

Form 3160-5
(June 2019)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.5. Lease Serial No.
NMSF078764
6. If Indian, Allottee or Tribe Name**SUBMIT IN TRIPLICATE - Other instructions on page 2**

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator
LOGOS OPERATING LLC3a. Address
2010 AFTON PLACE
FARMINGTON, NM 874013b. Phone No. (include area code)
(505) 278-87204. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC 30 T31N R05W NESW (K) 2300 FSL 946 FWL7. If Unit of CA/Agreement, Name and/or No.
NMNM078407E8. Well Name and No.
ROSA UNIT 662H9. API Well No.
30-039-3141710. Field and Pool or Exploratory Area
BASIN MANCOS11. Country or Parish, State
RIO ARriba COUNTY, NM

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

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

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

LOGOS Operating request a change in plans for the following:

Original TD @ 17,949' MD 6997' TVD to **new TD @ 17,395' MD 7000' TVD.**

Geology tops have been updated per changes.

Original KOP @ 6318' MD 6296' TVD to **new KOP @ 6381' MD 6377' TVD.**Original Landing point @ 7372' MD 6987' TVD to **new Landing point @ 7368' MD 7000' TVD.**Original 9.625" casing Intermediate @ 6255' MD to **new 6237' MD**Original 5.5" casing Production @ 17,949' MD to **new 17,395' MD**

Original 9.625" Intermediate & 5.5 Production cementing bbls and sacks have been updated per casing depth changes.

Attached: New C102, Operation and Direction Drilling Plans

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

Etta Trujillo

Title Regulatory Specialist

Signature *Etta Trujillo*

Date 3/24/2022

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

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

Office

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Instructions on page 2)



Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 30

Rosa Unit #662H

OH

Plan #3

Anticollision Report

19 November, 2021





Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Reference	Plan #3
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method	Stations
Depth Range:	Unlimited
Results Limited by:	Maximum centre distance of 2,000.00ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Pedal Curve
Casing Method:	Not applied

Survey Tool Program		Date	11/19/2021		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	17,394.71	Plan #3 (OH)	MWD	MWD - Standard	

Summary						
Site Name	Reference Measure	Offset Measure	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation	Warning
Offset Well - Wellbore - Design						
Rosa Unit 30						
Rosa Unit #658H - OH - Plan #3	1,584.88	1,584.40	17.46	6.12	1.539	CC
Rosa Unit #658H - OH - Plan #3	1,700.00	1,699.45	17.94	5.78	1.475	Level 3, ES, SF
Rosa Unit #659H - OH - Plan #2	764.77	765.15	8.39	2.96	1.545	CC, ES, SF
Rosa Unit #660H - OH - Plan #2	500.00	500.00	29.93	26.35	8.350	CC, ES
Rosa Unit #660H - OH - Plan #2	700.00	697.92	36.01	31.04	7.252	SF
Rosa Unit #663H - OH - Plan #2	500.00	500.00	59.95	56.36	16.722	CC, ES
Rosa Unit #663H - OH - Plan #2	17,395.33	17,562.45	773.26	135.38	1.212	Level 3, SF
Rosa Unit #664H - OH - Plan #3	500.00	500.00	45.14	41.55	12.591	CC, ES
Rosa Unit #664H - OH - Plan #3	17,395.33	17,500.81	1,438.09	787.67	2.211	SF
Rosa Unit #665H - OH - Plan #3	1,000.00	1,000.00	31.26	27.68	8.720	CC, ES
Rosa Unit #665H - OH - Plan #3	1,100.00	1,099.20	32.50	28.56	8.243	SF

Offset Design	Rosa Unit 30 - Rosa Unit #658H - OH - Plan #3										Offset Site Error:	0.00 ft
Survey Program:	0-MWD+HDGM										Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis	Highside	Offset Wellbore Centre	Rule Assigned:	Distance	Minimum	Separation	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation Factor			
0.00	0.00	0.00	0.00	0.00	0.00	0.00	17.51	17.51	0.00	N/A		
100.00	100.00	100.00	100.00	0.36	0.36	2.88	17.51	16.80	0.72	24.426		
200.00	200.00	200.00	200.00	0.72	0.72	2.88	17.49	16.08	1.43	12.213		
300.00	300.00	300.00	300.00	1.08	1.08	2.88	17.49	15.36	2.15	8.142		
400.00	400.00	400.00	400.00	1.43	1.43	2.88	17.49	14.64	2.87	6.107		
500.00	500.00	500.00	500.00	1.79	1.79	2.88	17.49	13.93	3.58	4.885		
600.00	600.00	600.00	600.00	2.15	2.15	2.88	17.49	13.21	4.30	4.071		
700.00	700.00	700.00	700.00	2.51	2.51	2.88	17.49	12.49	5.02	3.489		
800.00	800.00	800.00	800.00	2.87	2.87	2.88	17.49	11.78	5.74	3.053		
900.00	900.00	900.00	900.00	3.23	3.23	2.88	17.49	11.06	6.45	2.714		
1,000.00	1,000.00	1,000.00	1,000.00	3.58	3.58	2.88	17.49	10.34	7.17	2.443		
1,100.00	1,100.00	1,099.74	1,099.73	3.94	3.94	0.78	18.61	10.73	7.88	2.361		
1,200.00	1,200.00	1,199.72	1,199.70	4.30	4.30	-1.65	20.09	11.50	8.60	2.338		
1,300.00	1,299.98	1,299.70	1,299.66	4.66	4.65	-35.87	21.58	10.87	9.31	2.168		
1,319.49	1,319.46	1,319.18	1,319.14	4.73	4.72	-37.50	21.87	10.44	9.45	2.105		
1,400.00	1,399.90	1,399.64	1,399.59	5.02	5.01	-45.31	23.06	8.66	10.03	1.863		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #658H - OH - Plan #3													Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
1,500.00	1,499.81	1,499.57	1,499.51	5.37	5.37	-56.22	24.54	-3.08	17.73	6.99	10.74	1.650		
1,584.88	1,584.61	1,584.40	1,584.32	5.68	5.67	-66.12	25.80	-3.78	17.46	6.12	11.35	1.539 CC		
1,600.00	1,599.72	1,599.51	1,599.43	5.73	5.73	-67.91	26.03	-3.91	17.47	6.02	11.45	1.525		
1,700.00	1,699.63	1,699.45	1,699.35	6.09	6.08	-79.44	27.51	-4.74	17.94	5.78	12.17	1.475 Level 3, ES, SF		
1,800.00	1,799.55	1,799.38	1,799.27	6.45	6.44	-89.99	28.99	-5.57	19.10	6.21	12.88	1.482 Level 3		
1,900.00	1,899.46	1,899.32	1,899.19	6.81	6.80	-99.07	30.48	-6.41	20.81	7.21	13.60	1.530		
2,000.00	1,999.37	1,999.25	1,999.11	7.17	7.16	-106.61	31.96	-7.24	22.97	8.65	14.31	1.604		
2,100.00	2,099.29	2,099.19	2,099.03	7.53	7.52	-112.78	33.44	-8.07	25.45	10.42	15.03	1.693		
2,200.00	2,199.20	2,199.12	2,198.95	7.89	7.87	-117.80	34.93	-8.90	28.17	12.42	15.75	1.789		
2,300.00	2,299.11	2,299.06	2,298.87	8.25	8.23	-121.91	36.41	-9.74	31.07	14.60	16.46	1.887		
2,400.00	2,399.03	2,398.99	2,398.80	8.61	8.59	-125.31	37.89	-10.57	34.10	16.92	17.18	1.985		
2,500.00	2,498.94	2,498.93	2,498.72	8.97	8.95	-128.14	39.38	-11.40	37.23	19.34	17.90	2.080		
2,600.00	2,598.85	2,598.86	2,598.64	9.33	9.31	-130.53	40.86	-12.23	40.44	21.83	18.61	2.173		
2,700.00	2,698.76	2,698.80	2,698.56	9.69	9.66	-132.56	42.34	-13.07	43.71	24.38	19.33	2.261		
2,800.00	2,798.68	2,798.74	2,798.48	10.05	10.02	-134.31	43.83	-13.90	47.03	26.98	20.05	2.346		
2,900.00	2,898.59	2,898.67	2,898.40	10.41	10.38	-135.83	45.31	-14.73	50.38	29.61	20.77	2.426		
3,000.00	2,998.50	2,998.61	2,998.32	10.78	10.74	-137.16	46.79	-15.56	53.77	32.28	21.48	2.503		
3,100.00	3,098.42	3,098.54	3,098.24	11.14	11.10	-138.33	48.28	-16.40	57.18	34.98	22.20	2.575		
3,200.00	3,198.33	3,198.48	3,198.16	11.50	11.46	-139.37	49.76	-17.23	60.61	37.69	22.92	2.645		
3,300.00	3,298.24	3,298.41	3,298.08	11.86	11.81	-140.30	51.25	-18.06	64.06	40.42	23.64	2.710		
3,400.00	3,398.16	3,398.35	3,398.00	12.22	12.17	-141.13	52.73	-18.89	67.52	43.17	24.35	2.773		
3,500.00	3,498.07	3,498.28	3,497.93	12.59	12.53	-141.88	54.21	-19.72	71.00	45.93	25.07	2.832		
3,600.00	3,597.98	3,598.22	3,597.85	12.95	12.89	-142.56	55.70	-20.56	74.49	48.70	25.79	2.888		
3,700.00	3,697.89	3,698.15	3,697.77	13.31	13.25	-143.18	57.18	-21.39	77.99	51.48	26.51	2.942		
3,800.00	3,797.81	3,798.09	3,797.69	13.67	13.61	-143.74	58.66	-22.22	81.49	54.27	27.22	2.993		
3,900.00	3,897.72	3,898.02	3,897.61	14.04	13.97	-144.26	60.15	-23.05	85.00	57.06	27.94	3.042		
4,000.00	3,997.63	3,997.96	3,997.53	14.40	14.32	-144.74	61.63	-23.89	88.52	59.86	28.66	3.089		
4,100.00	4,097.55	4,097.90	4,097.45	14.76	14.68	-145.18	63.11	-24.72	92.05	62.67	29.38	3.133		
4,200.00	4,197.46	4,197.83	4,197.37	15.12	15.04	-145.59	64.60	-25.55	95.58	65.48	30.10	3.176		
4,300.00	4,297.37	4,297.77	4,297.29	15.49	15.40	-145.97	66.08	-26.38	99.12	68.30	30.81	3.217		
4,400.00	4,397.29	4,397.70	4,397.21	15.85	15.76	-146.32	67.56	-27.22	102.66	71.12	31.53	3.256		
4,500.00	4,497.20	4,497.64	4,497.14	16.21	16.12	-146.65	69.05	-28.05	106.20	73.95	32.25	3.293		
4,600.00	4,597.11	4,597.57	4,597.06	16.57	16.47	-146.96	70.53	-28.88	109.74	76.78	32.97	3.329		
4,700.00	4,697.03	4,697.51	4,696.98	16.94	16.83	-147.25	72.01	-29.71	113.29	79.61	33.69	3.363		
4,800.00	4,796.94	4,797.44	4,796.90	17.30	17.19	-147.52	73.50	-30.55	116.84	82.44	34.40	3.396		
4,900.00	4,896.85	4,897.38	4,896.82	17.66	17.55	-147.78	74.98	-31.38	120.40	85.28	35.12	3.428		
5,000.00	4,996.76	4,997.31	4,996.74	18.02	17.91	-148.02	76.46	-32.21	123.96	88.12	35.84	3.459		
5,100.00	5,096.68	5,097.25	5,096.66	18.39	18.27	-148.25	77.95	-33.04	127.51	90.96	36.56	3.488		
5,200.00	5,196.59	5,197.19	5,196.58	18.75	18.63	-148.46	79.43	-33.87	131.07	93.80	37.28	3.516		
5,300.00	5,296.50	5,297.12	5,296.50	19.11	18.98	-148.67	80.91	-34.71	134.64	96.64	37.99	3.544		
5,400.00	5,396.42	5,397.06	5,396.42	19.47	19.34	-148.86	82.40	-35.54	138.20	99.49	38.71	3.570		
5,500.00	5,496.33	5,496.99	5,496.34	19.84	19.70	-149.04	83.88	-36.37	141.77	102.33	39.43	3.595		
5,600.00	5,596.24	5,596.93	5,596.27	20.20	20.06	-149.22	85.36	-37.20	145.33	105.18	40.15	3.620		
5,700.00	5,696.16	5,696.86	5,696.19	20.56	20.42	-149.39	86.85	-38.04	148.90	108.03	40.87	3.643		
5,800.00	5,796.07	5,796.80	5,796.11	20.93	20.78	-149.54	88.33	-38.87	152.47	110.88	41.59	3.666		
5,900.00	5,895.98	5,896.73	5,896.03	21.29	21.14	-149.70	89.81	-39.70	156.04	113.74	42.30	3.689		
6,000.00	5,995.89	5,996.67	5,995.95	21.65	21.50	-149.84	91.30	-40.53	159.61	116.59	43.02	3.710		
6,100.00	6,095.81	6,096.60	6,095.87	22.01	21.85	-149.98	92.78	-41.37	163.18	119.44	43.74	3.731		
6,200.00	6,195.72	6,196.54	6,195.79	22.38	22.21	-150.11	94.26	-42.20	166.76	122.30	44.46	3.751		
6,300.00	6,295.63	6,296.47	6,295.71	22.74	22.57	-150.24	95.75	-43.03	170.33	125.15	45.18	3.770		
6,380.96	6,376.52	6,372.39	6,371.61	23.03	22.84	-150.26	96.88	-44.03	173.61	127.90	45.71	3.798		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #658H - OH - Plan #3													Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Reference (ft)	Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
							+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
6,400.00	6,395.54	6,387.78	6,386.97	23.10	22.90	-175.28	97.13	-44.87	175.27	129.48	45.79	3.828		
6,450.00	6,445.29	6,427.36	6,426.35	23.29	23.04	164.99	97.79	-48.72	183.79	137.87	45.93	4.002		
6,500.00	6,494.55	6,464.92	6,463.43	23.47	23.17	160.15	98.47	-54.64	198.27	152.33	45.94	4.316		
6,550.00	6,542.99	6,500.01	6,497.71	23.66	23.30	158.60	99.14	-62.13	218.57	172.71	45.86	4.766		
6,600.00	6,590.33	6,530.78	6,527.38	23.85	23.41	157.99	99.76	-70.25	244.37	198.73	45.64	5.354		
6,650.00	6,636.28	6,558.15	6,553.41	24.05	23.51	157.58	100.33	-78.66	275.20	229.81	45.39	6.063		
6,700.00	6,680.55	6,581.57	6,575.39	24.26	23.60	156.94	100.84	-86.75	310.43	265.33	45.10	6.883		
6,750.00	6,722.86	6,600.01	6,592.47	24.48	23.66	155.68	101.25	-93.68	349.42	304.65	44.77	7.805		
6,800.00	6,762.96	6,616.98	6,608.00	24.72	23.73	153.88	101.63	-100.49	391.50	346.94	44.56	8.785		
6,850.00	6,800.59	6,629.40	6,619.25	24.99	23.78	150.77	101.92	-105.73	436.04	391.70	44.35	9.833		
6,900.00	6,835.54	6,638.66	6,627.58	25.29	23.81	145.74	102.13	-109.79	482.48	438.31	44.17	10.922		
6,950.00	6,867.58	6,650.01	6,637.70	25.63	23.85	138.76	102.39	-114.92	530.34	486.11	44.23	11.991		
7,000.00	6,896.51	6,650.01	6,637.70	26.03	23.85	123.38	102.39	-114.92	579.04	535.03	44.01	13.156		
7,050.00	6,922.15	6,650.01	6,637.70	26.48	23.85	98.76	102.39	-114.92	628.30	584.37	43.94	14.300		
7,100.00	6,944.36	6,650.01	6,637.70	26.99	23.85	69.70	102.39	-114.92	677.74	633.77	43.97	15.414		
7,150.00	6,962.98	6,650.01	6,637.70	27.57	23.85	47.74	102.39	-114.92	727.03	682.94	44.09	16.489		
7,200.00	6,977.91	6,650.01	6,637.70	28.22	23.85	34.45	102.39	-114.92	775.93	731.65	44.28	17.523		
7,250.00	6,989.06	6,650.01	6,637.70	28.93	23.85	26.43	102.39	-114.92	824.24	779.71	44.53	18.511		
7,300.00	6,996.35	6,632.07	6,621.67	29.70	23.79	20.22	101.98	-106.89	871.35	826.95	44.40	19.625		
7,350.00	6,999.74	6,624.40	6,614.73	30.52	23.76	16.79	101.80	-103.59	917.53	872.96	44.58	20.583		
7,368.23	7,000.00	6,621.34	6,611.97	30.83	23.75	15.81	101.73	-102.30	934.07	889.42	44.64	20.922		
7,400.00	7,000.00	6,616.01	6,607.12	31.38	23.72	15.64	101.61	-100.09	962.78	918.01	44.77	21.506		
7,500.00	7,000.00	6,600.01	6,592.47	33.25	23.66	15.14	101.25	-93.68	1,053.91	1,008.79	45.12	23.358		
7,600.00	7,000.00	6,600.01	6,592.47	35.30	23.66	15.14	101.25	-93.68	1,146.23	1,100.58	45.66	25.106		
7,700.00	7,000.00	6,573.85	6,568.18	37.48	23.57	14.38	100.67	-83.99	1,238.94	1,193.23	45.70	27.107		
7,800.00	7,000.00	6,550.01	6,545.71	39.78	23.48	13.74	100.16	-76.04	1,332.76	1,286.99	45.77	29.118		
7,900.00	7,000.00	6,550.01	6,545.71	42.18	23.48	13.74	100.16	-76.04	1,426.83	1,380.71	46.12	30.936		
8,000.00	7,000.00	6,550.01	6,545.71	44.66	23.48	13.74	100.16	-76.04	1,521.66	1,475.24	46.42	32.783		
8,100.00	7,000.00	6,550.01	6,545.71	47.21	23.48	13.74	100.16	-76.04	1,617.11	1,570.44	46.67	34.653		
8,200.00	7,000.00	6,526.12	6,522.90	49.82	23.39	13.15	99.67	-68.92	1,712.47	1,665.82	46.65	36.712		
8,300.00	7,000.00	6,518.81	6,515.88	52.48	23.37	12.98	99.52	-66.92	1,808.46	1,761.68	46.78	38.659		
8,400.00	7,000.00	6,500.01	6,497.71	55.19	23.30	12.56	99.14	-62.13	1,904.91	1,858.11	46.80	40.706		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #659H - OH - Plan #2												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Highside		Offset Wellbore Centre		Distance		Minimum	Separation	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation (ft)		
0.00	0.00	0.00	0.00	0.00	0.00	-28.24	13.09	-7.03	14.86	14.86	0.00	N/A	
100.00	100.00	100.00	100.00	0.36	0.36	-28.24	13.09	-7.03	14.86	14.14	0.72	20.725	
200.00	200.00	200.00	200.00	0.72	0.72	-28.24	13.09	-7.03	14.86	13.42	1.43	10.362	
300.00	300.00	300.00	300.00	1.08	1.08	-28.24	13.09	-7.03	14.86	12.71	2.15	6.908	
400.00	400.00	400.00	400.00	1.43	1.43	-28.24	13.09	-7.03	14.86	11.99	2.87	5.181	
500.00	500.00	500.00	500.00	1.79	1.79	-28.24	13.09	-7.03	14.86	11.27	3.58	4.145	
600.00	600.00	600.39	600.37	2.15	2.14	-32.48	11.34	-7.22	13.45	9.16	4.29	3.138	
700.00	700.00	700.53	700.37	2.51	2.47	-51.84	6.11	-7.78	9.90	4.93	4.98	1.990	
764.77	764.77	765.15	764.77	2.74	2.69	-83.85	0.90	-8.34	8.39	2.96	5.43	1.545 CC, ES, SF	
800.00	800.00	800.19	799.64	2.87	2.81	-106.21	-2.53	-8.71	9.08	3.40	5.68	1.600	
900.00	900.00	899.41	898.18	3.23	3.17	-144.66	-14.04	-9.95	17.30	10.94	6.36	2.719	
1,000.00	1,000.00	998.69	996.74	3.58	3.54	-156.55	-25.89	-11.23	28.41	21.35	7.06	4.024	
1,100.00	1,100.00	1,097.96	1,095.30	3.94	3.92	-161.67	-37.75	-12.51	40.04	32.28	7.76	5.157	
1,200.00	1,200.00	1,197.24	1,193.86	4.30	4.30	-164.47	-49.60	-13.79	51.85	43.37	8.47	6.120	
1,300.00	1,299.98	1,296.30	1,292.20	4.66	4.69	-164.71	-61.43	-15.06	65.40	56.21	9.18	7.122	
1,319.49	1,319.46	1,315.56	1,311.32	4.73	4.76	-164.58	-63.73	-15.31	68.43	59.10	9.32	7.339	
1,400.00	1,399.90	1,395.04	1,390.23	5.02	5.07	-164.28	-73.22	-16.33	81.21	71.32	9.89	8.209	
1,500.00	1,499.81	1,493.77	1,488.24	5.37	5.46	-164.01	-85.01	-17.60	97.10	86.49	10.60	9.159	
1,600.00	1,599.72	1,592.50	1,586.26	5.73	5.86	-163.81	-96.80	-18.87	112.98	101.67	11.31	9.989	
1,700.00	1,699.63	1,691.23	1,684.27	6.09	6.25	-163.67	-108.59	-20.14	128.87	116.84	12.02	10.719	
1,800.00	1,799.55	1,789.96	1,782.29	6.45	6.65	-163.56	-120.38	-21.41	144.75	132.02	12.73	11.367	
1,900.00	1,899.46	1,888.69	1,880.30	6.81	7.05	-163.46	-132.17	-22.68	160.64	147.19	13.45	11.946	
2,000.00	1,999.37	1,987.42	1,978.32	7.17	7.44	-163.39	-143.96	-23.95	176.53	162.37	14.16	12.466	
2,100.00	2,099.29	2,086.15	2,076.33	7.53	7.84	-163.33	-155.75	-25.22	192.41	177.54	14.88	12.935	
2,200.00	2,199.20	2,184.88	2,174.35	7.89	8.24	-163.27	-167.53	-26.50	208.30	192.71	15.59	13.361	
2,300.00	2,299.11	2,283.61	2,272.36	8.25	8.64	-163.23	-179.32	-27.77	224.19	207.88	16.31	13.749	
2,400.00	2,399.03	2,382.34	2,370.38	8.61	9.04	-163.19	-191.11	-29.04	240.08	223.05	17.02	14.104	
2,500.00	2,498.94	2,481.07	2,468.39	8.97	9.45	-163.15	-202.90	-30.31	255.96	238.23	17.74	14.430	
2,600.00	2,598.85	2,579.80	2,566.41	9.33	9.85	-163.12	-214.69	-31.58	271.85	253.40	18.45	14.731	
2,700.00	2,698.76	2,678.53	2,664.42	9.69	10.25	-163.10	-226.48	-32.85	287.74	268.57	19.17	15.009	
2,800.00	2,798.68	2,777.26	2,762.44	10.05	10.65	-163.07	-238.27	-34.12	303.63	283.74	19.89	15.266	
2,900.00	2,898.59	2,875.99	2,860.45	10.41	11.06	-163.05	-250.06	-35.39	319.52	298.91	20.61	15.506	
3,000.00	2,998.50	2,974.72	2,958.47	10.78	11.46	-163.03	-261.85	-36.66	335.40	314.08	21.32	15.729	
3,100.00	3,098.42	3,073.45	3,056.48	11.14	11.86	-163.01	-273.64	-37.93	351.29	329.25	22.04	15.938	
3,200.00	3,198.33	3,172.18	3,154.50	11.50	12.26	-163.00	-285.43	-39.20	367.18	344.42	22.76	16.133	
3,300.00	3,298.24	3,270.91	3,252.51	11.86	12.67	-162.98	-297.22	-40.47	383.07	359.59	23.48	16.316	
3,400.00	3,398.16	3,369.64	3,350.53	12.22	13.07	-162.97	-309.01	-41.74	398.96	374.76	24.20	16.488	
3,500.00	3,498.07	3,468.37	3,448.54	12.59	13.48	-162.95	-320.80	-43.01	414.85	389.93	24.91	16.651	
3,600.00	3,597.98	3,567.09	3,546.56	12.95	13.88	-162.94	-332.59	-44.28	430.73	405.10	25.63	16.804	
3,700.00	3,697.89	3,665.82	3,644.57	13.31	14.28	-162.93	-344.38	-45.55	446.62	420.27	26.35	16.948	
3,800.00	3,797.81	3,764.55	3,742.59	13.67	14.69	-162.92	-356.16	-46.82	462.51	435.44	27.07	17.085	
3,900.00	3,897.72	3,863.28	3,840.60	14.04	15.09	-162.91	-367.95	-48.09	478.40	450.61	27.79	17.215	
4,000.00	3,997.63	3,962.01	3,938.62	14.40	15.50	-162.90	-379.74	-49.36	494.29	465.78	28.51	17.338	
4,100.00	4,097.55	4,060.74	4,036.63	14.76	15.90	-162.89	-391.53	-50.63	510.18	480.95	29.23	17.455	
4,200.00	4,197.46	4,159.47	4,134.65	15.12	16.31	-162.89	-403.32	-51.91	526.06	496.12	29.95	17.566	
4,300.00	4,297.37	4,258.20	4,232.66	15.49	16.71	-162.88	-415.11	-53.18	541.95	511.29	30.67	17.672	
4,400.00	4,397.29	4,356.93	4,330.68	15.85	17.12	-162.87	-426.90	-54.45	557.84	526.45	31.39	17.773	
4,500.00	4,497.20	4,455.66	4,428.69	16.21	17.52	-162.87	-438.69	-55.72	573.73	541.62	32.11	17.870	
4,600.00	4,597.11	4,554.39	4,526.71	16.57	17.93	-162.86	-450.48	-56.99	589.62	556.79	32.83	17.962	
4,700.00	4,697.03	4,653.12	4,624.72	16.94	18.33	-162.85	-462.27	-58.26	605.51	571.96	33.55	18.050	
4,800.00	4,796.94	4,751.85	4,722.74	17.30	18.74	-162.85	-474.06	-59.53	621.39	587.13	34.26	18.135	



