

Well Name: ROSA UNIT	Well Location: T31N / R5W / SEC 36 / NWNW / 36.861925 / -107.320894	County or Parish/State: RIO ARRIBA / NM
Well Number: 830H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF0078768, NMSF078768	Unit or CA Name: ROSA UNIT	Unit or CA Number: NMNM78407E
US Well Number: 3003931363	Operator: LOGOS OPERATING LLC	

Notice of Intent

Sundry ID: 2823582

Type of Submission: Notice of Intent Type of Action: APD Change

Date Sundry Submitted: 11/20/2024 Time Sundry Submitted: 10:53

Date proposed operation will begin: 11/20/2024

Procedure Description: LOGOS Operating request a change in plans for the following: Original TD @ 15,710' (MD) 7,163' (TVD) to new TD @ 19,384' (MD) 7,173' (TVD) Geology tops have been updated per changes. Original KOP @ 6,475'(MD) 6,445' (TVD) to new KOP @ 6,696'(MD) 6,537' (TVD) Original Landing point @ 7,539' (MD) 7,146' (TVD) to new Landing point @ 7,714' (MD) 7,173' (TVD) Original intermediate depth 6,441' to 6,635' Original production depth 15,710 to 19,384' All cementing bbls and sacks have been updated per casing depth changes Attached: C102, Operation and Directional Drill plans.

NOI Attachments

Procedure Description

- Logos__Rosa_Unit_830H_AC_Report_p4_20241120105147.pdf
- Rosa_Unit__830H_Updated_C_102_Plat_signed_20241120105147.pdf
- Rosa_Unit_830H_Operations_Plan_3_string_Prelim_WP4_11.8.2024_20241120105147.pdf
- Logos__Rosa_Unit_830H_Plan_Data_p4_20241120105147.pdf

Well Name: ROSA UNIT	Well Location: T31N / R5W / SEC 36 / NWNW / 36.861925 / -107.320894	County or Parish/State: RIO ARRIBA / NM
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US Well Number: 3003931363	Operator: LOGOS OPERATING LLC	

Operator

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

Operator Electronic Signature: LACEY GRANILLO

Signed on: NOV 20, 2024 10:53 AM

Name: LOGOS OPERATING LLC

Title: REGULATORY SPECIALIST

Street Address: 2010 AFTON PLACE

City: FARMINGTONState: NM

Phone: (505) 324-4145

Email address: LGRANILLO@LOGOSRESOURCESLLC.COM

Field

Representative Name:

Street Address:

City:State:Zip:

Phone:

Email address:

BLM Point of Contact

BLM POC Name: KENNETH G RENNICK

BLM POC Title: Petroleum Engineer

BLM POC Phone: 5055647742

BLM POC Email Address: krennick@blm.gov

Disposition: Approved

Disposition Date: 11/20/2024

Signature: Kenneth Rennick

C-102 Submit Electronically Via OCD Permitting	State of New Mexico Energy, Minerals & Natural Resources Department OIL CONSERVATION DIVISION	Revised July 9, 2024	
		Submittal Type	☒ Initial Submittal
			☐ Amended Report
		☐ As Drilled	

WELL LOCATION INFORMATION

API Number 30-039-31363	Pool Code 97232	Pool Name BASIN MANCOS
Property Code 320608	Property Name ROSA UNIT	Well Number 830H
OGRID No. 289408	Operator Name LOGOS OPERATING, LLC	Ground Level Elevation 6563'
Surface Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal		Mineral Owner: ☐ State ☐ Fee ☐ Tribal ☒ Federal

Surface Location

UL D	Section 36	Township 31N	Range 5W	Lot	Feet from N/S Line 525' NORTH	Feet from E/W Line 492' WEST	Latitude 36.861925 °N	Longitude -107.320894 °W	County RIO ARRIBA
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Bottom Hole Location

UL I	Section 28	Township 31N	Range 5W	Lot	Feet from N/S Line 1530' SOUTH	Feet from E/W Line 1002' EAST	Latitude 36.867555 °N	Longitude -107.362072 °W	County RIO ARRIBA
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Dedicated Acres 1280.00	Penetrated Spacing Unit: S/2 - Sections 25, 26, 27 & 28	Infill or Defining Well INFILL	Defining Well API	Overlapping Spacing Unit ☐ Yes ☒ No	Consolidation Code UNITIZATION
Order Numbers R-13457			Well setbacks are under Common Ownership: ☐ Yes ☒ No		

Kick Off Point (KOP)

UL M	Section 25	Township 31N	Range 5W	Lot	Feet from N/S Line 818' SOUTH	Feet from E/W Line 734' WEST	Latitude 36.865614 °N	Longitude -107.320065 °W	County RIO ARRIBA
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First Take Point (FTP)

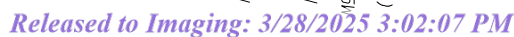
UL M	Section 25	Township 31N	Range 5W	Lot	Feet from N/S Line 998' SOUTH	Feet from E/W Line 105' WEST	Latitude 36.866108 °N	Longitude -107.322215 °W	County RIO ARRIBA
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Last Take Point (LTP)

UL I	Section 28	Township 31N	Range 5W	Lot	Feet from N/S Line 1530' SOUTH	Feet from E/W Line 1002' EAST	Latitude 36.867555 °N	Longitude -107.362072 °W	County RIO ARRIBA
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Unitized Area or Area of Uniform Interest ROSA UNIT	Spacing Unit Type ☒ Horizontal ☐ Vertical ☐ Directional	Ground Floor Elevation
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OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and, if the well is a vertical or directional well, that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division. <u>Lacey Granillo</u> Signature 11/20/24 Date <u>Lacey Granillo</u> Printed Name <u>lgranillo@logosresourcesllc.com</u> E-mail Address	SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.  JASON C. EDWARDS Signature and Seal of Professional Surveyor <table><tr><td>Certificate Number 15269</td><td>Date of Survey APRIL 20, 2016</td></tr></table>	Certificate Number 15269	Date of Survey APRIL 20, 2016
Certificate Number 15269	Date of Survey APRIL 20, 2016		





LOGOS Operating, LLC Operations Plan

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

Date:	November 8, 2024	Pool:	Basin Mancos
Well Name:	Rosa Unit 830H	GL Elevation:	6,563'
Surface Location:	Sec 36, T31N, R5W 525 FNL, 492 FWL (36.861925° N, 107.320894° W – NAD83)	KB:	30'
Bottom Hole Location:	Sec 28, T31N, R5W 1530 FSL, 1002 FEL (36.867555° N, -107.362072° W – NAD83)	Measured Depth:	19,384' (KB)
Lease Serial CA Serial	# NMSF078764 # NMNM78407E	County:	Rio Arriba

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2826'	2774'	*POINT LOOKOUT	6000'	5860'
KIRTLAND	2952'	2897'	*MANCOS	6560'	6404'
*FRUITLAND	3337'	3271'	KICKOFF POINT	6696'	6537'
*PICTURED CLIFFS	3700'	3624'	LANDING POINT	7714'	7173'
LEWIS	3802'	3723'	TD	19384'	7173'
CHACRA	4947'	4836'			
*CLIFF HOUSE	5778'	5644'			
MENEFEE	5813'	5678'			

* 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 12-1/4" intermediate hole. A LSND (WBM) or (OBM) will be used to drill the 8-1/2" curve and lateral portion of the wellbore. Treat for lost circulation as necessary. Obtain 100% returns prior to cementing. Notify Engineering of any mud losses.

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



- B. **BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **3000 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:** $7,173' \text{ TVD} \times 0.43 = 3,085 \text{ psi}$
- 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	OH SIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE (Pre-Set)	17.5"	333'	13.375"	54.5 LBS	J-55 or equiv	BTC
INTERMEDIATE	12.25"	6,635'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	19,384'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

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

B. **FLOAT EQUIPMENT:**

1. **SURFACE CASING:** 13-3/8" casing has been pre-set.
2. **INTERMEDIATE CASING:** 9-5/8" cement float shoe. 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. Optional use of an ICP may be used in conjunction with DV Tools.
3. **PRODUCTION CASING:** Run 5-1/2" casing with cement nose guide Float Shoe, 5-1/2" full or pup joints as necessary, Landing Collar, 5-1/2" full or pup joints as necessary, at least (1) one Toe Sleeve (Sliding Sleeve) positioned inside the applicable production area. Centralizer program will be determined by wellbore conditions. Production casing to be pressure tested during completion operations with frac stack installed.

C. **CEMENTING:**

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



1. SURFACE: 13-3/8" casing has been pre-set.
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 and optional ICP's 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.

Intermediate - 9-5/8" csg	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)	
Stage 1 Tail	6,135	500	0.3132		1.3	221	39	1.10	201	15.8
Stage 1 Lead	5,022	1,113	0.3132		1.3	453	81	1.90	239	12.4
					674	120		440		
Stage 2 Tail	4,422	600	0.3132		1.3	244	44	1.58	155	13.2
Stage 2 Lead	3,750	672	0.3132		1.3	274	49	1.90	144	12.4
					518	92		299		
Stage 3 Tail	3,100	650	0.3132		1.3	265	47	1.58	168	13.2
Stage 3 Lead	363	2,737	0.3132		1.3	1,114	198	1.58	705	12.4
Stage 3 Lead	-	363	1.4895	0.2653	1	541	96	1.90	285	12.4
						1,920	342		1157	
						3,112	554		1,896	
Set Depth, ft RKB	6635									

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.

Production - 5-1/2"	Top	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased hole Tail	6,535	100	0.2531	1	25	5	1.59	16	13.2
Open Hole Tail	6,635	12,749	0.2291	1.15	3,369	600	1.59	2,119	13.2
					3,395	605		2,135	

Set Depth, ft RKB 19384

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



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

B. PRESSURE TEST

Pressure test 5-1/2" casing to 0.22 psi/ft * 7,173' TVD = 1578 psi for 30 minutes. Increase pressure to Open RSI sleeves.

C. STIMULATION

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

D. PRODUCTION TUBING

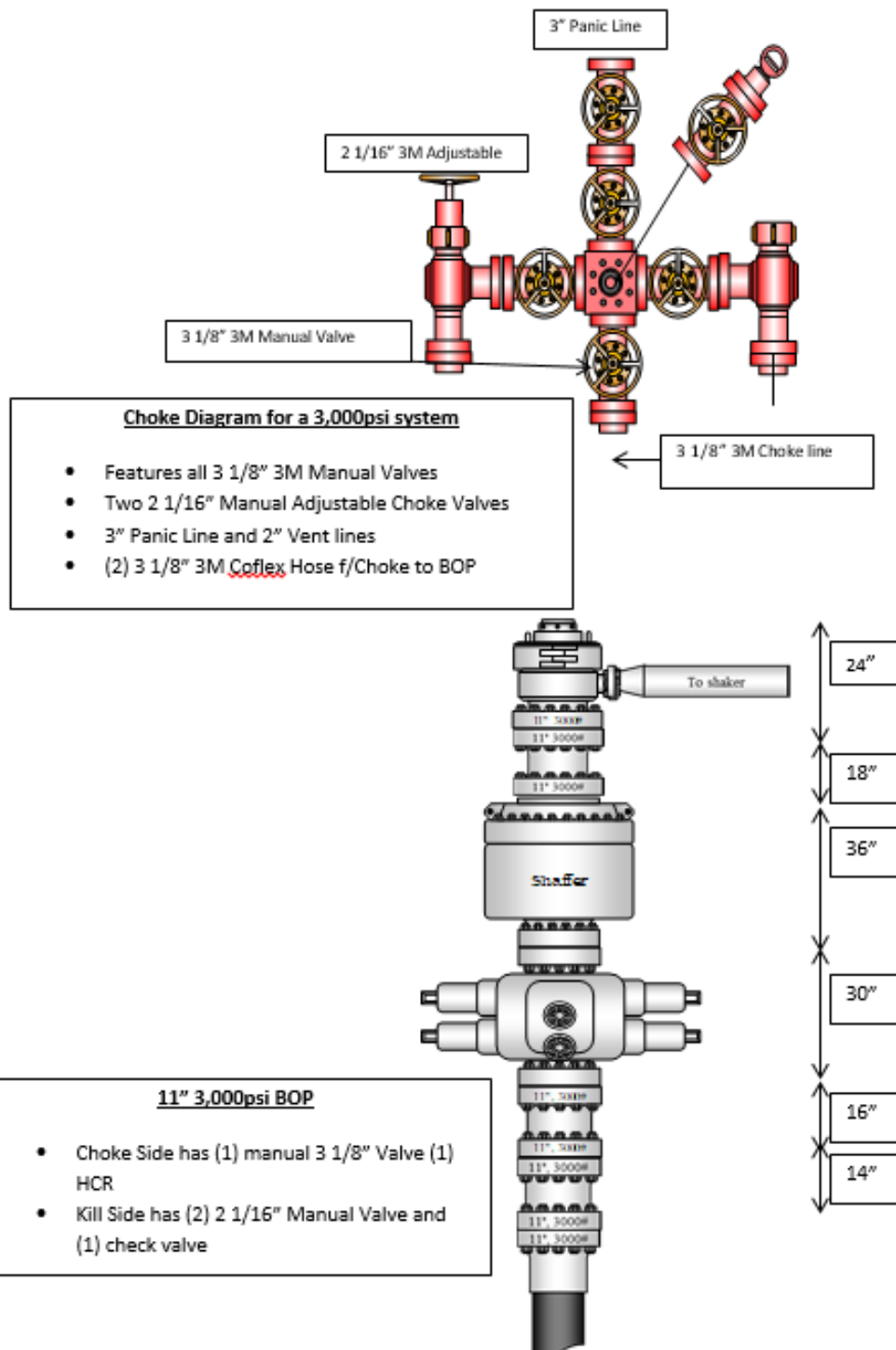
2-7/8", 6.5#, J-55 or L-80, EUE tubing will be run once volumes and pressures dictate. Due to the extremely high initial flow rates and pressures seen in offset wells, tubing will be installed once it is safe to do so, typically 12-36 months after completion.

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



BOP Equipment

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



Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 42

Rosa Unit 830H

OH

Plan: Plan #4

Standard Planning Report

05 January, 2024

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 830H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #4		

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

Site	Rosa Unit 42				
Site Position:		Northing:	2,133,465.56 usft	Latitude:	36.861919
From:	Lat/Long	Easting:	2,873,174.65 usft	Longitude:	-107.320293
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "		

Well	Rosa Unit 830H					
Well Position	+N/-S	0.00 usft	Northing:	2,133,466.81 usft	Latitude:	36.861925
	+E/-W	0.00 usft	Easting:	2,872,998.82 usft	Longitude:	-107.320894
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level:	6,563.00 usft	
Grid Convergence:	0.31 °					

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/18/2023	8.46	63.43	49,495.66747824

Design	Plan #4				
Audit Notes:					
Version:		Phase:	PLAN	Tie On Depth:	319.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	272.60	

Plan Survey Tool Program	Date	1/5/2024			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	125.00	319.00	Survey #1 (OH)	Standard Keeper 104	
				Standard Wireline Keeper ver 1	
2	319.00	19,383.69	Plan #4 (OH)	MWD+HRGM+MS	
				MWD + HRGM + Multi-Station	

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 830H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #4		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
319.00	2.31	121.18	318.92	-1.19	5.01	0.00	0.00	0.00	0.00	
469.00	2.31	121.18	468.80	-4.32	10.18	0.00	0.00	0.00	0.00	
1,196.26	13.53	9.21	1,189.56	72.45	36.48	2.00	1.54	-15.40	-120.27	
6,696.38	13.53	9.21	6,537.14	1,342.22	242.41	0.00	0.00	0.00	0.00	
7,713.53	90.00	272.60	7,173.00	1,522.87	-386.43	9.00	7.52	-9.50	-96.43	RU 830 POE
19,249.41	90.00	272.60	7,173.00	2,046.17	-11,910.44	0.00	0.00	0.00	0.00	RU 830 FPP
19,384.41	90.00	272.60	7,173.00	2,052.30	-12,045.30	0.00	0.00	0.00	0.00	RU 830 PBHL

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 830H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #4		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
125.00	0.55	44.51	125.00	0.43	0.42	-0.40	0.44	0.44	0.00
225.00	1.66	110.36	224.98	0.27	2.12	-2.10	1.52	1.11	65.85
319.00	2.31	121.18	318.92	-1.19	5.01	-5.06	0.80	0.69	11.51
Start 150.00 hold at 319.00 MD									
400.00	2.31	121.18	399.86	-2.88	7.81	-7.93	0.00	0.00	0.00
469.00	2.31	121.18	468.80	-4.32	10.18	-10.37	0.00	0.00	0.00
Start DLS 2.00 TFO -120.27									
500.00	2.07	106.17	499.78	-4.80	11.26	-11.46	2.00	-0.78	-48.42
600.00	2.47	54.77	599.71	-4.06	14.75	-14.92	2.00	0.40	-51.40
700.00	3.99	30.85	699.55	0.17	18.29	-18.27	2.00	1.52	-23.92
800.00	5.81	20.91	799.19	7.88	21.88	-21.50	2.00	1.82	-9.94
900.00	7.72	15.78	898.49	19.07	25.51	-24.62	2.00	1.91	-5.13
1,000.00	9.66	12.69	997.33	33.72	29.18	-27.63	2.00	1.95	-3.09
1,100.00	11.63	10.63	1,095.61	51.81	32.89	-30.50	2.00	1.96	-2.06
1,196.26	13.53	9.21	1,189.56	72.45	36.48	-33.16	2.00	1.97	-1.48
Start 5500.12 hold at 1196.26 MD									
1,200.00	13.53	9.21	1,193.19	73.32	36.62	-33.26	0.00	0.00	0.00
1,300.00	13.53	9.21	1,290.42	96.40	40.36	-35.95	0.00	0.00	0.00
1,400.00	13.53	9.21	1,387.65	119.49	44.11	-38.64	0.00	0.00	0.00
1,500.00	13.53	9.21	1,484.87	142.58	47.85	-41.34	0.00	0.00	0.00
1,600.00	13.53	9.21	1,582.10	165.66	51.60	-44.03	0.00	0.00	0.00
1,700.00	13.53	9.21	1,679.33	188.75	55.34	-46.72	0.00	0.00	0.00
1,800.00	13.53	9.21	1,776.55	211.83	59.09	-49.42	0.00	0.00	0.00
1,900.00	13.53	9.21	1,873.78	234.92	62.83	-52.11	0.00	0.00	0.00
2,000.00	13.53	9.21	1,971.01	258.01	66.57	-54.80	0.00	0.00	0.00
2,100.00	13.53	9.21	2,068.23	281.09	70.32	-57.49	0.00	0.00	0.00
2,200.00	13.53	9.21	2,165.46	304.18	74.06	-60.19	0.00	0.00	0.00
2,300.00	13.53	9.21	2,262.69	327.26	77.81	-62.88	0.00	0.00	0.00
2,400.00	13.53	9.21	2,359.91	350.35	81.55	-65.57	0.00	0.00	0.00
2,500.00	13.53	9.21	2,457.14	373.44	85.29	-68.27	0.00	0.00	0.00
2,600.00	13.53	9.21	2,554.37	396.52	89.04	-70.96	0.00	0.00	0.00
2,700.00	13.53	9.21	2,651.59	419.61	92.78	-73.65	0.00	0.00	0.00
2,800.00	13.53	9.21	2,748.82	442.70	96.53	-76.35	0.00	0.00	0.00
2,825.90	13.53	9.21	2,774.00	448.67	97.50	-77.04	0.00	0.00	0.00
Ojo Alamo									
2,900.00	13.53	9.21	2,846.05	465.78	100.27	-79.04	0.00	0.00	0.00
2,952.41	13.53	9.21	2,897.00	477.88	102.23	-80.45	0.00	0.00	0.00
Kirtland									
3,000.00	13.53	9.21	2,943.27	488.87	104.02	-81.73	0.00	0.00	0.00
3,100.00	13.53	9.21	3,040.50	511.95	107.76	-84.42	0.00	0.00	0.00
3,200.00	13.53	9.21	3,137.73	535.04	111.50	-87.12	0.00	0.00	0.00
3,300.00	13.53	9.21	3,234.95	558.13	115.25	-89.81	0.00	0.00	0.00
3,337.08	13.53	9.21	3,271.00	566.69	116.64	-90.81	0.00	0.00	0.00
Fruitland									
3,380.27	13.53	9.21	3,313.00	576.66	118.25	-91.97	0.00	0.00	0.00
Top of Coals									
3,400.00	13.53	9.21	3,332.18	581.21	118.99	-92.50	0.00	0.00	0.00
3,469.76	13.53	9.21	3,400.00	597.32	121.60	-94.38	0.00	0.00	0.00
Base of Coals									
3,500.00	13.53	9.21	3,429.40	604.30	122.74	-95.20	0.00	0.00	0.00
3,600.00	13.53	9.21	3,526.63	627.38	126.48	-97.89	0.00	0.00	0.00
3,700.00	13.53	9.21	3,623.86	650.47	130.22	-100.58	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 830H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #4		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
3,700.15	13.53	9.21	3,624.00	650.50	130.23	-100.59	0.00	0.00	0.00	
Pictured Cliffs										
3,800.00	13.53	9.21	3,721.08	673.56	133.97	-103.28	0.00	0.00	0.00	
3,801.97	13.53	9.21	3,723.00	674.01	134.04	-103.33	0.00	0.00	0.00	
Lewis										
3,900.00	13.53	9.21	3,818.31	696.64	137.71	-105.97	0.00	0.00	0.00	
4,000.00	13.53	9.21	3,915.54	719.73	141.46	-108.66	0.00	0.00	0.00	
4,100.00	13.53	9.21	4,012.76	742.82	145.20	-111.36	0.00	0.00	0.00	
4,200.00	13.53	9.21	4,109.99	765.90	148.95	-114.05	0.00	0.00	0.00	
4,300.00	13.53	9.21	4,207.22	788.99	152.69	-116.74	0.00	0.00	0.00	
4,400.00	13.53	9.21	4,304.44	812.07	156.43	-119.43	0.00	0.00	0.00	
4,500.00	13.53	9.21	4,401.67	835.16	160.18	-122.13	0.00	0.00	0.00	
4,600.00	13.53	9.21	4,498.90	858.25	163.92	-124.82	0.00	0.00	0.00	
4,700.00	13.53	9.21	4,596.12	881.33	167.67	-127.51	0.00	0.00	0.00	
4,800.00	13.53	9.21	4,693.35	904.42	171.41	-130.21	0.00	0.00	0.00	
4,900.00	13.53	9.21	4,790.58	927.50	175.15	-132.90	0.00	0.00	0.00	
4,946.72	13.53	9.21	4,836.00	938.29	176.90	-134.16	0.00	0.00	0.00	
Chacra										
5,000.00	13.53	9.21	4,887.80	950.59	178.90	-135.59	0.00	0.00	0.00	
5,100.00	13.53	9.21	4,985.03	973.68	182.64	-138.29	0.00	0.00	0.00	
5,200.00	13.53	9.21	5,082.26	996.76	186.39	-140.98	0.00	0.00	0.00	
5,300.00	13.53	9.21	5,179.48	1,019.85	190.13	-143.67	0.00	0.00	0.00	
5,400.00	13.53	9.21	5,276.71	1,042.94	193.88	-146.36	0.00	0.00	0.00	
5,484.64	13.53	9.21	5,359.00	1,062.47	197.04	-148.64	0.00	0.00	0.00	
Upper Cliff House										
5,500.00	13.53	9.21	5,373.94	1,066.02	197.62	-149.06	0.00	0.00	0.00	
5,600.00	13.53	9.21	5,471.16	1,089.11	201.36	-151.75	0.00	0.00	0.00	
5,700.00	13.53	9.21	5,568.39	1,112.19	205.11	-154.44	0.00	0.00	0.00	
5,777.77	13.53	9.21	5,644.00	1,130.15	208.02	-156.54	0.00	0.00	0.00	
Cliff House										
5,800.00	13.53	9.21	5,665.62	1,135.28	208.85	-157.14	0.00	0.00	0.00	
5,812.74	13.53	9.21	5,678.00	1,138.22	209.33	-157.48	0.00	0.00	0.00	
Menefee										
5,900.00	13.53	9.21	5,762.84	1,158.37	212.60	-159.83	0.00	0.00	0.00	
5,999.93	13.53	9.21	5,860.00	1,181.44	216.34	-162.52	0.00	0.00	0.00	
Point Lookout										
6,000.00	13.53	9.21	5,860.07	1,181.45	216.34	-162.52	0.00	0.00	0.00	
6,100.00	13.53	9.21	5,957.30	1,204.54	220.08	-165.22	0.00	0.00	0.00	
6,200.00	13.53	9.21	6,054.52	1,227.62	223.83	-167.91	0.00	0.00	0.00	
6,300.00	13.53	9.21	6,151.75	1,250.71	227.57	-170.60	0.00	0.00	0.00	
6,400.00	13.53	9.21	6,248.98	1,273.80	231.32	-173.30	0.00	0.00	0.00	
6,500.00	13.53	9.21	6,346.20	1,296.88	235.06	-175.99	0.00	0.00	0.00	
6,559.45	13.53	9.21	6,404.00	1,310.61	237.29	-177.59	0.00	0.00	0.00	
Mancos										
6,600.00	13.53	9.21	6,443.43	1,319.97	238.80	-178.68	0.00	0.00	0.00	
6,696.38	13.53	9.21	6,537.14	1,342.22	242.41	-181.28	0.00	0.00	0.00	
Start DLS 9.00 TFO -96.43										
6,700.00	13.49	7.82	6,540.66	1,343.06	242.54	-181.36	9.00	-0.90	-38.33	
6,750.00	13.83	348.74	6,589.27	1,354.70	242.17	-180.46	9.00	0.67	-38.17	
6,800.00	15.49	332.14	6,637.66	1,366.47	237.88	-175.64	9.00	3.33	-33.19	
6,850.00	18.13	319.47	6,685.53	1,378.29	229.70	-166.94	9.00	5.27	-25.34	
6,900.00	21.38	310.22	6,732.60	1,390.10	217.68	-154.39	9.00	6.50	-18.50	
6,950.00	25.00	303.42	6,778.56	1,401.81	201.89	-138.09	9.00	7.25	-13.59	

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 830H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #4		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
7,000.00	28.86	298.29	6,823.13	1,413.35	182.43	-118.13	9.00	7.72	-10.26
7,050.00	32.87	294.30	6,866.05	1,424.66	159.43	-94.64	9.00	8.02	-7.98
7,100.00	36.98	291.10	6,907.04	1,435.66	133.02	-67.76	9.00	8.22	-6.40
7,150.00	41.16	288.46	6,945.85	1,446.30	103.37	-37.65	9.00	8.36	-5.28
7,200.00	45.40	286.23	6,982.24	1,456.49	70.65	-4.51	9.00	8.47	-4.46
7,250.00	49.67	284.31	7,016.00	1,466.18	35.08	31.47	9.00	8.54	-3.85
7,253.10	49.93	284.19	7,018.00	1,466.76	32.78	33.79	9.00	8.57	-3.59
Top Black									
7,300.00	53.96	282.61	7,046.90	1,475.30	-3.14	70.06	9.00	8.60	-3.38
7,350.00	58.28	281.09	7,074.76	1,483.81	-43.76	111.02	9.00	8.64	-3.04
7,400.00	62.62	279.71	7,099.42	1,491.65	-86.53	154.11	9.00	8.67	-2.77
7,450.00	66.97	278.43	7,120.70	1,498.77	-131.19	199.05	9.00	8.70	-2.56
7,500.00	71.33	277.23	7,138.50	1,505.13	-177.47	245.57	9.00	8.72	-2.40
7,550.00	75.69	276.09	7,152.68	1,510.68	-225.08	293.38	9.00	8.73	-2.28
7,568.49	77.31	275.68	7,157.00	1,512.53	-242.96	311.32	9.00	8.74	-2.21
Top Target									
7,600.00	80.07	275.00	7,163.18	1,515.40	-273.72	342.19	9.00	8.74	-2.18
7,650.00	84.44	273.93	7,169.92	1,519.26	-323.11	391.69	9.00	8.75	-2.13
7,700.00	88.82	272.88	7,172.86	1,522.22	-372.92	441.59	9.00	8.75	-2.10
7,713.53	90.00	272.60	7,173.00	1,522.87	-386.43	455.11	9.00	8.75	-2.09
Start 11535.89 hold at 7713.53 MD									
7,800.00	90.00	272.60	7,173.00	1,526.79	-472.81	541.59	0.00	0.00	0.00
7,900.00	90.00	272.60	7,173.00	1,531.33	-572.71	641.59	0.00	0.00	0.00
8,000.00	90.00	272.60	7,173.00	1,535.87	-672.61	741.59	0.00	0.00	0.00
8,100.00	90.00	272.60	7,173.00	1,540.40	-772.50	841.59	0.00	0.00	0.00
8,200.00	90.00	272.60	7,173.00	1,544.94	-872.40	941.59	0.00	0.00	0.00
8,300.00	90.00	272.60	7,173.00	1,549.47	-972.30	1,041.59	0.00	0.00	0.00
8,400.00	90.00	272.60	7,173.00	1,554.01	-1,072.19	1,141.59	0.00	0.00	0.00
8,500.00	90.00	272.60	7,173.00	1,558.55	-1,172.09	1,241.59	0.00	0.00	0.00
8,600.00	90.00	272.60	7,173.00	1,563.08	-1,271.99	1,341.59	0.00	0.00	0.00
8,700.00	90.00	272.60	7,173.00	1,567.62	-1,371.89	1,441.59	0.00	0.00	0.00
8,800.00	90.00	272.60	7,173.00	1,572.16	-1,471.78	1,541.59	0.00	0.00	0.00
8,900.00	90.00	272.60	7,173.00	1,576.69	-1,571.68	1,641.59	0.00	0.00	0.00
9,000.00	90.00	272.60	7,173.00	1,581.23	-1,671.58	1,741.59	0.00	0.00	0.00
9,100.00	90.00	272.60	7,173.00	1,585.76	-1,771.47	1,841.59	0.00	0.00	0.00
9,200.00	90.00	272.60	7,173.00	1,590.30	-1,871.37	1,941.59	0.00	0.00	0.00
9,300.00	90.00	272.60	7,173.00	1,594.84	-1,971.27	2,041.59	0.00	0.00	0.00
9,400.00	90.00	272.60	7,173.00	1,599.37	-2,071.17	2,141.59	0.00	0.00	0.00
9,500.00	90.00	272.60	7,173.00	1,603.91	-2,171.06	2,241.59	0.00	0.00	0.00
9,600.00	90.00	272.60	7,173.00	1,608.45	-2,270.96	2,341.59	0.00	0.00	0.00
9,700.00	90.00	272.60	7,173.00	1,612.98	-2,370.86	2,441.59	0.00	0.00	0.00
9,800.00	90.00	272.60	7,173.00	1,617.52	-2,470.75	2,541.59	0.00	0.00	0.00
9,900.00	90.00	272.60	7,173.00	1,622.06	-2,570.65	2,641.59	0.00	0.00	0.00
10,000.00	90.00	272.60	7,173.00	1,626.59	-2,670.55	2,741.59	0.00	0.00	0.00
10,100.00	90.00	272.60	7,173.00	1,631.13	-2,770.44	2,841.59	0.00	0.00	0.00
10,200.00	90.00	272.60	7,173.00	1,635.66	-2,870.34	2,941.59	0.00	0.00	0.00
10,300.00	90.00	272.60	7,173.00	1,640.20	-2,970.24	3,041.59	0.00	0.00	0.00
10,400.00	90.00	272.60	7,173.00	1,644.74	-3,070.14	3,141.59	0.00	0.00	0.00
10,500.00	90.00	272.60	7,173.00	1,649.27	-3,170.03	3,241.59	0.00	0.00	0.00
10,600.00	90.00	272.60	7,173.00	1,653.81	-3,269.93	3,341.59	0.00	0.00	0.00
10,700.00	90.00	272.60	7,173.00	1,658.35	-3,369.83	3,441.59	0.00	0.00	0.00
10,800.00	90.00	272.60	7,173.00	1,662.88	-3,469.72	3,541.59	0.00	0.00	0.00
10,900.00	90.00	272.60	7,173.00	1,667.42	-3,569.62	3,641.59	0.00	0.00	0.00

