	2.90	-43.85
6,698.00	19.23	102.81	6,671.81	-462.13	89.36	115.02	10.02	5.55	-28.79
6,792.00	24.70	87.38	6,759.03	-464.66	124.13	149.88	8.41	5.82	-16.41
6,887.00	30.23	80.11	6,843.31	-459.64	167.57	192.96	6.80	5.82	-7.65
7,006.00	39.16	71.87	6,941.11	-442.76	232.95	257.31	8.46	7.50	-6.92
7,101.00	42.71	72.62	7,012.86	-423.80	292.23	315.43	3.77	3.74	0.79
7,195.00	55.65	74.26	7,074.18	-403.66	360.29	382.26	13.83	13.77	1.74
7,290.00	64.52	73.74	7,121.51	-380.97	439.36	459.94	9.35	9.34	-0.55
7,384.00	68.98	72.31	7,158.61	-355.75	521.93	540.98	4.95	4.74	-1.52
7,479.00	78.41	70.31	7,185.25	-326.53	608.19	625.47	10.13	9.93	-2.11
7,574.00	82.66	70.35	7,200.87	-294.99	696.41	711.79	4.47	4.47	0.04
7,600.00	84.30	70.66	7,203.82	-286.37	720.76	735.62	6.42	6.31	1.19
RU 649H Actual POE @ 7600' MD									
7,668.00	88.59	71.46	7,208.04	-264.35	784.94	798.47	6.42	6.31	1.18
7,762.00	89.13	72.78	7,209.91	-235.50	874.38	886.16	1.52	0.57	1.40
7,857.00	90.20	73.81	7,210.47	-208.19	965.37	975.48	1.56	1.13	1.08
7,952.00	90.27	76.07	7,210.08	-183.51	1,057.10	1,065.69	2.38	0.07	2.38

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)
8,046.00	90.10	77.80	7,209.77	-162.26	1,148.66	1,155.93	1.85	-0.18	1.84
8,141.00	91.44	79.05	7,208.50	-143.20	1,241.71	1,247.77	1.93	1.41	1.32
8,235.00	90.84	81.39	7,206.63	-127.24	1,334.32	1,339.35	2.57	-0.64	2.49
8,330.00	89.23	83.23	7,206.57	-114.53	1,428.46	1,432.63	2.57	-1.69	1.94
8,424.00	89.06	84.98	7,207.97	-104.87	1,521.95	1,525.43	1.87	-0.18	1.86
8,519.00	89.97	87.43	7,208.77	-98.59	1,616.73	1,619.71	2.75	0.96	2.58
8,613.00	90.67	89.57	7,208.25	-96.13	1,710.69	1,713.39	2.40	0.74	2.28
8,708.00	89.97	92.27	7,207.72	-97.65	1,805.67	1,808.30	2.94	-0.74	2.84
8,802.00	90.37	95.07	7,207.44	-103.67	1,899.46	1,902.29	3.01	0.43	2.98
8,897.00	89.97	94.87	7,207.16	-111.90	1,994.11	1,997.24	0.47	-0.42	-0.21
8,991.00	89.56	94.83	7,207.54	-119.85	2,087.77	2,091.20	0.44	-0.44	-0.04
9,086.00	89.16	94.69	7,208.60	-127.73	2,182.44	2,186.16	0.45	-0.42	-0.15
9,180.00	88.62	94.26	7,210.43	-135.06	2,276.13	2,280.12	0.73	-0.57	-0.46
9,275.00	89.80	92.72	7,211.74	-140.84	2,370.94	2,375.11	2.04	1.24	-1.62
9,369.00	89.29	92.90	7,212.48	-145.45	2,464.82	2,469.10	0.58	-0.54	0.19
9,464.00	88.45	92.69	7,214.36	-150.08	2,559.69	2,564.08	0.91	-0.88	-0.22
9,558.00	90.67	92.82	7,215.08	-154.60	2,653.58	2,658.07	2.37	2.36	0.14
9,653.00	90.37	93.17	7,214.21	-159.57	2,748.44	2,753.06	0.49	-0.32	0.37
9,747.00	89.63	92.66	7,214.21	-164.35	2,842.32	2,847.06	0.96	-0.79	-0.54
9,842.00	89.09	92.35	7,215.28	-168.50	2,937.22	2,942.05	0.66	-0.57	-0.33
9,947.00	90.30	93.04	7,215.83	-173.43	3,042.10	3,047.04	1.33	1.15	0.66
10,041.00	89.66	93.55	7,215.87	-178.84	3,135.95	3,141.04	0.87	-0.68	0.54
10,135.00	89.16	93.70	7,216.84	-184.78	3,229.75	3,235.03	0.56	-0.53	0.16
10,230.00	90.50	92.45	7,217.12	-189.88	3,324.61	3,330.03	1.93	1.41	-1.32
10,324.00	90.00	92.57	7,216.71	-193.99	3,418.52	3,424.02	0.55	-0.53	0.13
10,418.00	89.73	92.15	7,216.93	-197.86	3,512.44	3,518.01	0.53	-0.29	-0.45
10,513.00	89.43	92.11	7,217.63	-201.39	3,607.37	3,612.99	0.32	-0.32	-0.04
10,607.00	88.99	92.16	7,218.92	-204.90	3,701.30	3,706.96	0.47	-0.47	0.05
10,702.00	90.47	92.88	7,219.37	-209.07	3,796.20	3,801.95	1.73	1.56	0.76
10,796.00	90.00	92.88	7,218.98	-213.79	3,890.08	3,895.95	0.50	-0.50	0.00
10,891.00	89.53	92.35	7,219.37	-218.13	3,984.98	3,990.94	0.75	-0.49	-0.56
10,985.00	89.36	93.58	7,220.28	-222.99	4,078.85	4,084.94	1.32	-0.18	1.31
11,080.00	90.57	94.26	7,220.34	-229.49	4,173.62	4,179.93	1.46	1.27	0.72
11,174.00	90.37	94.19	7,219.57	-236.41	4,267.36	4,273.91	0.23	-0.21	-0.07
11,269.00	90.27	94.00	7,219.04	-243.19	4,362.12	4,368.89	0.23	-0.11	-0.20
11,363.00	89.80	93.85	7,218.98	-249.63	4,455.90	4,462.89	0.52	-0.50	-0.16
11,458.00	91.04	94.05	7,218.29	-256.17	4,550.67	4,557.87	1.32	1.31	0.21
11,552.00	90.91	93.91	7,216.69	-262.70	4,644.43	4,651.85	0.20	-0.14	-0.15
11,647.00	90.71	93.55	7,215.34	-268.88	4,739.22	4,746.84	0.43	-0.21	-0.38
11,742.00	90.13	93.49	7,214.65	-274.71	4,834.04	4,841.83	0.61	-0.61	-0.06
11,836.00	89.63	93.60	7,214.84	-280.52	4,927.86	4,935.83	0.54	-0.53	0.12
11,931.00	88.96	93.65	7,216.01	-286.53	5,022.66	5,030.82	0.71	-0.71	0.05
12,025.00	90.00	93.23	7,216.87	-292.17	5,116.48	5,124.81	1.19	1.11	-0.45
12,120.00	89.77	93.33	7,217.06	-297.60	5,211.33	5,219.81	0.26	-0.24	0.11