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #659H - OH - Plan #2												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Reference Depth (ft)	Offset Measured Depth (ft)	Vertical Offset Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
4,900.00	4,896.85	4,850.58	4,820.75	17.66	19.14	162.84	-485.85	-60.80	637.28	602.30	34.98	18.216	
5,000.00	4,996.76	4,949.31	4,918.77	18.02	19.55	162.84	-497.64	-62.07	653.17	617.47	35.70	18.294	
5,100.00	5,096.68	5,048.04	5,016.78	18.39	19.95	162.83	-509.43	-63.34	669.06	632.64	36.42	18.368	
5,200.00	5,196.59	5,146.77	5,114.80	18.75	20.36	162.83	-521.22	-64.61	684.95	647.80	37.14	18.440	
5,300.00	5,296.50	5,245.50	5,212.81	19.11	20.76	162.82	-533.01	-65.88	700.84	662.97	37.86	18.509	
5,400.00	5,396.42	5,344.23	5,310.83	19.47	21.17	162.82	-544.79	-67.15	716.72	678.14	38.58	18.575	
5,500.00	5,496.33	5,442.96	5,408.84	19.84	21.57	162.82	-556.58	-68.42	732.61	693.31	39.30	18.639	
5,600.00	5,596.24	5,541.69	5,506.86	20.20	21.98	162.81	-568.37	-69.69	748.50	708.48	40.03	18.701	
5,700.00	5,696.16	5,640.42	5,604.87	20.56	22.39	162.81	-580.16	-70.96	764.39	723.64	40.75	18.760	
5,800.00	5,796.07	5,739.15	5,702.89	20.93	22.79	162.80	-591.95	-72.23	780.28	738.81	41.47	18.817	
5,900.00	5,895.98	5,837.88	5,800.90	21.29	23.20	162.80	-603.74	-73.50	796.17	753.98	42.19	18.873	
6,000.00	5,995.89	5,936.61	5,898.92	21.65	23.60	162.80	-615.53	-74.77	812.06	769.15	42.91	18.926	
6,100.00	6,095.81	6,035.34	5,996.93	22.01	24.01	162.79	-627.32	-76.05	827.94	784.32	43.63	18.978	
6,200.00	6,195.72	6,134.07	6,094.95	22.38	24.41	162.79	-639.11	-77.32	843.83	799.48	44.35	19.028	
6,300.00	6,295.63	6,232.80	6,192.96	22.74	24.82	162.79	-650.90	-78.59	859.72	814.65	45.07	19.076	
6,380.96	6,376.52	6,312.73	6,272.32	23.03	25.15	162.79	-660.44	-79.61	872.58	826.93	45.65	19.114	
6,400.00	6,395.54	6,331.52	6,290.97	23.10	25.22	137.44	-662.69	-79.86	875.66	829.88	45.79	19.124	
6,450.00	6,445.29	6,380.64	6,339.74	23.29	25.43	116.56	-668.55	-80.49	884.27	838.12	46.15	19.160	
6,500.00	6,494.55	6,429.23	6,387.97	23.47	25.63	110.33	-674.35	-81.11	893.62	847.11	46.51	19.212	
6,550.00	6,542.99	6,476.97	6,435.37	23.66	25.82	107.40	-680.06	-81.73	903.75	856.87	46.88	19.279	
6,600.00	6,590.33	6,523.59	6,481.65	23.85	26.01	105.75	-685.62	-82.33	914.72	867.48	47.24	19.362	
6,650.00	6,636.28	6,567.05	6,524.80	24.05	26.19	104.69	-690.81	-82.89	926.63	879.04	47.60	19.469	
6,700.00	6,680.55	6,600.01	6,557.50	24.26	26.33	103.75	-694.73	-84.16	939.91	892.03	47.88	19.629	
6,750.00	6,722.86	6,626.81	6,584.01	24.48	26.44	102.80	-697.89	-86.46	954.98	906.84	48.14	19.839	
6,800.00	6,762.96	6,650.01	6,606.87	24.72	26.53	101.78	-700.59	-89.35	971.96	923.58	48.37	20.092	
6,850.00	6,800.59	6,671.39	6,627.83	24.99	26.62	100.64	-703.06	-92.75	990.94	942.33	48.61	20.384	
6,900.00	6,835.54	6,688.41	6,644.43	25.29	26.69	99.21	-705.01	-95.97	1,011.96	963.12	48.84	20.719	
6,950.00	6,867.58	6,700.01	6,655.69	25.63	26.73	97.33	-706.32	-98.42	1,034.98	985.93	49.05	21.101	
7,000.00	6,896.51	6,712.74	6,668.00	26.03	26.78	95.32	-707.75	-101.34	1,059.89	1,010.59	49.30	21.497	
7,050.00	6,922.15	6,720.54	6,675.50	26.48	26.82	92.84	-708.63	-103.25	1,086.56	1,037.01	49.55	21.929	
7,100.00	6,944.36	6,725.76	6,680.52	26.99	26.84	89.99	-709.21	-104.59	1,114.79	1,064.98	49.81	22.381	
7,150.00	6,962.98	6,728.68	6,683.32	27.57	26.85	86.81	-709.53	-105.35	1,144.35	1,094.26	50.09	22.846	
7,200.00	6,977.91	6,729.51	6,684.12	28.22	26.85	83.34	-709.63	-105.57	1,174.99	1,124.60	50.39	23.318	
7,250.00	6,989.06	6,728.50	6,683.14	28.93	26.85	79.66	-709.51	-105.30	1,206.47	1,155.76	50.71	23.793	
7,300.00	6,996.35	6,725.82	6,680.58	29.70	26.84	75.83	-709.22	-104.60	1,238.52	1,187.48	51.04	24.264	
7,350.00	6,999.74	6,721.67	6,676.59	30.52	26.82	71.95	-708.75	-103.54	1,270.89	1,219.50	51.39	24.730	
7,368.23	7,000.00	6,719.82	6,674.82	30.83	26.81	70.54	-708.55	-103.07	1,282.72	1,231.20	51.52	24.898	
7,400.00	7,000.00	6,716.52	6,671.64	31.38	26.80	70.35	-708.18	-102.25	1,303.55	1,251.81	51.75	25.192	
7,500.00	7,000.00	6,700.01	6,655.69	33.25	26.73	69.44	-706.32	-98.42	1,371.80	1,319.42	52.38	26.189	
7,600.00	7,000.00	6,700.01	6,655.69	35.30	26.73	69.44	-706.32	-98.42	1,443.52	1,390.37	53.15	27.157	
7,700.00	7,000.00	6,700.01	6,655.69	37.48	26.73	69.44	-706.32	-98.42	1,518.45	1,464.57	53.87	28.185	
7,800.00	7,000.00	6,700.01	6,655.69	39.78	26.73	69.44	-706.32	-98.42	1,596.12	1,541.59	54.53	29.269	
7,900.00	7,000.00	6,677.96	6,634.25	42.18	26.64	68.22	-703.81	-93.94	1,675.71	1,620.78	54.93	30.504	
8,000.00	7,000.00	6,672.40	6,628.81	44.66	26.62	67.91	-703.18	-92.93	1,757.54	1,702.10	55.44	31.702	
8,100.00	7,000.00	6,650.01	6,606.87	47.21	26.53	66.68	-700.59	-89.35	1,841.39	1,785.65	55.74	33.033	
8,200.00	7,000.00	6,650.01	6,606.87	49.82	26.53	66.68	-700.59	-89.35	1,926.36	1,870.15	56.21	34.269	



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design													Rosa Unit 30 - Rosa Unit #660H - OH - Plan #2		Offset Site Error:		0.00 ft	
Survey Program:		0-MWD										Offset Well Error:		0.00 ft				
Reference		Offset		Semi Major Axis			Offset Wellbore Centre			Rule Assigned:				Warning				
Measured	Vertical	Measured	Vertical	Reference	Offset	Highside				Distance								
Depth	Depth	Depth	Depth			Toolface	+N/-S	+E/-W		Between	Between	Minimum	Separation					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)		Centres	Ellipses	Separation	Factor					
										(ft)	(ft)	(ft)						
0.00	0.00	0.00	0.00	0.00	0.00	152.59	-26.57	13.78		29.93								
100.00	100.00	100.00	100.00	0.36	0.36	152.59	-26.57	13.78		29.93	29.21	0.72	41.748					
200.00	200.00	200.00	200.00	0.72	0.72	152.59	-26.57	13.78		29.93	28.50	1.43	20.874					
300.00	300.00	300.00	300.00	1.08	1.08	152.59	-26.57	13.78		29.93	27.78	2.15	13.916					
400.00	400.00	400.00	400.00	1.43	1.43	152.59	-26.57	13.78		29.93	27.06	2.87	10.437					
500.00	500.00	500.00	500.00	1.79	1.79	152.59	-26.57	13.78		29.93	26.35	3.58	8.350	CC, ES				
600.00	600.00	599.08	599.06	2.15	2.13	154.22	-28.28	13.66		31.42	27.14	4.28	7.339					
700.00	700.00	697.92	697.76	2.51	2.46	158.28	-33.39	13.30		36.01	31.04	4.97	7.252	SF				
800.00	800.00	796.29	795.76	2.87	2.80	163.11	-41.84	12.71		43.93	38.28	5.65	7.775					
900.00	900.00	893.96	892.72	3.23	3.15	167.49	-53.55	11.88		55.33	49.00	6.33	8.740					
1,000.00	1,000.00	990.73	988.33	3.58	3.52	171.00	-68.39	10.84		70.22	63.22	7.00	10.025					
1,100.00	1,100.00	1,086.37	1,082.28	3.94	3.91	173.66	-86.22	9.58		88.54	80.87	7.67	11.545					
1,200.00	1,200.00	1,181.22	1,174.83	4.30	4.32	175.66	-106.95	8.12		110.17	101.84	8.33	13.224					
1,300.00	1,299.98	1,278.14	1,269.13	4.66	4.76	147.83	-129.26	6.55		134.49	125.46	9.03	14.895					
1,319.49	1,319.46	1,296.94	1,287.42	4.73	4.84	148.15	-133.59	6.25		139.58	130.41	9.17	15.214					
1,400.00	1,399.90	1,374.50	1,362.89	5.02	5.20	149.51	-151.45	4.99		160.87	151.13	9.74	16.519					
1,500.00	1,499.81	1,470.85	1,456.63	5.37	5.66	150.76	-173.63	3.43		187.41	176.96	10.44	17.948					
1,600.00	1,599.72	1,567.19	1,550.38	5.73	6.13	151.70	-195.81	1.87		214.00	202.85	11.15	19.196					
1,700.00	1,699.63	1,663.54	1,644.12	6.09	6.60	152.44	-217.99	0.31		240.64	228.78	11.86	20.294					
1,800.00	1,799.55	1,759.89	1,737.87	6.45	7.08	153.03	-240.18	-1.26		267.31	254.74	12.57	21.267					
1,900.00	1,899.46	1,856.23	1,831.61	6.81	7.56	153.51	-262.36	-2.82		294.00	280.71	13.28	22.134					
2,000.00	1,999.37	1,952.58	1,925.36	7.17	8.04	153.91	-284.54	-4.38		320.70	306.70	14.00	22.911					
2,100.00	2,099.29	2,048.92	2,019.10	7.53	8.52	154.25	-306.72	-5.94		347.42	332.70	14.71	23.611					
2,200.00	2,199.20	2,145.27	2,112.85	7.89	9.01	154.54	-328.90	-7.50		374.14	358.71	15.43	24.244					
2,300.00	2,299.11	2,241.62	2,206.59	8.25	9.50	154.79	-351.09	-9.06		400.88	384.73	16.15	24.821					
2,400.00	2,399.03	2,337.96	2,300.34	8.61	9.99	155.02	-373.27	-10.62		427.62	410.75	16.87	25.347					
2,500.00	2,498.94	2,434.31	2,394.08	8.97	10.48	155.21	-395.45	-12.19		454.37	436.77	17.59	25.829					
2,600.00	2,598.85	2,530.65	2,487.83	9.33	10.98	155.38	-417.63	-13.75		481.12	462.80	18.31	26.272					
2,700.00	2,698.76	2,627.00	2,581.57	9.69	11.47	155.54	-439.81	-15.31		507.87	488.84	19.03	26.681					
2,800.00	2,798.68	2,723.35	2,675.32	10.05	11.97	155.68	-461.99	-16.87		534.63	514.87	19.76	27.060					
2,900.00	2,898.59	2,819.69	2,769.06	10.41	12.46	155.80	-484.18	-18.43		561.39	540.91	20.48	27.411					
3,000.00	2,998.50	2,916.04	2,862.81	10.78	12.96	155.92	-506.36	-19.99		588.15	566.95	21.20	27.738					
3,100.00	3,098.42	3,012.38	2,956.55	11.14	13.46	156.02	-528.54	-21.55		614.91	592.99	21.93	28.042					
3,200.00	3,198.33	3,108.73	3,050.30	11.50	13.96	156.12	-550.72	-23.12		641.68	619.03	22.65	28.327					
3,300.00	3,298.24	3,205.08	3,144.04	11.86	14.46	156.21	-572.90	-24.68		668.45	645.07	23.38	28.594					
3,400.00	3,398.16	3,301.42	3,237.79	12.22	14.95	156.29	-595.08	-26.24		695.22	671.11	24.10	28.844					
3,500.00	3,498.07	3,397.77	3,331.53	12.59	15.45	156.36	-617.27	-27.80		721.99	697.16	24.83	29.080					
3,600.00	3,597.98	3,494.11	3,425.28	12.95	15.95	156.43	-639.45	-29.36		748.76	723.20	25.55	29.302					
3,700.00	3,697.89	3,590.46	3,519.02	13.31	16.45	156.50	-661.63	-30.92		775.53	749.25	26.28	29.511					
3,800.00	3,797.81	3,686.81	3,612.77	13.67	16.95	156.56	-683.81	-32.48		802.30	775.30	27.01	29.709					
3,900.00	3,897.72	3,783.15	3,706.51	14.04	17.45	156.62	-705.99	-34.05		829.08	801.34	27.73	29.896					
4,000.00	3,997.63	3,879.50	3,800.25	14.40	17.95	156.67	-728.17	-35.61		855.85	827.39	28.46	30.073					
4,100.00	4,097.55	3,975.84	3,894.00	14.76	18.46	156.72	-750.36	-37.17		882.63	853.44	29.19	30.241					
4,200.00	4,197.46	4,072.19	3,987.74	15.12	18.96	156.77	-772.54	-38.73		909.40	879.49	29.91	30.401					
4,300.00	4,297.37	4,168.54	4,081.49	15.49	19.46	156.81	-794.72	-40.29		936.18	905.54	30.64	30.554					
4,400.00	4,397.29	4,264.88	4,175.23	15.85	19.96	156.85	-816.90	-41.85		962.95	931.59	31.37	30.699					
4,500.00	4,497.20	4,361.23	4,268.98	16.21	20.46	156.89	-839.08	-43.41		989.73	957.64	32.10	30.837					
4,600.00	4,597.11	4,457.57	4,362.72	16.57	20.96	156.93	-861.26	-44.98		1,016.51	983.69	32.82	30.969					
4,700.00	4,697.03	4,553.92	4,456.47	16.94	21.47	156.97	-883.45	-46.54		1,043.29	1,009.74	33.55	31.095					
4,800.00	4,796.94	4,650.27	4,550.21	17.30	21.97	157.00	-905.63	-48.10		1,070.07	1,035.79	34.28	31.215					
4,900.00	4,896.85	4,746.61	4,643.96	17.66	22.47	157.03	-927.81	-49.66		1,096.84	1,061.84	35.01	31.331					