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 830H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #4		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,000.00	90.00	272.60	7,173.00	1,671.95	-3,669.52	3,741.59	0.00	0.00	0.00
11,100.00	90.00	272.60	7,173.00	1,676.49	-3,769.42	3,841.59	0.00	0.00	0.00
11,200.00	90.00	272.60	7,173.00	1,681.03	-3,869.31	3,941.59	0.00	0.00	0.00
11,300.00	90.00	272.60	7,173.00	1,685.56	-3,969.21	4,041.59	0.00	0.00	0.00
11,400.00	90.00	272.60	7,173.00	1,690.10	-4,069.11	4,141.59	0.00	0.00	0.00
11,500.00	90.00	272.60	7,173.00	1,694.64	-4,169.00	4,241.59	0.00	0.00	0.00
11,600.00	90.00	272.60	7,173.00	1,699.17	-4,268.90	4,341.59	0.00	0.00	0.00
11,700.00	90.00	272.60	7,173.00	1,703.71	-4,368.80	4,441.59	0.00	0.00	0.00
11,800.00	90.00	272.60	7,173.00	1,708.24	-4,468.69	4,541.59	0.00	0.00	0.00
11,900.00	90.00	272.60	7,173.00	1,712.78	-4,568.59	4,641.59	0.00	0.00	0.00
12,000.00	90.00	272.60	7,173.00	1,717.32	-4,668.49	4,741.59	0.00	0.00	0.00
12,100.00	90.00	272.60	7,173.00	1,721.85	-4,768.39	4,841.59	0.00	0.00	0.00
12,200.00	90.00	272.60	7,173.00	1,726.39	-4,868.28	4,941.59	0.00	0.00	0.00
12,300.00	90.00	272.60	7,173.00	1,730.93	-4,968.18	5,041.59	0.00	0.00	0.00
12,400.00	90.00	272.60	7,173.00	1,735.46	-5,068.08	5,141.59	0.00	0.00	0.00
12,500.00	90.00	272.60	7,173.00	1,740.00	-5,167.97	5,241.59	0.00	0.00	0.00
12,600.00	90.00	272.60	7,173.00	1,744.54	-5,267.87	5,341.59	0.00	0.00	0.00
12,700.00	90.00	272.60	7,173.00	1,749.07	-5,367.77	5,441.59	0.00	0.00	0.00
12,800.00	90.00	272.60	7,173.00	1,753.61	-5,467.67	5,541.59	0.00	0.00	0.00
12,900.00	90.00	272.60	7,173.00	1,758.14	-5,567.56	5,641.59	0.00	0.00	0.00
13,000.00	90.00	272.60	7,173.00	1,762.68	-5,667.46	5,741.59	0.00	0.00	0.00
13,100.00	90.00	272.60	7,173.00	1,767.22	-5,767.36	5,841.59	0.00	0.00	0.00
13,200.00	90.00	272.60	7,173.00	1,771.75	-5,867.25	5,941.59	0.00	0.00	0.00
13,300.00	90.00	272.60	7,173.00	1,776.29	-5,967.15	6,041.59	0.00	0.00	0.00
13,400.00	90.00	272.60	7,173.00	1,780.83	-6,067.05	6,141.59	0.00	0.00	0.00
13,500.00	90.00	272.60	7,173.00	1,785.36	-6,166.94	6,241.59	0.00	0.00	0.00
13,600.00	90.00	272.60	7,173.00	1,789.90	-6,266.84	6,341.59	0.00	0.00	0.00
13,700.00	90.00	272.60	7,173.00	1,794.43	-6,366.74	6,441.59	0.00	0.00	0.00
13,800.00	90.00	272.60	7,173.00	1,798.97	-6,466.64	6,541.59	0.00	0.00	0.00
13,900.00	90.00	272.60	7,173.00	1,803.51	-6,566.53	6,641.59	0.00	0.00	0.00
14,000.00	90.00	272.60	7,173.00	1,808.04	-6,666.43	6,741.59	0.00	0.00	0.00
14,100.00	90.00	272.60	7,173.00	1,812.58	-6,766.33	6,841.59	0.00	0.00	0.00
14,200.00	90.00	272.60	7,173.00	1,817.12	-6,866.22	6,941.59	0.00	0.00	0.00
14,300.00	90.00	272.60	7,173.00	1,821.65	-6,966.12	7,041.59	0.00	0.00	0.00
14,400.00	90.00	272.60	7,173.00	1,826.19	-7,066.02	7,141.59	0.00	0.00	0.00
14,500.00	90.00	272.60	7,173.00	1,830.72	-7,165.92	7,241.59	0.00	0.00	0.00
14,600.00	90.00	272.60	7,173.00	1,835.26	-7,265.81	7,341.59	0.00	0.00	0.00
14,700.00	90.00	272.60	7,173.00	1,839.80	-7,365.71	7,441.59	0.00	0.00	0.00
14,800.00	90.00	272.60	7,173.00	1,844.33	-7,465.61	7,541.59	0.00	0.00	0.00
14,900.00	90.00	272.60	7,173.00	1,848.87	-7,565.50	7,641.59	0.00	0.00	0.00
15,000.00	90.00	272.60	7,173.00	1,853.41	-7,665.40	7,741.59	0.00	0.00	0.00
15,100.00	90.00	272.60	7,173.00	1,857.94	-7,765.30	7,841.59	0.00	0.00	0.00
15,200.00	90.00	272.60	7,173.00	1,862.48	-7,865.19	7,941.59	0.00	0.00	0.00
15,300.00	90.00	272.60	7,173.00	1,867.02	-7,965.09	8,041.59	0.00	0.00	0.00
15,400.00	90.00	272.60	7,173.00	1,871.55	-8,064.99	8,141.59	0.00	0.00	0.00
15,500.00	90.00	272.60	7,173.00	1,876.09	-8,164.89	8,241.59	0.00	0.00	0.00
15,600.00	90.00	272.60	7,173.00	1,880.62	-8,264.78	8,341.59	0.00	0.00	0.00
15,700.00	90.00	272.60	7,173.00	1,885.16	-8,364.68	8,441.59	0.00	0.00	0.00
15,800.00	90.00	272.60	7,173.00	1,889.70	-8,464.58	8,541.59	0.00	0.00	0.00
15,900.00	90.00	272.60	7,173.00	1,894.23	-8,564.47	8,641.59	0.00	0.00	0.00
16,000.00	90.00	272.60	7,173.00	1,898.77	-8,664.37	8,741.59	0.00	0.00	0.00
16,100.00	90.00	272.60	7,173.00	1,903.31	-8,764.27	8,841.59	0.00	0.00	0.00
16,200.00	90.00	272.60	7,173.00	1,907.84	-8,864.17	8,941.59	0.00	0.00	0.00
16,300.00	90.00	272.60	7,173.00	1,912.38	-8,964.06	9,041.59	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 830H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #4		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,400.00	90.00	272.60	7,173.00	1,916.91	-9,063.96	9,141.59	0.00	0.00	0.00
16,500.00	90.00	272.60	7,173.00	1,921.45	-9,163.86	9,241.59	0.00	0.00	0.00
16,600.00	90.00	272.60	7,173.00	1,925.99	-9,263.75	9,341.59	0.00	0.00	0.00
16,700.00	90.00	272.60	7,173.00	1,930.52	-9,363.65	9,441.59	0.00	0.00	0.00
16,800.00	90.00	272.60	7,173.00	1,935.06	-9,463.55	9,541.59	0.00	0.00	0.00
16,900.00	90.00	272.60	7,173.00	1,939.60	-9,563.44	9,641.59	0.00	0.00	0.00
17,000.00	90.00	272.60	7,173.00	1,944.13	-9,663.34	9,741.59	0.00	0.00	0.00
17,100.00	90.00	272.60	7,173.00	1,948.67	-9,763.24	9,841.59	0.00	0.00	0.00
17,200.00	90.00	272.60	7,173.00	1,953.21	-9,863.14	9,941.59	0.00	0.00	0.00
17,300.00	90.00	272.60	7,173.00	1,957.74	-9,963.03	10,041.59	0.00	0.00	0.00
17,400.00	90.00	272.60	7,173.00	1,962.28	-10,062.93	10,141.59	0.00	0.00	0.00
17,500.00	90.00	272.60	7,173.00	1,966.81	-10,162.83	10,241.59	0.00	0.00	0.00
17,600.00	90.00	272.60	7,173.00	1,971.35	-10,262.72	10,341.59	0.00	0.00	0.00
17,700.00	90.00	272.60	7,173.00	1,975.89	-10,362.62	10,441.59	0.00	0.00	0.00
17,800.00	90.00	272.60	7,173.00	1,980.42	-10,462.52	10,541.59	0.00	0.00	0.00
17,900.00	90.00	272.60	7,173.00	1,984.96	-10,562.42	10,641.59	0.00	0.00	0.00
18,000.00	90.00	272.60	7,173.00	1,989.50	-10,662.31	10,741.59	0.00	0.00	0.00
18,100.00	90.00	272.60	7,173.00	1,994.03	-10,762.21	10,841.59	0.00	0.00	0.00
18,200.00	90.00	272.60	7,173.00	1,998.57	-10,862.11	10,941.59	0.00	0.00	0.00
18,300.00	90.00	272.60	7,173.00	2,003.10	-10,962.00	11,041.59	0.00	0.00	0.00
18,400.00	90.00	272.60	7,173.00	2,007.64	-11,061.90	11,141.59	0.00	0.00	0.00
18,500.00	90.00	272.60	7,173.00	2,012.18	-11,161.80	11,241.59	0.00	0.00	0.00
18,600.00	90.00	272.60	7,173.00	2,016.71	-11,261.69	11,341.59	0.00	0.00	0.00
18,700.00	90.00	272.60	7,173.00	2,021.25	-11,361.59	11,441.59	0.00	0.00	0.00
18,800.00	90.00	272.60	7,173.00	2,025.79	-11,461.49	11,541.59	0.00	0.00	0.00
18,900.00	90.00	272.60	7,173.00	2,030.32	-11,561.39	11,641.59	0.00	0.00	0.00
19,000.00	90.00	272.60	7,173.00	2,034.86	-11,661.28	11,741.59	0.00	0.00	0.00
19,100.00	90.00	272.60	7,173.00	2,039.39	-11,761.18	11,841.59	0.00	0.00	0.00
19,200.00	90.00	272.60	7,173.00	2,043.93	-11,861.08	11,941.59	0.00	0.00	0.00
19,249.41	90.00	272.60	7,173.00	2,046.17	-11,910.44	11,991.00	0.00	0.00	0.00
Start 135.00 hold at 19249.41 MD									
19,300.00	90.00	272.60	7,173.00	2,048.47	-11,960.97	12,041.59	0.00	0.00	0.00
19,384.41	90.00	272.60	7,173.00	2,052.30	-12,045.30	12,126.00	0.00	0.00	0.00
TD at 19384.41									

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 830H
Company:	Logos Operating LLC	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site:	Rosa Unit 42	North Reference:	True
Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #4		

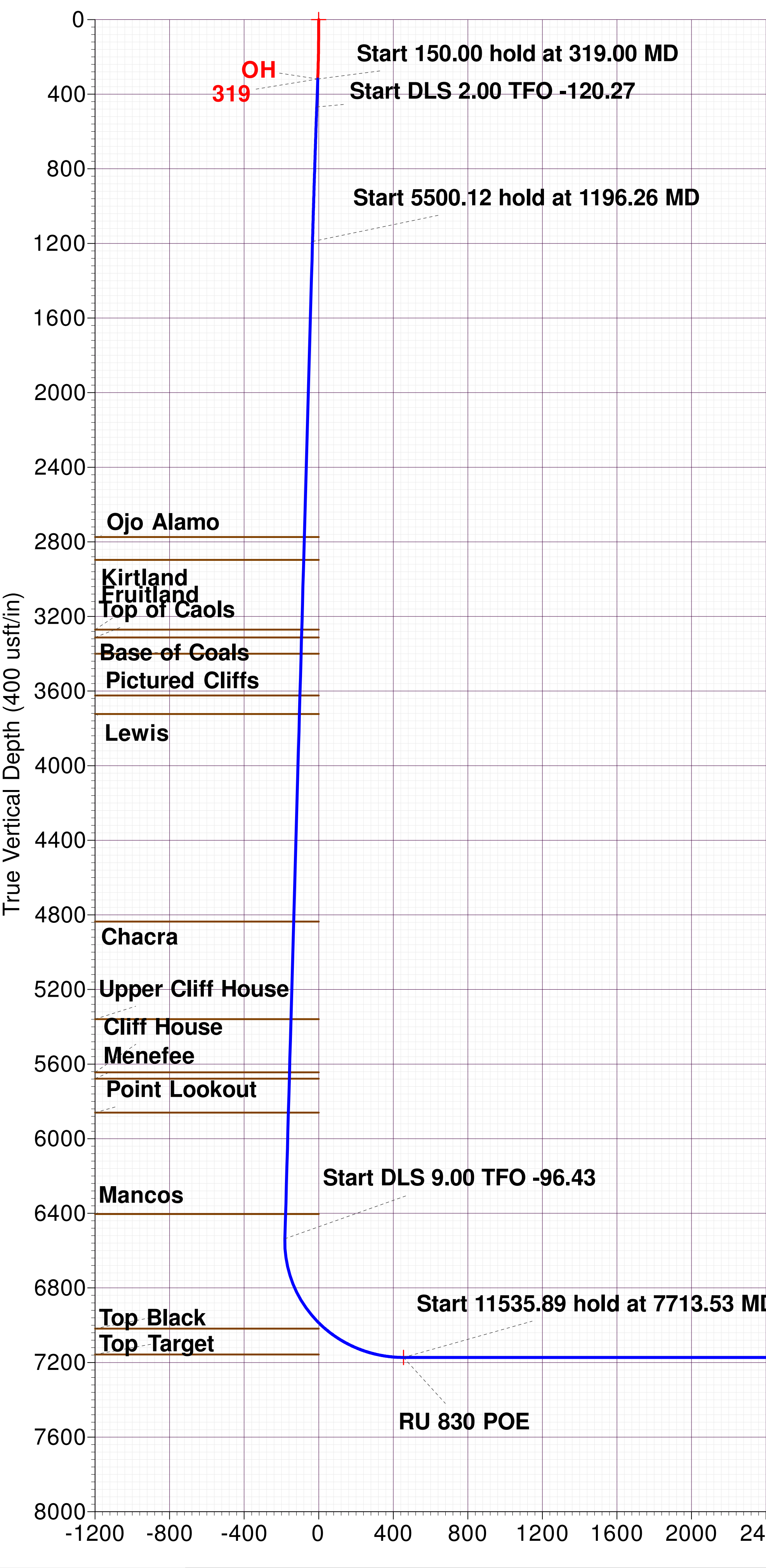
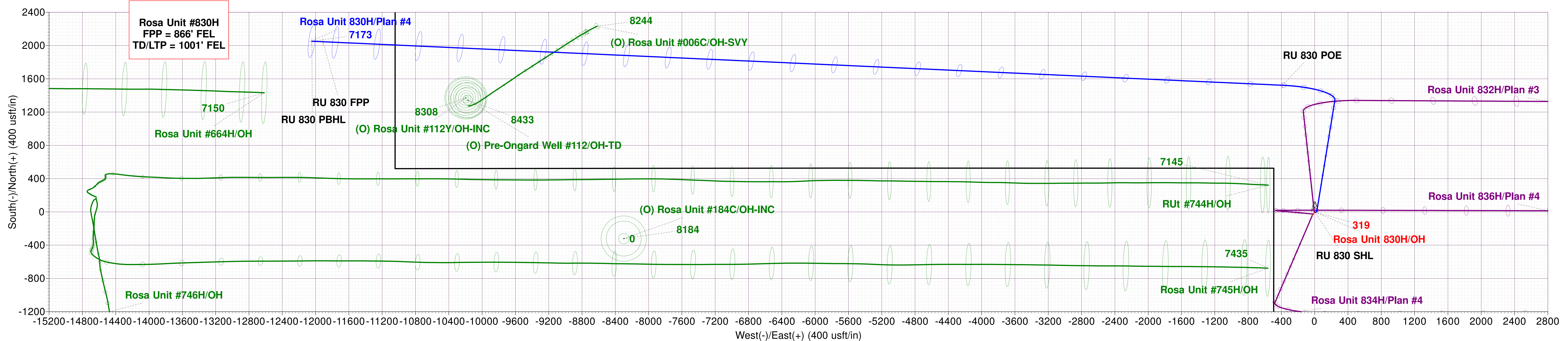
Design Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
RU 830 SHL	0.00	0.31	0.00	0.00	0.00	2,133,466.81	2,872,998.82	36.861925	-107.320894
- plan hits target center									
- Point									
RU 830 POE	0.00	0.31	7,173.00	1,522.87	-386.43	2,134,987.58	2,872,604.23	36.866108	-107.322215
- plan hits target center									
- Point									
RU 830 FPP	0.00	0.00	7,173.00	2,046.17	-11,910.44	2,135,449.04	2,861,077.57	36.867538	-107.361611
- plan hits target center									
- Point									
RU 830 PBHL	0.00	0.00	7,173.00	2,052.30	-12,045.30	2,135,454.44	2,860,942.68	36.867555	-107.362072
- plan hits target center									
- Point									

Formations						
Measured Depth	Vertical Depth	Name	Lithology	Dip	Dip Direction	
(usft)	(usft)			(°)	(°)	
2,825.90	2,774.00	Ojo Alamo				
2,952.41	2,897.00	Kirtland				
3,337.08	3,271.00	Fruitland		0.00		
3,380.27	3,313.00	Top of Coals		0.00		
3,469.76	3,400.00	Base of Coals		0.00		
3,700.15	3,624.00	Pictured Cliffs				
3,801.97	3,723.00	Lewis		0.00		
4,946.72	4,836.00	Chacra		0.00		
5,484.64	5,359.00	Upper Cliff House		0.00		
5,777.77	5,644.00	Cliff House				
5,812.74	5,678.00	Menefee				
5,999.93	5,860.00	Point Lookout				
6,559.45	6,404.00	Mancos				
7,253.10	7,018.00	Top Black				
7,568.49	7,157.00	Top Target				

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(usft)	(usft)	+N/-S	+E/-W	Comment	
(usft)	(usft)	(usft)	(usft)		
319.00	318.92	-1.19	5.01	Start 150.00 hold at 319.00 MD	
469.00	468.80	-4.32	10.18	Start DLS 2.00 TFO -120.27	
1,196.26	1,189.56	72.45	36.48	Start 5500.12 hold at 1196.26 MD	
6,696.38	6,537.14	1,342.22	242.41	Start DLS 9.00 TFO -96.43	
7,713.53	7,173.00	1,522.87	-386.43	Start 11535.89 hold at 7713.53 MD	
19,249.41	7,173.00	2,046.17	-11,910.44	Start 135.00 hold at 19249.41 MD	
19,384.41	7,173.00	2,052.30	-12,045.30	TD at 19384.41	

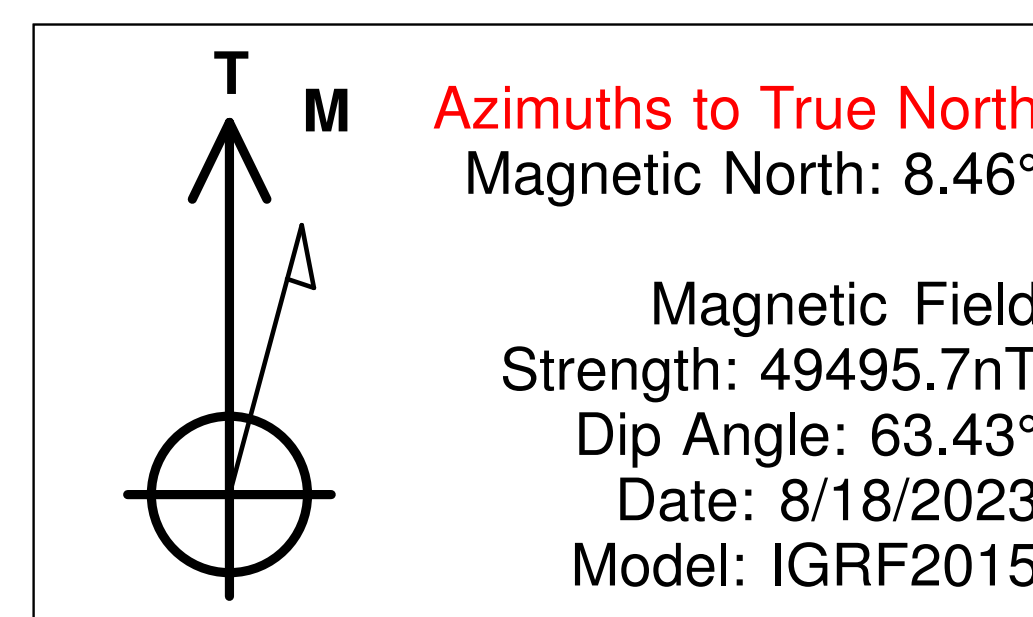


County: Rio Arriba, NM (NAD83)
Site: Rosa Unit 42
Well: Rosa Unit 830H
Depth Reference: 6563+30 @ 6593.00usft (H&P 530)
Rig: H&P 530
Plan: Plan #4
Job #: Prelim

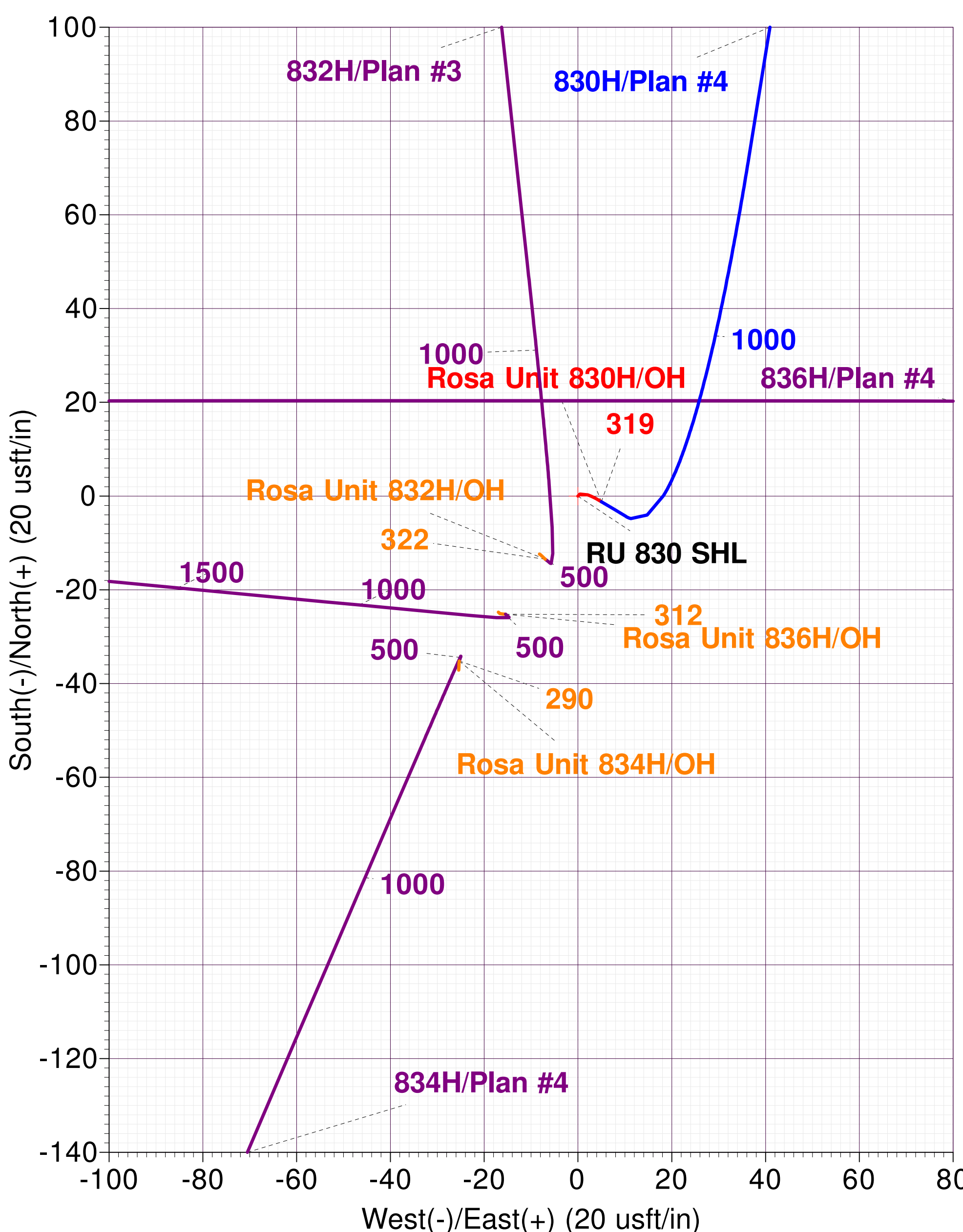


SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
1	319.00	2.31	121.18	318.92	-1.19	5.01	0.00	0.00	-5.06	Start 150.00 hold at 319.00 MD
2	469.00	2.31	121.18	468.80	-4.32	10.18	0.00	0.00	-10.37	Start DLS 2.00 TFO -120.27
3	1196.26	13.53	9.21	1189.56	72.45	36.48	2.00	-120.27	-33.16	Start 5500.12 hold at 1196.26 MD
4	6696.38	13.53	9.21	6537.14	1342.22	242.41	0.00	0.00	-181.28	Start DLS 9.00 TFO -96.43
5	7713.53	90.00	272.60	7173.00	1522.87	-386.43	9.00	-96.43	455.11	Start 11535.89 hold at 7713.53 MD
6	19249.41	90.00	272.60	7173.00	2046.17	-11910.44	0.00	0.00	11991.00	Start 135.00 hold at 19249.41 MD
7	19384.41	90.00	272.60	7173.00	2052.30	-12045.30	0.00	0.00	12126.00	TD at 19384.41

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude		
RU 830 SHL	0.00	0.00	0.00	2133466.81	2872998.82	36.861925	-107.320894		
RU 830 FPP	7173.00	2046.17	-11910.44	2135449.04	2861077.57	36.867538	-107.361611		
RU 830 PBHL	7173.00	2052.30	-12045.30	2135454.44	2860942.68	36.867555	-107.362072		
RU 830 POE	7173.00	1522.87	-386.43	2134987.58	2872604.22	36.866108	-107.322215		



TOTAL CORRECTION: 8.46°



FORMATION TOP DETAILS		
TVDPPath	MDPath	Formation
2774.00	2825.90	Ojo Alamo
2897.00	2952.41	Kirtland
3271.00	3337.08	Fruitland
3313.00	3380.27	Top of Coals
3400.00	3469.76	Base of Coals
3624.00	3700.15	Pictured Cliffs
3723.00	3801.97	Lewis
4836.00	4946.72	Chacra
5359.00	5484.64	Upper Cliff House
5644.00	5777.77	Cliff House
5678.00	5812.74	Menefee
5860.00	5999.93	Point Lookout
6404.00	6559.45	Mancos
7018.00	7253.10	Top Black
7157.00	7568.49	Top Target

Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 42

Rosa Unit 830H

OH

Plan #4

Anticollision Report

05 January, 2024

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Reference	Plan #4		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Max. Cent. Dist. of 100,000.00usft or Max. SF of 100,000	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	1/5/2024		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
125.00	319.00	Survey #1 (OH)	Standard Keeper 104	Standard Wireline Keeper ver 1.0.4	
319.00	19,383.69	Plan #4 (OH)	MWD+HRGM+MS	MWD + HRGM + Multi-Station Correction	

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Rosa Unit 30						
Rosa Unit #664H - OH - OH	19,384.41	19,340.96	843.28	396.74	1.889	CC, ES, SF
Rosa Unit 31						
Rosa Unit #744H - OH - OH	7,900.00	20,738.96	1,207.47	842.45	3.308	ES, SF
Rosa Unit #744H - OH - OH	8,126.55	20,513.74	1,205.88	844.76	3.339	CC
Rosa Unit #745H - OH - OH	7,788.93	21,289.96	2,220.50	1,854.24	6.063	CC
Rosa Unit #745H - OH - OH	7,800.00	21,289.96	2,220.52	1,854.19	6.062	ES, SF
Rosa Unit #746H - OH - OH	6,568.89	20,952.96	3,148.37	2,899.25	12.638	CC
Rosa Unit #746H - OH - OH	6,600.00	20,952.96	3,148.53	2,898.88	12.612	ES
Rosa Unit #746H - OH - OH	7,740.42	20,952.96	3,171.65	2,910.38	12.140	SF
Rosa Unit 42						
(O) Pre-Ongard Well #112 - OH - OH-TD	17,479.02	7,361.07	617.75	270.58	1.779	CC, ES, SF
(O) Rosa Unit #006C - OH - OH-SVY	16,004.45	7,828.39	317.31	140.80	1.798	CC, ES, SF
(O) Rosa Unit #112Y - OH - OH-INC	17,500.00	7,358.29	596.11	208.52	1.538	ES, SF
(O) Rosa Unit #112Y - OH - OH-INC	17,504.93	7,358.29	596.09	208.54	1.538	CC
(O) Rosa Unit #184C - OH - OH-INC	15,533.95	7,362.26	2,200.85	1,822.37	5.815	CC, ES
(O) Rosa Unit #184C - OH - OH-INC	15,600.00	7,362.26	2,201.85	1,822.85	5.810	SF
(O) Rosa Unit #601 - OH - OH-SVY	2,713.40	3,033.42	8,640.98	8,621.14	435.468	CC
(O) Rosa Unit #601 - OH - OH-SVY	3,300.00	3,572.03	8,643.80	8,619.39	354.096	ES
(O) Rosa Unit #601 - OH - OH-SVY	7,400.00	7,460.17	9,069.20	9,004.42	140.006	SF
(O) Schalk 32 #001A - OH - OH-SVY	1,059.58	1,327.30	10,583.78	10,577.05	1,574.182	CC
(O) Schalk 32 #001A - OH - OH-SVY	3,100.00	3,452.63	10,585.26	10,562.00	455.025	ES
(O) Schalk 32 #001A - OH - OH-SVY	6,950.00	3,502.00	11,314.73	11,275.87	291.137	SF
(O) Schalk 32 #003H - OH - OH-SVY	946.19	1,308.21	10,983.54	10,976.71	1,608.622	CC
(O) Schalk 32 #003H - OH - OH-SVY	1,000.00	1,361.33	10,983.66	10,976.44	1,521.065	ES
(O) Schalk 32 #003H - OH - OH-SVY	6,950.00	3,600.00	11,811.93	11,771.80	294.342	SF
Rosa Unit 830H - OH - OH	319.07	319.00	0.07	0.07	34.478	CC, ES, SF
Rosa Unit 832H - OH - OH	0.00	0.00	14.81			
Rosa Unit 832H - OH - OH	400.00	322.00	79.96	77.32	30.283	SF
Rosa Unit 832H - OH - Plan #3	0.00	0.00	14.81			
Rosa Unit 832H - OH - Plan #3	7,189.76	7,209.09	150.64	98.02	2.863	SF
Rosa Unit 834H - OH - OH	0.00	0.00	45.02			
Rosa Unit 834H - OH - OH	225.28	225.60	45.26	44.92	135.941	ES
Rosa Unit 834H - OH - OH	400.00	290.00	119.20	116.72	48.063	SF
Rosa Unit 834H - OH - Plan #4	0.00	0.00	45.02			

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Rosa Unit 42						
Rosa Unit 834H - OH - Plan #4	400.00	400.14	45.59	44.84	60.600	ES
Rosa Unit 834H - OH - Plan #4	700.00	695.02	64.14	61.44	23.764	SF
Rosa Unit 836H - OH - OH	0.00	0.00	30.01			
Rosa Unit 836H - OH - OH	400.00	312.00	93.59	91.05	36.833	SF
Rosa Unit 836H - OH - Plan #4	0.00	0.00	30.01			
Rosa Unit 836H - OH - Plan #4	800.00	795.86	62.07	58.88	19.440	SF