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)	
12,214.00	90.74	93.22	7,216.64	-302.97	5,305.17	5,313.81	1.04	1.03	-0.12	
12,309.00	90.30	93.17	7,215.78	-308.27	5,400.02	5,408.81	0.47	-0.46	-0.05	
12,404.00	90.17	93.24	7,215.39	-313.58	5,494.87	5,503.81	0.16	-0.14	0.07	
12,499.00	90.00	93.70	7,215.25	-319.33	5,589.70	5,598.81	0.52	-0.18	0.48	
12,593.00	89.26	93.43	7,215.85	-325.17	5,683.51	5,692.80	0.84	-0.79	-0.29	
12,687.00	90.54	93.42	7,216.02	-330.79	5,777.34	5,786.80	1.36	1.36	-0.01	
12,782.00	90.40	93.23	7,215.24	-336.30	5,872.18	5,881.79	0.25	-0.15	-0.20	
12,876.00	90.03	92.99	7,214.88	-341.40	5,966.04	5,975.79	0.47	-0.39	-0.26	
12,970.00	89.70	93.21	7,215.11	-346.48	6,059.90	6,069.79	0.42	-0.35	0.23	
13,065.00	89.26	93.09	7,215.97	-351.70	6,154.75	6,164.79	0.48	-0.46	-0.13	
13,159.00	90.74	93.06	7,215.97	-356.74	6,248.62	6,258.79	1.57	1.57	-0.03	
13,254.00	90.47	92.75	7,214.97	-361.56	6,343.49	6,353.78	0.43	-0.28	-0.33	
13,348.00	90.20	92.90	7,214.42	-366.19	6,437.37	6,447.78	0.33	-0.29	0.16	
13,443.00	89.93	93.15	7,214.31	-371.20	6,532.24	6,542.78	0.39	-0.28	0.26	
13,537.00	89.66	93.00	7,214.64	-376.25	6,626.10	6,636.77	0.33	-0.29	-0.16	
13,631.00	91.14	94.02	7,213.99	-382.00	6,719.92	6,730.77	1.91	1.57	1.09	
13,725.00	91.01	93.80	7,212.22	-388.41	6,813.69	6,824.74	0.27	-0.14	-0.23	
13,820.00	90.77	93.43	7,210.75	-394.40	6,908.48	6,919.73	0.46	-0.25	-0.39	
13,914.00	90.57	92.89	7,209.65	-399.58	7,002.33	7,013.72	0.61	-0.21	-0.57	
14,009.00	89.93	92.15	7,209.24	-403.76	7,097.24	7,108.71	1.03	-0.67	-0.78	
14,104.00	89.76	92.19	7,209.49	-407.35	7,192.17	7,203.70	0.18	-0.18	0.04	
14,198.00	89.80	91.92	7,209.85	-410.72	7,286.11	7,297.68	0.29	0.04	-0.29	
14,293.00	89.73	91.69	7,210.24	-413.72	7,381.06	7,392.65	0.25	-0.07	-0.24	
14,387.00	90.94	92.58	7,209.69	-417.22	7,474.99	7,486.63	1.60	1.29	0.95	
14,482.00	90.57	92.64	7,208.44	-421.54	7,569.89	7,581.61	0.39	-0.39	0.06	
14,577.00	90.30	93.08	7,207.72	-426.28	7,664.77	7,676.61	0.54	-0.28	0.46	
14,671.00	90.03	92.69	7,207.45	-431.02	7,758.65	7,770.61	0.50	-0.29	-0.41	
14,765.00	89.80	92.37	7,207.59	-435.16	7,852.55	7,864.60	0.42	-0.24	-0.34	
14,860.00	89.53	91.96	7,208.14	-438.75	7,947.48	7,959.58	0.52	-0.28	-0.43	
14,954.00	89.66	93.97	7,208.81	-443.62	8,041.35	8,053.58	2.14	0.14	2.14	
15,049.00	89.56	94.11	7,209.46	-450.31	8,136.11	8,148.56	0.18	-0.11	0.15	
15,143.00	90.77	93.98	7,209.18	-456.94	8,229.88	8,242.55	1.29	1.29	-0.14	
15,238.00	90.70	94.14	7,207.97	-463.66	8,324.63	8,337.53	0.18	-0.07	0.17	
15,332.00	90.27	93.59	7,207.17	-470.00	8,418.41	8,431.52	0.74	-0.46	-0.59	
15,427.00	90.10	93.24	7,206.86	-475.66	8,513.24	8,526.52	0.41	-0.18	-0.37	
15,521.00	90.13	93.81	7,206.68	-481.44	8,607.06	8,620.52	0.61	0.03	0.61	
15,616.00	90.07	93.58	7,206.51	-487.56	8,701.87	8,715.51	0.25	-0.06	-0.24	
15,710.00	89.80	93.63	7,206.62	-493.47	8,795.68	8,809.51	0.29	-0.29	0.05	
15,805.00	89.33	93.64	7,207.34	-499.49	8,890.49	8,904.51	0.49	-0.49	0.01	
15,899.00	89.30	93.91	7,208.46	-505.68	8,984.28	8,998.50	0.29	-0.03	0.29	
15,994.00	91.14	93.44	7,208.10	-511.77	9,079.08	9,093.49	2.00	1.94	-0.49	
16,088.00	91.21	93.72	7,206.17	-517.64	9,172.87	9,187.46	0.31	0.07	0.30	
16,183.00	90.77	93.79	7,204.53	-523.86	9,267.65	9,282.45	0.47	-0.46	0.07	