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #660H - OH - Plan #2													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.00	4,996.76	4,842.96	4,737.70	18.02	22.97	157.06	-949.99	-51.22	1,123.62	1,087.89	35.74	31.442		
5,100.00	5,096.68	4,939.30	4,831.45	18.39	23.48	157.09	-972.17	-52.78	1,150.40	1,113.94	36.47	31.548		
5,200.00	5,196.59	5,035.65	4,925.19	18.75	23.98	157.12	-994.35	-54.34	1,177.18	1,139.99	37.19	31.649		
5,300.00	5,296.50	5,132.00	5,018.94	19.11	24.48	157.15	-1,016.54	-55.91	1,203.96	1,166.04	37.92	31.747		
5,400.00	5,396.42	5,228.34	5,112.68	19.47	24.98	157.17	-1,038.72	-57.47	1,230.74	1,192.09	38.65	31.841		
5,500.00	5,496.33	5,324.69	5,206.43	19.84	25.49	157.20	-1,060.90	-59.03	1,257.52	1,218.14	39.38	31.932		
5,600.00	5,596.24	5,421.03	5,300.17	20.20	25.99	157.22	-1,083.08	-60.59	1,284.30	1,244.19	40.11	32.019		
5,700.00	5,696.16	5,517.38	5,393.92	20.56	26.49	157.24	-1,105.26	-62.15	1,311.08	1,270.24	40.84	32.102		
5,800.00	5,796.07	5,613.73	5,487.66	20.93	27.00	157.27	-1,127.44	-63.71	1,337.86	1,296.29	41.57	32.183		
5,900.00	5,895.98	5,710.07	5,581.41	21.29	27.50	157.29	-1,149.63	-65.27	1,364.64	1,322.34	42.30	32.261		
6,000.00	5,995.89	5,806.42	5,675.15	21.65	28.00	157.31	-1,171.81	-66.84	1,391.43	1,348.40	43.03	32.336		
6,100.00	6,095.81	5,902.76	5,768.90	22.01	28.51	157.33	-1,193.99	-68.40	1,418.21	1,374.45	43.76	32.408		
6,200.00	6,195.72	5,999.11	5,862.64	22.38	29.01	157.34	-1,216.17	-69.96	1,444.99	1,400.50	44.49	32.479		
6,300.00	6,295.63	6,095.46	5,956.39	22.74	29.51	157.36	-1,238.35	-71.52	1,471.77	1,426.55	45.22	32.546		
6,380.96	6,376.52	6,173.46	6,032.28	23.03	29.92	157.38	-1,256.31	-72.78	1,493.45	1,447.64	45.81	32.599		
6,400.00	6,395.54	6,191.79	6,050.12	23.10	30.02	131.83	-1,260.53	-73.08	1,498.58	1,452.63	45.95	32.612		
6,450.00	6,445.29	6,239.72	6,096.76	23.29	30.27	110.36	-1,271.57	-73.86	1,512.29	1,465.97	46.32	32.650		
6,500.00	6,494.55	6,287.12	6,142.88	23.47	30.51	103.49	-1,282.48	-74.63	1,526.31	1,479.62	46.69	32.693		
6,550.00	6,542.99	6,333.69	6,188.19	23.66	30.76	99.87	-1,293.20	-75.38	1,540.61	1,493.56	47.06	32.740		
6,600.00	6,590.33	6,379.15	6,232.42	23.85	30.99	97.51	-1,303.67	-76.12	1,555.19	1,507.76	47.43	32.791		
6,650.00	6,636.28	6,423.21	6,275.29	24.05	31.23	95.78	-1,313.81	-76.83	1,570.05	1,522.25	47.80	32.846		
6,700.00	6,680.55	6,465.60	6,316.53	24.26	31.45	94.40	-1,323.57	-77.52	1,585.23	1,537.05	48.18	32.903		
6,750.00	6,722.86	6,506.06	6,355.91	24.48	31.66	93.24	-1,332.89	-78.17	1,600.76	1,552.20	48.57	32.961		
6,800.00	6,762.96	6,542.68	6,391.53	24.72	31.85	92.16	-1,341.32	-78.78	1,616.71	1,567.75	48.95	33.026		
6,850.00	6,800.59	6,586.14	6,414.35	24.99	31.97	90.88	-1,346.71	-79.72	1,633.28	1,584.01	49.27	33.148		
6,900.00	6,835.54	6,586.18	6,433.80	25.29	32.08	89.55	-1,351.29	-81.21	1,650.62	1,601.02	49.61	33.275		
6,950.00	6,867.58	6,600.01	6,447.19	25.63	32.15	88.03	-1,354.44	-82.61	1,668.76	1,618.83	49.94	33.418		
7,000.00	6,896.51	6,616.36	6,462.99	26.03	32.23	86.58	-1,358.14	-84.64	1,687.67	1,637.33	50.34	33.527		
7,050.00	6,922.15	6,626.87	6,473.11	26.48	32.29	84.91	-1,360.51	-86.16	1,707.32	1,656.57	50.75	33.642		
7,100.00	6,944.36	6,634.63	6,480.56	26.99	32.33	83.11	-1,362.26	-87.40	1,727.65	1,676.45	51.20	33.743		
7,150.00	6,962.98	6,650.01	6,495.31	27.57	32.41	81.54	-1,365.70	-90.13	1,748.61	1,696.83	51.78	33.771		
7,200.00	6,977.91	6,650.01	6,495.31	28.22	32.41	79.41	-1,365.70	-90.13	1,769.96	1,717.68	52.28	33.853		
7,250.00	6,989.06	6,650.01	6,495.31	28.93	32.41	77.26	-1,365.70	-90.13	1,791.68	1,738.84	52.84	33.905		
7,300.00	6,996.35	6,650.01	6,495.31	29.70	32.41	75.12	-1,365.70	-90.13	1,813.62	1,760.17	53.45	33.929		
7,350.00	6,999.74	6,650.01	6,495.31	30.52	32.41	73.01	-1,365.70	-90.13	1,835.65	1,781.54	54.11	33.927		
7,368.23	7,000.00	6,650.01	6,495.31	30.83	32.41	72.25	-1,365.70	-90.13	1,843.67	1,789.32	54.35	33.921		
7,400.00	7,000.00	6,650.01	6,495.31	31.38	32.41	72.25	-1,365.70	-90.13	1,857.86	1,803.07	54.79	33.910		
7,500.00	7,000.00	6,630.30	6,476.41	33.25	32.30	71.58	-1,361.29	-86.70	1,905.04	1,849.03	56.02	34.008		
7,600.00	7,000.00	6,624.40	6,470.73	35.30	32.27	71.38	-1,359.96	-85.79	1,956.26	1,898.86	57.39	34.084		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #663H - OH - Plan #2													Offset Site Error: 0.00 ft	
Survey Program: 0-MWD									Rule Assigned:				Offset Well Error: 0.00 ft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
0.00	0.00	0.00	0.00	0.00	0.00	152.41	-53.13	27.76	59.95					
100.00	100.00	100.00	100.00	0.36	0.36	152.41	-53.13	27.76	59.95	59.23	0.72	83.612		
200.00	200.00	200.00	200.00	0.72	0.72	152.41	-53.13	27.76	59.95	58.51	1.43	41.806		
300.00	300.00	300.00	300.00	1.08	1.08	152.41	-53.13	27.76	59.95	57.79	2.15	27.871		
400.00	400.00	400.00	400.00	1.43	1.43	152.41	-53.13	27.76	59.95	57.08	2.87	20.903		
500.00	500.00	500.00	500.00	1.79	1.79	152.41	-53.13	27.76	59.95	56.36	3.58	16.722 CC, ES		
600.00	600.00	598.02	598.01	2.15	2.13	152.93	-54.79	28.00	61.56	57.29	4.28	14.391		
700.00	700.00	695.82	695.67	2.51	2.46	154.32	-59.75	28.73	66.44	61.48	4.96	13.400		
800.00	800.00	794.03	793.54	2.87	2.79	156.20	-67.83	29.91	74.41	68.77	5.64	13.184		
900.00	900.00	893.63	892.73	3.23	3.14	157.86	-76.71	31.22	83.13	76.79	6.34	13.105		
1,000.00	1,000.00	993.22	991.91	3.58	3.51	159.20	-85.58	32.52	91.91	84.86	7.05	13.042		
1,100.00	1,100.00	1,092.81	1,091.10	3.94	3.87	160.30	-94.46	33.82	100.72	92.97	7.75	12.990		
1,200.00	1,200.00	1,192.41	1,190.29	4.30	4.24	161.23	-103.34	35.12	109.57	101.11	8.46	12.947		
1,300.00	1,299.98	1,291.85	1,289.34	4.66	4.61	133.08	-112.20	36.42	119.63	110.45	9.17	13.042		
1,319.49	1,319.46	1,311.20	1,308.60	4.73	4.69	133.43	-113.93	36.67	121.87	112.56	9.31	13.088		
1,400.00	1,399.90	1,391.07	1,388.15	5.02	4.99	134.97	-121.04	37.71	131.39	121.51	9.88	13.296		
1,500.00	1,499.81	1,490.28	1,486.96	5.37	5.36	136.60	-129.89	39.01	143.32	132.73	10.59	13.534		
1,600.00	1,599.72	1,589.49	1,585.76	5.73	5.74	137.98	-138.73	40.30	155.35	144.05	11.30	13.748		
1,700.00	1,699.63	1,688.70	1,684.57	6.09	6.12	139.16	-147.57	41.60	167.46	155.45	12.01	13.942		
1,800.00	1,799.55	1,787.91	1,783.37	6.45	6.50	140.18	-156.42	42.90	179.63	166.90	12.72	14.118		
1,900.00	1,899.46	1,887.12	1,882.18	6.81	6.88	141.07	-165.26	44.19	191.84	178.40	13.44	14.278		
2,000.00	1,999.37	1,986.33	1,980.99	7.17	7.26	141.85	-174.10	45.49	204.10	189.95	14.15	14.424		
2,100.00	2,099.29	2,085.54	2,079.79	7.53	7.64	142.55	-182.94	46.78	216.39	201.52	14.86	14.557		
2,200.00	2,199.20	2,184.75	2,178.60	7.89	8.02	143.17	-191.79	48.08	228.70	213.12	15.58	14.680		
2,300.00	2,299.11	2,283.96	2,277.41	8.25	8.41	143.72	-200.63	49.38	241.04	224.75	16.29	14.793		
2,400.00	2,399.03	2,383.17	2,376.21	8.61	8.79	144.22	-209.47	50.67	253.41	236.39	17.01	14.897		
2,500.00	2,498.94	2,482.38	2,475.02	8.97	9.17	144.68	-218.32	51.97	265.78	248.06	17.73	14.993		
2,600.00	2,598.85	2,581.59	2,573.83	9.33	9.56	145.10	-227.16	53.26	278.18	259.73	18.44	15.083		
2,700.00	2,698.76	2,680.80	2,672.63	9.69	9.94	145.48	-236.00	54.56	290.58	271.42	19.16	15.166		
2,800.00	2,798.68	2,780.01	2,771.44	10.05	10.32	145.82	-244.84	55.86	303.00	283.13	19.88	15.244		
2,900.00	2,898.59	2,879.22	2,870.25	10.41	10.71	146.15	-253.69	57.15	315.43	294.84	20.59	15.317		
3,000.00	2,998.50	2,978.43	2,969.05	10.78	11.09	146.44	-262.53	58.45	327.87	306.56	21.31	15.384		
3,100.00	3,098.42	3,077.64	3,067.86	11.14	11.48	146.72	-271.37	59.74	340.31	318.28	22.03	15.448		
3,200.00	3,198.33	3,176.85	3,166.66	11.50	11.86	146.97	-280.22	61.04	352.77	330.02	22.75	15.508		
3,300.00	3,298.24	3,276.06	3,265.47	11.86	12.25	147.21	-289.06	62.34	365.23	341.76	23.47	15.565		
3,400.00	3,398.16	3,375.27	3,364.28	12.22	12.63	147.43	-297.90	63.63	377.69	353.51	24.18	15.618		
3,500.00	3,498.07	3,474.48	3,463.08	12.59	13.02	147.64	-306.74	64.93	390.16	365.26	24.90	15.668		
3,600.00	3,597.98	3,573.69	3,561.89	12.95	13.40	147.84	-315.59	66.22	402.64	377.02	25.62	15.716		
3,700.00	3,697.89	3,672.90	3,660.70	13.31	13.79	148.02	-324.43	67.52	415.12	388.78	26.34	15.761		
3,800.00	3,797.81	3,772.11	3,759.50	13.67	14.17	148.19	-333.27	68.82	427.60	400.54	27.06	15.804		
3,900.00	3,897.72	3,871.32	3,858.31	14.04	14.56	148.36	-342.12	70.11	440.09	412.31	27.78	15.844		
4,000.00	3,997.63	3,970.53	3,957.12	14.40	14.94	148.51	-350.96	71.41	452.58	424.08	28.49	15.883		
4,100.00	4,097.55	4,069.74	4,055.92	14.76	15.33	148.66	-359.80	72.70	465.07	435.86	29.21	15.920		
4,200.00	4,197.46	4,168.95	4,154.73	15.12	15.72	148.80	-368.64	74.00	477.56	447.63	29.93	15.955		
4,300.00	4,297.37	4,268.15	4,253.53	15.49	16.10	148.93	-377.49	75.29	490.06	459.41	30.65	15.988		
4,400.00	4,397.29	4,367.36	4,352.34	15.85	16.49	149.05	-386.33	76.59	502.56	471.19	31.37	16.020		
4,500.00	4,497.20	4,466.57	4,451.15	16.21	16.87	149.17	-395.17	77.89	515.07	482.98	32.09	16.051		
4,600.00	4,597.11	4,565.78	4,549.95	16.57	17.26	149.28	-404.02	79.18	527.57	494.76	32.81	16.080		
4,700.00	4,697.03	4,664.99	4,648.76	16.94	17.64	149.39	-412.86	80.48	540.08	506.55	33.53	16.108		
4,800.00	4,796.94	4,764.20	4,747.57	17.30	18.03	149.49	-421.70	81.77	552.59	518.34	34.25	16.135		
4,900.00	4,896.85	4,863.41	4,846.37	17.66	18.42	149.59	-430.54	83.07	565.10	530.13	34.97	16.161		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #663H - OH - Plan #2													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
5,000.00	4,996.76	4,962.62	4,945.18	18.02	18.80	149.69	-439.39	84.37	577.61	541.93	35.69	16.186		
5,100.00	5,096.68	5,061.83	5,043.99	18.39	19.19	149.78	-448.23	85.66	590.13	553.72	36.41	16.210		
5,200.00	5,196.59	5,161.04	5,142.79	18.75	19.57	149.86	-457.07	86.96	602.64	565.52	37.13	16.233		
5,300.00	5,296.50	5,260.25	5,241.60	19.11	19.96	149.94	-465.92	88.25	615.16	577.31	37.85	16.255		
5,400.00	5,396.42	5,359.46	5,340.40	19.47	20.35	150.02	-474.76	89.55	627.68	589.11	38.56	16.276		
5,500.00	5,496.33	5,458.67	5,439.21	19.84	20.73	150.10	-483.60	90.85	640.19	600.91	39.28	16.296		
5,600.00	5,596.24	5,557.88	5,538.02	20.20	21.12	150.17	-492.44	92.14	652.71	612.71	40.00	16.316		
5,700.00	5,696.16	5,657.09	5,636.82	20.56	21.50	150.24	-501.29	93.44	665.24	624.51	40.72	16.335		
5,800.00	5,796.07	5,756.30	5,735.63	20.93	21.89	150.31	-510.13	94.73	677.76	636.31	41.44	16.353		
5,900.00	5,895.98	5,855.51	5,834.44	21.29	22.28	150.38	-518.97	96.03	690.28	648.12	42.16	16.371		
6,000.00	5,995.89	5,954.72	5,933.24	21.65	22.66	150.44	-527.82	97.33	702.80	659.92	42.88	16.388		
6,100.00	6,095.81	6,053.93	6,032.05	22.01	23.05	150.50	-536.66	98.62	715.33	671.72	43.60	16.405		
6,200.00	6,195.72	6,153.14	6,130.86	22.38	23.44	150.56	-545.50	99.92	727.85	683.53	44.32	16.421		
6,300.00	6,295.63	6,252.35	6,229.66	22.74	23.82	150.62	-554.34	101.21	740.38	695.33	45.04	16.437		
6,380.96	6,376.52	6,332.67	6,309.65	23.03	24.13	150.66	-561.50	102.26	750.52	704.89	45.63	16.449		
6,400.00	6,395.54	6,351.56	6,328.46	23.10	24.21	125.39	-563.19	102.51	752.90	707.14	45.76	16.452		
6,450.00	6,445.29	6,401.01	6,377.72	23.29	24.40	104.79	-567.60	103.15	759.12	712.99	46.13	16.457		
6,500.00	6,494.55	6,450.02	6,426.53	23.47	24.59	98.95	-571.96	103.80	765.30	718.81	46.49	16.461		
6,550.00	6,542.99	6,498.29	6,474.60	23.66	24.78	96.52	-576.27	104.43	771.53	724.67	46.86	16.465		
6,600.00	6,590.33	6,545.51	6,521.63	23.85	24.96	95.47	-580.48	105.04	777.93	730.70	47.23	16.472		
6,650.00	6,636.28	6,595.50	6,571.35	24.05	25.16	95.16	-584.93	107.44	784.56	736.93	47.63	16.472		
6,700.00	6,680.55	6,647.25	6,622.46	24.26	25.36	95.16	-589.54	114.03	791.32	743.26	48.05	16.468		
6,750.00	6,722.86	6,700.72	6,674.52	24.48	25.57	95.35	-594.25	125.19	798.14	749.64	48.50	16.457		
6,800.00	6,762.96	6,756.06	6,727.22	24.72	25.78	95.66	-599.05	141.32	804.96	755.99	48.97	16.437		
6,850.00	6,800.59	6,813.40	6,780.14	24.99	25.99	96.06	-603.89	162.81	811.71	762.23	49.48	16.406		
6,900.00	6,835.54	6,872.88	6,832.76	25.29	26.22	96.51	-608.74	190.06	818.30	768.28	50.02	16.361		
6,950.00	6,867.58	6,934.61	6,884.45	25.63	26.45	97.00	-613.53	223.42	824.63	774.03	50.60	16.296		
7,000.00	6,896.51	6,998.66	6,934.42	26.03	26.71	97.50	-618.21	263.18	830.61	779.36	51.25	16.207		
7,050.00	6,922.15	7,065.08	6,981.75	26.48	26.99	98.00	-622.68	309.52	836.12	784.13	51.99	16.082		
7,100.00	6,944.36	7,133.83	7,025.40	26.99	27.33	98.48	-626.86	362.42	841.06	788.21	52.85	15.915		
7,150.00	6,962.98	7,204.79	7,064.23	27.57	27.76	98.93	-630.63	421.65	845.31	791.47	53.85	15.698		
7,200.00	6,977.91	7,277.77	7,097.06	28.22	28.35	99.33	-633.91	486.71	848.78	793.73	55.06	15.417		
7,250.00	6,989.06	7,352.46	7,122.75	28.93	29.10	99.67	-636.57	556.75	851.38	794.91	56.47	15.077		
7,300.00	6,996.35	7,428.48	7,140.34	29.70	30.05	99.92	-638.52	630.63	853.01	794.89	58.12	14.677		
7,350.00	6,999.74	7,505.34	7,149.07	30.52	31.17	100.08	-639.70	706.93	853.64	793.66	59.98	14.232		
7,368.23	7,000.00	7,533.47	7,149.97	30.83	31.61	100.12	-639.92	735.04	853.61	792.90	60.71	14.061		
7,400.00	7,000.00	7,567.45	7,150.00	31.38	32.17	100.12	-640.10	769.03	853.36	791.53	61.83	13.802		
7,500.00	7,000.00	7,667.45	7,150.00	33.25	33.96	100.13	-640.62	869.03	852.56	787.06	65.50	13.016		
7,600.00	7,000.00	7,767.45	7,150.00	35.30	35.91	100.14	-641.13	969.02	851.75	782.26	69.50	12.256		
7,700.00	7,000.00	7,867.44	7,150.00	37.48	38.03	100.15	-641.65	1,069.02	850.95	777.18	73.77	11.535		
7,800.00	7,000.00	7,967.44	7,150.00	39.78	40.26	100.16	-642.17	1,169.01	850.15	771.87	78.28	10.860		
7,900.00	7,000.00	8,067.44	7,150.00	42.18	42.61	100.17	-642.68	1,269.01	849.34	766.36	82.99	10.234		
8,000.00	7,000.00	8,167.43	7,150.00	44.66	45.04	100.18	-643.20	1,369.00	848.54	760.68	87.86	9.658		
8,100.00	7,000.00	8,267.43	7,150.00	47.21	47.55	100.19	-643.71	1,469.00	847.74	754.87	92.87	9.128		
8,200.00	7,000.00	8,367.43	7,150.00	49.82	50.13	100.20	-644.23	1,568.99	846.94	748.93	98.00	8.642		
8,300.00	7,000.00	8,467.42	7,150.00	52.48	52.75	100.21	-644.75	1,668.99	846.13	742.90	103.23	8.197		
8,400.00	7,000.00	8,567.42	7,150.00	55.19	55.42	100.22	-645.26	1,768.98	845.33	736.79	108.54	7.788		
8,500.00	7,000.00	8,667.42	7,150.00	57.93	58.14	100.23	-645.78	1,868.98	844.53	730.60	113.93	7.413		
8,600.00	7,000.00	8,767.41	7,150.00	60.70	60.88	100.24	-646.30	1,968.97	843.73	724.34	119.38	7.067		
8,700.00	7,000.00	8,867.41	7,150.00	63.50	63.66	100.25	-646.81	2,068.97	842.92	718.04	124.89	6.749		
8,800.00	7,000.00	8,967.41	7,150.00	66.33	66.46	100.26	-647.33	2,168.96	842.12	711.68	130.44	6.456		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #663H - OH - Plan #2													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Reference (ft)	Semi Major Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
8,900.00	7,000.00	9,067.40	7,150.00	69.17	69.29	100.27	-647.85	2,268.96	841.32	705.28	136.04	6.184		
9,000.00	7,000.00	9,167.40	7,150.00	72.04	72.13	100.28	-648.36	2,368.96	840.52	698.85	141.67	5.933		
9,100.00	7,000.00	9,267.40	7,150.00	74.92	75.00	100.29	-648.88	2,468.95	839.72	692.38	147.34	5.699		
9,200.00	7,000.00	9,367.39	7,150.00	77.81	77.88	100.30	-649.40	2,568.95	838.91	685.88	153.03	5.482		
9,300.00	7,000.00	9,467.39	7,150.00	80.72	80.77	100.31	-649.91	2,668.94	838.11	679.36	158.75	5.279		
9,400.00	7,000.00	9,567.39	7,150.00	83.64	83.68	100.32	-650.43	2,768.94	837.31	672.81	164.50	5.090		
9,500.00	7,000.00	9,667.38	7,150.00	86.58	86.59	100.33	-650.95	2,868.93	836.51	666.25	170.26	4.913		
9,600.00	7,000.00	9,767.38	7,150.00	89.52	89.52	100.34	-651.46	2,968.93	835.70	659.66	176.04	4.747		
9,700.00	7,000.00	9,867.38	7,150.00	92.47	92.46	100.35	-651.98	3,068.92	834.90	653.06	181.84	4.591		
9,800.00	7,000.00	9,967.37	7,150.00	95.42	95.40	100.36	-652.49	3,168.92	834.10	646.44	187.66	4.445		
9,900.00	7,000.00	10,067.37	7,150.00	98.39	98.36	100.37	-653.01	3,268.91	833.30	639.81	193.49	4.307		
10,000.00	7,000.00	10,167.37	7,150.00	101.36	101.32	100.38	-653.53	3,368.91	832.50	633.17	199.33	4.177		
10,100.00	7,000.00	10,267.36	7,150.00	104.34	104.28	100.39	-654.04	3,468.90	831.69	626.51	205.18	4.053		
10,200.00	7,000.00	10,367.36	7,150.00	107.32	107.26	100.40	-654.56	3,568.90	830.89	619.85	211.04	3.937		
10,300.00	7,000.00	10,467.36	7,150.00	110.31	110.23	100.41	-655.08	3,668.89	830.09	613.17	216.92	3.827		
10,400.00	7,000.00	10,567.35	7,150.00	113.30	113.22	100.42	-655.59	3,768.89	829.29	606.49	222.80	3.722		
10,500.00	7,000.00	10,667.35	7,150.00	116.30	116.20	100.43	-656.11	3,868.89	828.49	599.80	228.69	3.623		
10,600.00	7,000.00	10,767.35	7,150.00	119.30	119.20	100.44	-656.63	3,968.88	827.68	593.10	234.59	3.528		
10,700.00	7,000.00	10,867.34	7,150.00	122.30	122.19	100.45	-657.14	4,068.88	826.88	586.39	240.49	3.438		
10,800.00	7,000.00	10,967.34	7,150.00	125.31	125.19	100.46	-657.66	4,168.87	826.08	579.68	246.40	3.353		
10,900.00	7,000.00	11,067.34	7,150.00	128.32	128.19	100.47	-658.18	4,268.87	825.28	572.96	252.32	3.271		
11,000.00	7,000.00	11,167.33	7,150.00	131.33	131.20	100.48	-658.69	4,368.86	824.48	566.23	258.24	3.193		
11,100.00	7,000.00	11,267.33	7,150.00	134.35	134.21	100.49	-659.21	4,468.86	823.67	559.51	264.17	3.118		
11,200.00	7,000.00	11,367.33	7,150.00	137.37	137.22	100.50	-659.73	4,568.85	822.87	552.77	270.10	3.047		
11,300.00	7,000.00	11,467.32	7,150.00	140.39	140.23	100.51	-660.24	4,668.85	822.07	546.03	276.04	2.978		
11,400.00	7,000.00	11,567.32	7,150.00	143.41	143.25	100.52	-660.76	4,768.84	821.27	539.29	281.98	2.913		
11,500.00	7,000.00	11,667.32	7,150.00	146.44	146.27	100.53	-661.27	4,868.84	820.47	532.55	287.92	2.850		
11,600.00	7,000.00	11,767.31	7,150.00	149.46	149.29	100.55	-661.79	4,968.83	819.67	525.80	293.87	2.789		
11,700.00	7,000.00	11,867.31	7,150.00	152.49	152.31	100.56	-662.31	5,068.83	818.86	519.05	299.82	2.731		
11,800.00	7,000.00	11,967.31	7,150.00	155.52	155.34	100.57	-662.82	5,168.82	818.06	512.29	305.77	2.675		
11,900.00	7,000.00	12,067.30	7,150.00	158.56	158.36	100.58	-663.34	5,268.82	817.26	505.53	311.73	2.622		
12,000.00	7,000.00	12,167.30	7,150.00	161.59	161.39	100.59	-663.86	5,368.82	816.46	498.77	317.69	2.570		
12,100.00	7,000.00	12,267.30	7,150.00	164.63	164.42	100.60	-664.37	5,468.81	815.66	492.01	323.65	2.520		
12,200.00	7,000.00	12,367.29	7,150.00	167.66	167.45	100.61	-664.89	5,568.81	814.86	485.24	329.62	2.472		
12,300.00	7,000.00	12,467.29	7,150.00	170.70	170.48	100.62	-665.41	5,668.80	814.06	478.47	335.58	2.426		
12,400.00	7,000.00	12,567.29	7,150.00	173.74	173.52	100.63	-665.92	5,768.80	813.25	471.70	341.55	2.381		
12,500.00	7,000.00	12,667.28	7,150.00	176.78	176.55	100.64	-666.44	5,868.79	812.45	464.93	347.52	2.338		
12,600.00	7,000.00	12,767.28	7,150.00	179.82	179.59	100.65	-666.96	5,968.79	811.65	458.16	353.49	2.296		
12,700.00	7,000.00	12,867.28	7,150.00	182.87	182.63	100.66	-667.47	6,068.78	810.85	451.38	359.47	2.256		
12,800.00	7,000.00	12,967.27	7,150.00	185.91	185.66	100.67	-667.99	6,168.78	810.05	444.61	365.44	2.217		
12,900.00	7,000.00	13,067.27	7,150.00	188.96	188.70	100.68	-668.51	6,268.77	809.25	437.83	371.42	2.179		
13,000.00	7,000.00	13,167.27	7,150.00	192.00	191.74	100.69	-669.02	6,368.77	808.45	431.05	377.40	2.142		
13,100.00	7,000.00	13,267.26	7,150.00	195.05	194.79	100.70	-669.54	6,468.76	807.64	424.27	383.38	2.107		
13,200.00	7,000.00	13,367.26	7,150.00	198.10	197.83	100.71	-670.06	6,568.76	806.84	417.48	389.36	2.072		
13,300.00	7,000.00	13,467.26	7,150.00	201.14	200.87	100.73	-670.57	6,668.76	806.04	410.70	395.34	2.039		
13,400.00	7,000.00	13,567.25	7,150.00	204.19	203.92	100.74	-671.09	6,768.75	805.24	403.92	401.32	2.006		
13,500.00	7,000.00	13,667.25	7,150.00	207.24	206.96	100.75	-671.60	6,868.75	804.44	397.13	407.31	1.975		
13,600.00	7,000.00	13,767.25	7,150.00	210.29	210.01	100.76	-672.12	6,968.74	803.64	390.35	413.29	1.944		
13,700.00	7,000.00	13,867.24	7,150.00	213.34	213.05	100.77	-672.64	7,068.74	802.84	383.56	419.28	1.915		
13,800.00	7,000.00	13,967.24	7,150.00	216.40	216.10	100.78	-673.15	7,168.73	802.04	376.77	425.27	1.886		
13,900.00	7,000.00	14,067.24	7,150.00	219.45	219.15	100.79	-673.67	7,268.73	801.24	369.98	431.25	1.858		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design		Rosa Unit 30 - Rosa Unit #663H - OH - Plan #2												Offset Site Error:		0.00 ft
Survey Program:		0-MWD						Rule Assigned:						Offset Well Error:		0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)						
14,000.00	7,000.00	14,167.23	7,150.00	222.50	222.20	100.80	-674.19	7,368.72	800.43	363.19	437.24	1.831				
14,100.00	7,000.00	14,267.23	7,150.00	225.56	225.25	100.81	-674.70	7,468.72	799.63	356.40	443.23	1.804				
14,200.00	7,000.00	14,367.23	7,150.00	228.61	228.29	100.82	-675.22	7,568.71	798.83	349.61	449.22	1.778				
14,300.00	7,000.00	14,467.23	7,150.00	231.66	231.34	100.83	-675.74	7,668.71	798.03	342.82	455.21	1.753				
14,400.00	7,000.00	14,567.22	7,150.00	234.72	234.40	100.85	-676.25	7,768.70	797.23	336.03	461.20	1.729				
14,500.00	7,000.00	14,667.22	7,150.00	237.77	237.45	100.86	-676.77	7,868.70	796.43	329.24	467.19	1.705				
14,600.00	7,000.00	14,767.22	7,150.00	240.83	240.50	100.87	-677.29	7,968.69	795.63	322.44	473.19	1.681				
14,700.00	7,000.00	14,867.21	7,150.00	243.89	243.55	100.88	-677.80	8,068.69	794.83	315.65	479.18	1.659				
14,800.00	7,000.00	14,967.21	7,150.00	246.94	246.60	100.89	-678.32	8,168.69	794.03	308.86	485.17	1.637				
14,900.00	7,000.00	15,067.21	7,150.00	250.00	249.66	100.90	-678.84	8,268.68	793.23	302.06	491.16	1.615				
15,000.00	7,000.00	15,167.20	7,150.00	253.06	252.71	100.91	-679.35	8,368.68	792.43	295.27	497.16	1.594				
15,100.00	7,000.00	15,267.20	7,150.00	256.12	255.76	100.92	-679.87	8,468.67	791.63	288.48	503.15	1.573				
15,200.00	7,000.00	15,367.20	7,150.00	259.18	258.82	100.93	-680.38	8,568.67	790.83	281.68	509.14	1.553				
15,300.00	7,000.00	15,467.19	7,150.00	262.24	261.87	100.95	-680.90	8,668.66	790.02	274.89	515.14	1.534				
15,400.00	7,000.00	15,567.19	7,150.00	265.29	264.93	100.96	-681.42	8,768.66	789.22	268.09	521.13	1.514				
15,500.00	7,000.00	15,667.19	7,150.00	268.35	267.98	100.97	-681.93	8,868.65	788.42	261.30	527.13	1.496	Level 3			
15,600.00	7,000.00	15,767.18	7,150.00	271.41	271.04	100.98	-682.45	8,968.65	787.62	254.50	533.12	1.477	Level 3			
15,700.00	7,000.00	15,867.18	7,150.00	274.47	274.09	100.99	-682.97	9,068.64	786.82	247.71	539.11	1.459	Level 3			
15,800.00	7,000.00	15,967.18	7,150.00	277.53	277.15	101.00	-683.48	9,168.64	786.02	240.91	545.11	1.442	Level 3			
15,900.00	7,000.00	16,067.17	7,150.00	280.60	280.21	101.01	-684.00	9,268.63	785.22	234.12	551.10	1.425	Level 3			
16,000.00	7,000.00	16,167.17	7,150.00	283.66	283.26	101.02	-684.52	9,368.63	784.42	227.32	557.10	1.408	Level 3			
16,100.00	7,000.00	16,267.17	7,150.00	286.72	286.32	101.04	-685.03	9,468.62	783.62	220.53	563.09	1.392	Level 3			
16,200.00	7,000.00	16,367.16	7,150.00	289.78	289.38	101.05	-685.55	9,568.62	782.82	213.73	569.09	1.376	Level 3			
16,300.00	7,000.00	16,467.16	7,150.00	292.84	292.44	101.06	-686.07	9,668.62	782.02	206.94	575.08	1.360	Level 3			
16,400.00	7,000.00	16,567.16	7,150.00	295.90	295.49	101.07	-686.58	9,768.61	781.22	200.14	581.08	1.344	Level 3			
16,500.00	7,000.00	16,667.15	7,150.00	298.97	298.55	101.08	-687.10	9,868.61	780.42	193.35	587.07	1.329	Level 3			
16,600.00	7,000.00	16,767.15	7,150.00	302.03	301.61	101.09	-687.62	9,968.60	779.62	186.55	593.07	1.315	Level 3			
16,700.00	7,000.00	16,867.15	7,150.00	305.09	304.67	101.10	-688.13	10,068.60	778.82	179.76	599.06	1.300	Level 3			
16,800.00	7,000.00	16,967.14	7,150.00	308.15	307.73	101.12	-688.65	10,168.59	778.02	172.96	605.06	1.286	Level 3			
16,900.00	7,000.00	17,067.14	7,150.00	311.22	310.79	101.13	-689.16	10,268.59	777.22	166.17	611.05	1.272	Level 3			
17,000.00	7,000.00	17,167.14	7,150.00	314.28	313.85	101.14	-689.68	10,368.58	776.42	159.37	617.05	1.258	Level 3			
17,100.00	7,000.00	17,267.13	7,150.00	317.34	316.91	101.15	-690.20	10,468.58	775.62	152.58	623.04	1.245	Level 3			
17,200.00	7,000.00	17,367.13	7,150.00	320.41	319.97	101.16	-690.71	10,568.57	774.82	145.78	629.04	1.232	Level 3			
17,300.00	7,000.00	17,467.13	7,150.00	323.47	323.03	101.17	-691.23	10,668.57	774.02	138.99	635.03	1.219	Level 3			
17,395.33	7,000.00	17,562.45	7,150.00	323.47	325.94	101.19	-691.72	10,763.89	773.26	135.38	637.87	1.212	Level 3, SF			