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: Reference		396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM						Rule Assigned:		Offset Well Error: 0.00 usft				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	19,340.96	6,975.69	0.00	373.60	-83.52	1,432.34	-12,616.49	14,572.33					
125.00	125.00	19,340.96	6,975.69	0.06	373.60	-128.27	1,432.34	-12,616.49	14,511.72	14,451.62	60.11	241.433		
225.00	224.98	19,340.96	6,975.69	0.17	373.60	166.32	1,432.34	-12,616.49	14,465.08	14,405.20	59.88	241.580		
319.00	318.92	19,340.96	6,975.69	0.28	373.60	155.79	1,432.34	-12,616.49	14,423.02	14,363.34	59.68	241.662		
400.00	399.86	19,340.96	6,975.69	0.37	373.60	155.79	1,432.34	-12,616.49	14,387.48	14,327.29	60.20	239.007		
469.00	468.80	19,340.96	6,975.69	0.52	373.60	155.79	1,432.34	-12,616.49	14,357.50	14,297.48	60.02	239.201		
500.00	499.78	19,340.96	6,975.69	0.61	373.60	170.50	1,432.34	-12,616.49	14,344.10	14,284.15	59.96	239.237		
600.00	599.71	19,340.96	6,975.69	0.92	373.60	-139.09	1,432.34	-12,616.49	14,301.06	14,241.29	59.77	239.279		
700.00	699.55	19,340.96	6,975.69	1.26	373.60	-116.15	1,432.34	-12,616.49	14,258.32	14,198.73	59.59	239.273		
800.00	799.19	19,340.96	6,975.69	1.60	373.60	-107.18	1,432.34	-12,616.49	14,215.93	14,156.53	59.41	239.288		
900.00	898.49	19,340.96	6,975.69	1.97	373.60	-103.01	1,432.34	-12,616.49	14,173.97	14,114.75	59.22	239.352		
1,000.00	997.33	19,340.96	6,975.69	2.34	373.60	-100.86	1,432.34	-12,616.49	14,132.48	14,073.46	59.01	239.481		
1,100.00	1,095.61	19,340.96	6,975.69	2.74	373.60	-99.74	1,432.34	-12,616.49	14,091.51	14,032.71	58.79	239.675		
1,196.26	1,189.56	19,340.96	6,975.69	3.13	373.60	-99.20	1,432.34	-12,616.49	14,052.62	13,994.05	58.57	239.922		
1,200.00	1,193.19	19,340.96	6,975.69	3.15	373.60	-99.20	1,432.34	-12,616.49	14,051.12	13,992.56	58.56	239.933		
1,300.00	1,290.42	19,340.96	6,975.69	3.58	373.60	-99.20	1,432.34	-12,616.49	14,011.34	13,953.00	58.33	240.190		
1,400.00	1,387.65	19,340.96	6,975.69	4.01	373.60	-99.20	1,432.34	-12,616.49	13,972.16	13,914.04	58.12	240.413		
1,500.00	1,484.87	19,340.96	6,975.69	4.45	373.60	-99.20	1,432.34	-12,616.49	13,933.59	13,875.68	57.91	240.611		
1,600.00	1,582.10	19,340.96	6,975.69	4.90	373.60	-99.20	1,432.34	-12,616.49	13,895.63	13,837.92	57.71	240.792		
1,700.00	1,679.33	19,340.96	6,975.69	5.34	373.60	-99.20	1,432.34	-12,616.49	13,858.29	13,800.78	57.51	240.959		
1,800.00	1,776.55	19,340.96	6,975.69	5.79	373.60	-99.20	1,432.34	-12,616.49	13,821.57	13,764.25	57.32	241.116		
1,900.00	1,873.78	19,340.96	6,975.69	6.24	373.60	-99.20	1,432.34	-12,616.49	13,785.48	13,728.34	57.14	241.264		
2,000.00	1,971.01	19,340.96	6,975.69	6.69	373.60	-99.20	1,432.34	-12,616.49	13,750.02	13,693.06	56.96	241.404		
2,100.00	2,068.23	19,340.96	6,975.69	7.15	373.60	-99.20	1,432.34	-12,616.49	13,715.20	13,658.42	56.78	241.536		
2,200.00	2,165.46	19,340.96	6,975.69	7.60	373.60	-99.20	1,432.34	-12,616.49	13,681.02	13,624.41	56.61	241.661		
2,300.00	2,262.69	19,340.96	6,975.69	8.06	373.60	-99.20	1,432.34	-12,616.49	13,647.49	13,591.05	56.45	241.778		
2,400.00	2,359.91	19,340.96	6,975.69	8.51	373.60	-99.20	1,432.34	-12,616.49	13,614.61	13,558.33	56.29	241.886		
2,500.00	2,457.14	19,340.96	6,975.69	8.97	373.60	-99.20	1,432.34	-12,616.49	13,582.39	13,526.26	56.13	241.984		
2,600.00	2,554.37	19,340.96	6,975.69	9.42	373.60	-99.20	1,432.34	-12,616.49	13,550.83	13,494.85	55.98	242.072		
2,700.00	2,651.59	19,340.96	6,975.69	9.88	373.60	-99.20	1,432.34	-12,616.49	13,519.93	13,464.10	55.83	242.147		
2,800.00	2,748.82	19,340.96	6,975.69	10.34	373.60	-99.20	1,432.34	-12,616.49	13,489.71	13,434.01	55.69	242.208		
2,900.00	2,846.05	19,340.96	6,975.69	10.80	373.60	-99.20	1,432.34	-12,616.49	13,460.16	13,404.60	55.56	242.254		
3,000.00	2,943.27	19,340.96	6,975.69	11.25	373.60	-99.20	1,432.34	-12,616.49	13,431.29	13,375.85	55.44	242.282		
3,100.00	3,040.50	19,340.96	6,975.69	11.71	373.60	-99.20	1,432.34	-12,616.49	13,403.10	13,347.78	55.32	242.291		
3,200.00	3,137.73	19,340.96	6,975.69	12.17	373.60	-99.20	1,432.34	-12,616.49	13,375.61	13,320.40	55.21	242.278		
3,300.00	3,234.95	19,340.96	6,975.69	12.63	373.60	-99.20	1,432.34	-12,616.49	13,348.80	13,293.69	55.11	242.241		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: Reference		396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM						Rule Assigned:				Offset Well Error:	0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
3,400.00	3,332.18	19,340.96	6,975.69	13.09	373.60	-99.20	1,432.34	-12,616.49	13,322.69	13,267.68	55.01	242.178		
3,500.00	3,429.40	19,340.96	6,975.69	13.55	373.60	-99.20	1,432.34	-12,616.49	13,297.28	13,242.35	54.93	242.085		
3,600.00	3,526.63	19,340.96	6,975.69	14.00	373.60	-99.20	1,432.34	-12,616.49	13,272.58	13,217.73	54.85	241.961		
3,700.00	3,623.86	19,340.96	6,975.69	14.46	373.60	-99.20	1,432.34	-12,616.49	13,248.59	13,193.79	54.79	241.802		
3,800.00	3,721.08	19,340.96	6,975.69	14.92	373.60	-99.20	1,432.34	-12,616.49	13,225.30	13,170.56	54.74	241.606		
3,900.00	3,818.31	19,340.96	6,975.69	15.38	373.60	-99.20	1,432.34	-12,616.49	13,202.74	13,148.04	54.70	241.370		
4,000.00	3,915.54	19,340.96	6,975.69	15.84	373.60	-99.20	1,432.34	-12,616.49	13,180.89	13,126.22	54.67	241.091		
4,100.00	4,012.76	19,340.96	6,975.69	16.30	373.60	-99.20	1,432.34	-12,616.49	13,159.77	13,105.11	54.66	240.765		
4,200.00	4,109.99	19,340.96	6,975.69	16.76	373.60	-99.20	1,432.34	-12,616.49	13,139.38	13,084.72	54.66	240.390		
4,300.00	4,207.22	19,340.96	6,975.69	17.22	373.60	-99.20	1,432.34	-12,616.49	13,119.71	13,065.04	54.67	239.963		
4,400.00	4,304.44	19,340.96	6,975.69	17.68	373.60	-99.20	1,432.34	-12,616.49	13,100.78	13,046.08	54.71	239.480		
4,500.00	4,401.67	19,340.96	6,975.69	18.14	373.60	-99.20	1,432.34	-12,616.49	13,082.59	13,027.84	54.75	238.940		
4,600.00	4,498.90	19,340.96	6,975.69	18.60	373.60	-99.20	1,432.34	-12,616.49	13,065.14	13,010.32	54.82	238.338		
4,700.00	4,596.12	19,340.96	6,975.69	19.06	373.60	-99.20	1,432.34	-12,616.49	13,048.43	12,993.53	54.90	237.672		
4,800.00	4,693.35	19,340.96	6,975.69	19.52	373.60	-99.20	1,432.34	-12,616.49	13,032.46	12,977.46	55.00	236.940		
4,900.00	4,790.58	19,340.96	6,975.69	19.98	373.60	-99.20	1,432.34	-12,616.49	13,017.25	12,962.12	55.13	236.140		
5,000.00	4,887.80	19,340.96	6,975.69	20.44	373.60	-99.20	1,432.34	-12,616.49	13,002.78	12,947.52	55.27	235.269		
5,100.00	4,985.03	19,340.96	6,975.69	20.90	373.60	-99.20	1,432.34	-12,616.49	12,989.07	12,933.64	55.43	234.326		
5,200.00	5,082.26	19,340.96	6,975.69	21.36	373.60	-99.20	1,432.34	-12,616.49	12,976.12	12,920.50	55.62	233.309		
5,300.00	5,179.48	19,340.96	6,975.69	21.82	373.60	-99.20	1,432.34	-12,616.49	12,963.92	12,908.10	55.83	232.217		
5,400.00	5,276.71	19,340.96	6,975.69	22.27	373.60	-99.20	1,432.34	-12,616.49	12,952.49	12,896.43	56.06	231.049		
5,500.00	5,373.94	19,340.96	6,975.69	22.73	373.60	-99.20	1,432.34	-12,616.49	12,941.82	12,885.50	56.32	229.806		
5,600.00	5,471.16	19,340.96	6,975.69	23.19	373.60	-99.20	1,432.34	-12,616.49	12,931.91	12,875.31	56.60	228.487		
5,700.00	5,568.39	19,340.96	6,975.69	23.65	373.60	-99.20	1,432.34	-12,616.49	12,922.77	12,865.86	56.90	227.094		
5,800.00	5,665.62	19,340.96	6,975.69	24.11	373.60	-99.20	1,432.34	-12,616.49	12,914.39	12,857.15	57.24	225.627		
5,900.00	5,762.84	19,340.96	6,975.69	24.57	373.60	-99.20	1,432.34	-12,616.49	12,906.79	12,849.19	57.60	224.088		
6,000.00	5,860.07	19,340.96	6,975.69	25.03	373.60	-99.20	1,432.34	-12,616.49	12,899.95	12,841.97	57.98	222.479		
6,100.00	5,957.30	19,340.96	6,975.69	25.50	373.60	-99.20	1,432.34	-12,616.49	12,893.89	12,835.50	58.40	220.804		
6,200.00	6,054.52	19,340.96	6,975.69	25.96	373.60	-99.20	1,432.34	-12,616.49	12,888.60	12,829.77	58.83	219.064		
6,300.00	6,151.75	19,340.96	6,975.69	26.42	373.60	-99.20	1,432.34	-12,616.49	12,884.09	12,824.79	59.30	217.264		
6,400.00	6,248.98	19,340.96	6,975.69	26.88	373.60	-99.20	1,432.34	-12,616.49	12,880.35	12,820.55	59.80	215.408		
6,500.00	6,346.20	19,340.96	6,975.69	27.34	373.60	-99.20	1,432.34	-12,616.49	12,877.38	12,817.07	60.32	213.499		
6,600.00	6,443.43	19,340.96	6,975.69	27.80	373.60	-99.20	1,432.34	-12,616.49	12,875.19	12,814.33	60.86	211.543		
6,696.38	6,537.14	19,340.96	6,975.69	28.24	373.60	-99.20	1,432.34	-12,616.49	12,873.82	12,812.40	61.42	209.617		
6,700.00	6,540.66	19,340.96	6,975.69	28.26	373.60	-97.85	1,432.34	-12,616.49	12,873.77	12,812.34	61.44	209.544		
6,750.00	6,589.27	19,340.96	6,975.69	28.48	373.60	-79.31	1,432.34	-12,616.49	12,871.11	12,809.38	61.73	208.493		
6,800.00	6,637.66	19,340.96	6,975.69	28.71	373.60	-63.27	1,432.34	-12,616.49	12,864.74	12,802.71	62.04	207.373		
6,850.00	6,685.53	19,340.96	6,975.69	28.92	373.60	-51.18	1,432.34	-12,616.49	12,854.70	12,792.35	62.34	206.195		
6,900.00	6,732.60	19,340.96	6,975.69	29.13	373.60	-42.53	1,432.34	-12,616.49	12,841.02	12,778.37	62.65	204.968		
6,950.00	6,778.56	19,340.96	6,975.69	29.32	373.60	-36.36	1,432.34	-12,616.49	12,823.80	12,760.84	62.95	203.700		
7,000.00	6,823.13	19,340.96	6,975.69	29.51	373.60	-31.90	1,432.34	-12,616.49	12,803.11	12,739.86	63.26	202.401		
7,050.00	6,866.05	19,340.96	6,975.69	29.68	373.60	-28.61	1,432.34	-12,616.49	12,779.08	12,715.53	63.55	201.078		
7,100.00	6,907.04	19,340.96	6,975.69	29.85	373.60	-26.15	1,432.34	-12,616.49	12,751.83	12,687.98	63.84	199.739		
7,150.00	6,945.85	19,340.96	6,975.69	30.01	373.60	-24.31	1,432.34	-12,616.49	12,721.50	12,657.38	64.12	198.393		
7,200.00	6,982.24	19,340.96	6,975.69	30.15	373.60	-22.95	1,432.34	-12,616.49	12,688.27	12,623.88	64.39	197.048		
7,250.00	7,016.00	19,340.96	6,975.69	30.29	373.60	-21.98	1,432.34	-12,616.49	12,652.32	12,587.67	64.65	195.710		
7,300.00	7,046.90	19,340.96	6,975.69	30.43	373.60	-21.35	1,432.34	-12,616.49	12,613.84	12,548.95	64.89	194.389		
7,350.00	7,074.76	19,340.96	6,975.69	30.56	373.60	-21.05	1,432.34	-12,616.49	12,573.06	12,507.95	65.11	193.091		
7,400.00	7,099.42	19,340.96	6,975.69	30.69	373.60	-21.09	1,432.34	-12,616.49	12,530.20	12,464.88	65.32	191.823		
7,450.00	7,120.70	19,340.96	6,975.69	30.82	373.60	-21.55	1,432.34	-12,616.49	12,485.50	12,419.99	65.51	190.591		
7,500.00	7,138.50	19,340.96	6,975.69	30.95	373.60	-22.59	1,432.34	-12,616.49	12,439.23	12,373.56	65.68	189.401		
7,550.00	7,152.68	19,340.96	6,975.69	31.10	373.60	-24.59	1,432.34	-12,616.49	12,391.65	12,325.83	65.82	188.259		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM						Rule Assigned:				Offset Well Error:	0.00 usft	
Measured Depth (usft)	Reference Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
7,600.00	7,163.18	19,340.96	6,975.69	31.25	373.60	-28.50	1,432.34	-12,616.49	12,343.05	12,277.10	65.95	187.168		
7,650.00	7,169.92	19,340.96	6,975.69	31.41	373.60	-37.60	1,432.34	-12,616.49	12,293.70	12,227.66	66.05	186.133		
7,700.00	7,172.86	19,340.96	6,975.69	31.59	373.60	-68.69	1,432.34	-12,616.49	12,243.92	12,177.79	66.13	185.157		
7,713.53	7,173.00	19,340.96	6,975.69	31.64	373.60	-87.98	1,432.34	-12,616.49	12,230.41	12,164.27	66.15	184.902		
7,800.00	7,173.00	19,340.96	6,975.69	31.99	373.60	-87.98	1,432.34	-12,616.49	12,144.06	12,077.81	66.25	183.297		
7,900.00	7,173.00	19,340.96	6,975.69	32.47	373.60	-87.98	1,432.34	-12,616.49	12,044.20	11,977.82	66.38	181.438		
8,000.00	7,173.00	19,340.96	6,975.69	33.03	373.60	-87.98	1,432.34	-12,616.49	11,944.35	11,877.84	66.51	179.577		
8,100.00	7,173.00	19,340.96	6,975.69	33.66	373.60	-87.98	1,432.34	-12,616.49	11,844.50	11,777.85	66.65	177.713		
8,200.00	7,173.00	19,340.96	6,975.69	34.36	373.60	-87.98	1,432.34	-12,616.49	11,744.65	11,677.86	66.79	175.847		
8,300.00	7,173.00	19,340.96	6,975.69	35.13	373.60	-87.98	1,432.34	-12,616.49	11,644.80	11,577.87	66.93	173.978		
8,400.00	7,173.00	19,340.96	6,975.69	35.95	373.60	-87.98	1,432.34	-12,616.49	11,544.95	11,477.87	67.08	172.108		
8,500.00	7,173.00	19,340.96	6,975.69	36.82	373.60	-87.98	1,432.34	-12,616.49	11,445.11	11,377.88	67.23	170.235		
8,600.00	7,173.00	19,340.96	6,975.69	37.74	373.60	-87.98	1,432.34	-12,616.49	11,345.27	11,277.89	67.39	168.360		
8,700.00	7,173.00	19,340.96	6,975.69	38.71	373.60	-87.98	1,432.34	-12,616.49	11,245.44	11,177.89	67.55	166.484		
8,800.00	7,173.00	19,340.96	6,975.69	39.71	373.60	-87.98	1,432.34	-12,616.49	11,145.60	11,077.89	67.71	164.606		
8,900.00	7,173.00	19,340.96	6,975.69	40.76	373.60	-87.98	1,432.34	-12,616.49	11,045.77	10,977.89	67.88	162.726		
9,000.00	7,173.00	19,340.96	6,975.69	41.84	373.60	-87.98	1,432.34	-12,616.49	10,945.95	10,877.89	68.05	160.845		
9,100.00	7,173.00	19,340.96	6,975.69	42.96	373.60	-87.98	1,432.34	-12,616.49	10,846.12	10,777.89	68.23	158.962		
9,200.00	7,173.00	19,340.96	6,975.69	44.10	373.60	-87.98	1,432.34	-12,616.49	10,746.30	10,677.89	68.41	157.078		
9,300.00	7,173.00	19,340.96	6,975.69	45.27	373.60	-87.98	1,432.34	-12,616.49	10,646.48	10,577.88	68.60	155.193		
9,400.00	7,173.00	19,340.96	6,975.69	46.47	373.60	-87.98	1,432.34	-12,616.49	10,546.67	10,477.87	68.79	153.307		
9,500.00	7,173.00	19,340.96	6,975.69	47.70	373.60	-87.98	1,432.34	-12,616.49	10,446.86	10,377.86	68.99	151.420		
9,600.00	7,173.00	19,340.96	6,975.69	48.94	373.60	-87.98	1,432.34	-12,616.49	10,347.05	10,277.85	69.20	149.532		
9,700.00	7,173.00	19,340.96	6,975.69	50.20	373.60	-87.98	1,432.34	-12,616.49	10,247.25	10,177.84	69.41	147.643		
9,800.00	7,173.00	19,340.96	6,975.69	51.49	373.60	-87.98	1,432.34	-12,616.49	10,147.45	10,077.83	69.62	145.754		
9,900.00	7,173.00	19,340.96	6,975.69	52.79	373.60	-87.98	1,432.34	-12,616.49	10,047.65	9,977.81	69.84	143.864		
10,000.00	7,173.00	19,340.96	6,975.69	54.11	373.60	-87.98	1,432.34	-12,616.49	9,947.86	9,877.79	70.07	141.974		
10,100.00	7,173.00	19,340.96	6,975.69	55.44	373.60	-87.98	1,432.34	-12,616.49	9,848.07	9,777.77	70.30	140.084		
10,200.00	7,173.00	19,340.96	6,975.69	56.78	373.60	-87.98	1,432.34	-12,616.49	9,748.29	9,677.75	70.54	138.193		
10,300.00	7,173.00	19,340.96	6,975.69	58.14	373.60	-87.98	1,432.34	-12,616.49	9,648.51	9,577.73	70.79	136.303		
10,400.00	7,173.00	19,340.96	6,975.69	59.51	373.60	-87.98	1,432.34	-12,616.49	9,548.74	9,477.70	71.04	134.413		
10,500.00	7,173.00	19,340.96	6,975.69	60.90	373.60	-87.98	1,432.34	-12,616.49	9,448.97	9,377.67	71.30	132.523		
10,600.00	7,173.00	19,340.96	6,975.69	62.29	373.60	-87.98	1,432.34	-12,616.49	9,349.21	9,277.64	71.57	130.634		
10,700.00	7,173.00	19,340.96	6,975.69	63.69	373.60	-87.98	1,432.34	-12,616.49	9,249.45	9,177.61	71.84	128.745		
10,800.00	7,173.00	19,340.96	6,975.69	65.11	373.60	-87.98	1,432.34	-12,616.49	9,149.69	9,077.57	72.13	126.857		
10,900.00	7,173.00	19,340.96	6,975.69	66.53	373.60	-87.98	1,432.34	-12,616.49	9,049.95	8,977.53	72.42	124.970		
11,000.00	7,173.00	19,340.96	6,975.69	67.96	373.60	-87.98	1,432.34	-12,616.49	8,950.20	8,877.49	72.72	123.084		
11,100.00	7,173.00	19,340.96	6,975.69	69.39	373.60	-87.98	1,432.34	-12,616.49	8,850.47	8,777.44	73.02	121.199		
11,200.00	7,173.00	19,340.96	6,975.69	70.84	373.60	-87.98	1,432.34	-12,616.49	8,750.74	8,677.40	73.34	119.315		
11,300.00	7,173.00	19,340.96	6,975.69	72.29	373.60	-87.98	1,432.34	-12,616.49	8,651.01	8,577.35	73.67	117.433		
11,400.00	7,173.00	19,340.96	6,975.69	73.74	373.60	-87.98	1,432.34	-12,616.49	8,551.30	8,477.29	74.00	115.553		
11,500.00	7,173.00	19,340.96	6,975.69	75.21	373.60	-87.98	1,432.34	-12,616.49	8,451.58	8,377.24	74.35	113.675		
11,600.00	7,173.00	19,340.96	6,975.69	76.68	373.60	-87.98	1,432.34	-12,616.49	8,351.88	8,277.17	74.71	111.798		
11,700.00	7,173.00	19,340.96	6,975.69	78.15	373.60	-87.98	1,432.34	-12,616.49	8,252.18	8,177.11	75.07	109.924		
11,800.00	7,173.00	19,340.96	6,975.69	79.63	373.60	-87.98	1,432.34	-12,616.49	8,152.49	8,077.04	75.45	108.052		
11,900.00	7,173.00	19,340.96	6,975.69	81.11	373.60	-87.98	1,432.34	-12,616.49	8,052.81	7,976.97	75.84	106.183		
12,000.00	7,173.00	19,340.96	6,975.69	82.60	373.60	-87.98	1,432.34	-12,616.49	7,953.14	7,876.90	76.24	104.316		
12,100.00	7,173.00	19,340.96	6,975.69	84.09	373.60	-87.98	1,432.34	-12,616.49	7,853.47	7,776.82	76.65	102.452		
12,200.00	7,173.00	19,340.96	6,975.69	85.59	373.60	-87.98	1,432.34	-12,616.49	7,753.81	7,676.73	77.08	100.592		
12,300.00	7,173.00	19,340.96	6,975.69	87.09	373.60	-87.98	1,432.34	-12,616.49	7,654.17	7,576.64	77.52	98.735		
12,400.00	7,173.00	19,340.96	6,975.69	88.59	373.60	-87.98	1,432.34	-12,616.49	7,554.53	7,476.55	77.98	96.881		
12,500.00	7,173.00	19,340.96	6,975.69	90.10	373.60	-87.98	1,432.34	-12,616.49	7,454.90	7,376.45	78.45	95.031		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH											Offset Site Error:	0.00 usft
Survey Program: 396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)		Minimum Separation (usft)	Separation Factor
							+N/-S (usft)	+E/-W (usft)	Between Ellipses (usft)			Warning
12,600.00	7,173.00	19,340.96	6,975.69	91.61	373.60	-87.98	1,432.34	-12,616.49	7,355.28	7,276.35	78.93	93.186
12,700.00	7,173.00	19,340.96	6,975.69	93.13	373.60	-87.98	1,432.34	-12,616.49	7,255.67	7,176.24	79.43	91.344
12,800.00	7,173.00	19,340.96	6,975.69	94.64	373.60	-87.98	1,432.34	-12,616.49	7,156.07	7,076.12	79.95	89.507
12,900.00	7,173.00	19,340.96	6,975.69	96.16	373.60	-87.98	1,432.34	-12,616.49	7,056.49	6,976.00	80.48	87.675
13,000.00	7,173.00	19,340.96	6,975.69	97.69	373.60	-87.98	1,432.34	-12,616.49	6,956.91	6,875.87	81.04	85.848
13,100.00	7,173.00	19,340.96	6,975.69	99.21	373.60	-87.98	1,432.34	-12,616.49	6,857.35	6,775.74	81.61	84.026
13,200.00	7,173.00	19,340.96	6,975.69	100.74	373.60	-87.98	1,432.34	-12,616.49	6,757.80	6,675.60	82.20	82.209
13,300.00	7,173.00	19,340.96	6,975.69	102.27	373.60	-87.98	1,432.34	-12,616.49	6,658.26	6,575.45	82.82	80.399
13,400.00	7,173.00	19,340.96	6,975.69	103.80	373.60	-87.98	1,432.34	-12,616.49	6,558.74	6,475.29	83.45	78.594
13,500.00	7,173.00	19,340.96	6,975.69	105.33	373.60	-87.98	1,432.34	-12,616.49	6,459.24	6,375.13	84.11	76.796
13,600.00	7,173.00	19,340.96	6,975.69	106.87	373.60	-87.98	1,432.34	-12,616.49	6,359.74	6,274.95	84.79	75.005
13,700.00	7,173.00	19,340.96	6,975.69	108.41	373.60	-87.98	1,432.34	-12,616.49	6,260.27	6,174.77	85.50	73.221
13,800.00	7,173.00	19,340.96	6,975.69	109.95	373.60	-87.98	1,432.34	-12,616.49	6,160.81	6,074.58	86.23	71.444
13,900.00	7,173.00	19,340.96	6,975.69	111.49	373.60	-87.98	1,432.34	-12,616.49	6,061.37	5,974.38	86.99	69.675
14,000.00	7,173.00	19,340.96	6,975.69	113.03	373.60	-87.98	1,432.34	-12,616.49	5,961.95	5,874.16	87.79	67.914
14,100.00	7,173.00	19,340.96	6,975.69	114.58	373.60	-87.98	1,432.34	-12,616.49	5,862.55	5,773.94	88.61	66.162
14,200.00	7,173.00	19,340.96	6,975.69	116.13	373.60	-87.98	1,432.34	-12,616.49	5,763.17	5,673.70	89.46	64.418
14,300.00	7,173.00	19,340.96	6,975.69	117.68	373.60	-87.98	1,432.34	-12,616.49	5,663.81	5,573.45	90.35	62.684
14,400.00	7,173.00	19,340.96	6,975.69	119.23	373.60	-87.98	1,432.34	-12,616.49	5,564.47	5,473.19	91.28	60.960
14,500.00	7,173.00	19,340.96	6,975.69	120.78	373.60	-87.98	1,432.34	-12,616.49	5,465.16	5,372.91	92.25	59.245
14,600.00	7,173.00	19,340.96	6,975.69	122.33	373.60	-87.98	1,432.34	-12,616.49	5,365.87	5,272.62	93.25	57.542
14,700.00	7,173.00	19,340.96	6,975.69	123.88	373.60	-87.98	1,432.34	-12,616.49	5,266.61	5,172.31	94.30	55.849
14,800.00	7,173.00	19,340.96	6,975.69	125.44	373.60	-87.98	1,432.34	-12,616.49	5,167.38	5,071.98	95.40	54.168
14,900.00	7,173.00	19,340.96	6,975.69	127.00	373.60	-87.98	1,432.34	-12,616.49	5,068.18	4,971.64	96.54	52.499
15,000.00	7,173.00	19,340.96	6,975.69	128.55	373.60	-87.98	1,432.34	-12,616.49	4,969.01	4,871.28	97.73	50.843
15,100.00	7,173.00	19,340.96	6,975.69	130.11	373.60	-87.98	1,432.34	-12,616.49	4,869.87	4,770.89	98.98	49.199
15,200.00	7,173.00	19,340.96	6,975.69	131.67	373.60	-87.98	1,432.34	-12,616.49	4,770.78	4,670.49	100.29	47.570
15,300.00	7,173.00	19,340.96	6,975.69	133.23	373.60	-87.98	1,432.34	-12,616.49	4,671.72	4,570.06	101.66	45.954
15,400.00	7,173.00	19,340.96	6,975.69	134.80	373.60	-87.98	1,432.34	-12,616.49	4,572.70	4,469.60	103.10	44.354
15,500.00	7,173.00	19,340.96	6,975.69	136.36	373.60	-87.98	1,432.34	-12,616.49	4,473.72	4,369.12	104.60	42.768
15,600.00	7,173.00	19,340.96	6,975.69	137.92	373.60	-87.98	1,432.34	-12,616.49	4,374.79	4,268.60	106.19	41.199
15,700.00	7,173.00	19,340.96	6,975.69	139.49	373.60	-87.98	1,432.34	-12,616.49	4,275.91	4,168.06	107.85	39.647
15,800.00	7,173.00	19,340.96	6,975.69	141.05	373.60	-87.98	1,432.34	-12,616.49	4,177.08	4,067.49	109.60	38.112
15,900.00	7,173.00	19,340.96	6,975.69	142.62	373.60	-87.98	1,432.34	-12,616.49	4,078.32	3,966.87	111.44	36.595
16,000.00	7,173.00	19,340.96	6,975.69	144.19	373.60	-87.98	1,432.34	-12,616.49	3,979.61	3,866.22	113.39	35.097
16,100.00	7,173.00	19,340.96	6,975.69	145.76	373.60	-87.98	1,432.34	-12,616.49	3,880.97	3,765.53	115.44	33.619
16,200.00	7,173.00	19,340.96	6,975.69	147.33	373.60	-87.98	1,432.34	-12,616.49	3,782.40	3,664.79	117.61	32.161
16,300.00	7,173.00	19,340.96	6,975.69	148.90	373.60	-87.98	1,432.34	-12,616.49	3,683.90	3,564.00	119.90	30.724
16,400.00	7,173.00	19,340.96	6,975.69	150.47	373.60	-87.98	1,432.34	-12,616.49	3,585.49	3,463.16	122.33	29.309
16,500.00	7,173.00	19,340.96	6,975.69	152.04	373.60	-87.98	1,432.34	-12,616.49	3,487.18	3,362.27	124.91	27.917
16,600.00	7,173.00	19,340.96	6,975.69	153.61	373.60	-87.98	1,432.34	-12,616.49	3,388.96	3,261.31	127.65	26.549
16,700.00	7,173.00	19,340.96	6,975.69	155.18	373.60	-87.98	1,432.34	-12,616.49	3,290.84	3,160.28	130.56	25.205
16,800.00	7,173.00	19,340.96	6,975.69	156.76	373.60	-87.98	1,432.34	-12,616.49	3,192.85	3,059.18	133.67	23.887
16,900.00	7,173.00	19,340.96	6,975.69	158.33	373.60	-87.98	1,432.34	-12,616.49	3,094.98	2,958.00	136.98	22.595
17,000.00	7,173.00	19,340.96	6,975.69	159.90	373.60	-87.98	1,432.34	-12,616.49	2,997.25	2,856.73	140.52	21.330
17,100.00	7,173.00	19,340.96	6,975.69	161.48	373.60	-87.98	1,432.34	-12,616.49	2,899.68	2,755.37	144.31	20.094
17,200.00	7,173.00	19,340.96	6,975.69	163.06	373.60	-87.98	1,432.34	-12,616.49	2,802.28	2,653.90	148.37	18.887
17,300.00	7,173.00	19,340.96	6,975.69	164.63	373.60	-87.98	1,432.34	-12,616.49	2,705.06	2,552.32	152.74	17.710
17,400.00	7,173.00	19,340.96	6,975.69	166.21	373.60	-87.98	1,432.34	-12,616.49	2,608.06	2,450.61	157.45	16.564
17,500.00	7,173.00	19,340.96	6,975.69	167.79	373.60	-87.98	1,432.34	-12,616.49	2,511.30	2,348.77	162.53	15.451
17,600.00	7,173.00	19,340.96	6,975.69	169.36	373.60	-87.98	1,432.34	-12,616.49	2,414.80	2,246.77	168.03	14.371
17,700.00	7,173.00	19,340.96	6,975.69	170.94	373.60	-87.98	1,432.34	-12,616.49	2,318.59	2,144.60	173.99	13.326

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 30 - Rosa Unit #664H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 396-MWD+HDGM, 5794-Standard Keeper 104, 6450-MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Offset Wellbore Centre		Distance		Rule Assigned:		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
17,800.00	7,173.00	19,340.96	6,975.69	172.52	373.60	-87.98	1,432.34	-12,616.49	2,222.72	2,042.25	180.47	12.316	
17,900.00	7,173.00	19,340.96	6,975.69	174.10	373.60	-87.98	1,432.34	-12,616.49	2,127.23	1,939.69	187.54	11.343	
18,000.00	7,173.00	19,340.96	6,975.69	175.68	373.60	-87.98	1,432.34	-12,616.49	2,032.17	1,836.91	195.27	10.407	
18,100.00	7,173.00	19,340.96	6,975.69	177.26	373.60	-87.98	1,432.34	-12,616.49	1,937.62	1,733.88	203.74	9.510	
18,200.00	7,173.00	19,340.96	6,975.69	178.84	373.60	-87.98	1,432.34	-12,616.49	1,843.63	1,630.58	213.05	8.653	
18,300.00	7,173.00	19,340.96	6,975.69	180.42	373.60	-87.98	1,432.34	-12,616.49	1,750.31	1,526.98	223.33	7.837	
18,400.00	7,173.00	19,340.96	6,975.69	182.00	373.60	-87.98	1,432.34	-12,616.49	1,657.78	1,423.07	234.70	7.063	
18,500.00	7,173.00	19,340.96	6,975.69	183.59	373.60	-87.98	1,432.34	-12,616.49	1,566.16	1,318.82	247.33	6.332	
18,600.00	7,173.00	19,340.96	6,975.69	185.17	373.60	-87.98	1,432.34	-12,616.49	1,475.62	1,214.23	261.40	5.645	
18,700.00	7,173.00	19,340.96	6,975.69	186.75	373.60	-87.98	1,432.34	-12,616.49	1,386.39	1,109.29	277.11	5.003	
18,800.00	7,173.00	19,340.96	6,975.69	188.33	373.60	-87.98	1,432.34	-12,616.49	1,298.74	1,004.04	294.69	4.407	
18,900.00	7,173.00	19,340.96	6,975.69	189.92	373.60	-87.98	1,432.34	-12,616.49	1,212.99	898.58	314.40	3.858	
19,000.00	7,173.00	19,340.96	6,975.69	191.50	373.60	-87.98	1,432.34	-12,616.49	1,129.58	793.08	336.50	3.357	
19,100.00	7,173.00	19,340.96	6,975.69	193.09	373.60	-87.98	1,432.34	-12,616.49	1,049.09	687.87	361.22	2.904	
19,200.00	7,173.00	19,340.96	6,975.69	194.67	373.60	-87.98	1,432.34	-12,616.49	972.22	583.52	388.69	2.501	
19,249.41	7,173.00	19,340.96	6,975.69	195.45	373.60	-87.98	1,432.34	-12,616.49	935.85	532.56	403.28	2.321	
19,300.00	7,173.00	19,340.96	6,975.69	196.25	373.60	-87.98	1,432.34	-12,616.49	899.90	481.03	418.87	2.148	
19,384.41	7,173.00	19,340.96	6,975.69	197.34	373.60	-87.98	1,432.34	-12,616.49	843.28	396.74	446.53	1.889	CC, ES, SF