SDT

Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)
16,277.00	90.60	93.72	7,203.40	-530.02	9,361.45	9,376.43	0.20	-0.18	-0.07
16,372.00	90.40	93.55	7,202.57	-536.04	9,456.25	9,471.43	0.28	-0.21	-0.18
16,467.00	90.13	93.40	7,202.14	-541.80	9,551.07	9,566.43	0.33	-0.28	-0.16
16,561.00	90.34	93.18	7,201.75	-547.19	9,644.92	9,660.43	0.32	0.22	-0.23
16,656.00	90.30	93.93	7,201.22	-553.08	9,739.73	9,755.42	0.79	-0.04	0.79
16,750.00	90.30	93.67	7,200.73	-559.31	9,833.53	9,849.41	0.28	0.00	-0.28
16,845.00	90.23	94.01	7,200.29	-565.67	9,928.31	9,944.41	0.37	-0.07	0.36
16,939.00	89.80	93.77	7,200.26	-572.05	10,022.09	10,038.40	0.52	-0.46	-0.26
17,034.00	89.33	93.67	7,200.98	-578.21	10,116.89	10,133.39	0.51	-0.49	-0.11
17,129.00	91.28	92.92	7,200.48	-583.67	10,211.73	10,228.39	2.20	2.05	-0.79
17,223.00	91.21	92.61	7,198.44	-588.21	10,305.60	10,322.36	0.34	-0.07	-0.33
17,318.00	90.77	92.70	7,196.79	-592.61	10,400.48	10,417.34	0.47	-0.46	0.09
17,412.00	90.94	92.47	7,195.39	-596.85	10,494.37	10,511.33	0.30	0.18	-0.24
17,507.00	90.81	92.18	7,193.94	-600.70	10,589.28	10,606.30	0.33	-0.14	-0.31
17,601.00	90.44	92.21	7,192.92	-604.30	10,683.21	10,700.28	0.39	-0.39	0.03
17,696.00	90.27	92.16	7,192.33	-607.92	10,778.14	10,795.27	0.19	-0.18	-0.05
17,791.00	90.00	92.20	7,192.10	-611.54	10,873.07	10,890.25	0.29	-0.28	0.04
17,885.00	89.66	92.15	7,192.38	-615.10	10,967.00	10,984.24	0.37	-0.36	-0.05
17,980.00	90.61	92.00	7,192.16	-618.54	11,061.94	11,079.22	1.01	1.00	-0.16
18,075.00	90.37	92.28	7,191.35	-622.09	11,156.87	11,174.20	0.39	-0.25	0.29
18,169.00	90.17	92.62	7,190.90	-626.11	11,250.78	11,268.19	0.42	-0.21	0.36
18,264.00	90.10	92.56	7,190.68	-630.40	11,345.68	11,363.18	0.10	-0.07	-0.06
18,358.00	89.93	92.76	7,190.65	-634.76	11,439.58	11,457.18	0.28	-0.18	0.21
18,453.00	90.00	93.07	7,190.71	-639.59	11,534.46	11,552.18	0.33	0.07	0.33
18,548.00	90.07	93.72	7,190.65	-645.22	11,629.29	11,647.18	0.69	0.07	0.68
18,642.00	89.93	93.97	7,190.65	-651.52	11,723.08	11,741.17	0.30	-0.15	0.27
18,737.00	90.03	94.56	7,190.69	-658.59	11,817.82	11,836.15	0.63	0.11	0.62
18,831.00	89.87	94.35	7,190.77	-665.89	11,911.53	11,930.13	0.28	-0.17	-0.22
18,926.00	89.76	94.29	7,191.08	-673.05	12,006.26	12,025.11	0.13	-0.12	-0.06
19,020.00	89.83	94.22	7,191.41	-680.02	12,100.00	12,119.09	0.11	0.07	-0.07
19,115.00	89.73	93.93	7,191.78	-686.77	12,194.76	12,214.08	0.32	-0.11	-0.31
19,210.00	89.73	94.11	7,192.23	-693.43	12,289.53	12,309.07	0.19	0.00	0.19
19,304.00	90.24	93.72	7,192.25	-699.85	12,383.31	12,403.06	0.68	0.54	-0.41
19,399.00	90.34	93.58	7,191.77	-705.90	12,478.11	12,498.06	0.18	0.11	-0.15
19,494.00	89.87	93.64	7,191.59	-711.88	12,572.92	12,593.06	0.50	-0.49	0.06
19,588.00	91.92	92.74	7,190.13	-717.11	12,666.76	12,687.04	2.38	2.18	-0.96
19,683.00	92.49	92.85	7,186.47	-721.74	12,761.58	12,781.97	0.61	0.60	0.12
19,777.00	91.51	92.98	7,183.19	-726.52	12,855.40	12,875.91	1.05	-1.04	0.14
19,872.00	90.40	92.11	7,181.61	-730.73	12,950.29	12,970.89	1.48	-1.17	-0.92
19,966.00	89.97	91.98	7,181.30	-734.09	13,044.23	13,064.87	0.48	-0.46	-0.14
20,061.00	89.73	91.84	7,181.55	-737.25	13,139.17	13,159.84	0.29	-0.25	-0.15
20,155.00	89.50	92.10	7,182.18	-740.48	13,233.12	13,253.82	0.37	-0.24	0.28
20,249.00	89.39	92.18	7,183.09	-743.99	13,327.05	13,347.80	0.14	-0.12	0.09

SDT
Survey Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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)
20,344.00	89.46	92.30	7,184.05	-747.71	13,421.97	13,442.78	0.15	0.07	0.13
20,439.00	89.03	92.14	7,185.30	-751.39	13,516.89	13,537.76	0.48	-0.45	-0.17
RU 649H Actual FPP @ 20439' MD									
20,533.00	89.36	92.77	7,186.62	-755.41	13,610.79	13,631.74	0.76	0.35	0.67
20,569.00	89.43	92.55	7,187.00	-757.08	13,646.75	13,667.73	0.64	0.19	-0.61
Final ST01 MWD Survey @ 20569' MD									
20,638.00	89.43	92.55	7,187.69	-760.15	13,715.68	13,736.73	0.00	0.00	0.00
BHL ST01 @ 20638' 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 649H SHL - actual wellpath hits target center - Point	0.00	0.00	0.00	0.00	0.00	2,143,448.37	2,848,017.09	36.8896790	-107.4061360
RU 649H OH BHL - actual wellpath misses target center by 496.13ft at 13174.83ft MD (7215.77 TVD, -357.58 N, 6264.42 E) - Point	0.00	0.00	6,950.96	-776.43	6,240.36	2,142,699.87	2,854,260.85	36.8875444	-107.3847973
RU 649H Actual FPP - actual wellpath hits target center - Point	0.00	0.00	7,185.30	-751.39	13,516.89	2,142,757.49	2,861,537.18	36.8876061	-107.3599155
RU 649H ST01 BHL - actual wellpath hits target center - Point	0.00	0.00	7,187.69	-760.15	13,715.68	2,142,749.61	2,861,736.01	36.8875818	-107.3592358
RU 649H PBHL ST - actual wellpath misses target center by 23.84ft at 20569.00ft MD (7187.00 TVD, -757.08 N, 13646.75 E) - Point	0.00	0.00	7,198.93	-765.34	13,665.67	2,142,744.21	2,861,686.03	36.8875676	-107.3594068
RU 649H Actual POE - actual wellpath hits target center - Point	0.00	0.00	7,203.82	-286.37	720.76	2,143,165.22	2,848,739.12	36.8888923	-107.4036714

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,600.00	7,203.82	-286.37	720.76	RU 649H Actual POE @ 7600' MD
20,439.00	7,185.30	-751.39	13,516.89	RU 649H Actual FPP @ 20439' MD
20,569.00	7,187.00	-757.08	13,646.75	Final ST01 MWD Survey @ 20569' MD
20,638.00	7,187.69	-760.15	13,715.68	BHL ST01 @ 20638' MD

Checked By: _____

Approved By: _____

Date: _____

Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 27

Rosa Unit 649H

ST01

Design: ST01

Survey Report - Geographic

17 October, 2023

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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 649H					
Well Position	+N/-S	0.00 ft	Northing:	2,143,448.37 usft	Latitude:	36.8896790
	+E/-W	0.00 ft	Easting:	2,848,017.09 usft	Longitude:	-107.4061360
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	6,305.00 ft

Wellbore	ST01				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HRGM	9/15/2023	8.50	63.28	49,441.24817656