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #664H - OH - Plan #3													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Rule Assigned:		Distance		Minimum		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation (ft)	Factor		
0.00	0.00	0.00	0.00	0.00	0.00	152.67	-40.10	20.72	45.14					
100.00	100.00	100.00	100.00	0.36	0.36	152.67	-40.10	20.72	45.14	44.42	0.72	62.957		
200.00	200.00	200.00	200.00	0.72	0.72	152.67	-40.10	20.72	45.14	43.70	1.43	31.479		
300.00	300.00	300.00	300.00	1.08	1.08	152.67	-40.10	20.72	45.14	42.99	2.15	20.986		
400.00	400.00	400.00	400.00	1.43	1.43	152.67	-40.10	20.72	45.14	42.27	2.87	15.739		
500.00	500.00	500.00	500.00	1.79	1.79	152.67	-40.10	20.72	45.14	41.55	3.58	12.591	CC, ES	
600.00	600.00	598.55	598.53	2.15	2.13	153.54	-41.79	20.80	46.71	42.43	4.28	10.914		
700.00	700.00	696.87	696.71	2.51	2.46	155.82	-46.85	21.04	51.47	46.50	4.96	10.373		
800.00	800.00	794.72	794.20	2.87	2.79	158.79	-55.23	21.43	59.53	53.88	5.64	10.546		
900.00	900.00	891.89	890.67	3.23	3.14	161.80	-66.83	21.98	70.97	64.65	6.32	11.223		
1,000.00	1,000.00	988.16	985.80	3.58	3.51	164.46	-81.54	22.67	85.82	78.82	7.00	12.266		
1,100.00	1,100.00	1,085.97	1,082.08	3.94	3.90	166.62	-98.74	23.48	103.07	95.38	7.69	13.402		
1,200.00	1,200.00	1,184.39	1,178.96	4.30	4.31	168.18	-116.13	24.30	120.49	112.10	8.39	14.354		
1,300.00	1,299.98	1,282.54	1,275.55	4.66	4.72	140.15	-133.46	25.12	139.30	130.20	9.10	15.302		
1,319.49	1,319.46	1,301.60	1,294.31	4.73	4.80	140.48	-136.82	25.28	143.28	134.04	9.24	15.500		
1,400.00	1,399.90	1,380.26	1,371.74	5.02	5.14	141.88	-150.72	25.93	160.01	150.19	9.81	16.308		
1,500.00	1,499.81	1,477.98	1,467.92	5.37	5.57	143.27	-167.97	26.75	180.88	170.36	10.52	17.197		
1,600.00	1,599.72	1,575.69	1,564.09	5.73	6.00	144.37	-185.23	27.56	201.83	190.60	11.23	17.977		
1,700.00	1,699.63	1,673.41	1,660.27	6.09	6.43	145.26	-202.49	28.37	222.84	210.90	11.94	18.666		
1,800.00	1,799.55	1,771.12	1,756.44	6.45	6.86	146.00	-219.75	29.19	243.90	231.24	12.65	19.279		
1,900.00	1,899.46	1,868.84	1,852.62	6.81	7.30	146.62	-237.00	30.00	264.98	251.62	13.36	19.827		
2,000.00	1,999.37	1,966.55	1,948.79	7.17	7.74	147.15	-254.26	30.81	286.09	272.01	14.08	20.319		
2,100.00	2,099.29	2,064.27	2,044.97	7.53	8.18	147.60	-271.52	31.63	307.22	292.43	14.80	20.764		
2,200.00	2,199.20	2,161.98	2,141.14	7.89	8.62	148.00	-288.78	32.44	328.37	312.86	15.51	21.168		
2,300.00	2,299.11	2,259.70	2,237.32	8.25	9.07	148.35	-306.03	33.25	349.53	333.30	16.23	21.535		
2,400.00	2,399.03	2,357.41	2,333.49	8.61	9.51	148.66	-323.29	34.07	370.71	353.76	16.95	21.871		
2,500.00	2,498.94	2,455.12	2,429.67	8.97	9.96	148.94	-340.55	34.88	391.89	374.22	17.67	22.180		
2,600.00	2,598.85	2,552.84	2,525.84	9.33	10.40	149.19	-357.80	35.69	413.08	394.69	18.39	22.465		
2,700.00	2,698.76	2,650.55	2,622.02	9.69	10.85	149.41	-375.06	36.51	434.27	415.16	19.11	22.727		
2,800.00	2,798.68	2,748.27	2,718.19	10.05	11.29	149.61	-392.32	37.32	455.47	435.64	19.83	22.971		
2,900.00	2,898.59	2,845.98	2,814.37	10.41	11.74	149.80	-409.58	38.13	476.68	456.13	20.55	23.197		
3,000.00	2,998.50	2,943.70	2,910.54	10.78	12.19	149.97	-426.83	38.94	497.89	476.62	21.27	23.408		
3,100.00	3,098.42	3,041.41	3,006.72	11.14	12.64	150.12	-444.09	39.76	519.10	497.11	21.99	23.605		
3,200.00	3,198.33	3,139.13	3,102.89	11.50	13.09	150.27	-461.35	40.57	540.32	517.61	22.71	23.789		
3,300.00	3,298.24	3,236.84	3,199.07	11.86	13.54	150.40	-478.60	41.38	561.54	538.11	23.44	23.961		
3,400.00	3,398.16	3,334.56	3,295.24	12.22	13.98	150.52	-495.86	42.20	582.77	558.61	24.16	24.123		
3,500.00	3,498.07	3,432.27	3,391.42	12.59	14.43	150.63	-513.12	43.01	603.99	579.11	24.88	24.276		
3,600.00	3,597.98	3,529.98	3,487.59	12.95	14.88	150.74	-530.38	43.82	625.22	599.62	25.60	24.420		
3,700.00	3,697.89	3,627.70	3,583.77	13.31	15.33	150.84	-547.63	44.64	646.45	620.12	26.33	24.556		
3,800.00	3,797.81	3,725.41	3,679.95	13.67	15.78	150.93	-564.89	45.45	667.68	640.63	27.05	24.684		
3,900.00	3,897.72	3,823.13	3,776.12	14.04	16.23	151.02	-582.15	46.26	688.92	661.14	27.77	24.806		
4,000.00	3,997.63	3,920.84	3,872.30	14.40	16.68	151.10	-599.40	47.08	710.15	681.65	28.50	24.921		
4,100.00	4,097.55	4,018.56	3,968.47	14.76	17.14	151.18	-616.66	47.89	731.39	702.17	29.22	25.031		
4,200.00	4,197.46	4,116.27	4,064.65	15.12	17.59	151.25	-633.92	48.70	752.62	722.68	29.94	25.135		
4,300.00	4,297.37	4,213.99	4,160.82	15.49	18.04	151.32	-651.18	49.52	773.86	743.20	30.67	25.235		
4,400.00	4,397.29	4,311.70	4,257.00	15.85	18.49	151.39	-668.43	50.33	795.10	763.71	31.39	25.329		
4,500.00	4,497.20	4,409.41	4,353.17	16.21	18.94	151.45	-685.69	51.14	816.34	784.23	32.11	25.419		
4,600.00	4,597.11	4,507.13	4,449.35	16.57	19.39	151.51	-702.95	51.96	837.58	804.74	32.84	25.506		
4,700.00	4,697.03	4,604.84	4,545.52	16.94	19.84	151.56	-720.20	52.77	858.83	825.26	33.56	25.588		
4,800.00	4,796.94	4,702.56	4,641.70	17.30	20.29	151.62	-737.46	53.58	880.07	845.78	34.29	25.667		
4,900.00	4,896.85	4,800.27	4,737.87	17.66	20.74	151.67	-754.72	54.40	901.31	866.30	35.01	25.742		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #664H - OH - Plan #3													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Rule Assigned:		Distance		Minimum		Separation		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation (ft)	Factor		
5,000.00	4,996.76	4,897.99	4,834.05	18.02	21.20	151.72	-771.98	55.21	922.56	886.82	35.74	25.815		
5,100.00	5,096.68	4,995.70	4,930.22	18.39	21.65	151.76	-789.23	56.02	943.80	907.34	36.46	25.884		
5,200.00	5,196.59	5,093.42	5,026.40	18.75	22.10	151.81	-806.49	56.84	965.05	927.86	37.19	25.951		
5,300.00	5,296.50	5,191.13	5,122.57	19.11	22.55	151.85	-823.75	57.65	986.29	948.38	37.91	26.015		
5,400.00	5,396.42	5,288.85	5,218.75	19.47	23.00	151.89	-841.00	58.46	1,007.54	968.90	38.64	26.077		
5,500.00	5,496.33	5,386.56	5,314.92	19.84	23.46	151.93	-858.26	59.28	1,028.78	989.42	39.36	26.136		
5,600.00	5,596.24	5,484.27	5,411.10	20.20	23.91	151.96	-875.52	60.09	1,050.03	1,009.94	40.09	26.193		
5,700.00	5,696.16	5,581.99	5,507.27	20.56	24.36	152.00	-892.78	60.90	1,071.28	1,030.47	40.81	26.248		
5,800.00	5,796.07	5,679.70	5,603.45	20.93	24.81	152.03	-910.03	61.72	1,092.53	1,050.99	41.54	26.302		
5,900.00	5,895.98	5,777.42	5,699.62	21.29	25.26	152.07	-927.29	62.53	1,113.77	1,071.51	42.26	26.353		
6,000.00	5,995.89	5,875.13	5,795.80	21.65	25.72	152.10	-944.55	63.34	1,135.02	1,092.03	42.99	26.402		
6,100.00	6,095.81	5,972.85	5,891.97	22.01	26.17	152.13	-961.81	64.16	1,156.27	1,112.56	43.72	26.450		
6,200.00	6,195.72	6,070.56	5,988.15	22.38	26.62	152.16	-979.06	64.97	1,177.52	1,133.08	44.44	26.496		
6,300.00	6,295.63	6,168.28	6,084.32	22.74	27.07	152.19	-996.32	65.78	1,198.77	1,153.60	45.17	26.541		
6,380.96	6,376.52	6,247.38	6,162.19	23.03	27.44	152.21	-1,010.29	66.44	1,215.97	1,170.22	45.75	26.576		
6,400.00	6,395.54	6,265.99	6,180.49	23.10	27.53	126.77	-1,013.58	66.60	1,220.02	1,174.13	45.89	26.584		
6,450.00	6,445.29	6,314.68	6,228.42	23.29	27.75	105.63	-1,022.18	67.00	1,230.68	1,184.42	46.26	26.604		
6,500.00	6,494.55	6,362.93	6,275.91	23.47	27.97	99.15	-1,030.70	67.40	1,241.34	1,194.71	46.63	26.623		
6,550.00	6,542.99	6,410.43	6,322.66	23.66	28.19	95.99	-1,039.09	67.80	1,252.01	1,205.01	47.00	26.640		
6,600.00	6,590.33	6,456.89	6,368.39	23.85	28.41	94.14	-1,047.29	68.18	1,262.73	1,215.35	47.37	26.655		
6,650.00	6,636.28	6,506.20	6,416.89	24.05	28.64	92.98	-1,056.01	69.65	1,273.50	1,225.72	47.78	26.653		
6,700.00	6,680.55	6,558.42	6,467.96	24.26	28.88	92.18	-1,065.28	75.23	1,284.19	1,235.96	48.23	26.629		
6,750.00	6,722.86	6,612.58	6,520.26	24.48	29.13	91.59	-1,074.86	85.49	1,294.72	1,246.01	48.70	26.584		
6,800.00	6,762.96	6,668.86	6,573.47	24.72	29.38	91.15	-1,084.70	100.89	1,304.99	1,255.78	49.21	26.517		
6,850.00	6,800.59	6,727.47	6,627.22	24.99	29.64	90.83	-1,094.75	121.94	1,314.94	1,265.17	49.77	26.421		
6,900.00	6,835.54	6,788.59	6,680.96	25.29	29.90	90.59	-1,104.92	149.14	1,324.45	1,274.07	50.37	26.293		
6,950.00	6,867.58	6,852.36	6,734.02	25.63	30.17	90.43	-1,115.10	182.98	1,333.43	1,282.39	51.04	26.125		
7,000.00	6,896.51	6,918.90	6,785.52	26.03	30.46	90.32	-1,125.14	223.86	1,341.78	1,289.98	51.80	25.905		
7,050.00	6,922.15	6,988.26	6,834.40	26.48	30.76	90.26	-1,134.85	272.05	1,349.38	1,296.72	52.66	25.626		
7,100.00	6,944.36	7,060.38	6,879.42	26.99	31.10	90.22	-1,144.02	327.59	1,356.13	1,302.47	53.66	25.274		
7,150.00	6,962.98	7,135.10	6,919.21	27.57	31.48	90.20	-1,152.39	390.23	1,361.92	1,307.09	54.83	24.840		
7,200.00	6,977.91	7,212.12	6,952.37	28.22	31.95	90.19	-1,159.69	459.30	1,366.66	1,310.45	56.20	24.317		
7,250.00	6,989.06	7,290.98	6,977.54	28.93	32.54	90.16	-1,165.67	533.74	1,370.25	1,312.46	57.79	23.710		
7,300.00	6,996.35	7,371.11	6,993.63	29.70	33.28	90.10	-1,170.10	612.06	1,372.64	1,313.03	59.61	23.029		
7,350.00	6,999.74	7,451.82	6,999.92	30.52	34.19	90.02	-1,172.82	692.43	1,373.78	1,312.18	61.60	22.303		
7,368.23	7,000.00	7,473.91	7,000.00	30.83	34.46	90.00	-1,173.27	714.51	1,373.92	1,311.65	62.27	22.065		
7,400.00	7,000.00	7,505.68	7,000.00	31.38	34.89	90.00	-1,173.89	746.27	1,374.12	1,310.74	63.38	21.681		
7,500.00	7,000.00	7,605.67	7,000.00	33.25	36.39	90.00	-1,175.86	846.25	1,374.76	1,307.64	67.12	20.482		
7,600.00	7,000.00	7,705.67	7,000.00	35.30	38.14	90.00	-1,177.84	946.23	1,375.40	1,304.20	71.19	19.319		
7,700.00	7,000.00	7,805.67	7,000.00	37.48	40.08	90.00	-1,179.81	1,046.21	1,376.04	1,300.49	75.55	18.213		
7,800.00	7,000.00	7,905.67	7,000.00	39.78	42.18	90.00	-1,181.78	1,146.19	1,376.68	1,296.53	80.15	17.177		
7,900.00	7,000.00	8,005.67	7,000.00	42.18	44.41	90.00	-1,183.75	1,246.17	1,377.32	1,292.38	84.93	16.216		
8,000.00	7,000.00	8,105.66	7,000.00	44.66	46.76	90.00	-1,185.72	1,346.14	1,377.96	1,288.07	89.89	15.329		
8,100.00	7,000.00	8,205.66	7,000.00	47.21	49.19	90.00	-1,187.69	1,446.12	1,378.60	1,283.61	94.99	14.514		
8,200.00	7,000.00	8,305.66	7,000.00	49.82	51.69	90.00	-1,189.67	1,546.10	1,379.24	1,279.04	100.20	13.765		
8,300.00	7,000.00	8,405.66	7,000.00	52.48	54.26	90.00	-1,191.64	1,646.08	1,379.88	1,274.37	105.51	13.078		
8,400.00	7,000.00	8,505.66	7,000.00	55.19	56.88	90.00	-1,193.61	1,746.06	1,380.52	1,269.60	110.91	12.447		
8,500.00	7,000.00	8,605.65	7,000.00	57.93	59.55	90.00	-1,195.58	1,846.04	1,381.16	1,264.77	116.39	11.867		
8,600.00	7,000.00	8,705.65	7,000.00	60.70	62.26	90.00	-1,197.55	1,946.02	1,381.80	1,259.87	121.93	11.333		
8,700.00	7,000.00	8,805.65	7,000.00	63.50	65.00	90.00	-1,199.52	2,045.99	1,382.44	1,254.91	127.53	10.841		
8,800.00	7,000.00	8,905.65	7,000.00	66.33	67.77	90.00	-1,201.50	2,145.97	1,383.08	1,249.91	133.17	10.386		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #664H - OH - Plan #3													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
							+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
8,900.00	7,000.00	9,005.65	7,000.00	69.17	70.57	90.00	-1,203.47	2,245.95	1,383.72	1,244.86	138.86	9.965		
9,000.00	7,000.00	9,105.64	7,000.00	72.04	73.39	90.00	-1,205.44	2,345.93	1,384.36	1,239.78	144.58	9.575		
9,100.00	7,000.00	9,205.64	7,000.00	74.92	76.23	90.00	-1,207.41	2,445.91	1,385.00	1,234.66	150.34	9.212		
9,200.00	7,000.00	9,305.64	7,000.00	77.81	79.09	90.00	-1,209.38	2,545.89	1,385.64	1,229.51	156.13	8.875		
9,300.00	7,000.00	9,405.64	7,000.00	80.72	81.97	90.00	-1,211.36	2,645.87	1,386.28	1,224.34	161.94	8.560		
9,400.00	7,000.00	9,505.63	7,000.00	83.64	84.86	90.00	-1,213.33	2,745.84	1,386.92	1,219.14	167.78	8.266		
9,500.00	7,000.00	9,605.63	7,000.00	86.58	87.76	90.00	-1,215.30	2,845.82	1,387.56	1,213.92	173.64	7.991		
9,600.00	7,000.00	9,705.63	7,000.00	89.52	90.68	90.00	-1,217.27	2,945.80	1,388.20	1,208.68	179.52	7.733		
9,700.00	7,000.00	9,805.63	7,000.00	92.47	93.60	90.00	-1,219.24	3,045.78	1,388.84	1,203.42	185.42	7.490		
9,800.00	7,000.00	9,905.63	7,000.00	95.42	96.54	90.00	-1,221.21	3,145.76	1,389.48	1,198.15	191.33	7.262		
9,900.00	7,000.00	10,005.62	7,000.00	98.39	99.48	90.00	-1,223.19	3,245.74	1,390.12	1,192.86	197.26	7.047		
10,000.00	7,000.00	10,105.62	7,000.00	101.36	102.43	90.00	-1,225.16	3,345.71	1,390.76	1,187.56	203.20	6.844		
10,100.00	7,000.00	10,205.62	7,000.00	104.34	105.39	90.00	-1,227.13	3,445.69	1,391.40	1,182.24	209.16	6.652		
10,200.00	7,000.00	10,305.62	7,000.00	107.32	108.35	90.00	-1,229.10	3,545.67	1,392.04	1,176.92	215.12	6.471		
10,300.00	7,000.00	10,405.62	7,000.00	110.31	111.32	90.00	-1,231.07	3,645.65	1,392.68	1,171.59	221.09	6.299		
10,400.00	7,000.00	10,505.61	7,000.00	113.30	114.30	90.00	-1,233.04	3,745.63	1,393.32	1,166.24	227.08	6.136		
10,500.00	7,000.00	10,605.61	7,000.00	116.30	117.28	90.00	-1,235.02	3,845.61	1,393.96	1,160.89	233.07	5.981		
10,600.00	7,000.00	10,705.61	7,000.00	119.30	120.27	90.00	-1,236.99	3,945.59	1,394.60	1,155.53	239.07	5.833		
10,700.00	7,000.00	10,805.61	7,000.00	122.30	123.26	90.00	-1,238.96	4,045.56	1,395.24	1,150.16	245.08	5.693		
10,800.00	7,000.00	10,905.61	7,000.00	125.31	126.26	90.00	-1,240.93	4,145.54	1,395.88	1,144.79	251.09	5.559		
10,900.00	7,000.00	11,005.60	7,000.00	128.32	129.25	90.00	-1,242.90	4,245.52	1,396.52	1,139.41	257.11	5.432		
11,000.00	7,000.00	11,105.60	7,000.00	131.33	132.26	90.00	-1,244.88	4,345.50	1,397.16	1,134.02	263.14	5.310		
11,100.00	7,000.00	11,205.60	7,000.00	134.35	135.26	90.00	-1,246.85	4,445.48	1,397.80	1,128.63	269.17	5.193		
11,200.00	7,000.00	11,305.60	7,000.00	137.37	138.27	90.00	-1,248.82	4,545.46	1,398.44	1,123.23	275.21	5.081		
11,300.00	7,000.00	11,405.60	7,000.00	140.39	141.28	90.00	-1,250.79	4,645.44	1,399.08	1,117.83	281.25	4.974		
11,400.00	7,000.00	11,505.59	7,000.00	143.41	144.30	90.00	-1,252.76	4,745.41	1,399.72	1,112.42	287.30	4.872		
11,500.00	7,000.00	11,605.59	7,000.00	146.44	147.32	90.00	-1,254.73	4,845.39	1,400.36	1,107.01	293.35	4.774		
11,600.00	7,000.00	11,705.59	7,000.00	149.46	150.34	90.00	-1,256.71	4,945.37	1,401.00	1,101.60	299.40	4.679		
11,700.00	7,000.00	11,805.59	7,000.00	152.49	153.36	90.00	-1,258.68	5,045.35	1,401.64	1,096.18	305.46	4.589		
11,800.00	7,000.00	11,905.59	7,000.00	155.52	156.38	90.00	-1,260.65	5,145.33	1,402.28	1,090.75	311.53	4.501		
11,900.00	7,000.00	12,005.58	7,000.00	158.56	159.41	90.00	-1,262.62	5,245.31	1,402.92	1,085.33	317.59	4.417		
12,000.00	7,000.00	12,105.58	7,000.00	161.59	162.44	90.00	-1,264.59	5,345.29	1,403.56	1,079.90	323.66	4.337		
12,100.00	7,000.00	12,205.58	7,000.00	164.63	165.47	90.00	-1,266.56	5,445.26	1,404.20	1,074.47	329.73	4.259		
12,200.00	7,000.00	12,305.58	7,000.00	167.66	168.50	90.00	-1,268.54	5,545.24	1,404.84	1,069.03	335.81	4.183		
12,300.00	7,000.00	12,405.58	7,000.00	170.70	171.53	90.00	-1,270.51	5,645.22	1,405.48	1,063.59	341.89	4.111		
12,400.00	7,000.00	12,505.57	7,000.00	173.74	174.57	90.00	-1,272.48	5,745.20	1,406.12	1,058.15	347.97	4.041		
12,500.00	7,000.00	12,605.57	7,000.00	176.78	177.60	90.00	-1,274.45	5,845.18	1,406.76	1,052.71	354.05	3.973		
12,600.00	7,000.00	12,705.57	7,000.00	179.82	180.64	90.00	-1,276.42	5,945.16	1,407.40	1,047.27	360.13	3.908		
12,700.00	7,000.00	12,805.57	7,000.00	182.87	183.68	90.00	-1,278.40	6,045.13	1,408.04	1,041.82	366.22	3.845		
12,800.00	7,000.00	12,905.57	7,000.00	185.91	186.72	90.00	-1,280.37	6,145.11	1,408.68	1,036.37	372.31	3.784		
12,900.00	7,000.00	13,005.56	7,000.00	188.96	189.76	90.00	-1,282.34	6,245.09	1,409.32	1,030.92	378.40	3.724		
13,000.00	7,000.00	13,105.56	7,000.00	192.00	192.80	90.00	-1,284.31	6,345.07	1,409.96	1,025.47	384.49	3.667		
13,100.00	7,000.00	13,205.56	7,000.00	195.05	195.84	90.00	-1,286.28	6,445.05	1,410.60	1,020.01	390.59	3.611		
13,200.00	7,000.00	13,305.56	7,000.00	198.10	198.89	90.00	-1,288.25	6,545.03	1,411.24	1,014.56	396.68	3.558		
13,300.00	7,000.00	13,405.56	7,000.00	201.14	201.93	90.00	-1,290.23	6,645.01	1,411.88	1,009.10	402.78	3.505		
13,400.00	7,000.00	13,505.55	7,000.00	204.19	204.98	90.00	-1,292.20	6,744.98	1,412.52	1,003.64	408.88	3.455		
13,500.00	7,000.00	13,605.55	7,000.00	207.24	208.03	90.00	-1,294.17	6,844.96	1,413.16	998.18	414.98	3.405		
13,600.00	7,000.00	13,705.55	7,000.00	210.29	211.07	90.00	-1,296.14	6,944.94	1,413.80	992.72	421.08	3.358		
13,700.00	7,000.00	13,805.55	7,000.00	213.34	214.12	90.00	-1,298.11	7,044.92	1,414.44	987.25	427.19	3.311		
13,800.00	7,000.00	13,905.54	7,000.00	216.40	217.17	90.00	-1,300.08	7,144.90	1,415.08	981.79	433.29	3.266		
13,900.00	7,000.00	14,005.54	7,000.00	219.45	220.22	90.00	-1,302.06	7,244.88	1,415.72	976.32	439.40	3.222		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #664H - OH - Plan #3													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning	
							+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)				
14,000.00	7,000.00	14,105.54	7,000.00	222.50	223.27	90.00	-1,304.03	7,344.86	1,416.36	970.85	445.51	3.179		
14,100.00	7,000.00	14,205.54	7,000.00	225.56	226.32	90.00	-1,306.00	7,444.83	1,417.00	965.39	451.61	3.138		
14,200.00	7,000.00	14,305.54	7,000.00	228.61	229.38	90.00	-1,307.97	7,544.81	1,417.64	959.92	457.72	3.097		
14,300.00	7,000.00	14,405.53	7,000.00	231.66	232.43	90.00	-1,309.94	7,644.79	1,418.28	954.45	463.84	3.058		
14,400.00	7,000.00	14,505.53	7,000.00	234.72	235.48	90.00	-1,311.92	7,744.77	1,418.92	948.97	469.95	3.019		
14,500.00	7,000.00	14,605.53	7,000.00	237.77	238.54	90.00	-1,313.89	7,844.75	1,419.56	943.50	476.06	2.982		
14,600.00	7,000.00	14,705.53	7,000.00	240.83	241.59	90.00	-1,315.86	7,944.73	1,420.20	938.03	482.17	2.945		
14,700.00	7,000.00	14,805.53	7,000.00	243.89	244.65	90.00	-1,317.83	8,044.71	1,420.84	932.55	488.29	2.910		
14,800.00	7,000.00	14,905.52	7,000.00	246.94	247.70	90.00	-1,319.80	8,144.68	1,421.48	927.08	494.40	2.875		
14,900.00	7,000.00	15,005.52	7,000.00	250.00	250.76	90.00	-1,321.77	8,244.66	1,422.12	921.60	500.52	2.841		
15,000.00	7,000.00	15,105.52	7,000.00	253.06	253.82	90.00	-1,323.75	8,344.64	1,422.76	916.12	506.64	2.808		
15,100.00	7,000.00	15,205.52	7,000.00	256.12	256.87	90.00	-1,325.72	8,444.62	1,423.40	910.65	512.75	2.776		
15,200.00	7,000.00	15,305.52	7,000.00	259.18	259.93	90.00	-1,327.69	8,544.60	1,424.04	905.17	518.87	2.744		
15,300.00	7,000.00	15,405.51	7,000.00	262.24	262.99	90.00	-1,329.66	8,644.58	1,424.68	899.69	524.99	2.714		
15,400.00	7,000.00	15,505.51	7,000.00	265.29	266.05	90.00	-1,331.63	8,744.55	1,425.32	894.21	531.11	2.684		
15,500.00	7,000.00	15,605.51	7,000.00	268.35	269.10	90.00	-1,333.60	8,844.53	1,425.96	888.73	537.23	2.654		
15,600.00	7,000.00	15,705.51	7,000.00	271.41	272.16	90.00	-1,335.58	8,944.51	1,426.60	883.25	543.35	2.626		
15,700.00	7,000.00	15,805.51	7,000.00	274.47	275.22	90.00	-1,337.55	9,044.49	1,427.24	877.76	549.48	2.597		
15,800.00	7,000.00	15,905.50	7,000.00	277.53	278.28	90.00	-1,339.52	9,144.47	1,427.88	872.28	555.60	2.570		
15,900.00	7,000.00	16,005.50	7,000.00	280.60	281.34	90.00	-1,341.49	9,244.45	1,428.52	866.80	561.72	2.543		
16,000.00	7,000.00	16,105.50	7,000.00	283.66	284.40	90.00	-1,343.46	9,344.43	1,429.16	861.31	567.85	2.517		
16,100.00	7,000.00	16,205.50	7,000.00	286.72	287.47	90.00	-1,345.44	9,444.40	1,429.80	855.83	573.97	2.491		
16,200.00	7,000.00	16,305.50	7,000.00	289.78	290.53	90.00	-1,347.41	9,544.38	1,430.44	850.35	580.10	2.466		
16,300.00	7,000.00	16,405.49	7,000.00	292.84	293.59	90.00	-1,349.38	9,644.36	1,431.08	844.86	586.22	2.441		
16,400.00	7,000.00	16,505.49	7,000.00	295.90	296.65	90.00	-1,351.35	9,744.34	1,431.72	839.37	592.35	2.417		
16,500.00	7,000.00	16,605.49	7,000.00	298.97	299.71	90.00	-1,353.32	9,844.32	1,432.36	833.89	598.47	2.393		
16,600.00	7,000.00	16,705.49	7,000.00	302.03	302.77	90.00	-1,355.29	9,944.30	1,433.00	828.40	604.60	2.370		
16,700.00	7,000.00	16,805.49	7,000.00	305.09	305.84	90.00	-1,357.27	10,044.28	1,433.64	822.91	610.73	2.347		
16,800.00	7,000.00	16,905.48	7,000.00	308.15	308.90	90.00	-1,359.24	10,144.25	1,434.28	817.43	616.86	2.325		
16,900.00	7,000.00	17,005.48	7,000.00	311.22	311.96	90.00	-1,361.21	10,244.23	1,434.92	811.94	622.98	2.303		
17,000.00	7,000.00	17,105.48	7,000.00	314.28	315.03	90.00	-1,363.18	10,344.21	1,435.56	806.45	629.11	2.282		
17,100.00	7,000.00	17,205.48	7,000.00	317.34	318.09	90.00	-1,365.15	10,444.19	1,436.20	800.96	635.24	2.261		
17,200.00	7,000.00	17,305.48	7,000.00	320.41	321.15	90.00	-1,367.12	10,544.17	1,436.84	795.47	641.37	2.240		
17,300.00	7,000.00	17,405.47	7,000.00	323.47	324.22	90.00	-1,369.10	10,644.15	1,437.48	789.98	647.50	2.220		
17,395.33	7,000.00	17,500.81	7,000.00	323.47	327.14	90.00	-1,370.98	10,739.46	1,438.09	787.67	650.42	2.211 SF		