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Rule Assigned:		Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	20,806.96	7,074.42	0.00	336.82	-59.97	321.77	-556.61	7,174.30					
125.00	125.00	20,806.96	7,074.42	0.06	336.82	-110.17	321.77	-556.61	7,049.83	6,940.18	109.65	64.295		
225.00	224.98	20,806.96	7,074.42	0.17	336.82	-172.70	321.77	-556.61	6,950.41	6,840.63	109.78	63.312		
319.00	318.92	20,806.96	7,074.42	0.28	336.82	179.10	321.77	-556.61	6,857.18	6,747.27	109.91	62.387		
400.00	399.86	20,806.96	7,074.42	0.37	336.82	179.10	321.77	-556.61	6,776.93	6,665.03	111.90	60.561		
469.00	468.80	20,806.96	7,074.42	0.52	336.82	179.10	321.77	-556.61	6,708.58	6,596.64	111.94	59.929		
500.00	499.78	20,806.96	7,074.42	0.61	336.82	-169.93	321.77	-556.61	6,677.86	6,565.90	111.96	59.645		
600.00	599.71	20,806.96	7,074.42	0.92	336.82	-133.25	321.77	-556.61	6,578.69	6,466.67	112.01	58.733		
700.00	699.55	20,806.96	7,074.42	1.26	336.82	-125.35	321.77	-556.61	6,479.45	6,367.41	112.04	57.829		
800.00	799.19	20,806.96	7,074.42	1.60	336.82	-130.43	321.77	-556.61	6,380.29	6,268.23	112.06	56.938		
900.00	898.49	20,806.96	7,074.42	1.97	336.82	-137.73	321.77	-556.61	6,281.31	6,169.26	112.05	56.059		
1,000.00	997.33	20,806.96	7,074.42	2.34	336.82	-144.25	321.77	-556.61	6,182.66	6,070.64	112.02	55.193		
1,100.00	1,095.61	20,806.96	7,074.42	2.74	336.82	-149.44	321.77	-556.61	6,084.47	5,972.50	111.97	54.339		
1,196.26	1,189.56	20,806.96	7,074.42	3.13	336.82	-153.35	321.77	-556.61	5,990.52	5,878.61	111.91	53.528		
1,200.00	1,193.19	20,806.96	7,074.42	3.15	336.82	-153.35	321.77	-556.61	5,986.89	5,874.98	111.91	53.499		
1,300.00	1,290.42	20,806.96	7,074.42	3.58	336.82	-153.35	321.77	-556.61	5,889.68	5,777.82	111.86	52.652		
1,400.00	1,387.65	20,806.96	7,074.42	4.01	336.82	-153.35	321.77	-556.61	5,792.57	5,680.75	111.83	51.800		
1,500.00	1,484.87	20,806.96	7,074.42	4.45	336.82	-153.35	321.77	-556.61	5,695.56	5,583.76	111.81	50.941		
1,600.00	1,582.10	20,806.96	7,074.42	4.90	336.82	-153.35	321.77	-556.61	5,598.66	5,486.86	111.80	50.077		
1,700.00	1,679.33	20,806.96	7,074.42	5.34	336.82	-153.35	321.77	-556.61	5,501.86	5,390.05	111.81	49.206		
1,800.00	1,776.55	20,806.96	7,074.42	5.79	336.82	-153.35	321.77	-556.61	5,405.19	5,293.35	111.84	48.330		
1,900.00	1,873.78	20,806.96	7,074.42	6.24	336.82	-153.35	321.77	-556.61	5,308.63	5,196.75	111.88	47.447		
2,000.00	1,971.01	20,806.96	7,074.42	6.69	336.82	-153.35	321.77	-556.61	5,212.21	5,100.26	111.95	46.559		
2,100.00	2,068.23	20,806.96	7,074.42	7.15	336.82	-153.35	321.77	-556.61	5,115.92	5,003.89	112.03	45.664		
2,200.00	2,165.46	20,806.96	7,074.42	7.60	336.82	-153.35	321.77	-556.61	5,019.78	4,907.64	112.14	44.763		
2,300.00	2,262.69	20,806.96	7,074.42	8.06	336.82	-153.35	321.77	-556.61	4,923.79	4,811.52	112.27	43.855		
2,400.00	2,359.91	20,806.96	7,074.42	8.51	336.82	-153.35	321.77	-556.61	4,827.97	4,715.54	112.43	42.941		
2,500.00	2,457.14	20,806.96	7,074.42	8.97	336.82	-153.35	321.77	-556.61	4,732.32	4,619.69	112.62	42.019		
2,600.00	2,554.37	20,806.96	7,074.42	9.42	336.82	-153.35	321.77	-556.61	4,636.85	4,524.01	112.84	41.091		
2,700.00	2,651.59	20,806.96	7,074.42	9.88	336.82	-153.35	321.77	-556.61	4,541.57	4,428.48	113.10	40.156		
2,800.00	2,748.82	20,806.96	7,074.42	10.34	336.82	-153.35	321.77	-556.61	4,446.51	4,333.11	113.39	39.213		
2,900.00	2,846.05	20,806.96	7,074.42	10.80	336.82	-153.35	321.77	-556.61	4,351.66	4,237.93	113.73	38.262		
3,000.00	2,943.27	20,806.96	7,074.42	11.25	336.82	-153.35	321.77	-556.61	4,257.05	4,142.94	114.12	37.304		
3,100.00	3,040.50	20,806.96	7,074.42	11.71	336.82	-153.35	321.77	-556.61	4,162.70	4,048.14	114.56	36.338		
3,200.00	3,137.73	20,806.96	7,074.42	12.17	336.82	-153.35	321.77	-556.61	4,068.61	3,953.56	115.05	35.363		
3,300.00	3,234.95	20,806.96	7,074.42	12.63	336.82	-153.35	321.77	-556.61	3,974.81	3,859.20	115.61	34.380		
3,400.00	3,332.18	20,806.96	7,074.42	13.09	336.82	-153.35	321.77	-556.61	3,881.32	3,765.08	116.25	33.389		
3,500.00	3,429.40	20,806.96	7,074.42	13.55	336.82	-153.35	321.77	-556.61	3,788.17	3,671.21	116.96	32.389		
3,600.00	3,526.63	20,806.96	7,074.42	14.00	336.82	-153.35	321.77	-556.61	3,695.37	3,577.61	117.76	31.381		
3,700.00	3,623.86	20,806.96	7,074.42	14.46	336.82	-153.35	321.77	-556.61	3,602.96	3,484.30	118.66	30.365		
3,800.00	3,721.08	20,806.96	7,074.42	14.92	336.82	-153.35	321.77	-556.61	3,510.96	3,391.30	119.66	29.341		
3,900.00	3,818.31	20,806.96	7,074.42	15.38	336.82	-153.35	321.77	-556.61	3,419.41	3,298.62	120.79	28.309		
4,000.00	3,915.54	20,806.96	7,074.42	15.84	336.82	-153.35	321.77	-556.61	3,328.35	3,206.30	122.05	27.271		
4,100.00	4,012.76	20,806.96	7,074.42	16.30	336.82	-153.35	321.77	-556.61	3,237.81	3,114.36	123.45	26.227		
4,200.00	4,109.99	20,806.96	7,074.42	16.76	336.82	-153.35	321.77	-556.61	3,147.85	3,022.83	125.02	25.178		
4,300.00	4,207.22	20,806.96	7,074.42	17.22	336.82	-153.35	321.77	-556.61	3,058.52	2,931.74	126.78	24.125		
4,400.00	4,304.44	20,806.96	7,074.42	17.68	336.82	-153.35	321.77	-556.61	2,969.86	2,841.13	128.73	23.071		
4,500.00	4,401.67	20,806.96	7,074.42	18.14	336.82	-153.35	321.77	-556.61	2,881.94	2,751.04	130.90	22.017		
4,600.00	4,498.90	20,806.96	7,074.42	18.60	336.82	-153.35	321.77	-556.61	2,794.84	2,661.53	133.31	20.964		
4,700.00	4,596.12	20,806.96	7,074.42	19.06	336.82	-153.35	321.77	-556.61	2,708.63	2,572.63	136.00	19.917		
4,800.00	4,693.35	20,806.96	7,074.42	19.52	336.82	-153.35	321.77	-556.61	2,623.40	2,484.43	138.97	18.877		
4,900.00	4,790.58	20,806.96	7,074.42	19.98	336.82	-153.35	321.77	-556.61	2,539.24	2,396.97	142.27	17.848		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Offset												Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,000.00	4,887.80	20,806.96	7,074.42	20.44	336.82	-153.35	321.77	-556.61	2,456.28	2,310.36	145.91	16.834	
5,100.00	4,985.03	20,806.96	7,074.42	20.90	336.82	-153.35	321.77	-556.61	2,374.62	2,224.69	149.94	15.838	
5,200.00	5,082.26	20,806.96	7,074.42	21.36	336.82	-153.35	321.77	-556.61	2,294.42	2,140.05	154.37	14.864	
5,300.00	5,179.48	20,806.96	7,074.42	21.82	336.82	-153.35	321.77	-556.61	2,215.83	2,056.60	159.23	13.916	
5,400.00	5,276.71	20,806.96	7,074.42	22.27	336.82	-153.35	321.77	-556.61	2,139.03	1,974.46	164.57	12.998	
5,500.00	5,373.94	20,806.96	7,074.42	22.73	336.82	-153.35	321.77	-556.61	2,064.21	1,893.82	170.39	12.115	
5,600.00	5,471.16	20,806.96	7,074.42	23.19	336.82	-153.35	321.77	-556.61	1,991.61	1,814.89	176.72	11.270	
5,700.00	5,568.39	20,806.96	7,074.42	23.65	336.82	-153.35	321.77	-556.61	1,921.47	1,737.90	183.58	10.467	
5,800.00	5,665.62	20,806.96	7,074.42	24.11	336.82	-153.35	321.77	-556.61	1,854.08	1,663.12	190.96	9.709	
5,900.00	5,762.84	20,806.96	7,074.42	24.57	336.82	-153.35	321.77	-556.61	1,789.73	1,590.88	198.85	9.000	
6,000.00	5,860.07	20,806.96	7,074.42	25.03	336.82	-153.35	321.77	-556.61	1,728.78	1,521.55	207.23	8.342	
6,100.00	5,957.30	20,806.96	7,074.42	25.50	336.82	-153.35	321.77	-556.61	1,671.59	1,455.54	216.05	7.737	
6,200.00	6,054.52	20,806.96	7,074.42	25.96	336.82	-153.35	321.77	-556.61	1,618.56	1,393.34	225.22	7.187	
6,300.00	6,151.75	20,806.96	7,074.42	26.42	336.82	-153.35	321.77	-556.61	1,570.12	1,335.47	234.65	6.691	
6,400.00	6,248.98	20,806.96	7,074.42	26.88	336.82	-153.35	321.77	-556.61	1,526.70	1,282.52	244.19	6.252	
6,500.00	6,346.20	20,806.96	7,074.42	27.34	336.82	-153.35	321.77	-556.61	1,488.75	1,235.08	253.67	5.869	
6,600.00	6,443.43	20,806.96	7,074.42	27.80	336.82	-153.35	321.77	-556.61	1,456.68	1,193.79	262.89	5.541	
6,696.38	6,537.14	20,806.96	7,074.42	28.24	336.82	-153.35	321.77	-556.61	1,431.71	1,160.38	271.33	5.277	
6,700.00	6,540.66	20,806.96	7,074.42	28.26	336.82	-152.06	321.77	-556.61	1,430.88	1,159.25	271.64	5.268	
6,750.00	6,589.27	20,806.96	7,074.42	28.48	336.82	-134.41	321.77	-556.61	1,419.27	1,143.28	275.99	5.142	
6,800.00	6,637.66	20,806.96	7,074.42	28.71	336.82	-119.29	321.77	-556.61	1,407.28	1,126.74	280.54	5.016	
6,850.00	6,685.53	20,806.96	7,074.42	28.92	336.82	-108.14	321.77	-556.61	1,395.00	1,109.72	285.28	4.890	
6,900.00	6,732.60	20,806.96	7,074.42	29.13	336.82	-100.43	321.77	-556.61	1,382.49	1,092.32	290.17	4.764	
6,950.00	6,778.56	20,806.96	7,074.42	29.32	336.82	-95.22	321.77	-556.61	1,369.82	1,074.63	295.19	4.640	
7,000.00	6,823.13	20,806.96	7,074.42	29.51	336.82	-91.69	321.77	-556.61	1,357.06	1,056.75	300.32	4.519	
7,050.00	6,866.05	20,806.96	7,074.42	29.68	336.82	-89.33	321.77	-556.61	1,344.30	1,038.79	305.52	4.400	
7,100.00	6,907.04	20,806.96	7,074.42	29.85	336.82	-87.77	321.77	-556.61	1,331.61	1,020.86	310.75	4.285	
7,150.00	6,945.85	20,806.96	7,074.42	30.01	336.82	-86.78	321.77	-556.61	1,319.08	1,003.09	315.99	4.174	
7,200.00	6,982.24	20,806.96	7,074.42	30.15	336.82	-86.20	321.77	-556.61	1,306.78	985.60	321.18	4.069	
7,250.00	7,016.00	20,806.96	7,074.42	30.29	336.82	-85.93	321.77	-556.61	1,294.81	968.52	326.29	3.968	
7,300.00	7,046.90	20,806.96	7,074.42	30.43	336.82	-85.87	321.77	-556.61	1,283.23	951.96	331.27	3.874	
7,350.00	7,074.76	20,806.96	7,074.42	30.56	336.82	-85.99	321.77	-556.61	1,272.15	936.06	336.08	3.785	
7,400.00	7,099.42	20,806.96	7,074.42	30.69	336.82	-86.22	321.77	-556.61	1,261.64	920.96	340.68	3.703	
7,450.00	7,120.70	20,806.96	7,074.42	30.82	336.82	-86.53	321.77	-556.61	1,251.77	906.77	345.00	3.628	
7,500.00	7,138.50	20,806.96	7,074.42	30.95	336.82	-86.90	321.77	-556.61	1,242.63	893.62	349.01	3.560	
7,550.00	7,152.68	20,806.96	7,074.42	31.10	336.82	-87.31	321.77	-556.61	1,234.30	881.63	352.67	3.500	
7,600.00	7,163.18	20,806.96	7,074.42	31.25	336.82	-87.73	321.77	-556.61	1,226.83	870.91	355.92	3.447	
7,650.00	7,169.92	20,806.96	7,074.42	31.41	336.82	-88.16	321.77	-556.61	1,220.29	861.56	358.73	3.402	
7,700.00	7,172.86	20,806.96	7,074.42	31.59	336.82	-88.58	321.77	-556.61	1,214.74	853.67	361.07	3.364	
7,713.53	7,173.00	20,806.96	7,074.42	31.64	336.82	-88.69	321.77	-556.61	1,213.41	851.80	361.61	3.356	
7,800.00	7,173.00	20,806.96	7,074.42	31.99	336.82	-88.69	321.77	-556.61	1,208.25	844.11	364.14	3.318	
7,899.20	7,173.00	20,738.96	7,073.66	32.47	336.81	-88.66	325.30	-624.51	1,207.47	842.46	365.02	3.308	
7,900.00	7,173.00	20,738.96	7,073.66	32.47	336.81	-88.66	325.30	-624.51	1,207.47	842.45	365.02	3.308 ES, SF	
8,000.00	7,173.00	20,604.96	7,073.39	33.03	333.56	-88.64	331.63	-758.35	1,207.62	845.53	362.09	3.335	
8,100.00	7,173.00	20,530.80	7,073.91	33.66	331.76	-88.67	336.31	-832.36	1,205.91	844.63	361.27	3.338	
8,126.55	7,173.00	20,513.74	7,074.11	33.84	331.34	-88.68	337.10	-849.39	1,205.88	844.76	361.12	3.339 CC	
8,200.00	7,173.00	20,434.40	7,074.39	34.36	329.42	-88.69	340.60	-928.66	1,205.96	846.22	359.74	3.352	
8,221.01	7,173.00	20,414.96	7,074.19	34.52	328.94	-88.68	341.53	-948.08	1,205.93	846.48	359.45	3.355	
8,300.00	7,173.00	20,357.28	7,073.67	35.13	327.54	-88.66	343.72	-1,005.71	1,206.55	847.80	358.75	3.363	
8,400.00	7,173.00	20,278.91	7,073.64	35.95	325.64	-88.66	345.02	-1,084.07	1,209.39	851.71	357.67	3.381	
8,500.00	7,173.00	20,178.69	7,074.18	36.82	323.21	-88.69	345.67	-1,184.28	1,213.26	857.07	356.19	3.406	
8,600.00	7,173.00	20,064.21	7,074.51	37.74	320.43	-88.70	347.60	-1,298.74	1,216.09	861.62	354.47	3.431	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project						Rule Assigned:					Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,700.00	7,173.00	19,979.11	7,074.16	38.71	318.37	-88.69	349.21	-1,383.83	1,218.78	865.42	353.36	3.449		
8,800.00	7,173.00	19,892.98	7,074.52	39.71	316.28	-88.71	349.38	-1,469.96	1,223.09	870.86	352.23	3.472		
8,900.00	7,173.00	19,781.67	7,075.70	40.76	313.58	-88.77	349.39	-1,581.27	1,227.62	876.86	350.76	3.500		
9,000.00	7,173.00	19,678.97	7,077.31	41.84	311.09	-88.85	350.49	-1,683.94	1,231.05	881.59	349.46	3.523		
9,100.00	7,173.00	19,576.00	7,079.08	42.96	308.60	-88.94	351.55	-1,786.89	1,234.52	886.33	348.19	3.546		
9,200.00	7,173.00	19,496.77	7,079.62	44.10	306.68	-88.96	351.98	-1,866.12	1,238.54	891.26	347.28	3.566		
9,300.00	7,173.00	19,409.07	7,079.85	45.27	304.55	-88.98	351.01	-1,953.81	1,244.15	897.93	346.22	3.594		
9,400.00	7,173.00	19,305.09	7,080.87	46.47	302.04	-89.03	349.56	-2,057.78	1,250.06	905.04	345.03	3.623		
9,500.00	7,173.00	19,172.45	7,081.71	47.70	298.83	-89.07	349.84	-2,190.40	1,254.38	910.92	343.46	3.652		
9,600.00	7,173.00	19,091.96	7,081.72	48.94	296.87	-89.08	350.99	-2,270.88	1,257.62	915.00	342.62	3.671		
9,700.00	7,173.00	18,996.96	7,082.51	50.20	294.57	-89.11	350.84	-2,365.87	1,262.31	920.73	341.58	3.696		
9,800.00	7,173.00	18,923.11	7,083.71	51.49	292.79	-89.17	349.32	-2,439.70	1,268.72	927.99	340.73	3.724		
9,900.00	7,173.00	18,826.34	7,085.37	52.79	290.45	-89.25	346.96	-2,536.43	1,275.66	935.97	339.70	3.755		
10,000.00	7,173.00	18,682.10	7,086.25	54.11	286.96	-89.30	346.34	-2,680.66	1,280.39	942.16	338.23	3.786		
10,100.00	7,173.00	18,596.91	7,087.56	55.44	284.90	-89.36	346.63	-2,765.83	1,284.58	947.20	337.38	3.808		
10,200.00	7,173.00	18,512.83	7,089.54	56.78	282.86	-89.45	345.59	-2,849.88	1,290.30	953.79	336.52	3.834		
10,300.00	7,173.00	18,390.34	7,090.20	58.14	279.90	-89.48	344.59	-2,972.36	1,295.66	960.38	335.29	3.864		
10,400.00	7,173.00	18,303.96	7,089.68	59.51	277.81	-89.46	344.57	-3,058.73	1,300.27	965.86	334.42	3.888		
10,500.00	7,173.00	18,214.56	7,089.36	60.90	275.65	-89.45	343.02	-3,148.13	1,306.50	973.00	333.50	3.918		
10,600.00	7,173.00	18,092.19	7,088.65	62.29	272.68	-89.42	342.65	-3,270.49	1,311.23	978.93	332.30	3.946		
10,700.00	7,173.00	17,991.23	7,088.90	63.69	270.24	-89.43	342.62	-3,371.45	1,315.79	984.48	331.31	3.971		
10,800.00	7,173.00	17,850.05	7,089.98	65.11	266.82	-89.48	344.75	-3,512.60	1,318.88	989.15	329.73	4.000		
10,900.00	7,173.00	17,747.85	7,089.86	66.53	264.34	-89.47	348.09	-3,614.74	1,320.16	991.44	328.72	4.016		
11,000.00	7,173.00	17,649.37	7,089.43	67.96	261.95	-89.46	351.77	-3,713.15	1,320.96	993.18	327.78	4.030		
11,100.00	7,173.00	17,578.97	7,088.92	69.39	260.24	-89.43	353.29	-3,783.54	1,323.34	996.05	327.30	4.043		
11,200.00	7,173.00	17,490.24	7,088.40	70.84	258.09	-89.41	353.90	-3,872.26	1,327.20	1,000.71	326.49	4.065		
11,300.00	7,173.00	17,361.86	7,088.61	72.29	254.98	-89.42	355.59	-4,000.63	1,330.42	1,005.26	325.15	4.092		
11,400.00	7,173.00	17,246.73	7,089.88	73.74	252.19	-89.48	359.14	-4,115.69	1,331.83	1,007.87	323.96	4.111		
11,500.00	7,173.00	17,161.10	7,091.12	75.21	250.11	-89.53	361.97	-4,201.26	1,333.10	1,009.81	323.29	4.124		
11,600.00	7,173.00	17,082.40	7,091.47	76.68	248.20	-89.55	363.02	-4,279.96	1,336.23	1,013.56	322.68	4.141		
11,700.00	7,173.00	16,980.66	7,090.38	78.15	245.74	-89.50	364.01	-4,381.68	1,339.81	1,018.09	321.73	4.164		
11,800.00	7,173.00	16,885.70	7,089.63	79.63	243.44	-89.47	364.79	-4,476.64	1,343.54	1,022.67	320.87	4.187		
11,900.00	7,173.00	16,788.69	7,089.95	81.11	241.09	-89.49	365.14	-4,573.64	1,347.71	1,027.72	319.99	4.212		
12,000.00	7,173.00	16,675.85	7,091.02	82.60	238.36	-89.53	365.96	-4,686.48	1,351.52	1,032.59	318.93	4.238		
12,100.00	7,173.00	16,572.01	7,089.97	84.09	235.84	-89.49	367.72	-4,790.30	1,354.36	1,036.40	317.96	4.259		
12,200.00	7,173.00	16,473.14	7,090.05	85.59	233.45	-89.50	369.23	-4,889.15	1,357.38	1,040.30	317.08	4.281		
12,300.00	7,173.00	16,367.87	7,090.25	87.09	230.90	-89.51	371.01	-4,994.40	1,360.22	1,044.12	316.10	4.303		
12,400.00	7,173.00	16,283.97	7,089.54	88.59	228.87	-89.48	372.28	-5,078.29	1,363.28	1,047.86	315.42	4.322		
12,500.00	7,173.00	16,183.30	7,089.82	90.10	226.43	-89.49	372.77	-5,178.96	1,367.33	1,052.81	314.52	4.347		
12,600.00	7,173.00	16,063.99	7,090.13	91.61	223.54	-89.50	374.53	-5,298.25	1,370.39	1,057.03	313.37	4.373		
12,700.00	7,173.00	15,961.87	7,090.26	93.13	221.06	-89.51	376.93	-5,400.35	1,372.58	1,060.13	312.45	4.393		
12,800.00	7,173.00	15,875.97	7,091.45	94.64	218.98	-89.56	378.58	-5,486.22	1,375.19	1,063.42	311.77	4.411		
12,900.00	7,173.00	15,794.92	7,092.22	96.16	217.02	-89.59	379.17	-5,567.26	1,379.01	1,067.88	311.12	4.432		
13,000.00	7,173.00	15,686.97	7,092.35	97.69	214.41	-89.60	379.88	-5,675.21	1,382.86	1,072.70	310.16	4.459		
13,100.00	7,173.00	15,592.97	7,092.71	99.21	212.14	-89.62	380.20	-5,769.20	1,387.05	1,077.70	309.35	4.484		
13,200.00	7,173.00	15,518.51	7,093.14	100.74	210.34	-89.64	379.15	-5,843.66	1,392.83	1,084.13	308.70	4.512		
13,300.00	7,173.00	15,414.44	7,093.80	102.27	207.83	-89.66	377.43	-5,947.71	1,399.02	1,091.21	307.81	4.545		
13,400.00	7,173.00	15,343.80	7,093.21	103.80	206.13	-89.64	375.85	-6,018.33	1,405.85	1,098.76	307.09	4.578		
13,500.00	7,173.00	15,264.59	7,092.43	105.33	204.22	-89.61	372.30	-6,097.45	1,414.81	1,108.55	306.26	4.620		
13,600.00	7,173.00	15,159.54	7,092.06	106.87	201.70	-89.60	367.12	-6,202.37	1,424.27	1,118.87	305.40	4.664		
13,700.00	7,173.00	15,001.68	7,092.08	108.41	197.90	-89.60	362.94	-6,360.16	1,431.55	1,127.28	304.27	4.705		
13,800.00	7,173.00	14,886.20	7,091.17	109.95	195.11	-89.57	363.32	-6,475.64	1,435.72	1,132.48	303.24	4.735		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Rule Assigned:		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,173.00	14,799.96	7,090.74	111.49	193.02	-89.55	363.66	-6,561.87	1,439.90	1,137.37	302.52	4.760	
14,000.00	7,173.00	14,703.73	7,089.21	113.03	190.70	-89.49	362.63	-6,658.08	1,445.49	1,143.80	301.69	4.791	
14,100.00	7,173.00	14,583.29	7,085.78	114.58	187.79	-89.36	363.45	-6,778.47	1,449.27	1,148.67	300.60	4.821	
14,200.00	7,173.00	14,463.53	7,083.11	116.13	184.90	-89.26	365.02	-6,898.19	1,452.57	1,153.11	299.46	4.851	
14,300.00	7,173.00	14,379.90	7,081.83	117.68	182.87	-89.21	366.47	-6,981.80	1,455.40	1,156.59	298.81	4.871	
14,400.00	7,173.00	14,252.39	7,080.69	119.23	179.79	-89.16	368.66	-7,109.27	1,458.33	1,160.76	297.57	4.901	
14,493.28	7,173.00	14,136.16	7,077.59	120.67	176.98	-89.04	373.82	-7,225.35	1,458.30	1,161.96	296.34	4.921	
14,500.00	7,173.00	14,130.97	7,077.45	120.78	176.85	-89.04	374.06	-7,230.53	1,458.31	1,161.99	296.31	4.921	
14,600.00	7,173.00	14,045.32	7,075.71	122.33	174.78	-88.97	377.27	-7,316.10	1,459.09	1,163.39	295.70	4.934	
14,700.00	7,173.00	13,944.77	7,074.40	123.88	172.35	-88.92	380.81	-7,416.58	1,460.14	1,165.31	294.82	4.953	
14,800.00	7,173.00	13,835.08	7,073.52	125.44	169.70	-88.88	384.81	-7,526.19	1,461.06	1,167.26	293.80	4.973	
14,900.00	7,173.00	13,735.89	7,073.16	127.00	167.30	-88.87	389.14	-7,625.28	1,461.23	1,168.28	292.96	4.988	
15,000.00	7,173.00	13,649.34	7,072.41	128.55	165.21	-88.84	392.33	-7,711.77	1,462.11	1,169.78	292.33	5.002	
15,100.00	7,173.00	13,551.41	7,069.78	130.11	162.84	-88.74	395.21	-7,809.63	1,463.76	1,172.27	291.49	5.022	
15,200.00	7,173.00	13,472.06	7,067.75	131.67	160.92	-88.66	397.46	-7,888.92	1,465.61	1,174.69	290.93	5.038	
15,300.00	7,173.00	13,402.18	7,065.22	133.23	159.24	-88.56	397.75	-7,958.75	1,469.74	1,179.34	290.40	5.061	
15,400.00	7,173.00	13,304.50	7,061.80	134.80	156.89	-88.44	397.40	-8,056.37	1,474.72	1,185.17	289.55	5.093	
15,500.00	7,173.00	13,210.91	7,059.01	136.36	154.63	-88.33	396.64	-8,149.91	1,480.14	1,191.40	288.74	5.126	
15,600.00	7,173.00	13,110.17	7,056.76	137.92	152.21	-88.25	395.89	-8,250.62	1,485.49	1,197.61	287.88	5.160	
15,700.00	7,173.00	13,021.25	7,055.31	139.49	150.07	-88.20	394.64	-8,339.52	1,491.47	1,204.35	287.12	5.195	
15,800.00	7,173.00	12,915.19	7,054.44	141.05	147.52	-88.18	393.14	-8,445.57	1,497.43	1,211.19	286.24	5.231	
15,900.00	7,173.00	12,817.05	7,054.26	142.62	145.16	-88.18	391.92	-8,543.71	1,503.22	1,217.79	285.42	5.267	
16,000.00	7,173.00	12,719.12	7,054.62	144.19	142.80	-88.20	390.37	-8,641.61	1,509.31	1,224.69	284.62	5.303	
16,100.00	7,173.00	12,611.82	7,055.72	145.76	140.23	-88.25	388.99	-8,748.91	1,515.10	1,231.34	283.75	5.340	
16,200.00	7,173.00	12,500.56	7,057.46	147.33	137.55	-88.32	388.17	-8,860.15	1,520.33	1,237.48	282.85	5.375	
16,300.00	7,173.00	12,416.06	7,058.83	148.90	135.52	-88.38	387.71	-8,944.64	1,525.40	1,243.23	282.17	5.406	
16,400.00	7,173.00	12,315.14	7,059.38	150.47	133.10	-88.40	386.05	-9,045.54	1,531.57	1,250.22	281.35	5.444	
16,500.00	7,173.00	12,215.24	7,060.84	152.04	130.70	-88.46	385.00	-9,145.42	1,537.11	1,256.57	280.54	5.479	
16,600.00	7,173.00	12,106.42	7,062.86	153.61	128.10	-88.54	383.82	-9,254.21	1,542.70	1,263.02	279.67	5.516	
16,700.00	7,173.00	12,003.03	7,065.50	155.18	125.62	-88.65	383.26	-9,357.57	1,547.70	1,268.85	278.85	5.550	
16,800.00	7,173.00	11,884.75	7,069.59	156.76	122.78	-88.80	383.44	-9,475.78	1,552.01	1,274.12	277.89	5.585	
16,900.00	7,173.00	11,781.37	7,074.10	158.33	120.30	-88.97	384.48	-9,579.05	1,555.45	1,278.38	277.07	5.614	
17,000.00	7,173.00	11,690.32	7,076.94	159.90	118.12	-89.08	384.97	-9,670.06	1,559.38	1,283.01	276.37	5.642	
17,100.00	7,173.00	11,586.00	7,080.39	161.48	115.63	-89.21	385.51	-9,774.32	1,563.35	1,287.81	275.54	5.674	
17,200.00	7,173.00	11,479.08	7,084.80	163.06	113.07	-89.37	386.40	-9,881.14	1,567.00	1,292.32	274.68	5.705	
17,300.00	7,173.00	11,375.64	7,086.96	164.63	110.59	-89.45	387.77	-9,984.55	1,570.19	1,296.34	273.84	5.734	
17,400.00	7,173.00	11,264.28	7,088.50	166.21	107.93	-89.51	389.54	-10,095.88	1,573.14	1,300.23	272.90	5.764	
17,500.00	7,173.00	11,158.96	7,088.87	167.79	105.41	-89.52	391.99	-10,201.17	1,575.34	1,303.32	272.03	5.791	
17,600.00	7,173.00	11,059.46	7,089.93	169.36	103.03	-89.56	394.40	-10,300.64	1,577.45	1,306.22	271.23	5.816	
17,700.00	7,173.00	10,966.44	7,091.72	170.94	100.81	-89.63	396.43	-10,393.62	1,579.80	1,309.27	270.53	5.840	
17,800.00	7,173.00	10,874.94	7,093.05	172.52	98.62	-89.68	397.97	-10,485.09	1,582.64	1,312.80	269.84	5.865	
17,900.00	7,173.00	10,791.88	7,093.36	174.10	96.64	-89.69	398.73	-10,568.15	1,586.26	1,317.03	269.23	5.892	
18,000.00	7,173.00	10,706.25	7,093.70	175.68	94.61	-89.70	398.63	-10,653.78	1,590.91	1,322.34	268.57	5.924	
18,100.00	7,173.00	10,602.31	7,093.40	177.26	92.14	-89.69	398.03	-10,757.71	1,596.03	1,328.29	267.74	5.961	
18,200.00	7,173.00	10,492.06	7,094.73	178.84	89.52	-89.74	398.08	-10,867.95	1,600.51	1,333.65	266.87	5.997	
18,300.00	7,173.00	10,394.98	7,096.06	180.42	87.22	-89.79	398.32	-10,965.03	1,604.80	1,338.68	266.12	6.030	
18,400.00	7,173.00	10,317.07	7,096.25	182.00	85.37	-89.80	398.14	-11,042.94	1,609.62	1,344.10	265.52	6.062	
18,500.00	7,173.00	10,188.69	7,097.09	183.59	82.34	-89.83	398.05	-11,171.31	1,614.16	1,349.66	264.50	6.103	
18,600.00	7,173.00	10,104.22	7,096.74	185.17	80.34	-89.81	398.11	-11,255.77	1,618.63	1,354.76	263.87	6.134	
18,700.00	7,173.00	10,000.98	7,096.11	186.75	77.91	-89.79	397.90	-11,359.02	1,623.36	1,360.29	263.07	6.171	
18,800.00	7,173.00	9,903.67	7,095.49	188.33	75.62	-89.77	397.52	-11,456.32	1,628.29	1,365.96	262.33	6.207	
18,900.00	7,173.00	9,781.81	7,095.48	189.92	72.76	-89.77	398.15	-11,578.18	1,632.27	1,370.91	261.36	6.245	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #744H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 3048-B001Mb_MWD+HRGM, 20807-Project							Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,000.00	7,173.00	9,668.14	7,096.64	191.50	70.09	-89.81	399.70	-11,691.82	1,635.45	1,374.99	260.46	6.279		
19,100.00	7,173.00	9,546.64	7,099.39	193.09	67.26	-89.91	402.74	-11,813.25	1,637.48	1,378.03	259.45	6.311		
19,200.00	7,173.00	9,438.29	7,101.40	194.67	64.73	-89.98	406.47	-11,921.51	1,638.58	1,379.97	258.60	6.336		
19,249.41	7,173.00	9,385.85	7,101.98	195.45	63.51	-90.00	408.45	-11,973.92	1,638.95	1,380.75	258.20	6.348		
19,300.00	7,173.00	9,337.25	7,102.78	196.25	62.39	-90.03	410.35	-12,022.47	1,639.27	1,381.41	257.86	6.357		
19,384.41	7,173.00	9,261.98	7,103.32	197.34	60.65	-90.05	412.83	-12,097.70	1,640.30	1,383.20	257.10	6.380		