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	93.20	

Survey Program	Date	10/17/2023			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
74.20	1,001.80	Survey #1 - Gyro (OH)	A020Ga_GYRO-NS	OWSG Gyrocompass Gyro	
1,082.50	1,400.50	Survey #2 - Corrected Run 2 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
1,495.50	6,225.50	Survey #3 - Corrected Run 3 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
6,337.00	6,621.00	Survey #1 - ST01/Gyro (ST01)	A020Ga_GYRO-NS	OWSG Gyrocompass Gyro	
6,698.00	6,887.00	Survey #2 - ST01/Corrected Run 2 (ST01)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
7,006.00	20,569.00	Survey #3 - ST01/Corrected Run 3 (ST01)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	
20,638.00	20,638.00	Survey #4 - ST01/Projection (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	2,143,448.37	2,848,017.09	36.8896790	-107.4061360	
74.20	0.26	333.90	74.20	0.15	-0.07	2,143,448.52	2,848,017.02	36.8896794	-107.4061363	
165.36	0.38	329.11	165.36	0.60	-0.32	2,143,448.96	2,848,016.77	36.8896806	-107.4061371	
256.40	0.32	328.79	256.40	1.07	-0.61	2,143,449.44	2,848,016.48	36.8896819	-107.4061381	
347.59	0.35	27.94	347.59	1.54	-0.61	2,143,449.90	2,848,016.48	36.8896832	-107.4061381	
440.15	0.40	100.75	440.14	1.73	-0.16	2,143,450.09	2,848,016.92	36.8896837	-107.4061365	

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Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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	
534.77	1.18	158.75	534.76	0.76	0.52	2,143,449.13	2,848,017.61	36.8896810	-107.4061342	
629.29	2.63	166.70	629.22	-2.26	1.37	2,143,446.11	2,848,018.47	36.8896727	-107.4061313	
723.92	3.85	172.54	723.70	-7.52	2.28	2,143,440.85	2,848,019.41	36.8896583	-107.4061282	
818.59	4.68	170.06	818.11	-14.48	3.36	2,143,433.90	2,848,020.52	36.8896392	-107.4061245	
912.85	5.33	167.20	912.01	-22.54	5.00	2,143,425.85	2,848,022.19	36.8896171	-107.4061189	
1,001.80	6.13	165.28	1,000.51	-31.16	7.12	2,143,417.24	2,848,024.35	36.8895934	-107.4061117	
1,082.50	6.42	165.87	1,080.73	-39.70	9.31	2,143,408.71	2,848,026.58	36.8895699	-107.4061042	
1,177.50	6.11	177.33	1,175.16	-49.90	10.85	2,143,398.51	2,848,028.16	36.8895419	-107.4060989	
1,305.50	5.25	179.24	1,302.53	-62.56	11.24	2,143,385.86	2,848,028.61	36.8895071	-107.4060976	
1,400.50	5.71	181.19	1,397.10	-71.63	11.20	2,143,376.78	2,848,028.61	36.8894822	-107.4060977	
1,495.50	4.64	179.55	1,491.71	-80.20	11.13	2,143,368.22	2,848,028.58	36.8894587	-107.4060979	
1,591.50	3.14	170.72	1,587.49	-86.68	11.59	2,143,361.74	2,848,029.07	36.8894409	-107.4060964	
1,686.50	3.21	165.89	1,682.34	-91.83	12.66	2,143,356.60	2,848,030.16	36.8894267	-107.4060927	
1,781.50	4.23	160.16	1,777.14	-97.70	14.49	2,143,350.73	2,848,032.02	36.8894106	-107.4060864	
1,877.50	3.94	173.07	1,872.90	-104.31	16.09	2,143,344.13	2,848,033.65	36.8893925	-107.4060810	
1,971.50	3.29	189.53	1,966.71	-110.17	16.04	2,143,338.27	2,848,033.62	36.8893763	-107.4060812	
2,066.50	3.08	195.75	2,061.57	-115.32	14.89	2,143,333.12	2,848,032.50	36.8893622	-107.4060851	
2,161.50	3.51	198.47	2,156.41	-120.53	13.28	2,143,327.90	2,848,030.91	36.8893479	-107.4060906	
2,257.50	4.55	200.21	2,252.17	-126.89	11.03	2,143,321.53	2,848,028.69	36.8893304	-107.4060983	
2,352.50	4.84	202.09	2,346.85	-134.14	8.22	2,143,314.26	2,848,025.91	36.8893105	-107.4061079	
2,447.50	4.51	198.79	2,441.54	-141.39	5.51	2,143,307.00	2,848,023.24	36.8892906	-107.4061172	
2,542.50	3.88	190.41	2,536.28	-148.09	3.73	2,143,300.30	2,848,021.48	36.8892722	-107.4061233	
2,637.50	3.21	167.84	2,631.10	-153.85	3.71	2,143,294.53	2,848,021.49	36.8892564	-107.4061233	
2,733.50	2.49	149.26	2,726.99	-158.27	5.34	2,143,290.12	2,848,023.14	36.8892442	-107.4061177	
2,828.50	2.66	129.79	2,821.89	-161.46	8.09	2,143,286.95	2,848,025.90	36.8892355	-107.4061083	
2,923.50	2.92	127.14	2,916.78	-164.33	11.71	2,143,284.09	2,848,029.54	36.8892276	-107.4060960	
3,018.50	3.42	137.77	3,011.64	-167.89	15.54	2,143,280.55	2,848,033.39	36.8892178	-107.4060829	
3,114.50	3.93	143.60	3,107.44	-172.66	19.42	2,143,275.80	2,848,037.28	36.8892047	-107.4060696	
3,209.50	4.37	137.46	3,202.19	-177.94	23.80	2,143,270.53	2,848,041.69	36.8891902	-107.4060546	
3,304.50	4.99	149.61	3,296.87	-184.17	28.34	2,143,264.32	2,848,046.25	36.8891731	-107.4060391	
3,400.50	5.34	162.96	3,392.49	-192.05	31.76	2,143,256.47	2,848,049.71	36.8891515	-107.4060274	
3,495.50	6.12	165.01	3,487.01	-201.17	34.36	2,143,247.36	2,848,052.35	36.8891264	-107.4060185	
3,590.50	4.91	174.78	3,581.57	-210.11	36.04	2,143,238.43	2,848,054.07	36.8891019	-107.4060128	
3,685.50	3.93	191.15	3,676.29	-217.35	35.78	2,143,231.18	2,848,053.85	36.8890820	-107.4060136	
3,780.50	4.10	196.79	3,771.06	-223.79	34.17	2,143,224.73	2,848,052.27	36.8890643	-107.4060191	
3,876.50	3.06	193.45	3,866.87	-229.57	32.59	2,143,218.94	2,848,050.70	36.8890484	-107.4060246	
3,971.50	2.66	185.04	3,961.75	-234.23	31.80	2,143,214.28	2,848,049.94	36.8890356	-107.4060273	
4,066.50	2.57	179.51	4,056.66	-238.56	31.63	2,143,209.95	2,848,049.79	36.8890237	-107.4060279	
4,161.50	2.56	170.83	4,151.56	-242.78	31.98	2,143,205.73	2,848,050.16	36.8890121	-107.4060266	
4,256.50	2.92	180.95	4,246.45	-247.30	32.28	2,143,201.22	2,848,050.48	36.8889997	-107.4060256	
4,352.50	3.27	183.78	4,342.31	-252.48	32.06	2,143,196.04	2,848,050.28	36.8889855	-107.4060264	
4,447.50	3.46	178.99	4,437.15	-258.05	31.93	2,143,190.47	2,848,050.18	36.8889702	-107.4060268	
4,541.50	3.63	183.58	4,530.97	-263.85	31.80	2,143,184.66	2,848,050.07	36.8889542	-107.4060273	
4,637.50	3.78	184.40	4,626.77	-270.04	31.36	2,143,178.47	2,848,049.66	36.8889372	-107.4060288	
4,732.50	3.75	180.15	4,721.56	-276.27	31.12	2,143,172.24	2,848,049.44	36.8889201	-107.4060296	
4,826.50	4.11	178.92	4,815.34	-282.71	31.17	2,143,165.80	2,848,049.53	36.8889024	-107.4060294	
4,921.50	4.24	176.26	4,910.09	-289.62	31.46	2,143,158.89	2,848,049.85	36.8888835	-107.4060284	
5,016.50	4.28	176.43	5,004.83	-296.66	31.91	2,143,151.85	2,848,050.33	36.8888641	-107.4060269	
5,114.50	4.65	173.50	5,102.53	-304.26	32.59	2,143,144.26	2,848,051.04	36.8888432	-107.4060246	
5,209.50	5.01	175.40	5,197.19	-312.22	33.36	2,143,136.30	2,848,051.85	36.8888214	-107.4060219	
5,304.50	4.65	172.07	5,291.86	-320.17	34.22	2,143,128.36	2,848,052.75	36.8887995	-107.4060190	
5,368.50	4.07	172.44	5,355.67	-324.99	34.88	2,143,123.54	2,848,053.43	36.8887863	-107.4060167	
5,463.50	3.87	174.59	5,450.44	-331.52	35.63	2,143,117.01	2,848,054.20	36.8887684	-107.4060142	
5,526.50	3.95	174.25	5,513.30	-335.80	36.04	2,143,112.74	2,848,054.64	36.8887566	-107.4060128	
5,590.50	3.83	175.41	5,577.15	-340.12	36.44	2,143,108.41	2,848,055.05	36.8887447	-107.4060114	