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #665H - OH - Plan #3												Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00		136.30	-22.60	21.60	31.26				
100.00	100.00	100.00	100.00	0.36		136.30	-22.60	21.60	31.26	30.90	0.36	87.161	
200.00	200.00	200.00	200.00	0.72		136.30	-22.60	21.60	31.26	30.54	0.72	43.593	
300.00	300.00	300.00	300.00	1.08		136.30	-22.60	21.60	31.26	30.19	1.08	29.064	
400.00	400.00	400.00	400.00	1.43		136.30	-22.60	21.60	31.26	29.83	1.43	21.799	
500.00	500.00	500.00	500.00	1.79		136.30	-22.60	21.60	31.26	29.47	1.79	17.440	
600.00	600.00	600.00	600.00	2.15		136.30	-22.60	21.60	31.26	29.11	2.15	14.534	
700.00	700.00	700.00	700.00	2.51		136.30	-22.60	21.60	31.26	28.75	2.51	12.458	
800.00	800.00	800.00	800.00	2.87		136.30	-22.60	21.60	31.26	28.39	2.87	10.900	
900.00	900.00	900.00	900.00	3.23		136.30	-22.60	21.60	31.26	28.04	3.23	9.689	
1,000.00	1,000.00	1,000.00	1,000.00	3.58		136.30	-22.60	21.60	31.26	27.68	3.58	8.720 CC, ES	
1,100.00	1,100.00	1,099.20	1,099.18	3.94		138.46	-24.32	21.55	32.50	28.56	3.94	8.243 SF	
1,200.00	1,200.00	1,198.17	1,198.01	4.30		144.01	-29.45	21.39	36.45	32.15	4.30	8.481	
1,300.00	1,299.98	1,296.48	1,295.95	4.66		123.23	-37.92	21.12	44.52	39.88	4.65	9.581	
1,319.49	1,319.46	1,315.51	1,314.87	4.73		125.16	-39.95	21.06	46.78	42.06	4.72	9.920	
1,400.00	1,399.90	1,393.65	1,392.41	5.02		132.22	-49.59	20.76	58.02	53.03	4.99	11.629	
1,500.00	1,499.81	1,489.67	1,487.29	5.37		138.41	-64.33	20.30	75.70	70.38	5.32	14.225	
1,600.00	1,599.72	1,584.35	1,580.30	5.73		142.55	-81.96	19.75	97.14	91.50	5.64	17.210	
1,700.00	1,699.63	1,677.51	1,671.21	6.09		145.36	-102.30	19.11	122.08	116.12	5.96	20.488	
1,800.00	1,799.55	1,769.01	1,759.81	6.45		147.31	-125.15	18.40	150.31	144.04	6.26	24.001	
1,900.00	1,899.46	1,862.03	1,849.23	6.81		148.73	-150.73	17.60	181.15	174.57	6.58	27.511	
2,000.00	1,999.37	1,956.98	1,940.46	7.17		149.77	-177.09	16.78	212.32	205.40	6.93	30.660	
2,100.00	2,099.29	2,051.94	2,031.68	7.53		150.54	-203.44	15.95	243.54	236.28	7.27	33.517	
2,200.00	2,199.20	2,146.90	2,122.90	7.89		151.13	-229.80	15.13	274.79	267.18	7.61	36.121	
2,300.00	2,299.11	2,241.86	2,214.12	8.25		151.60	-256.16	14.31	306.06	298.11	7.95	38.502	
2,400.00	2,399.03	2,336.81	2,305.35	8.61		151.99	-282.51	13.48	337.35	329.06	8.29	40.687	
2,500.00	2,498.94	2,431.77	2,396.57	8.97		152.31	-308.87	12.66	368.65	360.01	8.63	42.699	
2,600.00	2,598.85	2,526.73	2,487.79	9.33		152.58	-335.22	11.84	399.95	390.98	8.98	44.557	
2,700.00	2,698.76	2,621.69	2,579.02	9.69		152.81	-361.58	11.01	431.27	421.95	9.32	46.278	
2,800.00	2,798.68	2,716.64	2,670.24	10.05		153.01	-387.94	10.19	462.59	452.93	9.66	47.877	
2,900.00	2,898.59	2,811.60	2,761.46	10.41		153.18	-414.29	9.37	493.91	483.91	10.01	49.366	
3,000.00	2,998.50	2,906.56	2,852.68	10.78		153.34	-440.65	8.55	525.24	514.89	10.35	50.755	
3,100.00	3,098.42	3,001.52	2,943.91	11.14		153.47	-467.00	7.72	556.57	545.88	10.69	52.055	
3,200.00	3,198.33	3,096.48	3,035.13	11.50		153.60	-493.36	6.90	587.90	576.86	11.04	53.273	
3,300.00	3,298.24	3,191.43	3,126.35	11.86		153.71	-519.72	6.08	619.24	607.86	11.38	54.417	
3,400.00	3,398.16	3,286.39	3,217.58	12.22		153.80	-546.07	5.25	650.57	638.85	11.72	55.494	
3,500.00	3,498.07	3,381.35	3,308.80	12.59		153.89	-572.43	4.43	681.91	669.84	12.07	56.508	
3,600.00	3,597.98	3,476.31	3,400.02	12.95		153.98	-598.78	3.61	713.25	700.84	12.41	57.466	
3,700.00	3,697.89	3,571.26	3,491.24	13.31		154.05	-625.14	2.79	744.59	731.83	12.76	58.372	
3,800.00	3,797.81	3,666.22	3,582.47	13.67		154.12	-651.50	1.96	775.93	762.83	13.10	59.229	
3,900.00	3,897.72	3,761.18	3,673.69	14.04		154.18	-677.85	1.14	807.28	793.83	13.45	60.042	
4,000.00	3,997.63	3,856.14	3,764.91	14.40		154.24	-704.21	0.32	838.62	824.83	13.79	60.814	
4,100.00	4,097.55	3,951.09	3,856.14	14.76		154.30	-730.56	-0.51	869.96	855.83	14.13	61.548	
4,200.00	4,197.46	4,046.05	3,947.36	15.12		154.35	-756.92	-1.33	901.31	886.83	14.48	62.247	
4,300.00	4,297.37	4,141.01	4,038.58	15.49		154.39	-783.28	-2.15	932.65	917.83	14.82	62.912	
4,400.00	4,397.29	4,235.97	4,129.81	15.85		154.44	-809.63	-2.98	964.00	948.83	15.17	63.547	
4,500.00	4,497.20	4,330.92	4,221.03	16.21		154.48	-835.99	-3.80	995.35	979.83	15.52	64.152	
4,600.00	4,597.11	4,425.88	4,312.25	16.57		154.52	-862.34	-4.62	1,026.69	1,010.83	15.86	64.732	
4,700.00	4,697.03	4,520.84	4,403.47	16.94		154.56	-888.70	-5.44	1,058.04	1,041.83	16.21	65.285	
4,800.00	4,796.94	4,615.80	4,494.70	17.30		154.59	-915.06	-6.27	1,089.39	1,072.84	16.55	65.816	
4,900.00	4,896.85	4,710.75	4,585.92	17.66		154.62	-941.41	-7.09	1,120.74	1,103.84	16.90	66.324	