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 409-B001Mb_MWD+HRGM, 21290-Project													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	21,289.96	7,363.81	0.00	339.92	-140.29	-676.45	-561.78	7,486.64					
125.00	125.00	21,289.96	7,363.81	0.06	339.92	175.56	-676.45	-561.78	7,362.59	7,248.14	114.45	64.330		
225.00	224.98	21,289.96	7,363.81	0.17	339.92	121.15	-676.45	-561.78	7,263.45	7,148.80	114.66	63.348		
319.00	318.92	21,289.96	7,363.81	0.28	339.92	115.85	-676.45	-561.78	7,170.30	7,055.46	114.84	62.436		
400.00	399.86	21,289.96	7,363.81	0.37	339.92	115.85	-676.45	-561.78	7,090.05	6,973.18	116.87	60.666		
469.00	468.80	21,289.96	7,363.81	0.52	339.92	115.85	-676.45	-561.78	7,021.71	6,904.76	116.94	60.043		
500.00	499.78	21,289.96	7,363.81	0.61	339.92	127.32	-676.45	-561.78	6,991.02	6,874.04	116.98	59.763		
600.00	599.71	21,289.96	7,363.81	0.92	339.92	169.35	-676.45	-561.78	6,892.26	6,775.14	117.13	58.845		
700.00	699.55	21,289.96	7,363.81	1.26	339.92	-173.59	-676.45	-561.78	6,793.98	6,676.66	117.32	57.908		
800.00	799.19	21,289.96	7,363.81	1.60	339.92	-168.76	-676.45	-561.78	6,696.32	6,578.74	117.58	56.951		
900.00	898.49	21,289.96	7,363.81	1.97	339.92	-167.52	-676.45	-561.78	6,599.42	6,481.52	117.90	55.973		
1,000.00	997.33	21,289.96	7,363.81	2.34	339.92	-167.47	-676.45	-561.78	6,503.45	6,385.15	118.30	54.974		
1,100.00	1,095.61	21,289.96	7,363.81	2.74	339.92	-167.82	-676.45	-561.78	6,408.56	6,289.78	118.78	53.953		
1,196.26	1,189.56	21,289.96	7,363.81	3.13	339.92	-168.30	-676.45	-561.78	6,318.39	6,199.06	119.33	52.949		
1,200.00	1,193.19	21,289.96	7,363.81	3.15	339.92	-168.30	-676.45	-561.78	6,314.92	6,195.57	119.34	52.914		
1,300.00	1,290.42	21,289.96	7,363.81	3.58	339.92	-168.30	-676.45	-561.78	6,222.02	6,102.01	120.01	51.844		
1,400.00	1,387.65	21,289.96	7,363.81	4.01	339.92	-168.30	-676.45	-561.78	6,129.35	6,008.62	120.74	50.766		
1,500.00	1,484.87	21,289.96	7,363.81	4.45	339.92	-168.30	-676.45	-561.78	6,036.92	5,915.40	121.52	49.680		
1,600.00	1,582.10	21,289.96	7,363.81	4.90	339.92	-168.30	-676.45	-561.78	5,944.73	5,822.37	122.35	48.586		
1,700.00	1,679.33	21,289.96	7,363.81	5.34	339.92	-168.30	-676.45	-561.78	5,852.79	5,729.54	123.25	47.487		
1,800.00	1,776.55	21,289.96	7,363.81	5.79	339.92	-168.30	-676.45	-561.78	5,761.12	5,636.91	124.21	46.382		
1,900.00	1,873.78	21,289.96	7,363.81	6.24	339.92	-168.30	-676.45	-561.78	5,669.74	5,544.50	125.24	45.273		
2,000.00	1,971.01	21,289.96	7,363.81	6.69	339.92	-168.30	-676.45	-561.78	5,578.65	5,452.32	126.33	44.160		
2,100.00	2,068.23	21,289.96	7,363.81	7.15	339.92	-168.30	-676.45	-561.78	5,487.87	5,360.38	127.49	43.044		
2,200.00	2,165.46	21,289.96	7,363.81	7.60	339.92	-168.30	-676.45	-561.78	5,397.42	5,268.68	128.74	41.926		
2,300.00	2,262.69	21,289.96	7,363.81	8.06	339.92	-168.30	-676.45	-561.78	5,307.31	5,177.25	130.06	40.808		
2,400.00	2,359.91	21,289.96	7,363.81	8.51	339.92	-168.30	-676.45	-561.78	5,217.56	5,086.10	131.46	39.690		
2,500.00	2,457.14	21,289.96	7,363.81	8.97	339.92	-168.30	-676.45	-561.78	5,128.19	4,995.24	132.95	38.573		
2,600.00	2,554.37	21,289.96	7,363.81	9.42	339.92	-168.30	-676.45	-561.78	5,039.22	4,904.69	134.53	37.458		
2,700.00	2,651.59	21,289.96	7,363.81	9.88	339.92	-168.30	-676.45	-561.78	4,950.67	4,814.46	136.21	36.346		
2,800.00	2,748.82	21,289.96	7,363.81	10.34	339.92	-168.30	-676.45	-561.78	4,862.56	4,724.57	137.99	35.239		
2,900.00	2,846.05	21,289.96	7,363.81	10.80	339.92	-168.30	-676.45	-561.78	4,774.92	4,635.05	139.87	34.138		
3,000.00	2,943.27	21,289.96	7,363.81	11.25	339.92	-168.30	-676.45	-561.78	4,687.78	4,545.91	141.87	33.043		
3,100.00	3,040.50	21,289.96	7,363.81	11.71	339.92	-168.30	-676.45	-561.78	4,601.16	4,457.18	143.98	31.956		
3,200.00	3,137.73	21,289.96	7,363.81	12.17	339.92	-168.30	-676.45	-561.78	4,515.09	4,368.87	146.22	30.878		
3,300.00	3,234.95	21,289.96	7,363.81	12.63	339.92	-168.30	-676.45	-561.78	4,429.61	4,281.02	148.59	29.811		
3,400.00	3,332.18	21,289.96	7,363.81	13.09	339.92	-168.30	-676.45	-561.78	4,344.75	4,193.66	151.09	28.756		
3,500.00	3,429.40	21,289.96	7,363.81	13.55	339.92	-168.30	-676.45	-561.78	4,260.55	4,106.81	153.73	27.714		
3,600.00	3,526.63	21,289.96	7,363.81	14.00	339.92	-168.30	-676.45	-561.78	4,177.04	4,020.51	156.52	26.686		
3,700.00	3,623.86	21,289.96	7,363.81	14.46	339.92	-168.30	-676.45	-561.78	4,094.27	3,934.80	159.47	25.674		
3,800.00	3,721.08	21,289.96	7,363.81	14.92	339.92	-168.30	-676.45	-561.78	4,012.29	3,849.71	162.58	24.679		
3,900.00	3,818.31	21,289.96	7,363.81	15.38	339.92	-168.30	-676.45	-561.78	3,931.14	3,765.29	165.85	23.703		
4,000.00	3,915.54	21,289.96	7,363.81	15.84	339.92	-168.30	-676.45	-561.78	3,850.87	3,681.58	169.30	22.746		
4,100.00	4,012.76	21,289.96	7,363.81	16.30	339.92	-168.30	-676.45	-561.78	3,771.55	3,598.63	172.93	21.810		
4,200.00	4,109.99	21,289.96	7,363.81	16.76	339.92	-168.30	-676.45	-561.78	3,693.24	3,516.50	176.74	20.896		
4,300.00	4,207.22	21,289.96	7,363.81	17.22	339.92	-168.30	-676.45	-561.78	3,615.99	3,435.24	180.75	20.006		
4,400.00	4,304.44	21,289.96	7,363.81	17.68	339.92	-168.30	-676.45	-561.78	3,539.89	3,354.93	184.95	19.139		
4,500.00	4,401.67	21,289.96	7,363.81	18.14	339.92	-168.30	-676.45	-561.78	3,465.00	3,275.63	189.36	18.298		
4,600.00	4,498.90	21,289.96	7,363.81	18.60	339.92	-168.30	-676.45	-561.78	3,391.40	3,197.43	193.97	17.484		
4,700.00	4,596.12	21,289.96	7,363.81	19.06	339.92	-168.30	-676.45	-561.78	3,319.18	3,120.39	198.80	16.696		
4,800.00	4,693.35	21,289.96	7,363.81	19.52	339.92	-168.30	-676.45	-561.78	3,248.44	3,044.61	203.83	15.937		
4,900.00	4,790.58	21,289.96	7,363.81	19.98	339.92	-168.30	-676.45	-561.78	3,179.27	2,970.20	209.07	15.207		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 409-B001Mb_MWD+HRGM, 21290-Project													Offset Well Error: 0.00 usft
Reference													
Measured Depth (usft)	Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,000.00	4,887.80	21,289.96	7,363.81	20.44	339.92	-168.30	-676.45	-561.78	3,111.78	2,897.26	214.52	14.506	
5,100.00	4,985.03	21,289.96	7,363.81	20.90	339.92	-168.30	-676.45	-561.78	3,046.07	2,825.89	220.18	13.835	
5,200.00	5,082.26	21,289.96	7,363.81	21.36	339.92	-168.30	-676.45	-561.78	2,982.27	2,756.24	226.03	13.194	
5,300.00	5,179.48	21,289.96	7,363.81	21.82	339.92	-168.30	-676.45	-561.78	2,920.50	2,688.43	232.08	12.584	
5,400.00	5,276.71	21,289.96	7,363.81	22.27	339.92	-168.30	-676.45	-561.78	2,860.90	2,622.60	238.30	12.006	
5,500.00	5,373.94	21,289.96	7,363.81	22.73	339.92	-168.30	-676.45	-561.78	2,803.59	2,558.92	244.67	11.458	
5,600.00	5,471.16	21,289.96	7,363.81	23.19	339.92	-168.30	-676.45	-561.78	2,748.73	2,497.54	251.19	10.943	
5,700.00	5,568.39	21,289.96	7,363.81	23.65	339.92	-168.30	-676.45	-561.78	2,696.46	2,438.64	257.82	10.459	
5,800.00	5,665.62	21,289.96	7,363.81	24.11	339.92	-168.30	-676.45	-561.78	2,646.94	2,382.40	264.54	10.006	
5,900.00	5,762.84	21,289.96	7,363.81	24.57	339.92	-168.30	-676.45	-561.78	2,600.33	2,329.02	271.31	9.584	
6,000.00	5,860.07	21,289.96	7,363.81	25.03	339.92	-168.30	-676.45	-561.78	2,556.78	2,278.69	278.08	9.194	
6,100.00	5,957.30	21,289.96	7,363.81	25.50	339.92	-168.30	-676.45	-561.78	2,516.44	2,231.62	284.83	8.835	
6,200.00	6,054.52	21,289.96	7,363.81	25.96	339.92	-168.30	-676.45	-561.78	2,479.49	2,188.00	291.49	8.506	
6,300.00	6,151.75	21,289.96	7,363.81	26.42	339.92	-168.30	-676.45	-561.78	2,446.07	2,148.05	298.02	8.208	
6,400.00	6,248.98	21,289.96	7,363.81	26.88	339.92	-168.30	-676.45	-561.78	2,416.34	2,111.97	304.36	7.939	
6,500.00	6,346.20	21,289.96	7,363.81	27.34	339.92	-168.30	-676.45	-561.78	2,390.41	2,079.95	310.46	7.700	
6,600.00	6,443.43	21,289.96	7,363.81	27.80	339.92	-168.30	-676.45	-561.78	2,368.43	2,052.17	316.26	7.489	
6,696.38	6,537.14	21,289.96	7,363.81	28.24	339.92	-168.30	-676.45	-561.78	2,351.08	2,029.56	321.52	7.312	
6,700.00	6,540.66	21,289.96	7,363.81	28.26	339.92	-167.00	-676.45	-561.78	2,350.50	2,028.79	321.71	7.306	
6,750.00	6,589.27	21,289.96	7,363.81	28.48	339.92	-149.15	-676.45	-561.78	2,342.40	2,018.02	324.38	7.221	
6,800.00	6,637.66	21,289.96	7,363.81	28.71	339.92	-133.80	-676.45	-561.78	2,334.18	2,007.09	327.09	7.136	
6,850.00	6,685.53	21,289.96	7,363.81	28.92	339.92	-122.39	-676.45	-561.78	2,325.90	1,996.05	329.85	7.051	
6,900.00	6,732.60	21,289.96	7,363.81	29.13	339.92	-114.40	-676.45	-561.78	2,317.60	1,984.98	332.61	6.968	
6,950.00	6,778.56	21,289.96	7,363.81	29.32	339.92	-108.88	-676.45	-561.78	2,309.33	1,973.95	335.38	6.886	
7,000.00	6,823.13	21,289.96	7,363.81	29.51	339.92	-105.03	-676.45	-561.78	2,301.14	1,963.01	338.14	6.805	
7,050.00	6,866.05	21,289.96	7,363.81	29.68	339.92	-102.32	-676.45	-561.78	2,293.10	1,952.24	340.85	6.728	
7,100.00	6,907.04	21,289.96	7,363.81	29.85	339.92	-100.39	-676.45	-561.78	2,285.24	1,941.72	343.52	6.652	
7,150.00	6,945.85	21,289.96	7,363.81	30.01	339.92	-99.02	-676.45	-561.78	2,277.62	1,931.50	346.12	6.580	
7,200.00	6,982.24	21,289.96	7,363.81	30.15	339.92	-98.05	-676.45	-561.78	2,270.28	1,921.66	348.63	6.512	
7,250.00	7,016.00	21,289.96	7,363.81	30.29	339.92	-97.37	-676.45	-561.78	2,263.29	1,912.25	351.03	6.447	
7,300.00	7,046.90	21,289.96	7,363.81	30.43	339.92	-96.91	-676.45	-561.78	2,256.67	1,903.36	353.32	6.387	
7,350.00	7,074.76	21,289.96	7,363.81	30.56	339.92	-96.62	-676.45	-561.78	2,250.49	1,895.03	355.46	6.331	
7,400.00	7,099.42	21,289.96	7,363.81	30.69	339.92	-96.45	-676.45	-561.78	2,244.77	1,887.32	357.45	6.280	
7,450.00	7,120.70	21,289.96	7,363.81	30.82	339.92	-96.37	-676.45	-561.78	2,239.56	1,880.29	359.27	6.234	
7,500.00	7,138.50	21,289.96	7,363.81	30.95	339.92	-96.36	-676.45	-561.78	2,234.90	1,873.99	360.90	6.192	
7,550.00	7,152.68	21,289.96	7,363.81	31.10	339.92	-96.40	-676.45	-561.78	2,230.81	1,868.46	362.34	6.157	
7,600.00	7,163.18	21,289.96	7,363.81	31.25	339.92	-96.48	-676.45	-561.78	2,227.32	1,863.75	363.57	6.126	
7,650.00	7,169.92	21,289.96	7,363.81	31.41	339.92	-96.60	-676.45	-561.78	2,224.47	1,859.89	364.58	6.101	
7,700.00	7,172.86	21,289.96	7,363.81	31.59	339.92	-96.73	-676.45	-561.78	2,222.26	1,856.90	365.36	6.082	
7,713.53	7,173.00	21,289.96	7,363.81	31.64	339.92	-96.77	-676.45	-561.78	2,221.78	1,856.24	365.53	6.078	
7,788.93	7,173.00	21,289.96	7,363.81	31.94	339.92	-96.77	-676.45	-561.78	2,220.50	1,854.24	366.26	6.063 CC	
7,800.00	7,173.00	21,289.96	7,363.81	31.99	339.92	-96.77	-676.45	-561.78	2,220.52	1,854.19	366.33	6.062 ES, SF	
7,900.00	7,173.00	21,192.96	7,361.65	32.47	339.27	-96.71	-672.85	-658.68	2,221.08	1,854.78	366.30	6.064	
8,000.00	7,173.00	21,103.39	7,360.00	33.03	337.10	-96.67	-669.79	-748.18	2,221.98	1,857.16	364.82	6.091	
8,100.00	7,173.00	21,025.22	7,359.12	33.66	335.20	-96.64	-667.58	-826.32	2,223.56	1,859.93	363.63	6.115	
8,200.00	7,173.00	20,935.64	7,358.55	34.36	333.03	-96.62	-665.75	-915.88	2,225.96	1,863.72	362.24	6.145	
8,300.00	7,173.00	20,824.21	7,357.65	35.13	330.33	-96.59	-663.49	-1,027.28	2,228.36	1,867.92	360.44	6.182	
8,400.00	7,173.00	20,735.83	7,357.09	35.95	328.19	-96.57	-661.53	-1,115.63	2,230.60	1,871.42	359.18	6.210	
8,500.00	7,173.00	20,639.53	7,356.47	36.82	325.85	-96.55	-659.84	-1,211.93	2,233.29	1,875.49	357.80	6.242	
8,600.00	7,173.00	20,555.17	7,355.55	37.74	323.81	-96.51	-658.68	-1,296.27	2,236.32	1,879.62	356.70	6.269	
8,700.00	7,173.00	20,460.80	7,355.00	38.71	321.53	-96.49	-657.92	-1,390.63	2,239.95	1,884.51	355.44	6.302	
8,800.00	7,173.00	20,369.02	7,354.80	39.71	319.30	-96.47	-657.29	-1,482.41	2,243.76	1,889.50	354.25	6.334	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		409-B001Mb_MWD+HRGM, 21290-Project										Offset Well Error:	0.00 usft	
Reference	Offset	Semi Major Axis		Rule Assigned:									Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,900.00	7,173.00	20,268.27	7,355.13	40.76	316.87	-96.47	-656.84	-1,583.16	2,247.86	1,894.91	352.94	6.369		
9,000.00	7,173.00	20,182.31	7,355.59	41.84	314.79	-96.47	-656.51	-1,669.12	2,252.07	1,900.16	351.91	6.400		
9,100.00	7,173.00	20,046.78	7,355.30	42.96	311.51	-96.45	-655.93	-1,804.64	2,256.20	1,906.12	350.08	6.445		
9,200.00	7,173.00	19,962.49	7,354.89	44.10	309.47	-96.43	-655.02	-1,888.93	2,259.59	1,910.43	349.16	6.471		
9,300.00	7,173.00	19,861.08	7,355.02	45.27	307.01	-96.42	-654.18	-1,990.33	2,263.29	1,915.33	347.96	6.504		
9,400.00	7,173.00	19,746.74	7,354.57	46.47	304.25	-96.40	-653.08	-2,104.67	2,266.81	1,920.24	346.57	6.541		
9,500.00	7,173.00	19,635.78	7,353.27	47.70	301.56	-96.36	-650.83	-2,215.60	2,269.14	1,923.88	345.26	6.572		
9,600.00	7,173.00	19,557.87	7,352.58	48.94	299.67	-96.34	-649.80	-2,293.49	2,272.22	1,927.68	344.54	6.595		
9,700.00	7,173.00	19,473.11	7,352.25	50.20	297.62	-96.32	-649.26	-2,378.25	2,276.06	1,932.35	343.70	6.622		
9,800.00	7,173.00	19,390.80	7,352.44	51.49	295.64	-96.31	-649.31	-2,460.56	2,280.65	1,937.75	342.89	6.651		
9,900.00	7,173.00	19,264.82	7,353.33	52.79	292.59	-96.32	-649.44	-2,586.54	2,285.42	1,943.98	341.43	6.694		
10,000.00	7,173.00	19,146.13	7,354.61	54.11	289.72	-96.34	-647.31	-2,705.20	2,288.16	1,948.09	340.06	6.729		
10,100.00	7,173.00	19,058.41	7,355.73	55.44	287.60	-96.36	-646.18	-2,792.91	2,291.51	1,952.28	339.22	6.755		
10,200.00	7,173.00	18,949.83	7,356.86	56.78	284.97	-96.38	-644.91	-2,901.47	2,294.98	1,956.93	338.05	6.789		
10,300.00	7,173.00	18,836.45	7,356.61	58.14	282.23	-96.36	-643.02	-3,014.83	2,297.81	1,960.99	336.82	6.822		
10,400.00	7,173.00	18,733.96	7,356.59	59.51	279.75	-96.36	-640.87	-3,117.30	2,300.22	1,964.44	335.78	6.850		
10,500.00	7,173.00	18,651.77	7,357.11	60.90	277.76	-96.36	-639.35	-3,199.47	2,302.99	1,967.90	335.09	6.873		
10,600.00	7,173.00	18,544.96	7,358.53	62.29	275.17	-96.39	-637.76	-3,306.26	2,306.17	1,972.19	333.98	6.905		
10,700.00	7,173.00	18,449.96	7,359.90	63.69	272.87	-96.42	-636.11	-3,401.23	2,309.12	1,976.04	333.08	6.933		
10,800.00	7,173.00	18,355.96	7,361.42	65.11	270.60	-96.45	-634.84	-3,495.21	2,312.46	1,980.27	332.20	6.961		
10,900.00	7,173.00	18,267.41	7,362.23	66.53	268.46	-96.46	-634.10	-3,583.75	2,316.22	1,984.81	331.42	6.989		
11,000.00	7,173.00	18,143.51	7,361.02	67.96	265.47	-96.42	-632.57	-3,707.64	2,319.35	1,989.25	330.10	7.026		
11,100.00	7,173.00	18,060.52	7,359.76	69.39	263.46	-96.38	-631.68	-3,790.62	2,322.62	1,993.16	329.45	7.050		
11,200.00	7,173.00	17,965.28	7,358.71	70.84	261.16	-96.34	-630.98	-3,885.85	2,326.28	1,997.67	328.61	7.079		
11,300.00	7,173.00	17,881.96	7,358.23	72.29	259.15	-96.32	-630.73	-3,969.16	2,330.42	2,002.49	327.93	7.106		
11,400.00	7,173.00	17,795.36	7,358.02	73.74	257.06	-96.30	-630.99	-4,055.77	2,335.21	2,008.01	327.20	7.137		
11,500.00	7,173.00	17,685.67	7,358.01	75.21	254.41	-96.29	-631.47	-4,165.46	2,340.16	2,014.00	326.16	7.175		
11,600.00	7,173.00	17,565.61	7,357.51	76.68	251.51	-96.26	-630.93	-4,285.51	2,344.13	2,019.17	324.96	7.214		
11,700.00	7,173.00	17,480.08	7,357.47	78.15	249.45	-96.25	-630.56	-4,371.04	2,348.21	2,023.94	324.27	7.242		
11,800.00	7,173.00	17,397.48	7,357.64	79.63	247.45	-96.25	-630.81	-4,453.64	2,353.03	2,029.43	323.61	7.271		
11,900.00	7,173.00	17,314.97	7,358.16	81.11	245.47	-96.25	-631.26	-4,536.15	2,358.22	2,035.29	322.93	7.303		
12,000.00	7,173.00	17,219.97	7,358.61	82.60	243.18	-96.24	-632.67	-4,631.14	2,364.25	2,042.15	322.10	7.340		
12,100.00	7,173.00	17,138.79	7,358.37	84.09	241.23	-96.22	-634.62	-4,712.29	2,371.04	2,049.61	321.43	7.376		
12,200.00	7,173.00	17,009.50	7,357.20	85.59	238.12	-96.17	-636.86	-4,841.55	2,377.14	2,056.92	320.22	7.423		
12,300.00	7,173.00	16,902.81	7,356.74	87.09	235.55	-96.15	-638.12	-4,948.23	2,382.79	2,063.52	319.27	7.463		
12,400.00	7,173.00	16,718.88	7,357.59	88.59	231.11	-96.15	-636.49	-5,132.14	2,386.55	2,069.43	317.11	7.526		
12,500.00	7,173.00	16,570.59	7,358.31	90.10	227.52	-96.16	-631.19	-5,280.33	2,387.65	2,072.33	315.32	7.572		
12,536.83	7,173.00	16,538.44	7,358.39	90.66	226.75	-96.16	-629.65	-5,312.45	2,387.57	2,072.48	315.09	7.577		
12,600.00	7,173.00	16,495.65	7,358.52	91.61	225.71	-96.17	-627.88	-5,355.20	2,387.84	2,072.92	314.92	7.582		
12,700.00	7,173.00	16,420.00	7,358.82	93.13	223.88	-96.17	-625.53	-5,430.81	2,389.28	2,074.80	314.48	7.598		
12,800.00	7,173.00	16,337.02	7,359.08	94.64	221.88	-96.17	-623.60	-5,513.77	2,391.51	2,077.62	313.89	7.619		
12,900.00	7,173.00	16,254.09	7,359.38	96.16	219.88	-96.17	-622.25	-5,596.69	2,394.44	2,081.15	313.29	7.643		
13,000.00	7,173.00	16,172.50	7,360.12	97.69	217.91	-96.18	-621.49	-5,678.27	2,398.13	2,085.44	312.69	7.669		
13,100.00	7,173.00	16,082.19	7,361.12	99.21	215.74	-96.20	-621.21	-5,768.57	2,402.44	2,090.48	311.96	7.701		
13,200.00	7,173.00	15,940.29	7,361.06	100.74	212.31	-96.19	-619.14	-5,910.45	2,405.27	2,094.80	310.48	7.747		
13,300.00	7,173.00	15,854.08	7,361.05	102.27	210.24	-96.18	-617.87	-5,996.65	2,408.31	2,098.48	309.84	7.773		
13,400.00	7,173.00	15,762.57	7,361.47	103.80	208.03	-96.18	-616.87	-6,088.15	2,411.79	2,102.69	309.10	7.803		
13,500.00	7,173.00	15,672.05	7,362.09	105.33	205.85	-96.19	-616.15	-6,178.67	2,415.58	2,107.20	308.39	7.833		
13,600.00	7,173.00	15,588.37	7,362.82	106.87	203.84	-96.19	-615.91	-6,262.35	2,419.91	2,112.15	307.76	7.863		
13,700.00	7,173.00	15,517.97	7,363.77	108.41	202.14	-96.21	-616.22	-6,332.74	2,425.07	2,117.79	307.28	7.892		
13,800.00	7,173.00	15,443.99	7,364.72	109.95	200.37	-96.22	-617.40	-6,406.70	2,431.35	2,124.63	306.72	7.927		
13,900.00	7,173.00	15,339.58	7,365.66	111.49	197.87	-96.22	-620.02	-6,511.08	2,438.46	2,132.62	305.83	7.973		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 409-B001Mb_MWD+HRGM, 21290-Project												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,000.00	7,173.00	15,257.83	7,366.87	113.03	195.91	-96.24	-622.00	-6,592.79	2,445.54	2,140.36	305.18	8.013	
14,100.00	7,173.00	15,164.44	7,368.87	114.58	193.67	-96.26	-624.82	-6,686.12	2,453.28	2,148.88	304.40	8.059	
14,200.00	7,173.00	15,053.47	7,369.69	116.13	191.02	-96.26	-628.14	-6,797.03	2,460.84	2,157.38	303.46	8.109	
14,300.00	7,173.00	14,885.09	7,367.76	117.68	186.98	-96.19	-630.69	-6,965.37	2,466.70	2,164.86	301.84	8.172	
14,400.00	7,173.00	14,782.18	7,366.72	119.23	184.51	-96.16	-630.56	-7,068.28	2,470.98	2,170.00	300.98	8.210	
14,500.00	7,173.00	14,690.09	7,366.15	120.78	182.30	-96.13	-630.69	-7,160.37	2,475.56	2,175.30	300.26	8.245	
14,600.00	7,173.00	14,605.62	7,365.63	122.33	180.27	-96.11	-631.17	-7,244.84	2,480.57	2,180.93	299.63	8.279	
14,700.00	7,173.00	14,515.67	7,365.10	123.88	178.12	-96.09	-632.23	-7,334.78	2,486.18	2,187.25	298.94	8.317	
14,800.00	7,173.00	14,353.52	7,363.63	125.44	174.23	-96.03	-632.23	-7,496.91	2,490.54	2,193.25	297.30	8.377	
14,900.00	7,173.00	14,277.76	7,363.12	127.00	172.41	-96.01	-631.73	-7,572.66	2,494.32	2,197.50	296.82	8.404	
15,000.00	7,173.00	14,188.86	7,362.93	128.55	170.28	-96.00	-631.70	-7,661.56	2,498.77	2,202.63	296.14	8.438	
15,100.00	7,173.00	14,086.40	7,362.94	130.11	167.82	-95.99	-631.96	-7,764.03	2,503.54	2,208.24	295.29	8.478	
15,200.00	7,173.00	13,950.17	7,364.12	131.67	164.56	-96.01	-630.32	-7,900.24	2,506.79	2,212.83	293.95	8.528	
15,300.00	7,173.00	13,843.80	7,365.58	133.23	162.01	-96.03	-628.67	-8,006.59	2,509.91	2,216.89	293.02	8.566	
15,400.00	7,173.00	13,732.04	7,366.40	134.80	159.33	-96.04	-626.43	-8,118.32	2,512.51	2,220.49	292.02	8.604	
15,500.00	7,173.00	13,647.99	7,366.92	136.36	157.31	-96.05	-624.81	-8,202.35	2,515.17	2,223.73	291.44	8.630	
15,600.00	7,173.00	13,563.12	7,367.65	137.92	155.28	-96.06	-623.73	-8,287.21	2,518.51	2,227.67	290.84	8.660	
15,700.00	7,173.00	13,456.36	7,368.53	139.49	152.72	-96.07	-622.68	-8,393.96	2,522.14	2,232.22	289.92	8.699	
15,800.00	7,173.00	13,314.42	7,368.03	141.05	149.33	-96.05	-619.38	-8,535.85	2,524.15	2,235.68	288.46	8.750	
15,900.00	7,173.00	13,249.97	7,367.33	142.62	147.78	-96.03	-618.02	-8,600.29	2,526.48	2,238.27	288.21	8.766	
16,000.00	7,173.00	13,154.97	7,366.44	144.19	145.51	-96.00	-616.87	-8,695.27	2,529.69	2,242.21	287.48	8.800	
16,100.00	7,173.00	13,077.69	7,365.96	145.76	143.67	-95.99	-616.40	-8,772.56	2,533.51	2,246.51	287.00	8.828	
16,200.00	7,173.00	12,989.32	7,365.88	147.33	141.56	-95.97	-616.35	-8,860.93	2,537.95	2,251.60	286.35	8.863	
16,300.00	7,173.00	12,912.84	7,365.89	148.90	139.74	-95.97	-616.73	-8,937.40	2,542.98	2,257.13	285.84	8.896	
16,400.00	7,173.00	12,719.02	7,366.13	150.47	135.12	-95.96	-614.31	-9,131.17	2,545.86	2,262.12	283.74	8.973	
16,500.00	7,173.00	12,641.93	7,366.80	152.04	133.28	-95.97	-612.70	-9,208.24	2,548.33	2,265.05	283.29	8.996	
16,600.00	7,173.00	12,537.89	7,367.00	153.61	130.81	-95.96	-610.86	-9,312.26	2,551.12	2,268.69	282.43	9.033	
16,700.00	7,173.00	12,445.95	7,366.18	155.18	128.62	-95.94	-609.16	-9,404.18	2,553.71	2,271.96	281.76	9.064	
16,800.00	7,173.00	12,356.60	7,365.65	156.76	126.49	-95.92	-608.12	-9,493.53	2,556.98	2,275.86	281.12	9.096	
16,900.00	7,173.00	12,258.38	7,365.68	158.33	124.16	-95.92	-606.91	-9,591.73	2,560.28	2,279.92	280.36	9.132	
17,000.00	7,173.00	12,153.56	7,366.04	159.90	121.67	-95.91	-605.76	-9,696.55	2,563.74	2,284.24	279.50	9.173	
17,100.00	7,173.00	12,066.30	7,365.50	161.48	119.60	-95.90	-604.69	-9,783.80	2,567.00	2,288.10	278.90	9.204	
17,200.00	7,173.00	11,987.77	7,365.06	163.06	117.75	-95.88	-604.51	-9,862.33	2,571.21	2,292.80	278.41	9.235	
17,300.00	7,173.00	11,899.80	7,365.07	164.63	115.67	-95.87	-604.72	-9,950.30	2,575.96	2,298.18	277.78	9.273	
17,400.00	7,173.00	11,810.11	7,365.22	166.21	113.55	-95.86	-605.42	-10,039.98	2,581.25	2,304.12	277.13	9.314	
17,500.00	7,173.00	11,708.90	7,365.28	167.79	111.17	-95.85	-606.14	-10,141.19	2,586.48	2,310.13	276.35	9.359	
17,600.00	7,173.00	11,623.14	7,365.42	169.36	109.15	-95.84	-607.17	-10,226.94	2,592.19	2,316.44	275.75	9.400	
17,700.00	7,173.00	11,523.66	7,365.52	170.94	106.82	-95.83	-608.39	-10,326.42	2,597.94	2,322.94	275.00	9.447	
17,800.00	7,173.00	11,359.98	7,365.98	172.52	102.98	-95.82	-609.95	-10,490.08	2,603.94	2,330.49	273.45	9.523	
17,900.00	7,173.00	11,281.29	7,366.70	174.10	101.14	-95.83	-609.19	-10,568.76	2,607.63	2,334.66	272.97	9.553	
18,000.00	7,173.00	11,115.65	7,368.20	175.68	97.26	-95.86	-605.93	-10,734.35	2,610.03	2,338.75	271.28	9.621	
18,100.00	7,173.00	10,974.96	7,369.61	177.26	93.97	-95.88	-601.15	-10,874.96	2,611.38	2,341.51	269.87	9.676	
18,200.00	7,173.00	10,887.98	7,370.00	178.84	91.93	-95.89	-597.24	-10,961.84	2,611.52	2,342.18	269.33	9.696	
18,300.00	7,173.00	10,813.39	7,369.73	180.42	90.20	-95.88	-594.51	-11,036.37	2,612.43	2,343.44	269.00	9.712	
18,400.00	7,173.00	10,735.03	7,369.55	182.00	88.37	-95.88	-592.70	-11,114.72	2,614.60	2,346.02	268.58	9.735	
18,500.00	7,173.00	10,649.52	7,368.87	183.59	86.39	-95.86	-591.27	-11,200.21	2,617.37	2,349.31	268.06	9.764	
18,600.00	7,173.00	10,555.70	7,366.84	185.17	84.22	-95.80	-590.29	-11,294.00	2,620.62	2,353.18	267.44	9.799	
18,700.00	7,173.00	10,460.75	7,364.78	186.75	82.04	-95.75	-589.35	-11,388.93	2,623.93	2,357.13	266.80	9.835	
18,800.00	7,173.00	10,372.93	7,363.14	188.33	80.02	-95.71	-588.78	-11,476.73	2,627.62	2,361.36	266.26	9.869	
18,900.00	7,173.00	10,289.26	7,361.96	189.92	78.11	-95.67	-588.64	-11,560.40	2,631.83	2,366.06	265.77	9.903	
19,000.00	7,173.00	10,204.54	7,361.91	191.50	76.18	-95.66	-589.00	-11,645.11	2,636.75	2,371.49	265.26	9.940	
19,100.00	7,173.00	10,076.72	7,361.74	193.09	73.28	-95.65	-589.44	-11,772.93	2,641.66	2,377.41	264.25	9.997	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #745H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 409-B001Mb_MWD+HRGM, 21290-Project													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,200.00	7,173.00	9,966.53	7,362.07	194.67	70.79	-95.65	-588.41	-11,883.11	2,645.25	2,381.79	263.45	10.041		
19,249.41	7,173.00	9,925.16	7,362.15	195.45	69.86	-95.64	-588.10	-11,924.48	2,647.13	2,383.90	263.23	10.056		
19,300.00	7,173.00	9,886.43	7,362.23	196.25	68.99	-95.64	-587.97	-11,963.22	2,649.25	2,386.22	263.04	10.072		
19,384.41	7,173.00	9,819.74	7,362.38	197.34	67.50	-95.64	-588.14	-12,029.90	2,653.29	2,390.88	262.41	10.111		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND							Rule Assigned:				Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	20,952.96	7,074.90	0.00	233.58	-161.28	-1,644.18	-557.18	7,353.77					
125.00	125.00	20,952.96	7,074.90	0.06	233.58	155.15	-1,644.18	-557.18	7,232.49	7,110.78	121.71	59.422		
225.00	224.98	20,952.96	7,074.90	0.17	233.58	95.03	-1,644.18	-557.18	7,135.57	7,013.49	122.08	58.451		
319.00	318.92	20,952.96	7,074.90	0.28	233.58	86.82	-1,644.18	-557.18	7,044.38	6,921.97	122.41	57.546		
400.00	399.86	20,952.96	7,074.90	0.37	233.58	86.82	-1,644.18	-557.18	6,965.80	6,841.26	124.53	55.935		
469.00	468.80	20,952.96	7,074.90	0.52	233.58	86.82	-1,644.18	-557.18	6,898.90	6,774.18	124.73	55.312		
500.00	499.78	20,952.96	7,074.90	0.61	233.58	100.76	-1,644.18	-557.18	6,868.90	6,744.09	124.82	55.032		
600.00	599.71	20,952.96	7,074.90	0.92	233.58	149.20	-1,644.18	-557.18	6,772.73	6,647.59	125.14	54.122		
700.00	699.55	20,952.96	7,074.90	1.26	233.58	170.78	-1,644.18	-557.18	6,677.62	6,552.11	125.52	53.202		
800.00	799.19	20,952.96	7,074.90	1.60	233.58	178.83	-1,644.18	-557.18	6,583.74	6,457.78	125.96	52.269		
900.00	898.49	20,952.96	7,074.90	1.97	233.58	-177.60	-1,644.18	-557.18	6,491.25	6,364.77	126.48	51.323		
1,000.00	997.33	20,952.96	7,074.90	2.34	233.58	-175.81	-1,644.18	-557.18	6,400.33	6,273.25	127.07	50.367		
1,100.00	1,095.61	20,952.96	7,074.90	2.74	233.58	-174.84	-1,644.18	-557.18	6,311.16	6,183.40	127.76	49.399		
1,196.26	1,189.56	20,952.96	7,074.90	3.13	233.58	-174.33	-1,644.18	-557.18	6,227.15	6,098.65	128.50	48.459		
1,200.00	1,193.19	20,952.96	7,074.90	3.15	233.58	-174.33	-1,644.18	-557.18	6,223.93	6,095.41	128.52	48.427		
1,300.00	1,290.42	20,952.96	7,074.90	3.58	233.58	-174.33	-1,644.18	-557.18	6,137.87	6,008.47	129.40	47.433		
1,400.00	1,387.65	20,952.96	7,074.90	4.01	233.58	-174.33	-1,644.18	-557.18	6,052.25	5,921.92	130.33	46.438		
1,500.00	1,484.87	20,952.96	7,074.90	4.45	233.58	-174.33	-1,644.18	-557.18	5,967.07	5,835.76	131.31	45.442		
1,600.00	1,582.10	20,952.96	7,074.90	4.90	233.58	-174.33	-1,644.18	-557.18	5,882.36	5,750.01	132.35	44.447		
1,700.00	1,679.33	20,952.96	7,074.90	5.34	233.58	-174.33	-1,644.18	-557.18	5,798.14	5,664.70	133.43	43.453		
1,800.00	1,776.55	20,952.96	7,074.90	5.79	233.58	-174.33	-1,644.18	-557.18	5,714.42	5,579.85	134.57	42.463		
1,900.00	1,873.78	20,952.96	7,074.90	6.24	233.58	-174.33	-1,644.18	-557.18	5,631.24	5,495.47	135.77	41.476		
2,000.00	1,971.01	20,952.96	7,074.90	6.69	233.58	-174.33	-1,644.18	-557.18	5,548.61	5,411.59	137.02	40.494		
2,100.00	2,068.23	20,952.96	7,074.90	7.15	233.58	-174.33	-1,644.18	-557.18	5,466.56	5,328.23	138.33	39.518		
2,200.00	2,165.46	20,952.96	7,074.90	7.60	233.58	-174.33	-1,644.18	-557.18	5,385.12	5,245.42	139.70	38.547		
2,300.00	2,262.69	20,952.96	7,074.90	8.06	233.58	-174.33	-1,644.18	-557.18	5,304.31	5,163.18	141.13	37.584		
2,400.00	2,359.91	20,952.96	7,074.90	8.51	233.58	-174.33	-1,644.18	-557.18	5,224.17	5,081.55	142.62	36.629		
2,500.00	2,457.14	20,952.96	7,074.90	8.97	233.58	-174.33	-1,644.18	-557.18	5,144.72	5,000.54	144.18	35.683		
2,600.00	2,554.37	20,952.96	7,074.90	9.42	233.58	-174.33	-1,644.18	-557.18	5,066.00	4,920.20	145.80	34.747		
2,700.00	2,651.59	20,952.96	7,074.90	9.88	233.58	-174.33	-1,644.18	-557.18	4,988.05	4,840.56	147.49	33.820		
2,800.00	2,748.82	20,952.96	7,074.90	10.34	233.58	-174.33	-1,644.18	-557.18	4,910.89	4,761.64	149.24	32.905		
2,900.00	2,846.05	20,952.96	7,074.90	10.80	233.58	-174.33	-1,644.18	-557.18	4,834.57	4,683.50	151.07	32.002		
3,000.00	2,943.27	20,952.96	7,074.90	11.25	233.58	-174.33	-1,644.18	-557.18	4,759.12	4,606.15	152.97	31.111		
3,100.00	3,040.50	20,952.96	7,074.90	11.71	233.58	-174.33	-1,644.18	-557.18	4,684.60	4,529.66	154.94	30.234		
3,200.00	3,137.73	20,952.96	7,074.90	12.17	233.58	-174.33	-1,644.18	-557.18	4,611.04	4,454.05	156.99	29.371		
3,300.00	3,234.95	20,952.96	7,074.90	12.63	233.58	-174.33	-1,644.18	-557.18	4,538.49	4,379.38	159.12	28.523		
3,400.00	3,332.18	20,952.96	7,074.90	13.09	233.58	-174.33	-1,644.18	-557.18	4,467.01	4,305.69	161.32	27.691		
3,500.00	3,429.40	20,952.96	7,074.90	13.55	233.58	-174.33	-1,644.18	-557.18	4,396.63	4,233.04	163.60	26.875		
3,600.00	3,526.63	20,952.96	7,074.90	14.00	233.58	-174.33	-1,644.18	-557.18	4,327.42	4,161.47	165.95	26.076		
3,700.00	3,623.86	20,952.96	7,074.90	14.46	233.58	-174.33	-1,644.18	-557.18	4,259.44	4,091.05	168.39	25.295		
3,800.00	3,721.08	20,952.96	7,074.90	14.92	233.58	-174.33	-1,644.18	-557.18	4,192.74	4,021.84	170.90	24.533		
3,900.00	3,818.31	20,952.96	7,074.90	15.38	233.58	-174.33	-1,644.18	-557.18	4,127.38	3,953.89	173.49	23.790		
4,000.00	3,915.54	20,952.96	7,074.90	15.84	233.58	-174.33	-1,644.18	-557.18	4,063.43	3,887.28	176.16	23.067		
4,100.00	4,012.76	20,952.96	7,074.90	16.30	233.58	-174.33	-1,644.18	-557.18	4,000.96	3,822.07	178.89	22.365		
4,200.00	4,109.99	20,952.96	7,074.90	16.76	233.58	-174.33	-1,644.18	-557.18	3,940.04	3,758.34	181.71	21.684		
4,300.00	4,207.22	20,952.96	7,074.90	17.22	233.58	-174.33	-1,644.18	-557.18	3,880.74	3,696.16	184.58	21.024		
4,400.00	4,304.44	20,952.96	7,074.90	17.68	233.58	-174.33	-1,644.18	-557.18	3,823.14	3,635.61	187.53	20.387		
4,500.00	4,401.67	20,952.96	7,074.90	18.14	233.58	-174.33	-1,644.18	-557.18	3,767.30	3,576.78	190.53	19.773		
4,600.00	4,498.90	20,952.96	7,074.90	18.60	233.58	-174.33	-1,644.18	-557.18	3,713.33	3,519.75	193.58	19.182		
4,700.00	4,596.12	20,952.96	7,074.90	19.06	233.58	-174.33	-1,644.18	-557.18	3,661.29	3,464.60	196.68	18.615		
4,800.00	4,693.35	20,952.96	7,074.90	19.52	233.58	-174.33	-1,644.18	-557.18	3,611.27	3,411.44	199.83	18.072		
4,900.00	4,790.58	20,952.96	7,074.90	19.98	233.58	-174.33	-1,644.18	-557.18	3,563.35	3,360.35	203.00	17.554		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND												Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Rule Assigned:					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	4,887.80	20,952.96	7,074.90	20.44	233.58	-174.33	-1,644.18	-557.18	3,517.63	3,311.43	206.19	17.060	
5,100.00	4,985.03	20,952.96	7,074.90	20.90	233.58	-174.33	-1,644.18	-557.18	3,474.18	3,264.78	209.40	16.591	
5,200.00	5,082.26	20,952.96	7,074.90	21.36	233.58	-174.33	-1,644.18	-557.18	3,433.09	3,220.49	212.60	16.148	
5,300.00	5,179.48	20,952.96	7,074.90	21.82	233.58	-174.33	-1,644.18	-557.18	3,394.46	3,178.67	215.79	15.730	
5,400.00	5,276.71	20,952.96	7,074.90	22.27	233.58	-174.33	-1,644.18	-557.18	3,358.36	3,139.40	218.96	15.338	
5,500.00	5,373.94	20,952.96	7,074.90	22.73	233.58	-174.33	-1,644.18	-557.18	3,324.88	3,102.80	222.08	14.972	
5,600.00	5,471.16	20,952.96	7,074.90	23.19	233.58	-174.33	-1,644.18	-557.18	3,294.09	3,068.94	225.15	14.631	
5,700.00	5,568.39	20,952.96	7,074.90	23.65	233.58	-174.33	-1,644.18	-557.18	3,266.07	3,037.92	228.15	14.316	
5,800.00	5,665.62	20,952.96	7,074.90	24.11	233.58	-174.33	-1,644.18	-557.18	3,240.90	3,009.84	231.06	14.026	
5,900.00	5,762.84	20,952.96	7,074.90	24.57	233.58	-174.33	-1,644.18	-557.18	3,218.65	2,984.77	233.88	13.762	
6,000.00	5,860.07	20,952.96	7,074.90	25.03	233.58	-174.33	-1,644.18	-557.18	3,199.36	2,962.78	236.58	13.523	
6,100.00	5,957.30	20,952.96	7,074.90	25.50	233.58	-174.33	-1,644.18	-557.18	3,183.10	2,943.95	239.15	13.310	
6,200.00	6,054.52	20,952.96	7,074.90	25.96	233.58	-174.33	-1,644.18	-557.18	3,169.91	2,928.33	241.58	13.122	
6,300.00	6,151.75	20,952.96	7,074.90	26.42	233.58	-174.33	-1,644.18	-557.18	3,159.84	2,915.98	243.85	12.958	
6,400.00	6,248.98	20,952.96	7,074.90	26.88	233.58	-174.33	-1,644.18	-557.18	3,152.90	2,906.94	245.96	12.819	
6,500.00	6,346.20	20,952.96	7,074.90	27.34	233.58	-174.33	-1,644.18	-557.18	3,149.13	2,901.23	247.90	12.703	
6,568.89	6,413.19	20,952.96	7,074.90	27.65	233.58	-174.33	-1,644.18	-557.18	3,148.37	2,899.25	249.12	12.638	CC
6,600.00	6,443.43	20,952.96	7,074.90	27.80	233.58	-174.33	-1,644.18	-557.18	3,148.53	2,898.88	249.64	12.612	ES
6,696.38	6,537.14	20,952.96	7,074.90	28.24	233.58	-174.33	-1,644.18	-557.18	3,150.95	2,899.81	251.15	12.546	
6,700.00	6,540.66	20,952.96	7,074.90	28.26	233.58	-172.97	-1,644.18	-557.18	3,151.10	2,899.90	251.20	12.544	
6,750.00	6,589.27	20,952.96	7,074.90	28.48	233.58	-154.23	-1,644.18	-557.18	3,153.10	2,901.17	251.94	12.516	
6,800.00	6,637.66	20,952.96	7,074.90	28.71	233.58	-138.00	-1,644.18	-557.18	3,155.06	2,902.40	252.66	12.487	
6,850.00	6,685.53	20,952.96	7,074.90	28.92	233.58	-125.69	-1,644.18	-557.18	3,156.97	2,903.58	253.39	12.459	
6,900.00	6,732.60	20,952.96	7,074.90	29.13	233.58	-116.82	-1,644.18	-557.18	3,158.80	2,904.71	254.09	12.432	
6,950.00	6,778.56	20,952.96	7,074.90	29.32	233.58	-110.41	-1,644.18	-557.18	3,160.56	2,905.77	254.79	12.405	
7,000.00	6,823.13	20,952.96	7,074.90	29.51	233.58	-105.69	-1,644.18	-557.18	3,162.23	2,906.77	255.46	12.379	
7,050.00	6,866.05	20,952.96	7,074.90	29.68	233.58	-102.12	-1,644.18	-557.18	3,163.80	2,907.69	256.11	12.353	
7,100.00	6,907.04	20,952.96	7,074.90	29.85	233.58	-99.37	-1,644.18	-557.18	3,165.26	2,908.53	256.73	12.329	
7,150.00	6,945.85	20,952.96	7,074.90	30.01	233.58	-97.20	-1,644.18	-557.18	3,166.60	2,909.28	257.32	12.306	
7,200.00	6,982.24	20,952.96	7,074.90	30.15	233.58	-95.47	-1,644.18	-557.18	3,167.82	2,909.94	257.88	12.284	
7,250.00	7,016.00	20,952.96	7,074.90	30.29	233.58	-94.07	-1,644.18	-557.18	3,168.90	2,910.50	258.40	12.263	
7,300.00	7,046.90	20,952.96	7,074.90	30.43	233.58	-92.94	-1,644.18	-557.18	3,169.84	2,910.95	258.89	12.244	
7,350.00	7,074.76	20,952.96	7,074.90	30.56	233.58	-92.02	-1,644.18	-557.18	3,170.64	2,911.31	259.34	12.226	
7,400.00	7,099.42	20,952.96	7,074.90	30.69	233.58	-91.29	-1,644.18	-557.18	3,171.29	2,911.55	259.74	12.210	
7,450.00	7,120.70	20,952.96	7,074.90	30.82	233.58	-90.70	-1,644.18	-557.18	3,171.78	2,911.69	260.10	12.195	
7,500.00	7,138.50	20,952.96	7,074.90	30.95	233.58	-90.24	-1,644.18	-557.18	3,172.12	2,911.71	260.41	12.181	
7,550.00	7,152.68	20,952.96	7,074.90	31.10	233.58	-89.90	-1,644.18	-557.18	3,172.30	2,911.62	260.68	12.169	
7,600.00	7,163.18	20,952.96	7,074.90	31.25	233.58	-89.67	-1,644.18	-557.18	3,172.32	2,911.41	260.90	12.159	
7,650.00	7,169.92	20,952.96	7,074.90	31.41	233.58	-89.54	-1,644.18	-557.18	3,172.17	2,911.10	261.07	12.150	
7,700.00	7,172.86	20,952.96	7,074.90	31.59	233.58	-89.50	-1,644.18	-557.18	3,171.87	2,910.68	261.20	12.144	
7,713.53	7,173.00	20,952.96	7,074.90	31.64	233.58	-89.51	-1,644.18	-557.18	3,171.76	2,910.54	261.22	12.142	
7,740.42	7,173.00	20,952.96	7,074.90	31.74	233.58	-89.51	-1,644.18	-557.18	3,171.65	2,910.38	261.26	12.140	SF
7,800.00	7,173.00	20,952.96	7,074.90	31.99	233.58	-89.51	-1,644.18	-557.18	3,172.21	2,910.91	261.29	12.140	
7,900.00	7,173.00	20,922.81	7,074.51	32.47	229.75	-89.50	-1,644.03	-587.32	3,175.52	2,917.95	257.57	12.329	
8,000.00	7,173.00	20,843.23	7,073.52	33.03	223.74	-89.49	-1,643.78	-666.89	3,179.78	2,927.80	251.97	12.620	
8,100.00	7,173.00	20,777.03	7,072.88	33.66	222.69	-89.48	-1,644.27	-733.09	3,185.05	2,933.73	251.32	12.673	
8,200.00	7,173.00	20,657.62	7,071.82	34.36	220.80	-89.46	-1,645.28	-852.49	3,190.43	2,940.09	250.34	12.745	
8,300.00	7,173.00	20,546.30	7,071.03	35.13	219.04	-89.44	-1,645.89	-963.81	3,195.53	2,946.05	249.48	12.809	
8,400.00	7,173.00	20,431.72	7,070.24	35.95	217.23	-89.43	-1,645.81	-1,078.38	3,199.99	2,951.33	248.65	12.869	
8,500.00	7,173.00	20,351.50	7,069.73	36.82	215.96	-89.42	-1,645.80	-1,158.61	3,204.54	2,956.40	248.14	12.914	
8,600.00	7,173.00	20,231.93	7,069.19	37.74	214.07	-89.41	-1,646.39	-1,278.17	3,209.64	2,962.26	247.39	12.974	
8,700.00	7,173.00	20,155.73	7,068.46	38.71	212.86	-89.40	-1,646.33	-1,354.36	3,214.18	2,967.19	246.99	13.013	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
8,800.00	7,173.00	20,039.98	7,065.86	39.71	211.04	-89.36	-1,647.12	-1,470.08	3,219.48	2,973.12	246.36	13.068	
8,900.00	7,173.00	19,929.96	7,062.24	40.76	209.30	-89.29	-1,646.84	-1,580.04	3,223.78	2,977.98	245.80	13.115	
9,000.00	7,173.00	19,865.79	7,060.79	41.84	208.28	-89.27	-1,646.98	-1,644.19	3,228.59	2,983.01	245.58	13.147	
9,100.00	7,173.00	19,787.13	7,059.56	42.96	207.04	-89.25	-1,648.01	-1,722.84	3,234.42	2,989.14	245.29	13.186	
9,200.00	7,173.00	19,623.63	7,058.33	44.10	204.46	-89.23	-1,649.27	-1,886.32	3,239.90	2,995.39	244.51	13.250	
9,300.00	7,173.00	19,506.15	7,058.58	45.27	202.61	-89.23	-1,648.20	-2,003.79	3,243.49	2,999.45	244.04	13.291	
9,400.00	7,173.00	19,395.20	7,058.65	46.47	200.85	-89.23	-1,647.08	-2,114.74	3,247.03	3,003.40	243.63	13.327	
9,500.00	7,173.00	19,285.04	7,058.84	47.70	199.11	-89.24	-1,645.33	-2,224.88	3,249.97	3,006.72	243.26	13.360	
9,600.00	7,173.00	19,192.81	7,059.47	48.94	197.65	-89.25	-1,643.90	-2,317.10	3,252.95	3,009.92	243.03	13.385	
9,700.00	7,173.00	19,096.84	7,060.14	50.20	196.13	-89.26	-1,642.62	-2,413.06	3,256.15	3,013.36	242.79	13.411	
9,800.00	7,173.00	19,008.21	7,060.87	51.49	194.73	-89.28	-1,641.61	-2,501.68	3,259.54	3,016.92	242.62	13.435	
9,900.00	7,173.00	18,923.99	7,061.81	52.79	193.40	-89.29	-1,641.02	-2,585.89	3,263.36	3,020.87	242.49	13.458	
10,000.00	7,173.00	18,824.63	7,062.96	54.11	191.83	-89.32	-1,640.68	-2,685.25	3,267.53	3,025.26	242.28	13.487	
10,100.00	7,173.00	18,705.72	7,064.16	55.44	189.96	-89.34	-1,639.84	-2,804.15	3,271.37	3,029.41	241.96	13.520	
10,200.00	7,173.00	18,605.96	7,065.04	56.78	188.38	-89.35	-1,638.76	-2,903.89	3,274.80	3,033.04	241.77	13.545	
10,300.00	7,173.00	18,532.09	7,065.85	58.14	187.22	-89.37	-1,638.26	-2,977.76	3,278.67	3,036.92	241.75	13.562	
10,400.00	7,173.00	18,402.34	7,067.43	59.51	185.17	-89.40	-1,637.54	-3,107.50	3,282.67	3,041.27	241.40	13.598	
10,500.00	7,173.00	18,322.96	7,067.72	60.90	183.92	-89.40	-1,636.73	-3,186.87	3,286.22	3,044.85	241.37	13.615	
10,600.00	7,173.00	18,246.07	7,067.39	62.29	182.71	-89.40	-1,636.45	-3,263.76	3,290.45	3,049.10	241.35	13.634	
10,700.00	7,173.00	18,142.99	7,066.38	63.69	181.08	-89.38	-1,636.72	-3,366.84	3,295.26	3,054.08	241.19	13.663	
10,800.00	7,173.00	18,068.55	7,065.43	65.11	179.91	-89.36	-1,637.01	-3,441.27	3,300.22	3,059.04	241.18	13.684	
10,900.00	7,173.00	17,978.48	7,064.30	66.53	178.49	-89.35	-1,638.03	-3,531.33	3,305.89	3,064.79	241.10	13.712	
11,000.00	7,173.00	17,893.88	7,063.25	67.96	177.17	-89.33	-1,639.10	-3,615.91	3,311.71	3,070.67	241.04	13.739	
11,100.00	7,173.00	17,798.85	7,062.30	69.39	175.68	-89.31	-1,640.88	-3,710.92	3,318.12	3,077.17	240.95	13.771	
11,200.00	7,173.00	17,681.53	7,061.35	70.84	173.83	-89.30	-1,642.58	-3,828.23	3,324.11	3,083.35	240.76	13.806	
11,300.00	7,173.00	17,566.46	7,060.54	72.29	172.03	-89.29	-1,643.74	-3,943.29	3,329.66	3,089.07	240.59	13.839	
11,400.00	7,173.00	17,490.11	7,060.13	73.74	170.83	-89.28	-1,644.59	-4,019.63	3,335.32	3,094.72	240.60	13.862	
11,500.00	7,173.00	17,396.64	7,059.90	75.21	169.36	-89.28	-1,646.13	-4,113.08	3,341.50	3,100.96	240.54	13.892	
11,600.00	7,173.00	17,308.19	7,060.23	76.68	167.98	-89.28	-1,647.73	-4,201.52	3,347.84	3,107.34	240.50	13.920	
11,700.00	7,173.00	17,210.15	7,061.81	78.15	166.45	-89.31	-1,649.81	-4,299.53	3,354.47	3,114.04	240.44	13.952	
11,800.00	7,173.00	17,041.22	7,064.30	79.63	163.80	-89.36	-1,652.07	-4,468.42	3,360.53	3,120.47	240.06	13.999	
11,900.00	7,173.00	16,858.98	7,067.39	81.11	160.94	-89.41	-1,650.05	-4,650.62	3,364.00	3,124.50	239.50	14.046	
12,000.00	7,173.00	16,591.75	7,073.40	82.60	156.72	-89.51	-1,635.39	-4,917.33	3,362.05	3,124.01	238.04	14.124	
12,100.00	7,173.00	16,525.97	7,074.94	84.09	155.68	-89.54	-1,630.63	-4,982.92	3,359.45	3,121.13	238.32	14.097	
12,200.00	7,173.00	16,473.37	7,075.70	85.59	154.85	-89.55	-1,627.45	-5,035.41	3,358.10	3,119.42	238.68	14.069	
12,225.56	7,173.00	16,462.63	7,075.73	85.97	154.68	-89.55	-1,626.94	-5,046.14	3,358.04	3,119.25	238.79	14.063	
12,300.00	7,173.00	16,430.97	7,075.55	87.09	154.19	-89.55	-1,625.70	-5,077.78	3,358.52	3,119.44	239.08	14.048	
12,400.00	7,173.00	16,373.88	7,074.92	88.59	153.29	-89.54	-1,624.21	-5,134.85	3,360.44	3,121.12	239.32	14.042	
12,500.00	7,173.00	16,293.91	7,074.15	90.10	152.03	-89.53	-1,623.06	-5,214.81	3,363.50	3,124.11	239.39	14.050	
12,600.00	7,173.00	16,179.34	7,073.17	91.61	150.24	-89.51	-1,621.18	-5,329.35	3,366.40	3,127.14	239.25	14.070	
12,700.00	7,173.00	16,093.85	7,072.99	93.13	148.90	-89.51	-1,619.69	-5,414.83	3,369.21	3,129.92	239.30	14.080	
12,800.00	7,173.00	15,987.64	7,073.03	94.64	147.23	-89.51	-1,618.36	-5,521.03	3,372.51	3,133.29	239.22	14.098	
12,900.00	7,173.00	15,904.65	7,073.03	96.16	145.93	-89.51	-1,617.07	-5,604.01	3,375.53	3,136.25	239.28	14.107	
13,000.00	7,173.00	15,814.85	7,073.10	97.69	144.53	-89.51	-1,616.44	-5,693.81	3,379.34	3,140.04	239.31	14.121	
13,100.00	7,173.00	15,725.68	7,071.66	99.21	143.13	-89.49	-1,615.68	-5,782.97	3,383.07	3,143.74	239.33	14.136	
13,200.00	7,173.00	15,674.97	7,070.76	100.74	142.34	-89.47	-1,615.61	-5,833.67	3,387.67	3,148.14	239.53	14.143	
13,300.00	7,173.00	15,579.97	7,069.42	102.27	140.86	-89.45	-1,616.56	-5,928.65	3,393.22	3,153.70	239.52	14.167	
13,400.00	7,173.00	15,485.97	7,068.35	103.80	139.40	-89.43	-1,617.92	-6,022.63	3,399.21	3,159.69	239.52	14.192	
13,500.00	7,173.00	15,390.97	7,067.32	105.33	137.92	-89.42	-1,619.26	-6,117.62	3,405.16	3,165.64	239.51	14.217	
13,600.00	7,173.00	15,296.97	7,066.32	106.87	136.46	-89.40	-1,620.74	-6,211.60	3,411.28	3,171.76	239.51	14.242	
13,700.00	7,173.00	15,219.89	7,065.59	108.41	135.27	-89.39	-1,622.19	-6,288.66	3,417.71	3,178.14	239.58	14.266	
13,800.00	7,173.00	15,097.82	7,064.50	109.95	133.38	-89.37	-1,624.70	-6,410.71	3,424.33	3,184.85	239.48	14.299	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND													Offset Well Error: 0.00 usft
Reference													
Offset													
Semi Major Axis													
Offset Wellbore Centre													
Distance													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
13,900.00	7,173.00	15,000.60	7,063.44	111.49	131.87	-89.35	-1,626.27	-6,507.90	3,430.50	3,191.03	239.47	14.325	
14,000.00	7,173.00	14,921.90	7,062.69	113.03	130.65	-89.34	-1,627.84	-6,586.58	3,437.04	3,197.50	239.53	14.349	
14,100.00	7,173.00	14,808.46	7,061.82	114.58	128.90	-89.33	-1,630.25	-6,700.00	3,443.70	3,204.23	239.48	14.380	
14,200.00	7,173.00	14,696.85	7,061.99	116.13	127.17	-89.33	-1,632.14	-6,811.59	3,449.92	3,210.50	239.43	14.409	
14,300.00	7,173.00	14,513.89	7,062.29	117.68	124.34	-89.34	-1,633.51	-6,994.53	3,455.51	3,216.46	239.05	14.455	
14,400.00	7,173.00	14,403.09	7,062.62	119.23	122.62	-89.35	-1,632.03	-7,105.33	3,458.66	3,219.67	238.99	14.472	
14,500.00	7,173.00	14,314.43	7,062.91	120.78	121.25	-89.35	-1,631.41	-7,193.99	3,462.47	3,223.42	239.05	14.484	
14,600.00	7,173.00	14,175.98	7,062.97	122.33	119.11	-89.35	-1,629.40	-7,332.42	3,465.53	3,226.69	238.83	14.510	
14,700.00	7,173.00	13,954.04	7,063.87	123.88	115.66	-89.37	-1,621.72	-7,554.21	3,466.85	3,228.88	237.98	14.568	
14,800.00	7,173.00	13,791.96	7,063.20	125.44	113.14	-89.36	-1,611.03	-7,715.94	3,464.64	3,227.21	237.43	14.592	
14,900.00	7,173.00	13,704.79	7,062.86	127.00	111.78	-89.35	-1,604.86	-7,802.88	3,462.10	3,224.54	237.56	14.574	
15,000.00	7,173.00	13,653.20	7,062.72	128.55	110.98	-89.35	-1,601.60	-7,854.37	3,460.39	3,222.41	237.98	14.541	
15,057.81	7,173.00	13,627.44	7,062.70	129.45	110.58	-89.35	-1,600.31	-7,880.10	3,460.12	3,221.88	238.24	14.524	
15,100.00	7,173.00	13,594.97	7,062.74	130.11	110.08	-89.35	-1,599.03	-7,912.54	3,460.33	3,222.01	238.32	14.520	
15,200.00	7,173.00	13,543.92	7,062.78	131.67	109.29	-89.35	-1,597.44	-7,963.56	3,461.54	3,222.87	238.67	14.504	
15,300.00	7,173.00	13,499.97	7,062.69	133.23	108.62	-89.35	-1,596.29	-8,007.50	3,463.79	3,224.78	239.01	14.492	
15,400.00	7,173.00	13,405.97	7,061.86	134.80	107.17	-89.34	-1,595.16	-8,101.48	3,467.14	3,228.08	239.06	14.503	
15,500.00	7,173.00	13,375.29	7,061.40	136.36	106.70	-89.33	-1,595.30	-8,132.16	3,471.78	3,232.38	239.39	14.502	
15,600.00	7,173.00	13,310.97	7,060.24	137.92	105.72	-89.31	-1,596.53	-8,196.46	3,478.07	3,238.53	239.54	14.520	
15,700.00	7,173.00	13,159.82	7,057.68	139.49	103.42	-89.27	-1,598.33	-8,347.58	3,483.81	3,244.45	239.36	14.554	
15,800.00	7,173.00	13,056.66	7,058.21	141.05	101.85	-89.28	-1,598.83	-8,450.72	3,488.83	3,249.46	239.38	14.575	
15,900.00	7,173.00	12,936.66	7,059.40	142.62	100.02	-89.30	-1,599.03	-8,570.72	3,493.53	3,254.21	239.32	14.598	
16,000.00	7,173.00	12,807.14	7,060.63	144.19	98.05	-89.32	-1,598.28	-8,700.23	3,497.48	3,258.27	239.20	14.621	
16,100.00	7,173.00	12,698.78	7,061.40	145.76	96.40	-89.34	-1,596.87	-8,808.58	3,500.69	3,261.50	239.19	14.635	
16,200.00	7,173.00	12,612.90	7,061.84	147.33	95.10	-89.34	-1,595.97	-8,894.45	3,504.17	3,264.87	239.30	14.644	
16,300.00	7,173.00	12,513.20	7,062.44	148.90	93.59	-89.35	-1,595.24	-8,994.15	3,507.97	3,268.63	239.34	14.657	
16,400.00	7,173.00	12,430.90	7,062.96	150.47	92.35	-89.36	-1,594.49	-9,076.45	3,511.64	3,272.18	239.46	14.665	
16,500.00	7,173.00	12,366.98	7,064.23	152.04	91.39	-89.38	-1,594.82	-9,140.36	3,516.55	3,276.90	239.66	14.673	
16,600.00	7,173.00	12,270.31	7,066.66	153.61	89.94	-89.42	-1,595.86	-9,236.99	3,522.13	3,282.41	239.72	14.693	
16,700.00	7,173.00	12,165.93	7,068.95	155.18	88.38	-89.46	-1,596.60	-9,341.33	3,527.35	3,287.60	239.75	14.713	
16,800.00	7,173.00	12,069.32	7,070.95	156.76	86.93	-89.50	-1,597.26	-9,437.92	3,532.55	3,292.73	239.82	14.730	
16,900.00	7,173.00	11,970.65	7,072.86	158.33	85.47	-89.53	-1,598.12	-9,536.57	3,537.94	3,298.07	239.88	14.749	
17,000.00	7,173.00	11,853.75	7,074.51	159.90	83.73	-89.56	-1,598.32	-9,653.46	3,542.57	3,302.70	239.87	14.769	
17,100.00	7,173.00	11,782.10	7,075.35	161.48	82.67	-89.57	-1,598.87	-9,725.11	3,547.84	3,307.81	240.03	14.781	
17,200.00	7,173.00	11,685.72	7,076.32	163.06	81.25	-89.59	-1,599.99	-9,821.47	3,553.54	3,313.43	240.11	14.800	
17,300.00	7,173.00	11,535.93	7,076.97	164.63	79.04	-89.60	-1,601.05	-9,971.25	3,558.89	3,318.91	239.98	14.830	
17,400.00	7,173.00	11,440.66	7,077.46	166.21	77.64	-89.61	-1,600.74	-10,066.52	3,563.10	3,323.03	240.07	14.842	
17,500.00	7,173.00	11,313.81	7,078.88	167.79	75.79	-89.63	-1,600.23	-10,193.36	3,567.25	3,327.22	240.03	14.862	
17,600.00	7,173.00	11,212.40	7,078.71	169.36	74.31	-89.63	-1,599.32	-10,294.76	3,570.89	3,330.79	240.10	14.873	
17,700.00	7,173.00	11,090.78	7,078.70	170.94	72.54	-89.63	-1,598.13	-10,416.37	3,574.50	3,334.42	240.08	14.889	
17,800.00	7,173.00	10,962.83	7,078.63	172.52	70.69	-89.63	-1,595.47	-10,544.30	3,576.90	3,336.88	240.02	14.902	
17,900.00	7,173.00	10,839.20	7,075.86	174.10	68.91	-89.58	-1,592.25	-10,667.86	3,578.86	3,338.89	239.98	14.913	
18,000.00	7,173.00	10,704.02	7,073.43	175.68	66.97	-89.54	-1,587.60	-10,802.93	3,579.98	3,340.12	239.86	14.925	
18,100.00	7,173.00	10,633.45	7,072.31	177.26	65.96	-89.53	-1,584.86	-10,873.44	3,580.74	3,340.61	240.14	14.911	
18,200.00	7,173.00	10,571.98	7,071.15	178.84	65.09	-89.51	-1,583.56	-10,934.88	3,583.00	3,342.55	240.45	14.901	
18,300.00	7,173.00	10,535.70	7,070.59	180.42	64.58	-89.50	-1,583.32	-10,971.15	3,586.57	3,345.72	240.85	14.892	
18,400.00	7,173.00	10,438.23	7,070.64	182.00	63.22	-89.50	-1,583.48	-11,068.62	3,591.26	3,350.28	240.98	14.903	
18,500.00	7,173.00	10,330.60	7,071.01	183.59	61.73	-89.51	-1,582.89	-11,176.25	3,595.23	3,354.16	241.07	14.913	
18,600.00	7,173.00	10,241.76	7,071.14	185.17	60.51	-89.51	-1,582.98	-11,265.09	3,599.82	3,358.57	241.25	14.922	
18,700.00	7,173.00	10,099.98	7,071.53	186.75	58.58	-89.52	-1,581.71	-11,406.86	3,603.37	3,362.14	241.23	14.938	
18,800.00	7,173.00	10,042.48	7,072.00	188.33	57.81	-89.52	-1,581.19	-11,464.35	3,607.10	3,365.56	241.54	14.934	
18,900.00	7,173.00	10,004.98	7,072.53	189.92	57.31	-89.53	-1,581.37	-11,501.85	3,612.30	3,370.42	241.88	14.934	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 31 - Rosa Unit #746H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 100-A020Ga_GYRO-NS, 450-B001Mb_MWD+HRGM, 6613-MWD+HRGM+MS, 20953-A026Ua_BLIND													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,000.00	7,173.00	9,940.04	7,073.23	191.50	56.45	-89.54	-1,582.55	-11,566.78	3,618.75	3,376.63	242.12	14.946		
19,100.00	7,173.00	9,862.51	7,073.33	193.09	55.45	-89.55	-1,585.00	-11,644.27	3,626.39	3,384.07	242.32	14.965		
19,200.00	7,173.00	9,723.60	7,073.97	194.67	53.67	-89.56	-1,588.91	-11,783.12	3,633.78	3,391.33	242.45	14.988		
19,249.41	7,173.00	9,666.74	7,074.73	195.45	52.95	-89.57	-1,590.07	-11,839.96	3,637.03	3,394.49	242.54	14.996		
19,300.00	7,173.00	9,606.97	7,075.84	196.25	52.20	-89.59	-1,591.17	-11,899.72	3,640.25	3,397.62	242.62	15.004		
19,384.41	7,173.00	9,499.10	7,076.20	197.34	50.86	-89.59	-1,592.66	-12,007.56	3,645.24	3,402.77	242.47	15.034		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD													Offset Site Error:	0.00 usft
Survey Program:		400-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	187.00	187.00	0.00	3.46	-82.48	1,342.79	-10,169.89	10,258.16					
125.00	125.00	312.00	312.00	0.06	5.77	-126.99	1,342.79	-10,169.89	10,258.52	10,252.70	5.81	1,764.604		
225.00	224.98	411.99	411.98	0.17	7.61	167.15	1,342.79	-10,169.89	10,260.22	10,252.45	7.77	1,320.931		
319.00	318.92	505.93	505.92	0.28	9.30	156.33	1,342.79	-10,169.89	10,263.28	10,253.70	9.58	1,071.617		
400.00	399.86	586.86	586.86	0.37	10.76	156.33	1,342.79	-10,169.89	10,266.27	10,255.14	11.13	922.651		
469.00	468.80	655.81	655.80	0.52	12.00	156.34	1,342.79	-10,169.89	10,268.82	10,256.30	12.52	820.090		
500.00	499.78	686.78	686.78	0.61	12.56	171.36	1,342.79	-10,169.89	10,269.94	10,256.78	13.17	779.867		
600.00	599.71	787.54	787.53	0.92	14.38	-137.21	1,343.52	-10,169.89	10,273.41	10,258.11	15.30	671.462		
700.00	699.55	889.13	889.12	1.26	16.21	-113.29	1,343.39	-10,169.89	10,276.35	10,258.88	17.46	588.398		
800.00	799.19	990.48	990.47	1.60	18.03	-103.39	1,343.13	-10,169.89	10,278.87	10,259.23	19.64	523.412		
900.00	898.49	1,085.51	1,085.49	1.97	19.75	-98.31	1,342.79	-10,169.89	10,280.98	10,259.27	21.71	473.494		
1,000.00	997.33	1,184.36	1,184.33	2.34	21.58	-95.30	1,342.79	-10,169.89	10,282.74	10,258.83	23.91	429.985		
1,100.00	1,095.61	1,282.63	1,282.61	2.74	23.39	-93.35	1,342.79	-10,169.89	10,284.13	10,258.01	26.12	393.691		
1,196.26	1,189.56	1,376.58	1,376.56	3.13	25.13	-92.06	1,342.79	-10,169.89	10,285.12	10,256.87	28.25	364.014		
1,200.00	1,193.19	1,380.21	1,380.19	3.15	25.19	-92.06	1,342.79	-10,169.89	10,285.16	10,256.82	28.34	362.951		
1,300.00	1,290.42	1,477.44	1,477.42	3.58	26.99	-92.19	1,342.79	-10,169.89	10,286.05	10,255.49	30.56	336.568		
1,400.00	1,387.65	1,574.67	1,574.65	4.01	28.79	-92.32	1,342.79	-10,169.89	10,286.99	10,254.20	32.79	313.697		
1,500.00	1,484.87	1,672.24	1,672.22	4.45	30.59	-92.44	1,343.35	-10,169.89	10,288.06	10,253.02	35.04	293.647		
1,600.00	1,582.10	1,769.94	1,769.92	4.90	32.39	-92.57	1,343.30	-10,169.89	10,289.10	10,251.82	37.28	275.964		
1,700.00	1,679.33	1,867.62	1,867.60	5.34	34.20	-92.70	1,343.22	-10,169.89	10,290.20	10,250.66	39.54	260.279		
1,800.00	1,776.55	1,965.29	1,965.26	5.79	36.00	-92.82	1,343.09	-10,169.89	10,291.34	10,249.55	41.79	246.274		
1,900.00	1,873.78	2,062.93	2,062.91	6.24	37.81	-92.95	1,342.92	-10,169.89	10,292.53	10,248.49	44.04	233.697		
2,000.00	1,971.01	2,158.07	2,158.01	6.69	39.76	-93.08	1,342.79	-10,169.89	10,293.78	10,247.34	46.45	221.621		
2,100.00	2,068.23	2,255.30	2,255.23	7.15	42.13	-93.20	1,342.79	-10,169.89	10,295.10	10,245.83	49.27	208.939		
2,200.00	2,165.46	2,352.52	2,352.46	7.60	44.51	-93.33	1,342.79	-10,169.89	10,296.47	10,244.37	52.10	197.631		
2,300.00	2,262.69	2,450.17	2,450.10	8.06	46.89	-93.45	1,343.79	-10,169.89	10,297.99	10,243.05	54.94	187.451		
2,400.00	2,359.91	2,549.50	2,549.43	8.51	49.31	-93.58	1,343.64	-10,169.89	10,299.45	10,241.63	57.82	178.142		
2,500.00	2,457.14	2,648.73	2,648.66	8.97	51.73	-93.71	1,343.28	-10,169.89	10,300.94	10,240.25	60.69	169.722		
2,600.00	2,554.37	2,741.75	2,741.37	9.42	54.03	-93.83	1,342.79	-10,169.89	10,302.48	10,239.03	63.44	162.386		
2,700.00	2,651.59	2,839.06	2,838.59	9.88	56.93	-93.96	1,342.79	-10,169.89	10,304.11	10,237.31	66.80	154.250		
2,800.00	2,748.82	2,936.29	2,935.82	10.34	59.77	-94.09	1,342.79	-10,169.89	10,305.80	10,235.70	70.10	147.018		
2,900.00	2,846.05	3,038.33	3,037.82	10.80	62.75	-94.21	1,344.25	-10,169.89	10,307.66	10,234.13	73.54	140.169		
3,000.00	2,943.27	3,146.79	3,146.24	11.25	65.92	-94.36	1,342.95	-10,169.89	10,309.36	10,232.19	77.16	133.603		
3,100.00	3,040.50	3,228.22	3,227.50	11.71	68.17	-94.46	1,342.79	-10,169.89	10,311.18	10,231.32	79.86	129.113		
3,200.00	3,137.73	3,332.08	3,331.33	12.17	71.00	-94.59	1,343.80	-10,169.89	10,313.16	10,230.00	83.16	124.019		
3,300.00	3,234.95	3,422.81	3,421.95	12.63	73.44	-94.72	1,342.79	-10,169.89	10,315.03	10,228.97	86.05	119.869		
3,400.00	3,332.18	3,520.03	3,519.18	13.09	75.87	-94.84	1,342.79	-10,169.89	10,317.03	10,228.10	88.93	116.007		
3,500.00	3,429.40	3,617.26	3,616.40	13.55	78.29	-94.97	1,342.79	-10,169.89	10,319.09	10,227.27	91.82	112.387		
3,600.00	3,526.63	3,714.49	3,713.63	14.00	80.72	-95.09	1,342.79	-10,169.89	10,321.20	10,226.49	94.70	108.988		
3,700.00	3,623.86	3,811.71	3,810.86	14.46	83.14	-95.22	1,342.79	-10,169.89	10,323.36	10,225.77	97.58	105.790		
3,800.00	3,721.08	3,908.94	3,908.08	14.92	85.57	-95.34	1,342.79	-10,169.89	10,325.57	10,225.10	100.47	102.776		
3,900.00	3,818.31	4,006.40	4,005.50	15.38	88.00	-95.45	1,346.62	-10,169.89	10,328.08	10,224.72	103.36	99.928		
4,000.00	3,915.54	4,105.03	4,104.11	15.84	90.46	-95.58	1,346.48	-10,169.89	10,330.38	10,224.10	106.27	97.206		
4,100.00	4,012.76	4,203.56	4,202.63	16.30	92.92	-95.71	1,346.11	-10,169.89	10,332.72	10,223.53	109.19	94.632		
4,200.00	4,109.99	4,301.99	4,301.05	16.76	95.37	-95.84	1,345.54	-10,169.89	10,335.10	10,223.00	112.10	92.194		
4,300.00	4,207.22	4,400.33	4,399.37	17.22	97.83	-95.97	1,344.74	-10,169.89	10,337.53	10,222.52	115.01	89.882		
4,400.00	4,304.44	4,498.57	4,497.59	17.68	100.28	-96.10	1,343.74	-10,169.89	10,340.00	10,222.08	117.92	87.686		
4,500.00	4,401.67	4,589.93	4,588.67	18.14	102.57	-96.22	1,342.79	-10,169.89	10,342.53	10,221.86	120.67	85.708		
4,600.00	4,498.90	4,687.15	4,685.90	18.60	105.10	-96.35	1,342.79	-10,169.89	10,345.17	10,221.51	123.66	83.657		
4,700.00	4,596.12	4,784.38	4,783.12	19.06	107.64	-96.47	1,342.79	-10,169.89	10,347.85	10,221.20	126.65	81.704		
4,800.00	4,693.35	4,881.61	4,880.35	19.52	110.17	-96.60	1,342.79	-10,169.89	10,350.59	10,220.95	129.64	79.841		
4,900.00	4,790.58	4,980.50	4,979.20	19.98	112.74	-96.72	1,344.64	-10,169.89	10,353.45	10,220.78	132.67	78.037		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD											Offset Site Error:	0.00 usft
Survey Program: 400-A027Ua_INC-ONLY											Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Rule Assigned:		Distance		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor
5,000.00	4,887.80	5,079.30	5,078.00	20.44	115.32	-96.85	1,344.05	-10,169.89	10,356.27	10,220.56	135.70	76.315
5,100.00	4,985.03	5,177.93	5,176.60	20.90	117.89	-96.98	1,343.04	-10,169.89	10,359.12	10,220.39	138.73	74.672
5,200.00	5,082.26	5,270.76	5,269.26	21.36	120.46	-97.10	1,342.79	-10,169.89	10,362.06	10,220.29	141.76	73.095
5,300.00	5,179.48	5,367.99	5,366.48	21.82	123.21	-97.22	1,342.79	-10,169.89	10,365.05	10,220.09	144.96	71.501
5,400.00	5,276.71	5,465.22	5,463.71	22.27	125.95	-97.35	1,342.79	-10,169.89	10,368.10	10,219.94	148.16	69.977
5,500.00	5,373.94	5,562.44	5,560.94	22.73	128.69	-97.47	1,342.79	-10,169.89	10,371.20	10,219.84	151.36	68.518
5,600.00	5,471.16	5,659.67	5,658.16	23.19	131.44	-97.60	1,342.79	-10,169.89	10,374.36	10,219.79	154.56	67.120
5,700.00	5,568.39	5,756.90	5,755.39	23.65	134.18	-97.72	1,342.79	-10,169.89	10,377.56	10,219.80	157.77	65.779
5,800.00	5,665.62	5,854.12	5,852.62	24.11	136.93	-97.85	1,342.79	-10,169.89	10,380.82	10,219.85	160.97	64.491
5,900.00	5,762.84	5,951.61	5,950.01	24.57	139.68	-97.94	1,348.07	-10,169.89	10,384.22	10,220.04	164.17	63.252
6,000.00	5,860.07	6,049.20	6,047.59	25.03	142.43	-98.07	1,347.84	-10,169.89	10,387.56	10,220.18	167.38	62.058
6,100.00	5,957.30	6,146.70	6,145.08	25.50	145.18	-98.19	1,347.41	-10,169.89	10,390.96	10,220.36	170.59	60.911
6,200.00	6,054.52	6,244.11	6,242.47	25.96	147.93	-98.32	1,346.76	-10,169.89	10,394.40	10,220.60	173.80	59.808
6,300.00	6,151.75	6,341.43	6,339.77	26.42	150.68	-98.45	1,345.91	-10,169.89	10,397.90	10,220.90	177.00	58.745
6,400.00	6,248.98	6,438.66	6,436.97	26.88	153.42	-98.58	1,344.86	-10,169.89	10,401.45	10,221.25	180.20	57.722
6,500.00	6,346.20	6,535.79	6,534.08	27.34	156.16	-98.71	1,343.59	-10,169.89	10,405.06	10,221.66	183.40	56.736
6,600.00	6,443.43	6,632.68	6,630.43	27.80	158.95	-98.84	1,342.79	-10,169.89	10,408.72	10,222.08	186.64	55.769
6,696.38	6,537.14	6,726.39	6,724.14	28.24	161.72	-98.96	1,342.79	-10,169.89	10,412.30	10,222.46	189.84	54.847
6,700.00	6,540.66	6,729.91	6,727.66	28.26	161.82	-97.61	1,342.79	-10,169.89	10,412.43	10,222.47	189.96	54.813
6,750.00	6,589.27	6,778.52	6,776.27	28.48	163.25	-79.12	1,342.79	-10,169.89	10,412.06	10,220.44	191.63	54.335
6,800.00	6,637.66	6,826.91	6,824.66	28.71	164.68	-63.14	1,342.79	-10,169.89	10,407.79	10,214.51	193.28	53.848
6,850.00	6,685.53	6,874.79	6,872.53	28.92	166.10	-51.10	1,342.79	-10,169.89	10,399.65	10,204.73	194.91	53.355
6,900.00	6,732.60	6,921.85	6,919.60	29.13	167.48	-42.51	1,342.79	-10,169.89	10,387.67	10,191.16	196.52	52.859
6,950.00	6,778.56	6,967.81	6,965.56	29.32	168.84	-36.40	1,342.79	-10,169.89	10,371.95	10,173.87	198.08	52.362
7,000.00	6,823.13	7,012.39	7,010.13	29.51	170.16	-31.99	1,342.79	-10,169.89	10,352.57	10,152.97	199.60	51.867
7,050.00	6,866.05	7,055.30	7,053.05	29.68	171.42	-28.77	1,342.79	-10,169.89	10,329.65	10,128.59	201.06	51.377
7,100.00	6,907.04	7,096.29	7,094.04	29.85	172.63	-26.38	1,342.79	-10,169.89	10,303.33	10,100.88	202.45	50.894
7,150.00	6,945.85	7,135.10	7,132.85	30.01	173.78	-24.62	1,342.79	-10,169.89	10,273.78	10,070.01	203.76	50.420
7,200.00	6,982.24	7,171.50	7,169.24	30.15	174.85	-23.35	1,342.79	-10,169.89	10,241.17	10,036.18	205.00	49.957
7,250.00	7,016.00	7,205.25	7,203.00	30.29	175.85	-22.49	1,342.79	-10,169.89	10,205.71	9,999.57	206.14	49.508
7,300.00	7,046.90	7,236.15	7,233.90	30.43	176.76	-21.98	1,342.79	-10,169.89	10,167.62	9,960.43	207.19	49.074
7,350.00	7,074.76	7,264.02	7,261.76	30.56	177.58	-21.83	1,342.79	-10,169.89	10,127.12	9,918.98	208.13	48.657
7,400.00	7,099.42	7,288.65	7,286.29	30.69	178.31	-21.99	1,348.83	-10,169.89	10,084.37	9,875.40	208.97	48.258
7,450.00	7,120.70	7,309.87	7,307.50	30.82	178.94	-22.68	1,348.82	-10,169.89	10,039.82	9,830.12	209.69	47.879
7,500.00	7,138.50	7,327.59	7,325.22	30.95	179.46	-24.04	1,348.80	-10,169.89	9,993.64	9,783.34	210.30	47.521
7,550.00	7,152.68	7,341.72	7,339.35	31.10	179.88	-26.51	1,348.78	-10,169.89	9,946.13	9,735.34	210.79	47.186
7,600.00	7,163.18	7,352.17	7,349.80	31.25	180.18	-31.19	1,348.77	-10,169.89	9,897.57	9,686.41	211.15	46.874
7,650.00	7,169.92	7,358.88	7,356.51	31.41	180.38	-41.63	1,348.75	-10,169.89	9,848.26	9,636.86	211.40	46.586
7,700.00	7,172.86	7,361.80	7,359.43	31.59	180.47	-73.09	1,348.75	-10,169.89	9,798.51	9,586.98	211.52	46.324
7,713.53	7,173.00	7,361.94	7,359.57	31.64	180.47	-89.96	1,348.75	-10,169.89	9,785.01	9,573.47	211.54	46.257
7,800.00	7,173.00	7,361.93	7,359.56	31.99	180.47	-89.96	1,348.75	-10,169.89	9,698.71	9,487.12	211.59	45.838
7,900.00	7,173.00	7,361.92	7,359.55	32.47	180.47	-89.96	1,348.75	-10,169.89	9,598.92	9,387.27	211.65	45.353
8,000.00	7,173.00	7,361.91	7,359.54	33.03	180.47	-89.96	1,348.75	-10,169.89	9,499.13	9,287.41	211.71	44.868
8,100.00	7,173.00	7,361.90	7,359.53	33.66	180.47	-89.96	1,348.75	-10,169.89	9,399.34	9,187.56	211.78	44.383
8,200.00	7,173.00	7,361.90	7,359.52	34.36	180.47	-89.96	1,348.75	-10,169.89	9,299.56	9,087.71	211.85	43.898
8,300.00	7,173.00	7,361.89	7,359.51	35.13	180.47	-89.95	1,348.75	-10,169.89	9,199.78	8,987.86	211.92	43.412
8,400.00	7,173.00	7,361.88	7,359.51	35.95	180.47	-89.95	1,348.75	-10,169.89	9,100.01	8,888.02	211.99	42.927
8,500.00	7,173.00	7,361.87	7,359.50	36.82	180.47	-89.95	1,348.75	-10,169.89	9,000.24	8,788.18	212.07	42.441
8,600.00	7,173.00	7,361.86	7,359.49	37.74	180.47	-89.95	1,348.75	-10,169.89	8,900.48	8,688.34	212.14	41.955
8,700.00	7,173.00	7,361.85	7,359.48	38.71	180.47	-89.95	1,348.75	-10,169.89	8,800.73	8,588.50	212.22	41.469
8,800.00	7,173.00	7,361.84	7,359.47	39.71	180.47	-89.95	1,348.75	-10,169.89	8,700.97	8,488.67	212.31	40.983
8,900.00	7,173.00	7,361.83	7,359.46	40.76	180.47	-89.95	1,348.75	-10,169.89	8,601.23	8,388.84	212.39	40.497