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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
5,653.50	4.00	176.52	5,640.00	-344.41	36.74	2,143,104.12	2,848,055.37	36.8887329	-107.4060104
5,717.50	3.98	175.08	5,703.85	-348.85	37.06	2,143,099.69	2,848,055.72	36.8887208	-107.4060093
5,781.50	3.84	171.79	5,767.70	-353.19	37.56	2,143,095.35	2,848,056.23	36.8887088	-107.4060076
5,844.50	3.39	170.23	5,830.57	-357.11	38.18	2,143,091.43	2,848,056.87	36.8886981	-107.4060055
5,908.50	3.56	169.95	5,894.45	-360.93	38.85	2,143,087.61	2,848,057.55	36.8886876	-107.4060032
5,971.50	3.72	167.90	5,957.33	-364.86	39.62	2,143,083.69	2,848,058.34	36.8886768	-107.4060005
6,035.50	3.88	167.25	6,021.19	-369.00	40.53	2,143,079.56	2,848,059.27	36.8886654	-107.4059974
6,098.50	4.02	167.15	6,084.04	-373.23	41.49	2,143,075.33	2,848,060.25	36.8886538	-107.4059941
6,162.50	4.18	158.16	6,147.87	-377.58	42.86	2,143,070.98	2,848,061.64	36.8886418	-107.4059895
6,225.50	4.32	165.49	6,210.70	-382.01	44.31	2,143,066.56	2,848,063.11	36.8886297	-107.4059845
6,337.00	11.35	170.24	6,321.09	-396.91	47.22	2,143,051.68	2,848,066.09	36.8885888	-107.4059745
6,432.00	13.20	165.94	6,413.92	-416.64	51.44	2,143,031.96	2,848,070.40	36.8885345	-107.4059601
6,527.00	12.23	166.20	6,506.59	-436.94	56.48	2,143,011.69	2,848,075.52	36.8884788	-107.4059429
6,621.00	14.96	124.98	6,598.15	-453.60	68.82	2,142,995.08	2,848,087.94	36.8884330	-107.4059007
6,698.00	19.23	102.81	6,671.81	-462.13	89.36	2,142,986.65	2,848,108.52	36.8884096	-107.4058304
6,792.00	24.70	87.38	6,759.03	-464.66	124.13	2,142,984.26	2,848,143.30	36.8884026	-107.4057115
6,887.00	30.23	80.11	6,843.31	-459.64	167.57	2,142,989.48	2,848,186.71	36.8884164	-107.4055630
7,006.00	39.16	71.87	6,941.11	-442.76	232.95	2,143,006.65	2,848,252.02	36.8884628	-107.4053394
7,101.00	42.71	72.62	7,012.86	-423.80	292.23	2,143,025.88	2,848,311.21	36.8885149	-107.4051367
7,195.00	55.65	74.26	7,074.18	-403.66	360.29	2,143,046.32	2,848,379.18	36.8885702	-107.4049040
7,290.00	64.52	73.74	7,121.51	-380.97	439.36	2,143,069.36	2,848,458.15	36.8886325	-107.4046336
7,384.00	68.98	72.31	7,158.61	-355.75	521.93	2,143,094.96	2,848,540.61	36.8887018	-107.4043512
7,479.00	78.41	70.31	7,185.25	-326.53	608.19	2,143,124.56	2,848,626.74	36.8887820	-107.4040563
7,574.00	82.66	70.35	7,200.87	-294.99	696.41	2,143,156.49	2,848,714.81	36.8888687	-107.4037546
7,600.00	84.30	70.66	7,203.82	-286.37	720.76	2,143,165.22	2,848,739.12	36.8888923	-107.4036714
RU 649H Actual POE @ 7600' MD									
7,668.00	88.59	71.46	7,208.04	-264.35	784.94	2,143,187.53	2,848,803.20	36.8889528	-107.4034519
7,762.00	89.13	72.78	7,209.91	-235.50	874.38	2,143,216.79	2,848,892.51	36.8890321	-107.4031460
7,857.00	90.20	73.81	7,210.47	-208.19	965.37	2,143,244.50	2,848,983.38	36.8891071	-107.4028349
7,952.00	90.27	76.07	7,210.08	-183.51	1,057.10	2,143,269.59	2,849,075.00	36.8891749	-107.4025212
8,046.00	90.10	77.80	7,209.77	-162.26	1,148.66	2,143,291.25	2,849,166.46	36.8892332	-107.4022081
8,141.00	91.44	79.05	7,208.50	-143.20	1,241.71	2,143,310.73	2,849,259.43	36.8892855	-107.4018899
8,235.00	90.84	81.39	7,206.63	-127.24	1,334.32	2,143,327.10	2,849,351.97	36.8893294	-107.4015732
8,330.00	89.23	83.23	7,206.57	-114.53	1,428.46	2,143,340.24	2,849,446.05	36.8893643	-107.4012513
8,424.00	89.06	84.98	7,207.97	-104.87	1,521.95	2,143,350.31	2,849,539.49	36.8893908	-107.4009316
8,519.00	89.97	87.43	7,208.77	-98.59	1,616.73	2,143,357.02	2,849,634.24	36.8894080	-107.4006075
8,613.00	90.67	89.57	7,208.25	-96.13	1,710.69	2,143,359.90	2,849,728.19	36.8894148	-107.4002862
8,708.00	89.97	92.27	7,207.72	-97.65	1,805.67	2,143,358.80	2,849,823.17	36.8894106	-107.3999614
8,802.00	90.37	95.07	7,207.44	-103.67	1,899.46	2,143,353.20	2,849,917.00	36.8893940	-107.3996407
8,897.00	89.97	94.87	7,207.16	-111.90	1,994.11	2,143,345.40	2,850,011.67	36.8893714	-107.3993171
8,991.00	89.56	94.83	7,207.54	-119.85	2,087.77	2,143,337.87	2,850,105.37	36.8893496	-107.3989968
9,086.00	89.16	94.69	7,208.60	-127.73	2,182.44	2,143,330.41	2,850,200.07	36.8893279	-107.3986731
9,180.00	88.62	94.26	7,210.43	-135.06	2,276.13	2,143,323.50	2,850,293.80	36.8893077	-107.3983527
9,275.00	89.80	92.72	7,211.74	-140.84	2,370.94	2,143,318.14	2,850,388.63	36.8892918	-107.3980285
9,369.00	89.29	92.90	7,212.48	-145.45	2,464.82	2,143,313.95	2,850,482.54	36.8892791	-107.3977074
9,464.00	88.45	92.69	7,214.36	-150.08	2,559.69	2,143,309.74	2,850,577.42	36.8892664	-107.3973830
9,558.00	90.67	92.82	7,215.08	-154.60	2,653.58	2,143,305.65	2,850,671.33	36.8892540	-107.3970620
9,653.00	90.37	93.17	7,214.21	-159.57	2,748.44	2,143,301.11	2,850,766.21	36.8892403	-107.3967376
9,747.00	89.63	92.66	7,214.21	-164.35	2,842.32	2,143,296.75	2,850,860.11	36.8892271	-107.3964166
9,842.00	89.09	92.35	7,215.28	-168.50	2,937.22	2,143,293.02	2,850,955.03	36.8892157	-107.3960921
9,947.00	90.30	93.04	7,215.83	-173.43	3,042.10	2,143,288.55	2,851,059.93	36.8892021	-107.3957334
10,041.00	89.66	93.55	7,215.87	-178.84	3,135.95	2,143,283.57	2,851,153.80	36.8891873	-107.3954125
10,135.00	89.16	93.70	7,216.84	-184.78	3,229.75	2,143,278.05	2,851,247.63	36.8891709	-107.3950918
10,230.00	90.50	92.45	7,217.12	-189.88	3,324.61	2,143,273.38	2,851,342.51	36.8891569	-107.3947674
10,324.00	90.00	92.57	7,216.71	-193.99	3,418.52	2,143,269.68	2,851,436.44	36.8891455	-107.3944463