Lonestar Consulting, LLC

Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Offset Design Rosa Unit 30 - Rosa Unit #665H - OH - Plan #3													Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 ft
Reference	Vertical	Offset	Semi Major Axis	Offset	Highside	Offset Wellbore Centre		Distance		Minimum	Separation	Warning		
Measured Depth (ft)	Depth (ft)	Measured Depth (ft)	Reference (ft)	Offset (ft)	Toolface (°)	+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation (ft)	Factor			
5,000.00	4,996.76	4,805.71	18.02		154.65	-967.77	-7.91	1,152.09	1,134.84	17.24	66.811			
5,100.00	5,096.68	4,900.67	18.39		154.68	-994.12	-8.74	1,183.43	1,165.84	17.59	67.279			
5,200.00	5,196.59	4,995.63	18.75		154.71	-1,020.48	-9.56	1,214.78	1,196.85	17.94	67.728			
5,300.00	5,296.50	5,090.58	19.11		154.74	-1,046.84	-10.38	1,246.13	1,227.85	18.28	68.160			
5,400.00	5,396.42	5,185.54	19.47		154.76	-1,073.19	-11.21	1,277.48	1,258.85	18.63	68.575			
5,500.00	5,496.33	5,280.50	19.84		154.79	-1,099.55	-12.03	1,308.83	1,289.86	18.98	68.975			
5,600.00	5,596.24	5,375.46	20.20		154.81	-1,125.90	-12.85	1,340.18	1,320.86	19.32	69.360			
5,700.00	5,696.16	5,470.41	20.56		154.83	-1,152.26	-13.67	1,371.53	1,351.86	19.67	69.731			
5,800.00	5,796.07	5,565.37	20.93		154.85	-1,178.61	-14.50	1,402.88	1,382.87	20.02	70.089			
5,900.00	5,895.98	5,660.33	21.29		154.87	-1,204.97	-15.32	1,434.23	1,413.87	20.36	70.433			
6,000.00	5,995.89	5,755.29	21.65		154.89	-1,231.33	-16.14	1,465.58	1,444.87	20.71	70.766			
6,100.00	6,095.81	5,850.24	22.01		154.91	-1,257.68	-16.97	1,496.93	1,475.88	21.06	71.088			
6,200.00	6,195.72	5,945.20	22.38		154.93	-1,284.04	-17.79	1,528.28	1,506.88	21.40	71.399			
6,300.00	6,295.63	6,040.16	22.74		154.94	-1,310.39	-18.61	1,559.64	1,537.88	21.75	71.699			
6,380.96	6,376.52	6,117.04	23.03		154.96	-1,331.73	-19.28	1,585.02	1,562.98	22.03	71.935			
6,400.00	6,395.54	6,135.11	23.10		129.32	-1,336.75	-19.44	1,591.00	1,568.90	22.10	71.990			
6,450.00	6,445.29	6,182.38	23.29		107.62	-1,349.87	-19.85	1,606.85	1,584.57	22.28	72.136			
6,500.00	6,494.55	6,229.15	23.47		100.53	-1,362.85	-20.25	1,622.82	1,600.37	22.45	72.280			
6,550.00	6,542.99	6,275.14	23.66		96.71	-1,375.61	-20.65	1,638.88	1,616.25	22.63	72.419			
6,600.00	6,590.33	6,320.06	23.85		94.16	-1,388.08	-21.04	1,654.99	1,632.18	22.81	72.550			
6,650.00	6,636.28	6,363.63	24.05		92.25	-1,400.18	-21.42	1,671.17	1,648.17	23.00	72.667			
6,700.00	6,680.55	6,405.59	24.26		90.73	-1,411.82	-21.78	1,687.42	1,664.23	23.19	72.766			
6,750.00	6,722.86	6,445.68	24.48		89.44	-1,422.95	-22.13	1,703.76	1,680.37	23.39	72.836			
6,800.00	6,762.96	6,483.64	24.72		88.30	-1,433.49	-22.46	1,720.25	1,696.64	23.61	72.867			
6,850.00	6,800.59	6,519.25	24.99		87.24	-1,443.37	-22.77	1,736.91	1,713.07	23.84	72.845			
6,900.00	6,835.54	6,552.29	25.29		86.23	-1,452.54	-23.05	1,753.80	1,729.70	24.10	72.757			
6,950.00	6,867.58	6,574.19	25.63		85.00	-1,458.61	-23.49	1,771.02	1,746.65	24.37	72.683			
7,000.00	6,896.51	6,591.19	26.03		83.66	-1,463.29	-24.33	1,788.68	1,764.03	24.66	72.548			
7,050.00	6,922.15	6,600.00	26.48		82.09	-1,465.71	-24.95	1,806.81	1,781.85	24.96	72.380			
7,100.00	6,944.36	6,615.11	26.99		80.71	-1,469.84	-26.29	1,825.34	1,799.99	25.35	72.011			
7,150.00	6,962.98	6,622.60	27.57		79.08	-1,471.87	-27.08	1,844.26	1,818.50	25.76	71.599			
7,200.00	6,977.91	6,627.48	28.22		77.37	-1,473.20	-27.65	1,863.47	1,837.26	26.21	71.096			
7,250.00	6,989.06	6,630.03	28.93		75.59	-1,473.89	-27.96	1,882.88	1,856.17	26.70	70.513			
7,300.00	6,996.35	6,630.51	29.70		73.76	-1,474.02	-28.02	1,902.38	1,875.15	27.23	69.865			
7,350.00	6,999.74	6,629.14	30.52		71.91	-1,473.65	-27.85	1,921.86	1,894.08	27.78	69.170			
7,368.23	7,000.00	6,628.23	30.83		71.23	-1,473.40	-27.74	1,928.93	1,900.94	27.99	68.909			
7,400.00	7,000.00	6,626.49	31.38		71.18	-1,472.93	-27.53	1,941.45	1,913.09	28.36	68.453			
7,500.00	7,000.00	6,621.51	33.25		71.02	-1,471.58	-26.96	1,983.66	1,954.09	29.57	67.091			



Lonestar Consulting, LLC

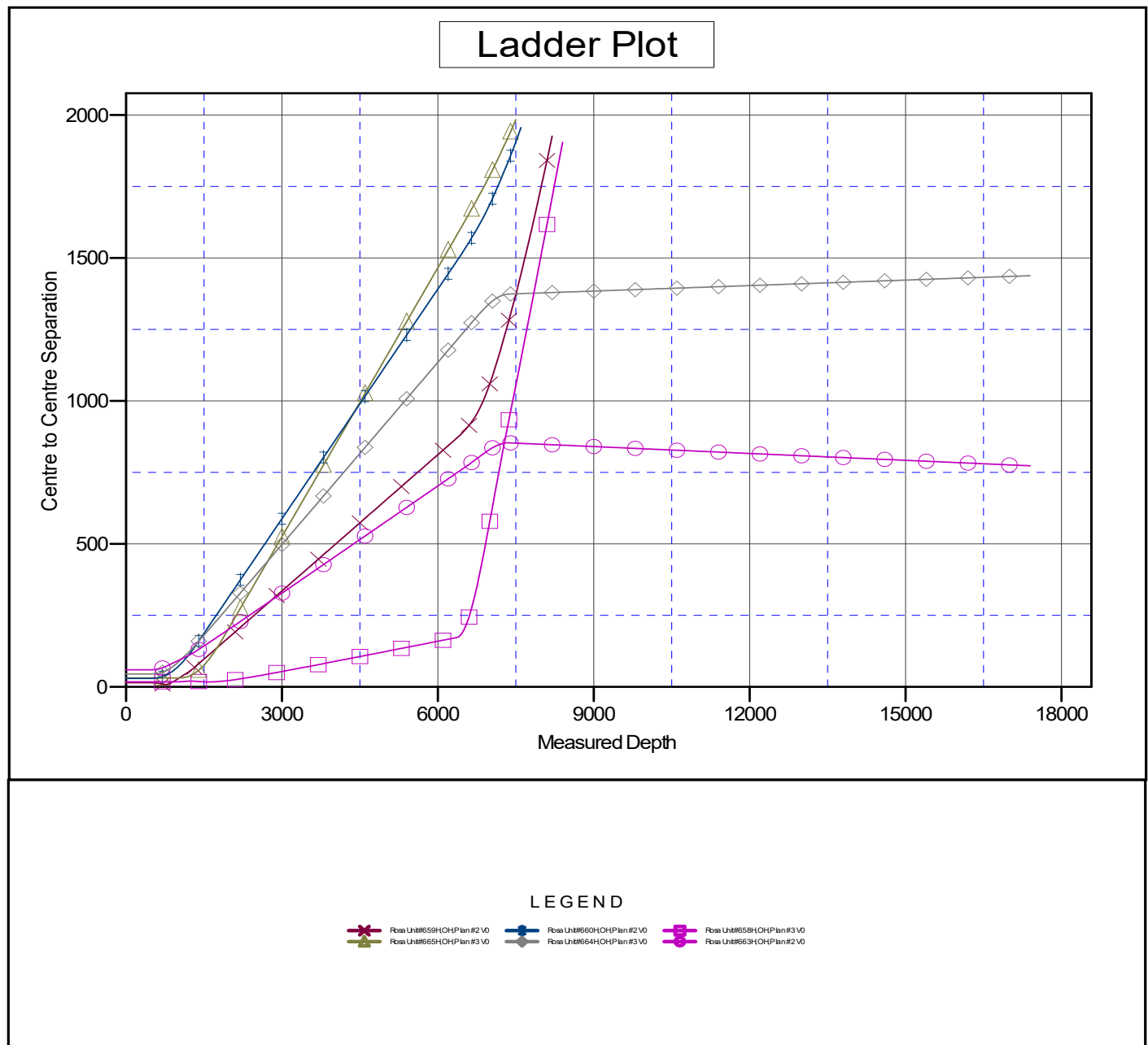
Anticollision Report



Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6394' @ 6394.00ft
 Offset Depths are relative to Offset Datum
 Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit #662H - Slot B2 (662H)
 Coordinate System is US State Plane 1983, New Mexico Western Zone
 Grid Convergence at Surface is: 0.26°





Lonestar Consulting, LLC

Anticollision Report

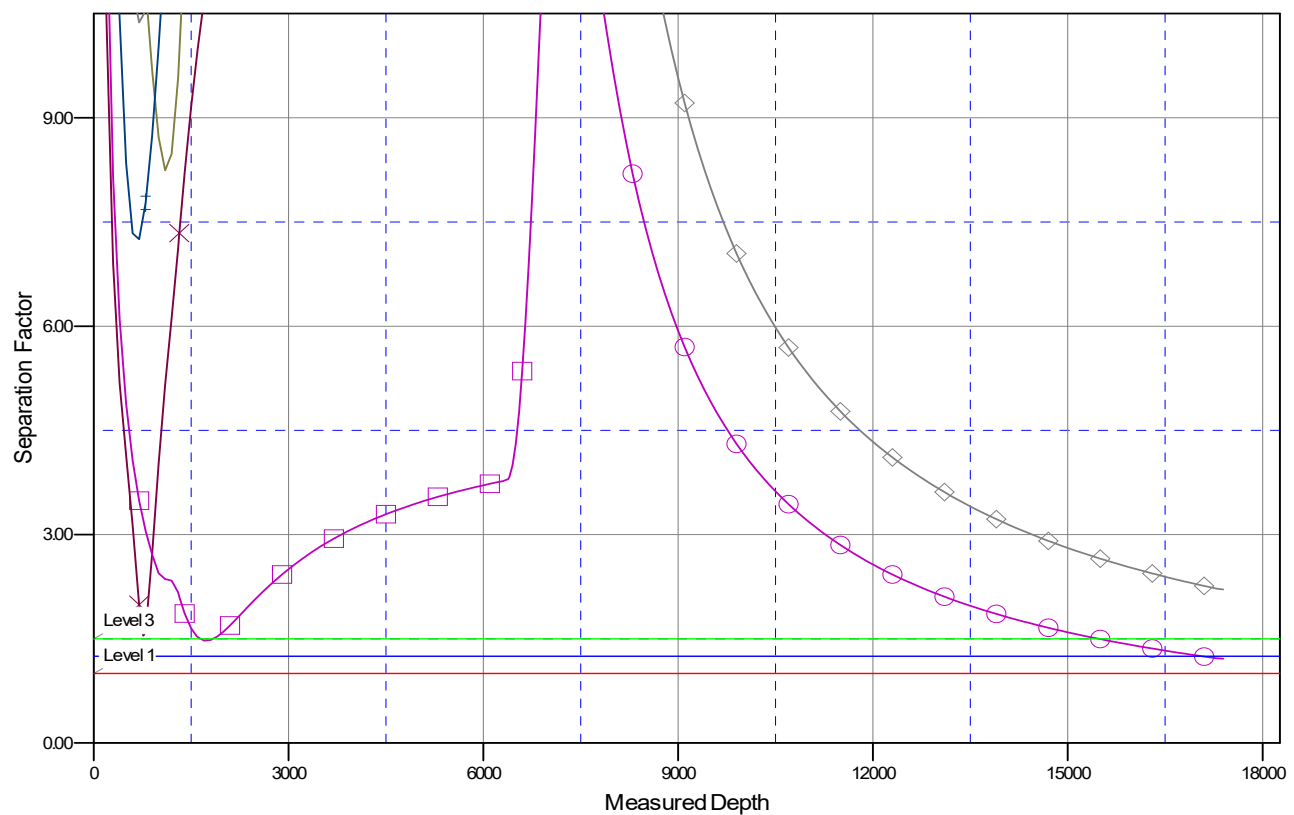


Company:	Logos Operating LLC	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Project:	Rio Arriba, NM NAD83	TVD Reference:	GL 6394' @ 6394.00ft
Reference Site:	Rosa Unit 30	MD Reference:	GL 6394' @ 6394.00ft
Site Error:	0.00 ft	North Reference:	True
Reference Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	Grand Junction
Reference Design:	Plan #3	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL 6394' @ 6394.00ft
 Offset Depths are relative to Offset Datum
 Central Meridian is -107.8333334