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD													Offset Site Error:	0.00 usft
Survey Program:		400-A027Ua_INC-ONLY					Rule Assigned:						Offset Well Error:	0.00 usft
Reference	Offset	Reference	Offset	Semi Major Axis	Highside	Offset Wellbore Centre		Distance				Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,000.00	7,173.00	7,361.82	7,359.45	41.84	180.47	-89.95	1,348.75	-10,169.89	8,501.49	8,289.01	212.48	40.010		
9,100.00	7,173.00	7,361.82	7,359.44	42.96	180.47	-89.95	1,348.75	-10,169.89	8,401.76	8,189.18	212.57	39.524		
9,200.00	7,173.00	7,361.81	7,359.43	44.10	180.47	-89.95	1,348.75	-10,169.89	8,302.03	8,089.36	212.67	39.037		
9,300.00	7,173.00	7,361.80	7,359.43	45.27	180.47	-89.95	1,348.75	-10,169.89	8,202.31	7,989.55	212.77	38.551		
9,400.00	7,173.00	7,361.79	7,359.42	46.47	180.47	-89.95	1,348.75	-10,169.89	8,102.60	7,889.73	212.87	38.064		
9,500.00	7,173.00	7,361.78	7,359.41	47.70	180.47	-89.95	1,348.75	-10,169.89	8,002.90	7,789.92	212.97	37.577		
9,600.00	7,173.00	7,361.77	7,359.40	48.94	180.47	-89.94	1,348.75	-10,169.89	7,903.20	7,690.12	213.08	37.090		
9,700.00	7,173.00	7,361.76	7,359.39	50.20	180.47	-89.94	1,348.75	-10,169.89	7,803.51	7,590.32	213.19	36.603		
9,800.00	7,173.00	7,361.75	7,359.38	51.49	180.47	-89.94	1,348.75	-10,169.89	7,703.83	7,490.52	213.31	36.116		
9,900.00	7,173.00	7,361.74	7,359.37	52.79	180.47	-89.94	1,348.75	-10,169.89	7,604.15	7,390.73	213.42	35.629		
10,000.00	7,173.00	7,361.73	7,359.36	54.11	180.47	-89.94	1,348.75	-10,169.89	7,504.49	7,290.94	213.55	35.142		
10,100.00	7,173.00	7,361.73	7,359.35	55.44	180.47	-89.94	1,348.75	-10,169.89	7,404.83	7,191.16	213.67	34.655		
10,200.00	7,173.00	7,361.72	7,359.34	56.78	180.47	-89.94	1,348.75	-10,169.89	7,305.18	7,091.38	213.80	34.168		
10,300.00	7,173.00	7,361.71	7,359.34	58.14	180.47	-89.94	1,348.75	-10,169.89	7,205.55	6,991.61	213.94	33.681		
10,400.00	7,173.00	7,361.70	7,359.33	59.51	180.46	-89.94	1,348.75	-10,169.89	7,105.92	6,891.85	214.07	33.194		
10,500.00	7,173.00	7,361.69	7,359.32	60.90	180.46	-89.94	1,348.75	-10,169.89	7,006.30	6,792.09	214.22	32.706		
10,600.00	7,173.00	7,361.68	7,359.31	62.29	180.46	-89.94	1,348.75	-10,169.89	6,906.70	6,692.33	214.37	32.219		
10,700.00	7,173.00	7,361.67	7,359.30	63.69	180.46	-89.94	1,348.75	-10,169.89	6,807.11	6,592.59	214.52	31.732		
10,800.00	7,173.00	7,361.66	7,359.29	65.11	180.46	-89.93	1,348.75	-10,169.89	6,707.53	6,492.85	214.68	31.245		
10,900.00	7,173.00	7,361.65	7,359.28	66.53	180.46	-89.93	1,348.75	-10,169.89	6,607.96	6,393.11	214.84	30.757		
11,000.00	7,173.00	7,361.65	7,359.27	67.96	180.46	-89.93	1,348.75	-10,169.89	6,508.40	6,293.39	215.01	30.270		
11,100.00	7,173.00	7,361.64	7,359.26	69.39	180.46	-89.93	1,348.75	-10,169.89	6,408.86	6,193.67	215.19	29.783		
11,200.00	7,173.00	7,361.63	7,359.26	70.84	180.46	-89.93	1,348.75	-10,169.89	6,309.33	6,093.96	215.37	29.296		
11,300.00	7,173.00	7,361.62	7,359.25	72.29	180.46	-89.93	1,348.75	-10,169.89	6,209.82	5,994.27	215.56	28.808		
11,400.00	7,173.00	7,361.61	7,359.24	73.74	180.46	-89.93	1,348.75	-10,169.89	6,110.32	5,894.57	215.75	28.321		
11,500.00	7,173.00	7,361.60	7,359.23	75.21	180.46	-89.93	1,348.75	-10,169.89	6,010.85	5,794.89	215.95	27.834		
11,600.00	7,173.00	7,361.59	7,359.22	76.68	180.46	-89.93	1,348.75	-10,169.89	5,911.38	5,695.22	216.16	27.347		
11,700.00	7,173.00	7,361.58	7,359.21	78.15	180.46	-89.93	1,348.75	-10,169.89	5,811.94	5,595.56	216.38	26.860		
11,800.00	7,173.00	7,361.57	7,359.20	79.63	180.46	-89.93	1,348.75	-10,169.89	5,712.52	5,495.91	216.60	26.373		
11,900.00	7,173.00	7,361.57	7,359.19	81.11	180.46	-89.93	1,348.75	-10,169.89	5,613.11	5,396.28	216.84	25.886		
12,000.00	7,173.00	7,361.56	7,359.18	82.60	180.46	-89.92	1,348.75	-10,169.89	5,513.73	5,296.65	217.08	25.400		
12,100.00	7,173.00	7,361.55	7,359.18	84.09	180.46	-89.92	1,348.75	-10,169.89	5,414.37	5,197.04	217.33	24.913		
12,200.00	7,173.00	7,361.54	7,359.17	85.59	180.46	-89.92	1,348.75	-10,169.89	5,315.04	5,097.44	217.59	24.426		
12,300.00	7,173.00	7,361.53	7,359.16	87.09	180.46	-89.92	1,348.75	-10,169.89	5,215.73	4,997.86	217.87	23.940		
12,400.00	7,173.00	7,361.52	7,359.15	88.59	180.46	-89.92	1,348.75	-10,169.89	5,116.45	4,898.29	218.15	23.453		
12,500.00	7,173.00	7,361.51	7,359.14	90.10	180.46	-89.92	1,348.75	-10,169.89	5,017.19	4,798.74	218.45	22.967		
12,600.00	7,173.00	7,361.50	7,359.13	91.61	180.46	-89.92	1,348.75	-10,169.89	4,917.97	4,699.21	218.76	22.481		
12,700.00	7,173.00	7,361.49	7,359.12	93.13	180.46	-89.92	1,348.75	-10,169.89	4,818.78	4,599.69	219.08	21.995		
12,800.00	7,173.00	7,361.49	7,359.11	94.64	180.46	-89.92	1,348.75	-10,169.89	4,719.62	4,500.20	219.42	21.509		
12,900.00	7,173.00	7,361.48	7,359.10	96.16	180.46	-89.92	1,348.75	-10,169.89	4,620.50	4,400.72	219.78	21.024		
13,000.00	7,173.00	7,361.47	7,359.10	97.69	180.46	-89.92	1,348.75	-10,169.89	4,521.42	4,301.27	220.15	20.538		
13,100.00	7,173.00	7,361.46	7,359.09	99.21	180.46	-89.92	1,348.75	-10,169.89	4,422.38	4,201.84	220.54	20.053		
13,200.00	7,173.00	7,361.45	7,359.08	100.74	180.46	-89.91	1,348.75	-10,169.89	4,323.38	4,102.44	220.94	19.568		
13,300.00	7,173.00	7,361.44	7,359.07	102.27	180.46	-89.91	1,348.75	-10,169.89	4,224.43	4,003.06	221.37	19.083		
13,400.00	7,173.00	7,361.43	7,359.06	103.80	180.46	-89.91	1,348.75	-10,169.89	4,125.53	3,903.71	221.82	18.598		
13,500.00	7,173.00	7,361.42	7,359.05	105.33	180.46	-89.91	1,348.75	-10,169.89	4,026.69	3,804.39	222.30	18.114		
13,600.00	7,173.00	7,361.41	7,359.04	106.87	180.46	-89.91	1,348.75	-10,169.89	3,927.90	3,705.10	222.80	17.630		
13,700.00	7,173.00	7,361.41	7,359.03	108.41	180.46	-89.91	1,348.75	-10,169.89	3,829.18	3,605.85	223.32	17.146		
13,800.00	7,173.00	7,361.40	7,359.03	109.95	180.46	-89.91	1,348.75	-10,169.89	3,730.52	3,506.64	223.88	16.663		
13,900.00	7,173.00	7,361.39	7,359.02	111.49	180.46	-89.91	1,348.75	-10,169.89	3,631.94	3,407.47	224.47	16.180		
14,000.00	7,173.00	7,361.38	7,359.01	113.03	180.46	-89.91	1,348.75	-10,169.89	3,533.44	3,308.34	225.10	15.697		
14,100.00	7,173.00	7,361.37	7,359.00	114.58	180.46	-89.91	1,348.75	-10,169.89	3,435.02	3,209.26	225.76	15.215		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD												Offset Site Error:	0.00 usft
Survey Program:		400-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,200.00	7,173.00	7,361.36	7,358.99	116.13	180.45	-89.91	1,348.75	-10,169.89	3,336.70	3,110.23	226.47	14.734	
14,300.00	7,173.00	7,361.35	7,358.98	117.68	180.45	-89.91	1,348.75	-10,169.89	3,238.48	3,011.26	227.22	14.253	
14,400.00	7,173.00	7,361.34	7,358.97	119.23	180.45	-89.90	1,348.75	-10,169.89	3,140.38	2,912.35	228.02	13.772	
14,500.00	7,173.00	7,361.34	7,358.96	120.78	180.45	-89.90	1,348.75	-10,169.89	3,042.39	2,813.51	228.88	13.293	
14,600.00	7,173.00	7,361.33	7,358.95	122.33	180.45	-89.90	1,348.75	-10,169.89	2,944.55	2,714.75	229.80	12.814	
14,700.00	7,173.00	7,361.32	7,358.95	123.88	180.45	-89.90	1,348.75	-10,169.89	2,846.85	2,616.06	230.79	12.335	
14,800.00	7,173.00	7,361.31	7,358.94	125.44	180.45	-89.90	1,348.75	-10,169.89	2,749.32	2,517.47	231.85	11.858	
14,900.00	7,173.00	7,361.30	7,358.93	127.00	180.45	-89.90	1,348.75	-10,169.89	2,651.97	2,418.98	232.99	11.382	
15,000.00	7,173.00	7,361.29	7,358.92	128.55	180.45	-89.90	1,348.75	-10,169.89	2,554.83	2,320.60	234.22	10.908	
15,100.00	7,173.00	7,361.28	7,358.91	130.11	180.45	-89.90	1,348.75	-10,169.89	2,457.91	2,222.35	235.56	10.434	
15,200.00	7,173.00	7,361.27	7,358.90	131.67	180.45	-89.90	1,348.75	-10,169.89	2,361.26	2,124.24	237.02	9.962	
15,300.00	7,173.00	7,361.26	7,358.89	133.23	180.45	-89.90	1,348.75	-10,169.89	2,264.89	2,026.29	238.60	9.493	
15,400.00	7,173.00	7,361.26	7,358.88	134.80	180.45	-89.90	1,348.75	-10,169.89	2,168.85	1,928.53	240.33	9.025	
15,500.00	7,173.00	7,361.25	7,358.87	136.36	180.45	-89.90	1,348.75	-10,169.89	2,073.19	1,830.97	242.22	8.559	
15,600.00	7,173.00	7,361.24	7,358.87	137.92	180.45	-89.89	1,348.75	-10,169.89	1,977.96	1,733.66	244.30	8.097	
15,700.00	7,173.00	7,361.23	7,358.86	139.49	180.45	-89.89	1,348.75	-10,169.89	1,883.22	1,636.63	246.59	7.637	
15,800.00	7,173.00	7,361.22	7,358.85	141.05	180.45	-89.89	1,348.75	-10,169.89	1,789.05	1,539.93	249.12	7.181	
15,900.00	7,173.00	7,361.21	7,358.84	142.62	180.45	-89.89	1,348.75	-10,169.89	1,695.56	1,443.62	251.94	6.730	
16,000.00	7,173.00	7,361.20	7,358.83	144.19	180.45	-89.89	1,348.75	-10,169.89	1,602.84	1,347.78	255.07	6.284	
16,100.00	7,173.00	7,361.19	7,358.82	145.76	180.45	-89.89	1,348.75	-10,169.89	1,511.06	1,252.49	258.57	5.844	
16,200.00	7,173.00	7,361.19	7,358.81	147.33	180.45	-89.89	1,348.75	-10,169.89	1,420.39	1,157.90	262.49	5.411	
16,300.00	7,173.00	7,361.18	7,358.80	148.90	180.45	-89.89	1,348.75	-10,169.89	1,331.05	1,064.15	266.90	4.987	
16,400.00	7,173.00	7,361.17	7,358.80	150.47	180.45	-89.89	1,348.75	-10,169.89	1,243.34	971.47	271.87	4.573	
16,500.00	7,173.00	7,361.16	7,358.79	152.04	180.45	-89.89	1,348.75	-10,169.89	1,157.62	880.14	277.48	4.172	
16,600.00	7,173.00	7,361.15	7,358.78	153.61	180.45	-89.89	1,348.75	-10,169.89	1,074.38	790.57	283.81	3.786	
16,700.00	7,173.00	7,361.14	7,358.77	155.18	180.45	-89.89	1,348.75	-10,169.89	994.23	703.30	290.92	3.418	
16,800.00	7,173.00	7,361.13	7,358.76	156.76	180.45	-89.89	1,348.75	-10,169.89	917.98	619.13	298.85	3.072	
16,900.00	7,173.00	7,361.12	7,358.75	158.33	180.45	-89.88	1,348.75	-10,169.89	846.69	539.14	307.55	2.753	
17,000.00	7,173.00	7,361.11	7,358.74	159.90	180.45	-89.88	1,348.75	-10,169.89	781.71	464.88	316.84	2.467	
17,100.00	7,173.00	7,361.11	7,358.73	161.48	180.45	-89.88	1,348.75	-10,169.89	724.76	398.47	326.29	2.221	
17,200.00	7,173.00	7,361.10	7,358.73	163.06	180.45	-89.88	1,348.75	-10,169.89	677.84	342.69	335.15	2.023	
17,300.00	7,173.00	7,361.09	7,358.72	164.63	180.45	-89.88	1,348.75	-10,169.89	643.17	300.85	342.32	1.879	
17,400.00	7,173.00	7,361.08	7,358.71	166.21	180.45	-89.88	1,348.75	-10,169.89	622.78	276.23	346.56	1.797	
17,479.02	7,173.00	7,361.07	7,358.70	167.45	180.45	-89.88	1,348.75	-10,169.89	617.75	270.58	347.17	1.779	CC, ES, SF
17,500.00	7,173.00	7,361.07	7,358.70	167.79	180.45	-89.88	1,348.75	-10,169.89	618.11	271.21	346.89	1.782	
17,600.00	7,173.00	7,361.06	7,358.69	169.36	180.45	-89.88	1,348.75	-10,169.89	629.49	286.35	343.13	1.835	
17,700.00	7,173.00	7,361.05	7,358.68	170.94	180.45	-89.88	1,348.75	-10,169.89	656.09	320.12	335.96	1.953	
17,800.00	7,173.00	7,361.04	7,358.67	172.52	180.45	-89.88	1,348.75	-10,169.89	696.16	369.55	326.62	2.131	
17,900.00	7,173.00	7,361.04	7,358.66	174.10	180.45	-89.88	1,348.75	-10,169.89	747.56	431.22	316.34	2.363	
18,000.00	7,173.00	7,361.03	7,358.66	175.68	180.44	-89.88	1,348.75	-10,169.89	808.11	502.03	306.08	2.640	
18,100.00	7,173.00	7,361.02	7,358.65	177.26	180.44	-89.87	1,348.75	-10,169.89	875.92	579.52	296.40	2.955	
18,200.00	7,173.00	7,361.01	7,358.64	178.84	180.44	-89.87	1,348.75	-10,169.89	949.44	661.86	287.58	3.301	
18,300.00	7,173.00	7,361.00	7,358.63	180.42	180.44	-89.87	1,348.75	-10,169.89	1,027.44	747.74	279.70	3.673	
18,400.00	7,173.00	7,360.99	7,358.62	182.00	180.44	-89.87	1,348.75	-10,169.89	1,108.97	836.24	272.74	4.066	
18,500.00	7,173.00	7,360.98	7,358.61	183.59	180.44	-89.87	1,348.75	-10,169.89	1,193.32	926.71	266.62	4.476	
18,600.00	7,173.00	7,360.97	7,358.60	185.17	180.44	-89.87	1,348.75	-10,169.89	1,279.93	1,018.68	261.25	4.899	
18,700.00	7,173.00	7,360.97	7,358.59	186.75	180.44	-89.87	1,348.75	-10,169.89	1,368.36	1,111.82	256.54	5.334	
18,800.00	7,173.00	7,360.96	7,358.59	188.33	180.44	-89.87	1,348.75	-10,169.89	1,458.29	1,205.88	252.41	5.777	
18,900.00	7,173.00	7,360.95	7,358.58	189.92	180.44	-89.87	1,348.75	-10,169.89	1,549.45	1,300.68	248.77	6.228	
19,000.00	7,173.00	7,360.94	7,358.57	191.50	180.44	-89.87	1,348.75	-10,169.89	1,641.65	1,396.08	245.57	6.685	
19,100.00	7,173.00	7,360.93	7,358.56	193.09	180.44	-89.87	1,348.75	-10,169.89	1,734.70	1,491.97	242.73	7.147	
19,200.00	7,173.00	7,360.92	7,358.55	194.67	180.44	-89.87	1,348.75	-10,169.89	1,828.50	1,588.27	240.22	7.612	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Pre-Ongard Well #112 - OH - OH-TD													Offset Site Error:	0.00 usft
Survey Program: 400-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
19,249.41	7,173.00	7,360.92	7,358.55	195.45	180.44	-89.87	1,348.75	-10,169.89	1,875.08	1,635.99	239.09	7.843		
19,300.00	7,173.00	7,360.91	7,358.54	196.25	180.44	-89.86	1,348.75	-10,169.89	1,922.91	1,684.92	237.99	8.080		
19,384.41	7,173.00	7,360.91	7,358.53	197.34	180.44	-89.86	1,348.75	-10,169.89	2,003.03	1,764.21	238.82	8.387		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program: 348-APC_ISCWSA REV 2 MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	3,515.13	3,076.86	0.00	29.74	-76.99	2,060.79	-8,918.63	9,598.36					
125.00	125.00	3,596.00	3,150.97	0.06	30.37	-121.51	2,077.41	-8,890.87	9,561.24	9,538.60	22.64	422.336		
225.00	224.98	3,610.05	3,163.84	0.17	30.47	172.87	2,080.40	-8,886.09	9,533.57	9,510.70	22.87	416.928		
319.00	318.92	3,626.00	3,178.54	0.28	30.59	162.22	2,083.73	-8,880.88	9,509.90	9,486.78	23.12	411.413		
400.00	399.86	3,626.00	3,178.54	0.37	30.59	162.22	2,083.73	-8,880.88	9,490.48	9,466.96	23.52	403.492		
469.00	468.80	3,640.00	3,191.51	0.52	30.69	162.24	2,086.59	-8,876.46	9,474.39	9,450.67	23.71	399.578		
500.00	499.78	3,658.00	3,208.26	0.61	30.81	177.13	2,090.20	-8,870.92	9,467.31	9,443.42	23.89	396.370		
600.00	599.71	3,685.50	3,233.90	0.92	31.00	-131.93	2,095.64	-8,862.59	9,444.30	9,419.98	24.32	388.353		
700.00	699.55	3,722.00	3,267.95	1.26	31.25	-108.46	2,102.82	-8,851.59	9,421.12	9,396.28	24.84	379.282		
800.00	799.19	3,753.00	3,296.97	1.60	31.46	-98.99	2,108.75	-8,842.46	9,397.91	9,372.57	25.34	370.849		
900.00	898.49	3,800.41	3,341.56	1.97	31.76	-94.33	2,117.47	-8,828.89	9,374.68	9,348.74	25.93	361.477		
1,000.00	997.33	3,848.00	3,386.55	2.34	32.05	-91.72	2,125.59	-8,815.70	9,351.41	9,324.89	26.53	352.525		
1,100.00	1,095.61	3,848.00	3,386.55	2.74	32.05	-90.17	2,125.59	-8,815.70	9,328.25	9,301.35	26.90	346.747		
1,196.26	1,189.56	3,879.00	3,416.16	3.13	32.22	-89.23	2,130.04	-8,807.66	9,306.14	9,278.73	27.41	339.541		
1,200.00	1,193.19	3,879.00	3,416.16	3.15	32.22	-89.23	2,130.04	-8,807.66	9,305.29	9,277.86	27.42	339.316		
1,300.00	1,290.42	3,911.00	3,446.91	3.58	32.39	-89.24	2,134.07	-8,799.77	9,282.84	9,254.89	27.95	332.163		
1,400.00	1,387.65	3,943.00	3,477.78	4.01	32.54	-89.26	2,137.74	-8,792.22	9,261.12	9,232.65	28.47	325.298		
1,500.00	1,484.87	3,943.00	3,477.78	4.45	32.54	-89.26	2,137.74	-8,792.22	9,240.22	9,211.34	28.88	319.924		
1,600.00	1,582.10	3,974.00	3,507.89	4.90	32.68	-89.28	2,140.94	-8,785.58	9,220.30	9,190.90	29.40	313.610		
1,700.00	1,679.33	3,974.00	3,507.89	5.34	32.68	-89.28	2,140.94	-8,785.58	9,201.15	9,171.33	29.82	308.563		
1,800.00	1,776.55	3,974.00	3,507.89	5.79	32.68	-89.28	2,140.94	-8,785.58	9,183.05	9,152.81	30.24	303.678		
1,900.00	1,873.78	4,006.00	3,539.17	6.24	32.81	-89.30	2,143.91	-8,779.51	9,165.75	9,135.00	30.76	298.020		
2,000.00	1,971.01	4,037.00	3,569.56	6.69	32.92	-89.32	2,146.71	-8,774.05	9,149.36	9,118.09	31.27	292.637		
2,100.00	2,068.23	4,037.00	3,569.56	7.15	32.92	-89.32	2,146.71	-8,774.05	9,133.76	9,102.08	31.69	288.256		
2,200.00	2,165.46	4,068.00	3,600.02	7.60	33.03	-89.34	2,149.43	-8,769.01	9,119.01	9,086.82	32.19	283.267		
2,300.00	2,262.69	4,068.00	3,600.02	8.06	33.03	-89.34	2,149.43	-8,769.01	9,105.22	9,072.61	32.61	279.201		
2,400.00	2,359.91	4,099.00	3,630.58	8.51	33.13	-89.37	2,152.04	-8,764.51	9,092.24	9,059.13	33.11	274.596		
2,500.00	2,457.14	4,131.00	3,662.19	8.97	33.22	-89.40	2,154.63	-8,760.26	9,080.14	9,046.53	33.61	270.172		
2,600.00	2,554.37	4,161.00	3,691.86	9.42	33.31	-89.42	2,157.03	-8,756.49	9,068.76	9,034.66	34.10	265.955		
2,700.00	2,651.59	4,193.00	3,723.55	9.88	33.39	-89.45	2,159.55	-8,752.80	9,058.22	9,023.63	34.59	261.871		
2,800.00	2,748.82	4,193.00	3,723.55	10.34	33.39	-89.45	2,159.55	-8,752.80	9,048.51	9,013.50	35.00	258.508		
2,900.00	2,846.05	4,225.00	3,755.30	10.80	33.47	-89.48	2,161.86	-8,749.61	9,039.69	9,004.20	35.49	254.744		
3,000.00	2,943.27	4,239.82	3,770.03	11.25	33.50	-89.49	2,162.84	-8,748.32	9,031.77	8,995.84	35.92	251.414		
3,100.00	3,040.50	4,256.00	3,786.13	11.71	33.54	-89.51	2,163.84	-8,747.03	9,024.73	8,988.37	36.36	248.185		
3,200.00	3,137.73	4,287.00	3,817.01	12.17	33.59	-89.54	2,165.50	-8,744.81	9,018.48	8,981.66	36.82	244.906		
3,300.00	3,234.95	4,330.05	3,859.93	12.63	33.66	-89.59	2,167.31	-8,742.17	9,012.96	8,975.66	37.30	241.656		
3,400.00	3,332.18	4,351.00	3,880.84	13.09	33.69	-89.62	2,168.06	-8,741.05	9,008.21	8,970.48	37.73	238.766		
3,500.00	3,429.40	4,382.00	3,911.79	13.55	33.74	-89.66	2,169.08	-8,739.64	9,004.24	8,966.07	38.17	235.897		
3,600.00	3,526.63	4,414.00	3,943.76	14.00	33.77	-89.70	2,169.97	-8,738.52	9,001.11	8,962.50	38.61	233.141		
3,700.00	3,623.86	4,444.00	3,973.75	14.46	33.80	-89.74	2,170.61	-8,737.80	8,998.80	8,959.77	39.04	230.523		
3,800.00	3,721.08	4,497.71	4,027.44	14.92	33.85	-89.81	2,171.40	-8,736.82	8,997.12	8,957.63	39.49	227.850		
3,900.00	3,818.31	4,658.45	4,188.14	15.38	34.00	-90.04	2,173.35	-8,733.60	8,995.20	8,955.12	40.07	224.463		
4,000.00	3,915.54	4,757.62	4,287.28	15.84	34.12	-90.18	2,174.52	-8,731.38	8,993.16	8,952.55	40.61	221.440		
4,100.00	4,012.76	4,856.80	4,386.43	16.30	34.24	-90.31	2,175.70	-8,729.13	8,991.16	8,950.01	41.15	218.495		
4,200.00	4,109.99	4,955.99	4,485.58	16.76	34.36	-90.45	2,176.88	-8,726.87	8,989.20	8,947.51	41.69	215.625		
4,300.00	4,207.22	5,055.18	4,584.74	17.22	34.47	-90.59	2,178.08	-8,724.58	8,987.27	8,945.05	42.23	212.828		
4,400.00	4,304.44	5,154.38	4,683.90	17.68	34.59	-90.73	2,179.29	-8,722.28	8,985.38	8,942.61	42.77	210.100		
4,500.00	4,401.67	5,253.58	4,783.06	18.14	34.71	-90.87	2,180.51	-8,719.95	8,983.53	8,940.22	43.31	207.440		
4,600.00	4,498.90	5,352.78	4,882.23	18.60	34.83	-91.01	2,181.74	-8,717.61	8,981.71	8,937.86	43.85	204.845		
4,700.00	4,596.12	5,451.99	4,981.41	19.06	34.95	-91.14	2,182.98	-8,715.25	8,979.92	8,935.53	44.39	202.312		
4,800.00	4,693.35	5,551.21	5,080.59	19.52	35.07	-91.28	2,184.24	-8,712.86	8,978.17	8,933.24	44.93	199.840		
4,900.00	4,790.58	5,650.43	5,179.78	19.98	35.19	-91.42	2,185.50	-8,710.46	8,976.45	8,930.99	45.47	197.426		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY											Offset Site Error:	0.00 usft
Survey Program: 348-APC_ISCWSA REV 2 MWD											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor
Warning												
5,000.00	4,887.80	5,749.66	5,278.97	20.44	35.31	-91.56	2,186.77	-8,708.03	8,974.77	8,928.77	46.01	195.069
5,100.00	4,985.03	5,848.89	5,378.16	20.90	35.43	-91.70	2,188.05	-8,705.59	8,973.13	8,926.58	46.55	192.766
5,200.00	5,082.26	5,948.13	5,477.36	21.36	35.55	-91.84	2,189.35	-8,703.13	8,971.52	8,924.43	47.09	190.516
5,300.00	5,179.48	6,047.37	5,576.56	21.82	35.67	-91.97	2,190.65	-8,700.64	8,969.94	8,922.31	47.63	188.316
5,400.00	5,276.71	6,146.62	5,675.77	22.27	35.79	-92.11	2,191.97	-8,698.14	8,968.40	8,920.23	48.17	186.166
5,500.00	5,373.94	6,245.88	5,774.98	22.73	35.91	-92.25	2,193.29	-8,695.61	8,966.90	8,918.18	48.72	184.064
5,600.00	5,471.16	6,345.13	5,874.20	23.19	36.03	-92.39	2,194.63	-8,693.07	8,965.43	8,916.17	49.26	182.007
5,700.00	5,568.39	6,444.40	5,973.42	23.65	36.15	-92.53	2,195.97	-8,690.50	8,963.99	8,914.19	49.80	179.996
5,800.00	5,665.62	6,543.67	6,072.65	24.11	36.27	-92.66	2,197.33	-8,687.92	8,962.59	8,912.25	50.34	178.027
5,900.00	5,762.84	6,642.94	6,171.88	24.57	36.40	-92.80	2,198.70	-8,685.32	8,961.22	8,910.34	50.89	176.101
6,000.00	5,860.07	6,742.22	6,271.11	25.03	36.52	-92.94	2,200.08	-8,682.69	8,959.89	8,908.46	51.43	174.215
6,100.00	5,957.30	6,841.50	6,370.35	25.50	36.64	-93.08	2,201.46	-8,680.05	8,958.59	8,906.62	51.97	172.369
6,200.00	6,054.52	6,940.79	6,469.59	25.96	36.76	-93.22	2,202.86	-8,677.38	8,957.33	8,904.81	52.52	170.560
6,300.00	6,151.75	7,040.09	6,568.84	26.42	36.88	-93.35	2,204.27	-8,674.70	8,956.10	8,903.04	53.06	168.789
6,400.00	6,248.98	7,139.39	6,668.09	26.88	37.00	-93.49	2,205.69	-8,671.99	8,954.90	8,901.30	53.60	167.054
6,500.00	6,346.20	7,238.69	6,767.35	27.34	37.12	-93.63	2,207.12	-8,669.27	8,953.74	8,899.59	54.15	165.354
6,600.00	6,443.43	7,338.00	6,866.61	27.80	37.24	-93.77	2,208.56	-8,666.52	8,952.62	8,897.92	54.69	163.687
6,696.38	6,537.14	7,433.72	6,962.29	28.24	37.36	-93.90	2,209.96	-8,663.86	8,951.56	8,896.34	55.22	162.112
6,700.00	6,540.66	7,437.32	6,965.88	28.26	37.36	-92.55	2,210.02	-8,663.76	8,951.51	8,896.27	55.24	162.053
6,750.00	6,589.27	7,486.91	7,015.45	28.48	37.42	-74.06	2,210.74	-8,662.37	8,948.73	8,893.23	55.51	161.213
6,800.00	6,637.66	7,536.17	7,064.69	28.71	37.48	-58.03	2,211.47	-8,660.99	8,942.06	8,886.29	55.78	160.322
6,850.00	6,685.53	7,584.80	7,113.29	28.92	37.54	-45.92	2,212.19	-8,659.62	8,931.53	8,875.50	56.04	159.389
6,900.00	6,732.60	7,632.49	7,160.95	29.13	37.60	-37.22	2,212.90	-8,658.27	8,917.21	8,860.92	56.29	158.421
6,950.00	6,778.56	7,678.94	7,207.38	29.32	37.66	-30.96	2,213.59	-8,656.95	8,899.19	8,842.66	56.53	157.424
7,000.00	6,823.13	7,723.88	7,252.29	29.51	37.71	-26.36	2,214.26	-8,655.67	8,877.57	8,820.81	56.76	156.404
7,050.00	6,866.05	7,767.02	7,295.41	29.68	37.77	-22.88	2,214.91	-8,654.44	8,852.49	8,795.51	56.98	155.367
7,100.00	6,907.04	7,808.09	7,336.46	29.85	37.82	-20.18	2,215.53	-8,653.26	8,824.10	8,766.92	57.18	154.318
7,150.00	6,945.85	7,846.84	7,375.20	30.01	37.86	-18.02	2,216.11	-8,652.15	8,792.58	8,735.21	57.37	153.263
7,200.00	6,982.24	7,883.04	7,411.37	30.15	37.91	-16.25	2,216.66	-8,651.11	8,758.12	8,700.57	57.54	152.205
7,250.00	7,016.00	7,916.46	7,444.77	30.29	37.95	-14.76	2,217.16	-8,650.14	8,720.92	8,663.23	57.70	151.151
7,300.00	7,046.90	7,946.89	7,475.18	30.43	37.99	-13.45	2,217.63	-8,649.26	8,681.23	8,623.40	57.83	150.105
7,350.00	7,074.76	7,974.14	7,502.42	30.56	38.02	-12.24	2,218.04	-8,648.47	8,639.28	8,581.33	57.95	149.070
7,400.00	7,099.42	7,998.05	7,526.32	30.69	38.05	-11.05	2,218.41	-8,647.78	8,595.33	8,537.27	58.06	148.052
7,450.00	7,120.70	8,018.48	7,546.74	30.82	38.07	-9.76	2,218.72	-8,647.18	8,549.65	8,491.51	58.14	147.054
7,500.00	7,138.50	8,035.28	7,563.53	30.95	38.10	-8.16	2,218.97	-8,646.69	8,502.53	8,444.32	58.20	146.079
7,550.00	7,152.68	8,048.37	7,576.62	31.10	38.11	-5.81	2,219.18	-8,646.31	8,454.25	8,395.99	58.25	145.131
7,600.00	7,163.18	8,057.67	7,585.91	31.25	38.12	-1.33	2,219.32	-8,646.04	8,405.10	8,346.82	58.28	144.211
7,650.00	7,169.92	8,063.11	7,591.34	31.41	38.13	12.46	2,219.40	-8,645.88	8,355.41	8,297.11	58.30	143.322
7,700.00	7,172.86	8,064.66	7,592.90	31.59	38.13	101.99	2,219.42	-8,645.84	8,305.46	8,247.16	58.30	142.466
7,713.53	7,173.00	8,064.41	7,592.65	31.64	38.13	125.68	2,219.42	-8,645.84	8,291.94	8,233.65	58.30	142.240
7,800.00	7,173.00	8,061.91	7,590.15	31.99	38.13	125.39	2,219.38	-8,645.92	8,205.57	8,147.29	58.28	140.805
7,900.00	7,173.00	8,059.02	7,587.26	32.47	38.12	125.05	2,219.34	-8,646.00	8,105.68	8,047.43	58.25	139.143
8,000.00	7,173.00	8,056.13	7,584.37	33.03	38.12	124.71	2,219.29	-8,646.08	8,005.80	7,947.57	58.23	137.479
8,100.00	7,173.00	8,053.24	7,581.48	33.66	38.12	124.36	2,219.25	-8,646.17	7,905.92	7,847.71	58.21	135.813
8,200.00	7,173.00	8,050.35	7,578.59	34.36	38.11	124.02	2,219.21	-8,646.25	7,806.05	7,747.85	58.19	134.145
8,300.00	7,173.00	8,047.46	7,575.71	35.13	38.11	123.66	2,219.16	-8,646.34	7,706.17	7,648.00	58.17	132.476
8,400.00	7,173.00	8,044.58	7,572.82	35.95	38.11	123.31	2,219.12	-8,646.42	7,606.30	7,548.15	58.15	130.804
8,500.00	7,173.00	8,041.69	7,569.94	36.82	38.10	122.95	2,219.07	-8,646.51	7,506.42	7,448.29	58.13	129.131
8,600.00	7,173.00	8,038.81	7,567.05	37.74	38.10	122.59	2,219.03	-8,646.59	7,406.56	7,348.44	58.11	127.456
8,700.00	7,173.00	8,035.92	7,564.17	38.71	38.10	122.23	2,218.98	-8,646.67	7,306.69	7,248.60	58.09	125.780
8,800.00	7,173.00	8,033.04	7,561.29	39.71	38.09	121.86	2,218.94	-8,646.76	7,206.82	7,148.75	58.07	124.101
8,900.00	7,173.00	8,030.16	7,558.41	40.76	38.09	121.49	2,218.90	-8,646.84	7,106.96	7,048.91	58.05	122.422