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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
10,418.00	89.73	92.15	7,216.93	-197.86	3,512.44	2,143,266.23	2,851,530.37	36.8891349	-107.3941251
10,513.00	89.43	92.11	7,217.63	-201.39	3,607.37	2,143,263.12	2,851,625.32	36.8891251	-107.3938005
10,607.00	88.99	92.16	7,218.92	-204.90	3,701.30	2,143,260.04	2,851,719.26	36.8891155	-107.3934793
10,702.00	90.47	92.88	7,219.37	-209.07	3,796.20	2,143,256.29	2,851,814.18	36.8891040	-107.3931548
10,796.00	90.00	92.88	7,218.98	-213.79	3,890.08	2,143,251.99	2,851,908.08	36.8890910	-107.3928338
10,891.00	89.53	92.35	7,219.37	-218.13	3,984.98	2,143,248.08	2,852,003.00	36.8890790	-107.3925092
10,985.00	89.36	93.58	7,220.28	-222.99	4,078.85	2,143,243.64	2,852,096.89	36.8890656	-107.3921883
11,080.00	90.57	94.26	7,220.34	-229.49	4,173.62	2,143,237.57	2,852,191.69	36.8890478	-107.3918642
11,174.00	90.37	94.19	7,219.57	-236.41	4,267.36	2,143,231.06	2,852,285.46	36.8890287	-107.3915436
11,269.00	90.27	94.00	7,219.04	-243.19	4,362.12	2,143,224.70	2,852,380.25	36.8890100	-107.3912196
11,363.00	89.80	93.85	7,218.98	-249.63	4,455.90	2,143,218.69	2,852,474.05	36.8889923	-107.3908989
11,458.00	91.04	94.05	7,218.29	-256.17	4,550.67	2,143,212.57	2,852,568.85	36.8889743	-107.3905749
11,552.00	90.91	93.91	7,216.69	-262.70	4,644.43	2,143,206.46	2,852,662.64	36.8889563	-107.3902543
11,647.00	90.71	93.55	7,215.34	-268.88	4,739.22	2,143,200.71	2,852,757.46	36.8889393	-107.3899301
11,742.00	90.13	93.49	7,214.65	-274.71	4,834.04	2,143,195.30	2,852,852.30	36.8889233	-107.3896059
11,836.00	89.63	93.60	7,214.84	-280.52	4,927.86	2,143,189.91	2,852,946.14	36.8889073	-107.3892851
11,931.00	88.96	93.65	7,216.01	-286.53	5,022.66	2,143,184.33	2,853,040.97	36.8888907	-107.3889609
12,025.00	90.00	93.23	7,216.87	-292.17	5,116.48	2,143,179.11	2,853,134.82	36.8888752	-107.3886401
12,120.00	89.77	93.33	7,217.06	-297.60	5,211.33	2,143,174.10	2,853,229.69	36.8888602	-107.3883158
12,214.00	90.74	93.22	7,216.64	-302.97	5,305.17	2,143,169.15	2,853,323.55	36.8888454	-107.3879949
12,309.00	90.30	93.17	7,215.78	-308.27	5,400.02	2,143,164.28	2,853,418.43	36.8888308	-107.3876705
12,404.00	90.17	93.24	7,215.39	-313.58	5,494.87	2,143,159.39	2,853,513.30	36.8888162	-107.3873462
12,499.00	90.00	93.70	7,215.25	-319.33	5,589.70	2,143,154.06	2,853,608.15	36.8888003	-107.3870219
12,593.00	89.26	93.43	7,215.85	-325.17	5,683.51	2,143,148.64	2,853,701.99	36.8887842	-107.3867011
12,687.00	90.54	93.42	7,216.02	-330.79	5,777.34	2,143,143.44	2,853,795.84	36.8887687	-107.3863803
12,782.00	90.40	93.23	7,215.24	-336.30	5,872.18	2,143,138.36	2,853,890.70	36.8887535	-107.3860560
12,876.00	90.03	92.99	7,214.88	-341.40	5,966.04	2,143,133.68	2,853,984.59	36.8887395	-107.3857350
12,970.00	89.70	93.21	7,215.11	-346.48	6,059.90	2,143,129.02	2,854,078.47	36.8887255	-107.3854141
13,065.00	89.26	93.09	7,215.97	-351.70	6,154.75	2,143,124.22	2,854,173.34	36.8887111	-107.3850897
13,159.00	90.74	93.06	7,215.97	-356.74	6,248.62	2,143,119.60	2,854,267.23	36.8886972	-107.3847688
13,254.00	90.47	92.75	7,214.97	-361.56	6,343.49	2,143,115.21	2,854,362.12	36.8886839	-107.3844444
13,348.00	90.20	92.90	7,214.42	-366.19	6,437.37	2,143,111.00	2,854,456.02	36.8886711	-107.3841233
13,443.00	89.93	93.15	7,214.31	-371.20	6,532.24	2,143,106.41	2,854,550.91	36.8886573	-107.3837989
13,537.00	89.66	93.00	7,214.64	-376.25	6,626.10	2,143,101.78	2,854,644.80	36.8886434	-107.3834780
13,631.00	91.14	94.02	7,213.99	-382.00	6,719.92	2,143,096.45	2,854,738.64	36.8886275	-107.3831572
13,725.00	91.01	93.80	7,212.22	-388.41	6,813.69	2,143,090.46	2,854,832.43	36.8886098	-107.3828365
13,820.00	90.77	93.43	7,210.75	-394.40	6,908.48	2,143,084.90	2,854,927.26	36.8885933	-107.3825124
13,914.00	90.57	92.89	7,209.65	-399.58	7,002.33	2,143,080.14	2,855,021.13	36.8885790	-107.3821915
14,009.00	89.93	92.15	7,209.24	-403.76	7,097.24	2,143,076.38	2,855,116.05	36.8885675	-107.3818669
14,104.00	89.76	92.19	7,209.49	-407.35	7,192.17	2,143,073.21	2,855,211.00	36.8885575	-107.3815423
14,198.00	89.80	91.92	7,209.85	-410.72	7,286.11	2,143,070.26	2,855,304.95	36.8885482	-107.3812211
14,293.00	89.73	91.69	7,210.24	-413.72	7,381.06	2,143,067.69	2,855,399.92	36.8885399	-107.3808964
14,387.00	90.94	92.58	7,209.69	-417.22	7,474.99	2,143,064.61	2,855,493.86	36.8885302	-107.3805752
14,482.00	90.57	92.64	7,208.44	-421.54	7,569.89	2,143,060.71	2,855,588.77	36.8885183	-107.3802507
14,577.00	90.30	93.08	7,207.72	-426.28	7,664.77	2,143,056.40	2,855,683.67	36.8885052	-107.3799263
14,671.00	90.03	92.69	7,207.45	-431.02	7,758.65	2,143,052.09	2,855,777.57	36.8884921	-107.3796053
14,765.00	89.80	92.37	7,207.59	-435.16	7,852.55	2,143,048.36	2,855,871.50	36.8884807	-107.3792842
14,860.00	89.53	91.96	7,208.14	-438.75	7,947.48	2,143,045.19	2,855,966.44	36.8884707	-107.3789596
14,954.00	89.66	93.97	7,208.81	-443.62	8,041.35	2,143,040.75	2,856,060.33	36.8884573	-107.3786386
15,049.00	89.56	94.11	7,209.46	-450.31	8,136.11	2,143,034.48	2,856,155.12	36.8884388	-107.3783146
15,143.00	90.77	93.98	7,209.18	-456.94	8,229.88	2,143,028.27	2,856,248.91	36.8884205	-107.3779939
15,238.00	90.70	94.14	7,207.97	-463.66	8,324.63	2,143,021.97	2,856,343.70	36.8884020	-107.3776699
15,332.00	90.27	93.59	7,207.17	-470.00	8,418.41	2,143,016.05	2,856,437.51	36.8883845	-107.3773493
15,427.00	90.10	93.24	7,206.86	-475.66	8,513.24	2,143,010.82	2,856,532.36	36.8883689	-107.3770250
15,521.00	90.13	93.81	7,206.68	-481.44	8,607.06	2,143,005.46	2,856,626.21	36.8883529	-107.3767042