Coordinates are relative to: Rosa Unit #662H - Slot B2 (662H)
 Coordinate System is US State Plane 1983, New Mexico Western Zone
 Grid Convergence at Surface is: 0.26°

Separation Factor Plot



LEGEND



Released to Imaging: 3/28/2022 2:05:33 PM



Company: Logos Operating LLC
Project: Rio Arriba, NM NAD83
Site: Rosa Unit 30
Well: Rosa Unit #662H
Wellbore: OH
Design: Plan #3

PROJECT DETAILS: Rio Arriba, NM NAD83

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

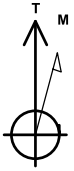


WELL DETAILS: Rosa Unit #662H

		GL 6394' @ 6394.00ft			
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	2136165.14	2848512.74	36.8696679	-107.4045529 B2 (662H)

Plan: Plan #3 (Rosa Unit #662H/OH)

Created By: Janie Collins Date: 9:29, November 19 2021



Azimuths to True North
Magnetic North: 10

Magnetic Field
Strength: 51652
Dip Angle: 63.82°
Date: 12/31/2004
Model: IGRF2000

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
662H POE Rev 1	7000.00	200.38	741.60	2136368.85	2849253.44	36.8702183	-107.4020176
662H BHL	7000.00	66.84	10767.82	2136280.32	2859280.13	36.8698458	-107.3677413

SECTION DETAILS

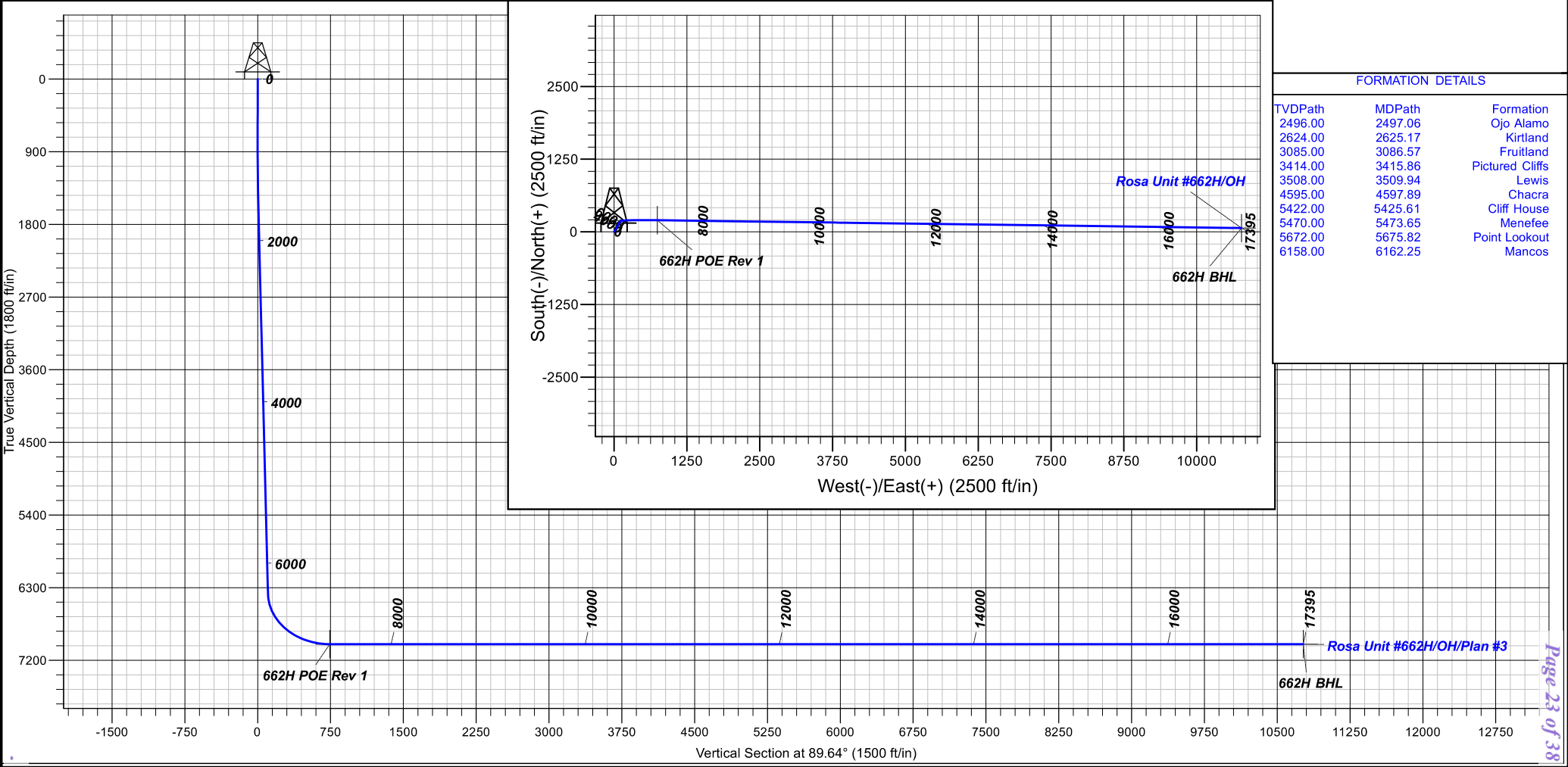
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00	0.00
1319.49	2.39	29.41	1319.46	2.17	1.22	2.00	29.41	1.24
6380.96	2.39	29.41	6376.52	186.03	104.86	0.00	106.01	1.24
7368.23	90.00	90.76	7000.00	200.38	741.60	9.00	61.37	742.83
17395.33	90.00	90.76	7000.00	66.84	10767.82	0.00	0.00	10768.02

CASING DETAILS

No casing data is available

FORMATION DETAILS

TVDPath	MDPath	Formation
2496.00	2497.06	Ojo Alamo
2624.00	2625.17	Kirtland
3085.00	3086.57	Fruitland
3414.00	3415.86	Pictured Cliffs
3508.00	3509.94	Lewis
4595.00	4597.89	Chacra
5422.00	5425.61	Cliff House
5470.00	5473.65	Menefee
5672.00	5675.82	Point Lookout
6158.00	6162.25	Mancos



Received by OCB: 3/28/2022 4:03:02 PM

Page 23 of 38



Logos Operating LLC

Rio Arriba, NM NAD83

Rosa Unit 30

Rosa Unit #662H - Slot B2 (662H)

OH

Plan: Plan #3

Standard Planning Report

19 November, 2021





Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Operating LLC	TVD Reference:	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	North Reference:	True
Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

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 30		
Site Position:		Northing:	2,136,112.13 usft
From:	Lat/Long	Easting:	2,848,540.75 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in
		Latitude:	36.8695220
		Longitude:	-107.4044580
		Grid Convergence:	0.26 °

Well	Rosa Unit #662H - Slot B2 (662H)					
Well Position	+N/-S	53.13 ft	Northing:	2,136,165.13 usft	Latitude:	36.8696679
	+E/-W	-27.76 ft	Easting:	2,848,512.75 usft	Longitude:	-107.4045529
Position Uncertainty		0.00 ft	Wellhead Elevation:		Ground Level:	6,394.00 ft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2000	12/31/2004	10.80	63.86	51,652.04058676

Design	Plan #3				
Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(ft)	(ft)	(ft)	(°)	
	0.00	0.00	0.00	89.64	

Plan Survey Tool Program	Date	11/19/2021			
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	17,394.71	Plan #3 (OH)	MWD	
				MWD - Standard	

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,319.49	2.39	29.41	1,319.46	2.17	1.22	2.00	2.00	0.00	29.41	
6,380.96	2.39	29.41	6,376.52	186.03	104.86	0.00	0.00	0.00	0.00	
7,368.23	90.00	90.76	7,000.00	200.38	741.60	9.00	8.87	6.21	61.37	662H POE Rev 1
17,395.33	90.00	90.76	7,000.00	66.84	10,767.82	0.00	0.00	0.00	0.00	662H BHL



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Operating LLC	TVD Reference:	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	North Reference:	True
Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	2.00	29.41	1,299.98	1.52	0.86	0.87	2.00	2.00	0.00
1,319.49	2.39	29.41	1,319.46	2.17	1.22	1.24	2.00	2.00	0.00
1,400.00	2.39	29.41	1,399.90	5.10	2.87	2.90	0.00	0.00	0.00
1,500.00	2.39	29.41	1,499.81	8.73	4.92	4.97	0.00	0.00	0.00
1,600.00	2.39	29.41	1,599.72	12.36	6.97	7.04	0.00	0.00	0.00
1,700.00	2.39	29.41	1,699.63	15.99	9.01	9.11	0.00	0.00	0.00
1,800.00	2.39	29.41	1,799.55	19.62	11.06	11.18	0.00	0.00	0.00
1,900.00	2.39	29.41	1,899.46	23.26	13.11	13.25	0.00	0.00	0.00
2,000.00	2.39	29.41	1,999.37	26.89	15.16	15.32	0.00	0.00	0.00
2,100.00	2.39	29.41	2,099.29	30.52	17.21	17.39	0.00	0.00	0.00
2,200.00	2.39	29.41	2,199.20	34.15	19.25	19.46	0.00	0.00	0.00
2,300.00	2.39	29.41	2,299.11	37.79	21.30	21.53	0.00	0.00	0.00
2,400.00	2.39	29.41	2,399.03	41.42	23.35	23.60	0.00	0.00	0.00
2,500.00	2.39	29.41	2,498.94	45.05	25.40	25.67	0.00	0.00	0.00
2,600.00	2.39	29.41	2,598.85	48.68	27.44	27.74	0.00	0.00	0.00
2,700.00	2.39	29.41	2,698.76	52.32	29.49	29.82	0.00	0.00	0.00
2,800.00	2.39	29.41	2,798.68	55.95	31.54	31.89	0.00	0.00	0.00
2,900.00	2.39	29.41	2,898.59	59.58	33.59	33.96	0.00	0.00	0.00
3,000.00	2.39	29.41	2,998.50	63.21	35.63	36.03	0.00	0.00	0.00
3,100.00	2.39	29.41	3,098.42	66.85	37.68	38.10	0.00	0.00	0.00
3,200.00	2.39	29.41	3,198.33	70.48	39.73	40.17	0.00	0.00	0.00
3,300.00	2.39	29.41	3,298.24	74.11	41.78	42.24	0.00	0.00	0.00
3,400.00	2.39	29.41	3,398.16	77.74	43.82	44.31	0.00	0.00	0.00
3,500.00	2.39	29.41	3,498.07	81.38	45.87	46.38	0.00	0.00	0.00
3,600.00	2.39	29.41	3,597.98	85.01	47.92	48.45	0.00	0.00	0.00
3,700.00	2.39	29.41	3,697.89	88.64	49.97	50.52	0.00	0.00	0.00
3,800.00	2.39	29.41	3,797.81	92.27	52.01	52.59	0.00	0.00	0.00
3,900.00	2.39	29.41	3,897.72	95.91	54.06	54.66	0.00	0.00	0.00
4,000.00	2.39	29.41	3,997.63	99.54	56.11	56.73	0.00	0.00	0.00
4,100.00	2.39	29.41	4,097.55	103.17	58.16	58.80	0.00	0.00	0.00
4,200.00	2.39	29.41	4,197.46	106.80	60.20	60.87	0.00	0.00	0.00
4,300.00	2.39	29.41	4,297.37	110.44	62.25	62.94	0.00	0.00	0.00
4,400.00	2.39	29.41	4,397.29	114.07	64.30	65.01	0.00	0.00	0.00
4,500.00	2.39	29.41	4,497.20	117.70	66.35	67.08	0.00	0.00	0.00
4,600.00	2.39	29.41	4,597.11	121.33	68.40	69.15	0.00	0.00	0.00
4,700.00	2.39	29.41	4,697.03	124.97	70.44	71.22	0.00	0.00	0.00
4,800.00	2.39	29.41	4,796.94	128.60	72.49	73.29	0.00	0.00	0.00
4,900.00	2.39	29.41	4,896.85	132.23	74.54	75.36	0.00	0.00	0.00
5,000.00	2.39	29.41	4,996.76	135.86	76.59	77.43	0.00	0.00	0.00
5,100.00	2.39	29.41	5,096.68	139.50	78.63	79.50	0.00	0.00	0.00



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Operating LLC	TVD Reference:	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	North Reference:	True
Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
5,200.00	2.39	29.41	5,196.59	143.13	80.68	81.57	0.00	0.00	0.00	
5,300.00	2.39	29.41	5,296.50	146.76	82.73	83.64	0.00	0.00	0.00	
5,400.00	2.39	29.41	5,396.42	150.39	84.78	85.71	0.00	0.00	0.00	
5,500.00	2.39	29.41	5,496.33	154.03	86.82	87.78	0.00	0.00	0.00	
5,600.00	2.39	29.41	5,596.24	157.66	88.87	89.85	0.00	0.00	0.00	
5,700.00	2.39	29.41	5,696.16	161.29	90.92	91.92	0.00	0.00	0.00	
5,800.00	2.39	29.41	5,796.07	164.92	92.97	93.99	0.00	0.00	0.00	
5,900.00	2.39	29.41	5,895.98	168.56	95.01	96.06	0.00	0.00	0.00	
6,000.00	2.39	29.41	5,995.89	172.19	97.06	98.13	0.00	0.00	0.00	
6,100.00	2.39	29.41	6,095.81	175.82	99.11	100.20	0.00	0.00	0.00	
6,200.00	2.39	29.41	6,195.72	179.45	101.16	102.27	0.00	0.00	0.00	
6,300.00	2.39	29.41	6,295.63	183.09	103.20	104.34	0.00	0.00	0.00	
6,380.96	2.39	29.41	6,376.52	186.03	104.86	106.01	0.00	0.00	0.00	
6,400.00	3.55	54.53	6,395.54	186.71	105.54	106.69	9.00	6.07	131.91	
6,500.00	12.04	80.88	6,494.55	190.17	118.38	119.56	9.00	8.50	26.35	
6,600.00	20.96	85.28	6,590.33	193.30	146.56	147.76	9.00	8.92	4.40	
6,700.00	29.93	87.12	6,680.55	196.04	189.39	190.60	9.00	8.97	1.84	
6,800.00	38.91	88.16	6,762.96	198.30	245.80	247.03	9.00	8.98	1.05	
6,900.00	47.89	88.87	6,835.54	200.05	314.42	315.65	9.00	8.99	0.70	
7,000.00	56.88	89.39	6,896.51	201.23	393.54	394.79	9.00	8.99	0.53	
7,100.00	65.88	89.82	6,944.36	201.81	481.23	482.48	9.00	8.99	0.43	
7,200.00	74.87	90.20	6,977.91	201.79	575.33	576.57	9.00	8.99	0.37	
7,300.00	83.86	90.54	6,996.35	201.16	673.51	674.74	9.00	8.99	0.34	
7,368.23	90.00	90.76	7,000.00	200.38	741.60	742.83	9.00	8.99	0.33	
7,400.00	90.00	90.76	7,000.00	199.96	773.37	774.59	0.00	0.00	0.00	
7,500.00	90.00	90.76	7,000.00	198.63	873.36	874.58	0.00	0.00	0.00	
7,600.00	90.00	90.76	7,000.00	197.30	973.35	974.56	0.00	0.00	0.00	
7,700.00	90.00	90.76	7,000.00	195.96	1,073.34	1,074.54	0.00	0.00	0.00	
7,800.00	90.00	90.76	7,000.00	194.63	1,173.33	1,174.52	0.00	0.00	0.00	
7,900.00	90.00	90.76	7,000.00	193.30	1,273.32	1,274.50	0.00	0.00	0.00	
8,000.00	90.00	90.76	7,000.00	191.97	1,373.32	1,374.48	0.00	0.00	0.00	
8,100.00	90.00	90.76	7,000.00	190.64	1,473.31	1,474.46	0.00	0.00	0.00	
8,200.00	90.00	90.76	7,000.00	189.31	1,573.30	1,574.44	0.00	0.00	0.00	
8,300.00	90.00	90.76	7,000.00	187.97	1,673.29	1,674.42	0.00	0.00	0.00	
8,400.00	90.00	90.76	7,000.00	186.64	1,773.28	1,774.40	0.00	0.00	0.00	
8,500.00	90.00	90.76	7,000.00	185.31	1,873.27	1,874.39	0.00	0.00	0.00	
8,600.00	90.00	90.76	7,000.00	183.98	1,973.26	1,974.37	0.00	0.00	0.00	
8,700.00	90.00	90.76	7,000.00	182.65	2,073.25	2,074.35	0.00	0.00	0.00	
8,800.00	90.00	90.76	7,000.00	181.31	2,173.24	2,174.33	0.00	0.00	0.00	
8,900.00	90.00	90.76	7,000.00	179.98	2,273.24	2,274.31	0.00	0.00	0.00	
9,000.00	90.00	90.76	7,000.00	178.65	2,373.23	2,374.29	0.00	0.00	0.00	
9,100.00	90.00	90.76	7,000.00	177.32	2,473.22	2,474.27	0.00	0.00	0.00	
9,200.00	90.00	90.76	7,000.00	175.99	2,573.21	2,574.25	0.00	0.00	0.00	
9,300.00	90.00	90.76	7,000.00	174.65	2,673.20	2,674.23	0.00	0.00	0.00	
9,400.00	90.00	90.76	7,000.00	173.32	2,773.19	2,774.21	0.00	0.00	0.00	
9,500.00	90.00	90.76	7,000.00	171.99	2,873.18	2,874.19	0.00	0.00	0.00	
9,600.00	90.00	90.76	7,000.00	170.66	2,973.17	2,974.18	0.00	0.00	0.00	
9,700.00	90.00	90.76	7,000.00	169.33	3,073.16	3,074.16	0.00	0.00	0.00	
9,800.00	90.00	90.76	7,000.00	168.00	3,173.16	3,174.14	0.00	0.00	0.00	
9,900.00	90.00	90.76	7,000.00	166.66	3,273.15	3,274.12	0.00	0.00	0.00	
10,000.00	90.00	90.76	7,000.00	165.33	3,373.14	3,374.10	0.00	0.00	0.00	
10,100.00	90.00	90.76	7,000.00	164.00	3,473.13	3,474.08	0.00	0.00	0.00	
10,200.00	90.00	90.76	7,000.00	162.67	3,573.12	3,574.06	0.00	0.00	0.00	