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY											Offset Site Error:	0.00 usft
Survey Program: 348-APC_ISCWSA REV 2 MWD											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor
9,000.00	7,173.00	8,027.28	7,555.54	41.84	38.09	121.12	2,218.85	-8,646.93	7,007.10	6,949.07	58.03	120.741
9,100.00	7,173.00	8,024.40	7,552.66	42.96	38.08	120.75	2,218.81	-8,647.01	6,907.25	6,849.23	58.02	119.058
9,200.00	7,173.00	8,021.52	7,549.78	44.10	38.08	120.37	2,218.76	-8,647.09	6,807.40	6,749.40	58.00	117.374
9,300.00	7,173.00	8,018.65	7,546.91	45.27	38.07	119.99	2,218.72	-8,647.18	6,707.55	6,649.57	57.98	115.689
9,400.00	7,173.00	8,015.77	7,544.03	46.47	38.07	119.61	2,218.68	-8,647.26	6,607.70	6,549.74	57.96	114.002
9,500.00	7,173.00	8,012.90	7,541.16	47.70	38.07	119.22	2,218.63	-8,647.34	6,507.86	6,449.92	57.94	112.315
9,600.00	7,173.00	8,010.03	7,538.29	48.94	38.06	118.83	2,218.59	-8,647.43	6,408.02	6,350.09	57.93	110.626
9,700.00	7,173.00	8,007.15	7,535.42	50.20	38.06	118.44	2,218.54	-8,647.51	6,308.18	6,250.28	57.91	108.935
9,800.00	7,173.00	8,004.28	7,532.55	51.49	38.06	118.04	2,218.50	-8,647.60	6,208.35	6,150.46	57.89	107.244
9,900.00	7,173.00	8,001.41	7,529.68	52.79	38.05	117.65	2,218.46	-8,647.68	6,108.53	6,050.65	57.87	105.552
10,000.00	7,173.00	7,998.55	7,526.82	54.11	38.05	117.25	2,218.41	-8,647.76	6,008.70	5,950.85	57.85	103.858
10,100.00	7,173.00	7,995.68	7,523.95	55.44	38.05	116.84	2,218.37	-8,647.85	5,908.89	5,851.05	57.84	102.164
10,200.00	7,173.00	7,992.81	7,521.09	56.78	38.04	116.44	2,218.33	-8,647.93	5,809.07	5,751.25	57.82	100.468
10,300.00	7,173.00	7,989.95	7,518.22	58.14	38.04	116.03	2,218.28	-8,648.01	5,709.26	5,651.46	57.80	98.772
10,400.00	7,173.00	7,987.08	7,515.36	59.51	38.04	115.61	2,218.24	-8,648.10	5,609.46	5,551.68	57.79	97.075
10,500.00	7,173.00	7,984.22	7,512.50	60.90	38.03	115.20	2,218.19	-8,648.18	5,509.66	5,451.90	57.77	95.376
10,600.00	7,173.00	7,981.36	7,509.64	62.29	38.03	114.78	2,218.15	-8,648.26	5,409.87	5,352.12	57.75	93.677
10,700.00	7,173.00	7,978.50	7,506.78	63.69	38.03	114.36	2,218.11	-8,648.34	5,310.09	5,252.36	57.73	91.977
10,800.00	7,173.00	7,975.64	7,503.92	65.11	38.02	113.94	2,218.06	-8,648.43	5,210.31	5,152.60	57.72	90.276
10,900.00	7,173.00	7,972.78	7,501.07	66.53	38.02	113.51	2,218.02	-8,648.51	5,110.54	5,052.84	57.70	88.575
11,000.00	7,173.00	7,969.93	7,498.21	67.96	38.01	113.08	2,217.98	-8,648.59	5,010.78	4,953.10	57.68	86.872
11,100.00	7,173.00	7,967.07	7,495.36	69.39	38.01	112.65	2,217.93	-8,648.68	4,911.02	4,853.36	57.66	85.168
11,200.00	7,173.00	7,964.22	7,492.51	70.84	38.01	112.22	2,217.89	-8,648.76	4,811.27	4,753.63	57.64	83.464
11,300.00	7,173.00	7,961.36	7,489.65	72.29	38.00	111.78	2,217.85	-8,648.84	4,711.54	4,653.91	57.63	81.759
11,400.00	7,173.00	7,958.51	7,486.80	73.74	38.00	111.34	2,217.80	-8,648.92	4,611.81	4,554.20	57.61	80.052
11,500.00	7,173.00	7,955.66	7,483.95	75.21	38.00	110.90	2,217.76	-8,649.01	4,512.09	4,454.50	57.59	78.345
11,600.00	7,173.00	7,952.81	7,481.10	76.68	37.99	110.46	2,217.72	-8,649.09	4,412.38	4,354.81	57.58	76.637
11,700.00	7,173.00	7,949.96	7,478.26	78.15	37.99	110.01	2,217.67	-8,649.17	4,312.69	4,255.13	57.56	74.927
11,800.00	7,173.00	7,947.11	7,475.41	79.63	37.99	109.56	2,217.63	-8,649.25	4,213.01	4,155.46	57.54	73.216
11,900.00	7,173.00	7,944.27	7,472.57	81.11	37.98	109.11	2,217.59	-8,649.34	4,113.34	4,055.81	57.53	71.505
12,000.00	7,173.00	7,941.42	7,469.72	82.60	37.98	108.65	2,217.54	-8,649.42	4,013.68	3,956.17	57.51	69.791
12,100.00	7,173.00	7,938.58	7,466.88	84.09	37.98	108.20	2,217.50	-8,649.50	3,914.04	3,856.55	57.49	68.076
12,200.00	7,173.00	7,935.73	7,464.04	85.59	37.97	107.74	2,217.46	-8,649.58	3,814.42	3,756.94	57.48	66.360
12,300.00	7,173.00	7,932.89	7,461.20	87.09	37.97	107.27	2,217.41	-8,649.67	3,714.82	3,657.35	57.47	64.641
12,400.00	7,173.00	7,930.05	7,458.36	88.59	37.97	106.81	2,217.37	-8,649.75	3,615.23	3,557.77	57.46	62.921
12,500.00	7,173.00	7,927.21	7,455.52	90.10	37.96	106.34	2,217.33	-8,649.83	3,515.67	3,458.22	57.45	61.198
12,600.00	7,173.00	7,924.37	7,452.68	91.61	37.96	105.88	2,217.28	-8,649.91	3,416.13	3,358.69	57.44	59.473
12,700.00	7,173.00	7,921.53	7,449.85	93.13	37.96	105.41	2,217.24	-8,649.99	3,316.61	3,259.18	57.44	57.744
12,800.00	7,173.00	7,918.70	7,447.01	94.64	37.95	104.93	2,217.20	-8,650.08	3,217.12	3,159.69	57.44	56.012
12,900.00	7,173.00	7,915.86	7,444.18	96.16	37.95	104.46	2,217.16	-8,650.16	3,117.67	3,060.23	57.44	54.277
13,000.00	7,173.00	7,913.03	7,441.34	97.69	37.95	103.98	2,217.11	-8,650.24	3,018.24	2,960.79	57.45	52.537
13,100.00	7,173.00	7,910.19	7,438.51	99.21	37.94	103.50	2,217.07	-8,650.32	2,918.86	2,861.39	57.47	50.793
13,200.00	7,173.00	7,907.36	7,435.68	100.74	37.94	103.02	2,217.03	-8,650.40	2,819.51	2,762.02	57.49	49.042
13,300.00	7,173.00	7,904.53	7,432.85	102.27	37.93	102.54	2,216.98	-8,650.49	2,720.21	2,662.68	57.53	47.286
13,400.00	7,173.00	7,901.70	7,430.02	103.80	37.93	102.06	2,216.94	-8,650.57	2,620.95	2,563.38	57.58	45.522
13,500.00	7,173.00	7,898.87	7,427.20	105.33	37.93	101.57	2,216.90	-8,650.65	2,521.76	2,464.12	57.64	43.750
13,600.00	7,173.00	7,896.05	7,424.37	106.87	37.92	101.08	2,216.85	-8,650.73	2,422.62	2,364.90	57.72	41.969
13,700.00	7,173.00	7,893.22	7,421.55	108.41	37.92	100.60	2,216.81	-8,650.81	2,323.56	2,265.73	57.83	40.177
13,800.00	7,173.00	7,890.39	7,418.72	109.95	37.92	100.10	2,216.77	-8,650.89	2,224.58	2,166.61	57.97	38.373
13,900.00	7,173.00	7,887.57	7,415.90	111.49	37.91	99.61	2,216.73	-8,650.98	2,125.69	2,067.54	58.15	36.554
14,000.00	7,173.00	7,884.75	7,413.08	113.03	37.91	99.12	2,216.68	-8,651.06	2,026.90	1,968.53	58.38	34.720
14,100.00	7,173.00	7,881.92	7,410.26	114.58	37.91	98.63	2,216.64	-8,651.14	1,928.24	1,869.57	58.67	32.867