SDT

Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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
15,616.00	90.07	93.58	7,206.51	-487.56	8,701.87	2,142,999.76	2,856,721.04	36.8883360	-107.3763800
15,710.00	89.80	93.63	7,206.62	-493.47	8,795.68	2,142,994.27	2,856,814.87	36.8883197	-107.3760592
15,805.00	89.33	93.64	7,207.34	-499.49	8,890.49	2,142,988.67	2,856,909.71	36.8883031	-107.3757350
15,899.00	89.30	93.91	7,208.46	-505.68	8,984.28	2,142,982.91	2,857,003.52	36.8882860	-107.3754143
15,994.00	91.14	93.44	7,208.10	-511.77	9,079.08	2,142,977.24	2,857,098.35	36.8882692	-107.3750902
16,088.00	91.21	93.72	7,206.17	-517.64	9,172.87	2,142,971.79	2,857,192.17	36.8882530	-107.3747694
16,183.00	90.77	93.79	7,204.53	-523.86	9,267.65	2,142,966.00	2,857,286.98	36.8882358	-107.3744453
16,277.00	90.60	93.72	7,203.40	-530.02	9,361.45	2,142,960.26	2,857,380.80	36.8882188	-107.3741246
16,372.00	90.40	93.55	7,202.57	-536.04	9,456.25	2,142,954.66	2,857,475.63	36.8882022	-107.3738005
16,467.00	90.13	93.40	7,202.14	-541.80	9,551.07	2,142,949.33	2,857,570.48	36.8881863	-107.3734762
16,561.00	90.34	93.18	7,201.75	-547.19	9,644.92	2,142,944.35	2,857,664.34	36.8881714	-107.3731553
16,656.00	90.30	93.93	7,201.22	-553.08	9,739.73	2,142,938.89	2,857,759.18	36.8881551	-107.3728311
16,750.00	90.30	93.67	7,200.73	-559.31	9,833.53	2,142,933.08	2,857,853.00	36.8881379	-107.3725104
16,845.00	90.23	94.01	7,200.29	-565.67	9,928.31	2,142,927.14	2,857,947.81	36.8881204	-107.3721863
16,939.00	89.80	93.77	7,200.26	-572.05	10,022.09	2,142,921.18	2,858,041.63	36.8881028	-107.3718656
17,034.00	89.33	93.67	7,200.98	-578.21	10,116.89	2,142,915.44	2,858,136.45	36.8880857	-107.3715415
17,129.00	91.28	92.92	7,200.48	-583.67	10,211.73	2,142,910.41	2,858,231.31	36.8880706	-107.3712172
17,223.00	91.21	92.61	7,198.44	-588.21	10,305.60	2,142,906.30	2,858,325.20	36.8880581	-107.3708962
17,318.00	90.77	92.70	7,196.79	-592.61	10,400.48	2,142,902.32	2,858,420.10	36.8880459	-107.3705718
17,412.00	90.94	92.47	7,195.39	-596.85	10,494.37	2,142,898.50	2,858,514.01	36.8880342	-107.3702507
17,507.00	90.81	92.18	7,193.94	-600.70	10,589.28	2,142,895.07	2,858,608.94	36.8880235	-107.3699261
17,601.00	90.44	92.21	7,192.92	-604.30	10,683.21	2,142,891.89	2,858,702.88	36.8880135	-107.3696050
17,696.00	90.27	92.16	7,192.33	-607.92	10,778.14	2,142,888.70	2,858,797.82	36.8880035	-107.3692804
17,791.00	90.00	92.20	7,192.10	-611.54	10,873.07	2,142,885.51	2,858,892.77	36.8879934	-107.3689558
17,885.00	89.66	92.15	7,192.38	-615.10	10,967.00	2,142,882.36	2,858,986.71	36.8879835	-107.3686346
17,980.00	90.61	92.00	7,192.16	-618.54	11,061.94	2,142,879.35	2,859,081.66	36.8879740	-107.3683099
18,075.00	90.37	92.28	7,191.35	-622.09	11,156.87	2,142,876.22	2,859,176.61	36.8879641	-107.3679853
18,169.00	90.17	92.62	7,190.90	-626.11	11,250.78	2,142,872.63	2,859,270.54	36.8879530	-107.3676642
18,264.00	90.10	92.56	7,190.68	-630.40	11,345.68	2,142,868.76	2,859,365.46	36.8879411	-107.3673397
18,358.00	89.93	92.76	7,190.65	-634.76	11,439.58	2,142,864.82	2,859,459.38	36.8879290	-107.3670186
18,453.00	90.00	93.07	7,190.71	-639.59	11,534.46	2,142,860.41	2,859,554.27	36.8879156	-107.3666942
18,548.00	90.07	93.72	7,190.65	-645.22	11,629.29	2,142,855.21	2,859,649.13	36.8879001	-107.3663699
18,642.00	89.93	93.97	7,190.65	-651.52	11,723.08	2,142,849.32	2,859,742.95	36.8878826	-107.3660492
18,737.00	90.03	94.56	7,190.69	-658.59	11,817.82	2,142,842.68	2,859,837.71	36.8878631	-107.3657253
18,831.00	89.87	94.35	7,190.77	-665.89	11,911.53	2,142,835.80	2,859,931.46	36.8878430	-107.3654049
18,926.00	89.76	94.29	7,191.08	-673.05	12,006.26	2,142,829.07	2,860,026.22	36.8878232	-107.3650809
19,020.00	89.83	94.22	7,191.41	-680.02	12,100.00	2,142,822.51	2,860,119.99	36.8878039	-107.3647604
19,115.00	89.73	93.93	7,191.78	-686.77	12,194.76	2,142,816.19	2,860,214.78	36.8877853	-107.3644364
19,210.00	89.73	94.11	7,192.23	-693.43	12,289.53	2,142,809.95	2,860,309.57	36.8877669	-107.3641124