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Operating LLC	TVD Reference:	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	North Reference:	True
Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
10,300.00	90.00	90.76	7,000.00	161.34	3,673.11	3,674.04	0.00	0.00	0.00	
10,400.00	90.00	90.76	7,000.00	160.00	3,773.10	3,774.02	0.00	0.00	0.00	
10,500.00	90.00	90.76	7,000.00	158.67	3,873.09	3,874.00	0.00	0.00	0.00	
10,600.00	90.00	90.76	7,000.00	157.34	3,973.08	3,973.98	0.00	0.00	0.00	
10,700.00	90.00	90.76	7,000.00	156.01	4,073.08	4,073.97	0.00	0.00	0.00	
10,800.00	90.00	90.76	7,000.00	154.68	4,173.07	4,173.95	0.00	0.00	0.00	
10,900.00	90.00	90.76	7,000.00	153.34	4,273.06	4,273.93	0.00	0.00	0.00	
11,000.00	90.00	90.76	7,000.00	152.01	4,373.05	4,373.91	0.00	0.00	0.00	
11,100.00	90.00	90.76	7,000.00	150.68	4,473.04	4,473.89	0.00	0.00	0.00	
11,200.00	90.00	90.76	7,000.00	149.35	4,573.03	4,573.87	0.00	0.00	0.00	
11,300.00	90.00	90.76	7,000.00	148.02	4,673.02	4,673.85	0.00	0.00	0.00	
11,400.00	90.00	90.76	7,000.00	146.69	4,773.01	4,773.83	0.00	0.00	0.00	
11,500.00	90.00	90.76	7,000.00	145.35	4,873.01	4,873.81	0.00	0.00	0.00	
11,600.00	90.00	90.76	7,000.00	144.02	4,973.00	4,973.79	0.00	0.00	0.00	
11,700.00	90.00	90.76	7,000.00	142.69	5,072.99	5,073.78	0.00	0.00	0.00	
11,800.00	90.00	90.76	7,000.00	141.36	5,172.98	5,173.76	0.00	0.00	0.00	
11,900.00	90.00	90.76	7,000.00	140.03	5,272.97	5,273.74	0.00	0.00	0.00	
12,000.00	90.00	90.76	7,000.00	138.69	5,372.96	5,373.72	0.00	0.00	0.00	
12,100.00	90.00	90.76	7,000.00	137.36	5,472.95	5,473.70	0.00	0.00	0.00	
12,200.00	90.00	90.76	7,000.00	136.03	5,572.94	5,573.68	0.00	0.00	0.00	
12,300.00	90.00	90.76	7,000.00	134.70	5,672.93	5,673.66	0.00	0.00	0.00	
12,400.00	90.00	90.76	7,000.00	133.37	5,772.93	5,773.64	0.00	0.00	0.00	
12,500.00	90.00	90.76	7,000.00	132.03	5,872.92	5,873.62	0.00	0.00	0.00	
12,600.00	90.00	90.76	7,000.00	130.70	5,972.91	5,973.60	0.00	0.00	0.00	
12,700.00	90.00	90.76	7,000.00	129.37	6,072.90	6,073.58	0.00	0.00	0.00	
12,800.00	90.00	90.76	7,000.00	128.04	6,172.89	6,173.57	0.00	0.00	0.00	
12,900.00	90.00	90.76	7,000.00	126.71	6,272.88	6,273.55	0.00	0.00	0.00	
13,000.00	90.00	90.76	7,000.00	125.38	6,372.87	6,373.53	0.00	0.00	0.00	
13,100.00	90.00	90.76	7,000.00	124.04	6,472.86	6,473.51	0.00	0.00	0.00	
13,200.00	90.00	90.76	7,000.00	122.71	6,572.85	6,573.49	0.00	0.00	0.00	
13,300.00	90.00	90.76	7,000.00	121.38	6,672.85	6,673.47	0.00	0.00	0.00	
13,400.00	90.00	90.76	7,000.00	120.05	6,772.84	6,773.45	0.00	0.00	0.00	
13,500.00	90.00	90.76	7,000.00	118.72	6,872.83	6,873.43	0.00	0.00	0.00	
13,600.00	90.00	90.76	7,000.00	117.38	6,972.82	6,973.41	0.00	0.00	0.00	
13,700.00	90.00	90.76	7,000.00	116.05	7,072.81	7,073.39	0.00	0.00	0.00	
13,800.00	90.00	90.76	7,000.00	114.72	7,172.80	7,173.38	0.00	0.00	0.00	
13,900.00	90.00	90.76	7,000.00	113.39	7,272.79	7,273.36	0.00	0.00	0.00	
14,000.00	90.00	90.76	7,000.00	112.06	7,372.78	7,373.34	0.00	0.00	0.00	
14,100.00	90.00	90.76	7,000.00	110.72	7,472.77	7,473.32	0.00	0.00	0.00	
14,200.00	90.00	90.76	7,000.00	109.39	7,572.77	7,573.30	0.00	0.00	0.00	
14,300.00	90.00	90.76	7,000.00	108.06	7,672.76	7,673.28	0.00	0.00	0.00	
14,400.00	90.00	90.76	7,000.00	106.73	7,772.75	7,773.26	0.00	0.00	0.00	
14,500.00	90.00	90.76	7,000.00	105.40	7,872.74	7,873.24	0.00	0.00	0.00	
14,600.00	90.00	90.76	7,000.00	104.07	7,972.73	7,973.22	0.00	0.00	0.00	
14,700.00	90.00	90.76	7,000.00	102.73	8,072.72	8,073.20	0.00	0.00	0.00	
14,800.00	90.00	90.76	7,000.00	101.40	8,172.71	8,173.18	0.00	0.00	0.00	
14,900.00	90.00	90.76	7,000.00	100.07	8,272.70	8,273.17	0.00	0.00	0.00	
15,000.00	90.00	90.76	7,000.00	98.74	8,372.69	8,373.15	0.00	0.00	0.00	
15,100.00	90.00	90.76	7,000.00	97.41	8,472.69	8,473.13	0.00	0.00	0.00	
15,200.00	90.00	90.76	7,000.00	96.07	8,572.68	8,573.11	0.00	0.00	0.00	
15,300.00	90.00	90.76	7,000.00	94.74	8,672.67	8,673.09	0.00	0.00	0.00	
15,400.00	90.00	90.76	7,000.00	93.41	8,772.66	8,773.07	0.00	0.00	0.00	
15,500.00	90.00	90.76	7,000.00	92.08	8,872.65	8,873.05	0.00	0.00	0.00	



Lonestar Consulting, LLC

Planning Report



Database:	Grand Junction	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Operating LLC	TVD Reference:	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	North Reference:	True
Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
15,600.00	90.00	90.76	7,000.00	90.75	8,972.64	8,973.03	0.00	0.00	0.00	
15,700.00	90.00	90.76	7,000.00	89.41	9,072.63	9,073.01	0.00	0.00	0.00	
15,800.00	90.00	90.76	7,000.00	88.08	9,172.62	9,172.99	0.00	0.00	0.00	
15,900.00	90.00	90.76	7,000.00	86.75	9,272.61	9,272.97	0.00	0.00	0.00	
16,000.00	90.00	90.76	7,000.00	85.42	9,372.61	9,372.96	0.00	0.00	0.00	
16,100.00	90.00	90.76	7,000.00	84.09	9,472.60	9,472.94	0.00	0.00	0.00	
16,200.00	90.00	90.76	7,000.00	82.76	9,572.59	9,572.92	0.00	0.00	0.00	
16,300.00	90.00	90.76	7,000.00	81.42	9,672.58	9,672.90	0.00	0.00	0.00	
16,400.00	90.00	90.76	7,000.00	80.09	9,772.57	9,772.88	0.00	0.00	0.00	
16,500.00	90.00	90.76	7,000.00	78.76	9,872.56	9,872.86	0.00	0.00	0.00	
16,600.00	90.00	90.76	7,000.00	77.43	9,972.55	9,972.84	0.00	0.00	0.00	
16,700.00	90.00	90.76	7,000.00	76.10	10,072.54	10,072.82	0.00	0.00	0.00	
16,800.00	90.00	90.76	7,000.00	74.76	10,172.54	10,172.80	0.00	0.00	0.00	
16,900.00	90.00	90.76	7,000.00	73.43	10,272.53	10,272.78	0.00	0.00	0.00	
17,000.00	90.00	90.76	7,000.00	72.10	10,372.52	10,372.77	0.00	0.00	0.00	
17,100.00	90.00	90.76	7,000.00	70.77	10,472.51	10,472.75	0.00	0.00	0.00	
17,200.00	90.00	90.76	7,000.00	69.44	10,572.50	10,572.73	0.00	0.00	0.00	
17,300.00	90.00	90.76	7,000.00	68.10	10,672.49	10,672.71	0.00	0.00	0.00	
17,395.33	90.00	90.76	7,000.00	66.84	10,767.82	10,768.02	0.00	0.00	0.00	

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									
662H POE Rev 1	0.00	0.00	7,000.00	200.38	741.60	2,136,368.85	2,849,253.44	36.8702183	-107.4020176
- plan hits target center									
- Point									
662H BHL	0.00	0.00	7,000.00	66.84	10,767.82	2,136,280.32	2,859,280.13	36.8698458	-107.3677413
- plan hits target center									
- Point									

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,497.06	2,496.00	Ojo Alamo		0.00	0.00	
2,625.17	2,624.00	Kirtland		0.00	0.00	
3,086.57	3,085.00	Fruitland		0.00	0.00	
3,415.86	3,414.00	Pictured Cliffs		0.00	0.00	
3,509.94	3,508.00	Lewis		0.00	0.00	
4,597.89	4,595.00	Chacra		0.00	0.00	
5,425.61	5,422.00	Cliff House		0.00	0.00	
5,473.65	5,470.00	Menefee		0.00	0.00	
5,675.82	5,672.00	Point Lookout		0.00	0.00	
6,162.25	6,158.00	Mancos		0.00	0.00	



Lonestar Consulting, LLC
Planning Report



Database:	Grand Junction	Local Co-ordinate Reference	Well Rosa Unit #662H - Slot B2 (662H)
Company:	Logos Operating LLC	TVD Reference:	GL 6394' @ 6394.00ft
Project:	Rio Arriba, NM NAD83	MD Reference:	GL 6394' @ 6394.00ft
Site:	Rosa Unit 30	North Reference:	True
Well:	Rosa Unit #662H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #3		

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
1,200.00	1,200.00	0.00	0.00	Start Build 2.00	
1,319.49	1,319.46	2.17	1.22	Start 5061.47 hold at 1319.49 MD	
6,380.96	6,376.52	186.03	104.86	Start DLS 9.00 TFO 61.37	
7,368.23	7,000.00	200.38	741.60	Start 10027.10 hold at 7368.23 MD	
17,235.33	7,000.00	68.97	10,607.83	First Perf @ 17,235' MD	
17,235.33	7,000.00	68.97	10,607.83	36.8698518, -107.3682882	
17,395.04	7,000.00	66.84	10,767.52	TD at 17395.33	



LOGOS Operating, LLC Operations Plan

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

Date:	December 10, 2021	Pool:	Basin Mancos
Well Name:	Rosa Unit 662H	GL Elevation:	6,394'
Surface Location:	Sec 30, T31N, R5W 2300 FSL, 946 FWL (36.869662° N, 107.404553° W – NAD83)	Measured Depth:	17,395' (GL)
Bottom Hole Location:	Sec 28, T31N, R5W 2360 FSL, 2614 FWL (36.869846° N, 107.367741° W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF078764, CA Serial #NMNM78407E

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2497	2496	*POINT LOOKOUT	5676	5672
KIRTLAND	2625	2624	*MANCOS	6162	6158
*FRUITLAND	3087	3085	KICKOFF POINT	6381	6377
*PICTURED CLIFFS	3416	3414	LANDING POINT	7368	7000
LEWIS	3510	3508			
CHACRA	4598	4595			
*CLIFF HOUSE	5426	5422			
MENEFEE	5474	5470	TD	17,395	7,000

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

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

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

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

II. DRILLING

A. MUD PROGRAM: LSND mud (WBM) will be used to drill the 17-1/2" surface hole as well as the 12-1/4" directional vertical hole. A LSND (WBM) or (OBM) will be used to drill the 8-3/4" curve and lateral portion of the wellbore. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses. Mud weights of 8.8-13 ppg will be used as necessary to maintain sufficient overbalance of reservoir pressure.

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

ROSA UNIT 662H



times.

- B. BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing to **1500 psi for 30 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. BOP equipment will be tested every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure. Annular preventers will be functionally operated at least once per week. Pipe and blind rams shall be activated each trip or but not more than once a day. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE. **All tests and inspections will be recorded and logged with time and results.** A full BOP test will be conducted when initially installed for the first well on the pad or if seals subject to test pressure are broken, following related repairs and at a minimum of 30 day intervals. A BOPE Shell Test only will be conducted for subsequent wells on the pad when seals subject to pressure have not been broken or repaired and fall within the 30 day interval of first full test.
- C. GeoHazards:** There are no Geohazards
- D. Maximum Anticipated Pressure:** $7000' \text{ TVD} \times 0.43 = 3010 \text{ psi}$
- E. H2S Concerns:** There is no record of any naturally occurring H2S in any formation in the Rosa Unit. No H2S is anticipated in this formation or this well.

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OHSIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	17.5"	320' or greater	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE	12.25"	6,237'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	17,395'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

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

B. FLOAT EQUIPMENT:

- SURFACE CASING:** 13-3/8" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (3) joints of Surface Casing.
- INTERMEDIATE CASING:** 9-5/8" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. Optional use of DV Tools (2) will be strategically placed above loss circulation zones anticipated in the Mesaverde and Fruitland Coal. Optional use of cancellation plugs for DV tools may be used if losses while cementing are not encountered.
- PRODUCTION CASING:** Run 5-1/2" casing with cement nose guide Float Shoe, 5-1/2" full or pup joints as necessary, Landing Collar, 5-1/2" full or pup joints as necessary, at least (1) RSI (Sliding Sleeve) positioned inside the applicable production area. Centralizer program will be determined by wellbore conditions. Production casing to be pressure tested during completion operations with frac stack installed.

ROSA UNIT 662H



C. CEMENTING:

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

1. SURFACE: Casing shall be set at ~ 320' and cemented to surface. TOC at Surface.
263 sks of 15.8 ppg Type Neat G, 1.18 cuft/sk yield or equivalent 223 sks of 14.6 ppg Type III with 1.39 cuft/sk yield, 30% excess.
2. INTERMEDIATE: Intermediate casing shall be kept fluid filled while running in to the hole to meet BLM minimum collapse requirements. The intermediate casing will be cemented in 2 or 3 stages using DV/STAGE tools in order to reduce cement losses and maximize cement coverage. Operator proposes optional DV tools above anticipated loss circulation zones in the Mesaverde and in the Fruitland coal. If losses are not observed during the second stage a cancelation plug will be pumped and the remaining cement will be pumped during stage 2. If cement does not circulate to the DV tool(s) or to surface, a CBL will be run to determine TOC.

	Top (ft)	Footage (ft)	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	5,776	461	0.31318	1.3	205	37	1.15	178	15.8
Stage 1 Lead	4,648	1,128	0.31318	1.3	459	82	2.30	200	12.3
					664	118		378	
Stage 2 Tail	3,616	1,032	0.31318	1.3	420	75	1.50	280	13.5
Stage 2 Lead	3,137	479	0.31318	1.3	195	35	2.30	85	12.3
					615	110		365	
Stage 3 Tail	2,387	750	0.31318	1.3	305	54	1.99	153	12.8
Stage 3 Lead	320	2,067	0.31318	1.3	842	150	2.53	333	12
Stage 3 Lead	-	320	0.36268	1	116	21	2.53	46	12
					1,263	225		532	
All Stage Totals					2543	453		1275	

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

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

	Top (ft)	Footage (ft)	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased Lead	6,137	100	0.2531	1	25	5	1.56	16	13
Open Hole Lead	6,237	11,158	0.2291	1.15	2,950	525	1.56	1,891	13
					2,976	530		1,907	

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

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

IV. COMPLETION

A. CBL

ROSA UNIT 662H



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

B. PRESSURE TEST

- C. With frac stack installed on wellhead, pressure test 5-1/2" casing to 1540 psi (0.22 psi/ft * 7,000' TVD) for 30 minutes. Increase pressure to Open RSI sleeves.

D. STIMULATION

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

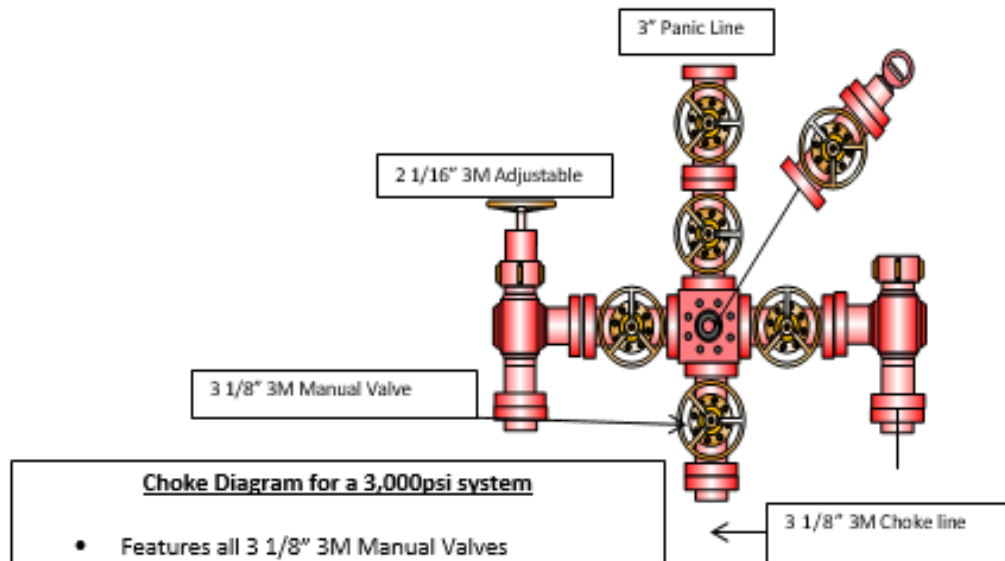
E. PRODUCTION TUBING

2-7/8", 6.5#, J-55, EUE tubing will be run once volumes and pressures dictate.

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

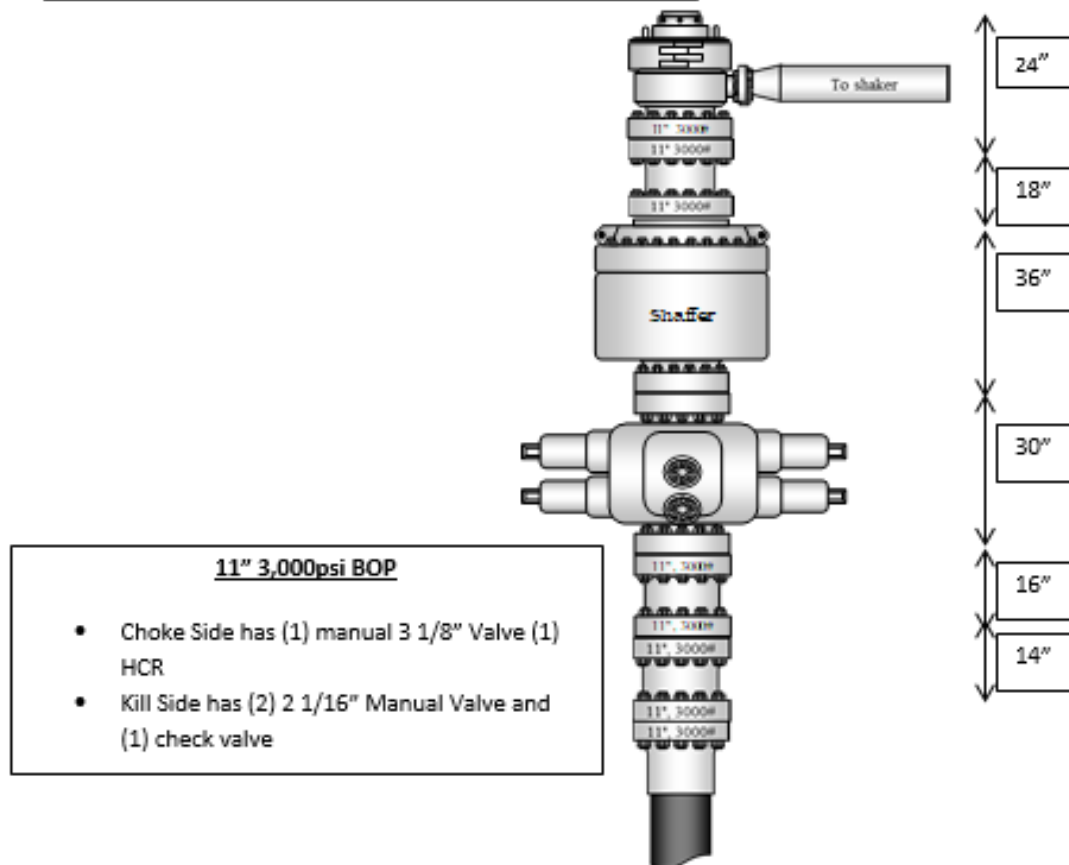


3M 11" B.O.P.E Diagram



Choke Diagram for a 3,000psi system

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



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

ROSA UNIT 662H

Well Name: ROSA UNIT	Well Location: T31N / R5W / SEC 30 / NESW /	County or Parish/State:
Well Number: 662H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF0078764	Unit or CA Name:	Unit or CA Number: NMNM078707E
US Well Number: 3003931417	Well Status: Approved Application for Permit to Drill	Operator: LOGOS OPERATING LLC

Notice of Intent

Sundry ID: 2663882

Type of Submission: Notice of Intent	Type of Action: Other
Date Sundry Submitted: 03/24/2022	Time Sundry Submitted: 03:27
Date proposed operation will begin: 04/04/2022	

Procedure Description: LOGOS Operating request a change in plans for the following: Original TD @ 17,949' MD 6997' TVD to new TD @ 17,395' MD 7000' TVD. Geology tops have been updated per changes. Original KOP @ 6318' MD 6296' TVD to new KOP @ 6381' MD 6377' TVD. Original Landing point @ 7372' MD 6987' TVD to new Landing point @ 7368' MD 7000' TVD. Original 9.625" casing Intermediate @ 6255' MD to new 6237' MD Original 5.5" casing Production @ 17,949' MD to new 17,395' MD Original 9.625" Intermediate & 5.5 Production cementing bbls and sacks have been updated per casing depth changes. Attached: New C102, Operation and Direction Drilling Plans

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

3160_5_Rosa_Unit_662H_Change_in_plans_20220324_20220324152630.pdf

Well Name: ROSA UNIT	Well Location: T31N / R5W / SEC 30 / NESW /	County or Parish/State:
Well Number: 662H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF0078764	Unit or CA Name:	Unit or CA Number: NMNM078707E
US Well Number: 3003931417	Well Status: Approved Application for Permit to Drill	Operator: LOGOS OPERATING LLC

Operator Certification

I certify that the foregoing is true and correct. Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. Electronic submission of Sundry Notices through this system satisfies regulations requiring a submission of Form 3160-5 or a Sundry Notice.

Operator Electronic Signature: ETTA TRUJILLO	Signed on: MAR 24, 2022 03:27 PM
Name: LOGOS OPERATING LLC	
Title: Regulatory Specialist	
Street Address: 2010 AFTON PLACE	
City: Farmington	State: NM
Phone: (505) 324-4154	
Email address: ETRUJILLO@LOGOSRESOURCESLLC.COM	

Field Representative

Representative Name:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

BLM Point of Contact

BLM POC Name: KENNETH G RENNICK	BLM POC Title: Petroleum Engineer
BLM POC Phone: 5055647742	BLM POC Email Address: krennick@blm.gov
Disposition: Approved	Disposition Date: 03/25/2022
Signature: Kenneth Rennick	

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 93211

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 93211
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
kpickford	Adhere to previous NMOCD Conditions of Approval	3/28/2022