19,304.00	90.24	93.72	7,192.25	-699.85	12,383.31	2,142,803.95	2,860,403.38	36.8877491	-107.3637917
19,399.00	90.34	93.58	7,191.77	-705.90	12,478.11	2,142,798.33	2,860,498.21	36.8877324	-107.3634675
19,494.00	89.87	93.64	7,191.59	-711.88	12,572.92	2,142,792.77	2,860,593.05	36.8877159	-107.3631433
19,588.00	91.92	92.74	7,190.13	-717.11	12,666.76	2,142,787.96	2,860,686.91	36.8877014	-107.3628225
19,683.00	92.49	92.85	7,186.47	-721.74	12,761.58	2,142,783.76	2,860,781.74	36.8876885	-107.3624982
19,777.00	91.51	92.98	7,183.19	-726.52	12,855.40	2,142,779.40	2,860,875.58	36.8876753	-107.3621774
19,872.00	90.40	92.11	7,181.61	-730.73	12,950.29	2,142,775.61	2,860,970.49	36.8876636	-107.3618530
19,966.00	89.97	91.98	7,181.30	-734.09	13,044.23	2,142,772.68	2,861,064.45	36.8876543	-107.3615318
20,061.00	89.73	91.84	7,181.55	-737.25	13,139.17	2,142,769.93	2,861,159.41	36.8876454	-107.3612071
20,155.00	89.50	92.10	7,182.18	-740.48	13,233.12	2,142,767.12	2,861,253.36	36.8876364	-107.3608859
20,249.00	89.39	92.18	7,183.09	-743.99	13,327.05	2,142,764.03	2,861,347.31	36.8876267	-107.3605647
20,344.00	89.46	92.30	7,184.05	-747.71	13,421.97	2,142,760.75	2,861,442.24	36.8876164	-107.3602401
20,439.00	89.03	92.14	7,185.30	-751.39	13,516.89	2,142,757.49	2,861,537.18	36.8876061	-107.3599155
RU 649H Actual FPP @ 20439' MD									
20,533.00	89.36	92.77	7,186.62	-755.41	13,610.79	2,142,753.89	2,861,631.10	36.8875949	-107.3595944

SDT
Survey Report - Geographic

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 649H
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 649H	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
20,569.00	89.43	92.55	7,187.00	-757.08	13,646.75	2,142,752.38	2,861,667.07	36.8875903	-107.3594715
Final ST01 MWD Survey @ 20569' MD									
20,638.00	89.43	92.55	7,187.69	-760.15	13,715.68	2,142,749.61	2,861,736.01	36.8875818	-107.3592358
BHL ST01 @ 20638' MD									

Design Targets									
Target Name									
- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
RU 649H SHL	0.00	0.00	0.00	0.00	0.00	2,143,448.37	2,848,017.09	36.8896790	-107.4061360
- actual wellpath hits target center									
- Point									
RU 649H OH BHL	0.00	0.00	6,950.96	-776.43	6,240.36	2,142,699.87	2,854,260.85	36.8875444	-107.3847973
- actual wellpath misses target center by 496.13ft at 13174.83ft MD (7215.77 TVD, -357.58 N, 6264.42 E)									
- Point									
RU 649H Actual FPP	0.00	0.00	7,185.30	-751.39	13,516.89	2,142,757.49	2,861,537.18	36.8876061	-107.3599155
- actual wellpath hits target center									
- Point									
RU 649H ST01 BHL	0.00	0.00	7,187.69	-760.15	13,715.68	2,142,749.61	2,861,736.01	36.8875818	-107.3592358
- actual wellpath hits target center									
- Point									
RU 649H PBHL ST	0.00	0.00	7,198.93	-765.34	13,665.67	2,142,744.21	2,861,686.03	36.8875676	-107.3594068
- actual wellpath misses target center by 23.84ft at 20569.00ft MD (7187.00 TVD, -757.08 N, 13646.75 E)									
- Point									
RU 649H Actual POE	0.00	0.00	7,203.82	-286.37	720.76	2,143,165.22	2,848,739.12	36.8888923	-107.4036714
- actual wellpath hits target center									
- Point									

Design Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
7,600.00	7,203.82	-286.37	720.76	RU 649H Actual POE @ 7600' MD
20,439.00	7,185.30	-751.39	13,516.89	RU 649H Actual FPP @ 20439' MD
20,569.00	7,187.00	-757.08	13,646.75	Final ST01 MWD Survey @ 20569' MD
20,638.00	7,187.69	-760.15	13,715.68	BHL ST01 @ 20638' MD

Checked By: _____

Approved By: _____

Date: _____

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 277042

ACKNOWLEDGMENTS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 277042
	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.

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
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Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 277042

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 277042
	Action Type: [C-104] Completion Packet (C-104C)

CONDITIONS

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