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		348-APC_ISCWSA REV 2 MWD						Rule Assigned:				Offset Well Error:	0.00 usft	
Measured Depth (usft)	Reference Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
14,200.00	7,173.00	7,879.10	7,407.44	116.13	37.90	98.13	2,216.60	-8,651.22	1,829.72	1,770.68	59.03	30.995		
14,300.00	7,173.00	7,876.28	7,404.62	117.68	37.90	97.63	2,216.56	-8,651.30	1,731.36	1,671.86	59.50	29.100		
14,400.00	7,173.00	7,873.47	7,401.80	119.23	37.90	97.13	2,216.51	-8,651.38	1,633.19	1,573.11	60.09	27.181		
14,500.00	7,173.00	7,870.65	7,398.99	120.78	37.89	96.64	2,216.47	-8,651.46	1,535.26	1,474.42	60.84	25.236		
14,600.00	7,173.00	7,867.83	7,396.17	122.33	37.89	96.14	2,216.43	-8,651.54	1,437.61	1,375.81	61.79	23.265		
14,700.00	7,173.00	7,865.02	7,393.36	123.88	37.89	95.63	2,216.39	-8,651.63	1,340.29	1,277.28	63.02	21.269		
14,800.00	7,173.00	7,862.20	7,390.55	125.44	37.88	95.13	2,216.34	-8,651.71	1,243.40	1,178.81	64.59	19.252		
14,900.00	7,173.00	7,859.39	7,387.73	127.00	37.88	94.63	2,216.30	-8,651.79	1,147.03	1,080.42	66.61	17.221		
15,000.00	7,173.00	7,856.58	7,384.92	128.55	37.88	94.13	2,216.26	-8,651.87	1,051.34	982.12	69.22	15.188		
15,100.00	7,173.00	7,853.77	7,382.11	130.11	37.87	93.62	2,216.21	-8,651.95	956.51	883.91	72.61	13.174		
15,200.00	7,173.00	7,850.96	7,379.31	131.67	37.87	93.12	2,216.17	-8,652.03	862.85	785.83	77.02	11.203		
15,300.00	7,173.00	7,848.15	7,376.50	133.23	37.87	92.61	2,216.13	-8,652.11	770.77	687.99	82.78	9.311		
15,400.00	7,173.00	7,845.34	7,373.69	134.80	37.86	92.11	2,216.09	-8,652.19	680.92	590.57	90.35	7.537		
15,500.00	7,173.00	7,842.53	7,370.89	136.36	37.86	91.60	2,216.05	-8,652.27	594.30	494.02	100.29	5.926		
15,600.00	7,173.00	7,839.73	7,368.08	137.92	37.86	91.10	2,216.00	-8,652.35	512.57	399.31	113.26	4.526		
15,700.00	7,173.00	7,836.92	7,365.28	139.49	37.85	90.59	2,215.96	-8,652.43	438.45	308.70	129.75	3.379		
15,800.00	7,173.00	7,834.12	7,362.48	141.05	37.85	90.09	2,215.92	-8,652.51	376.49	227.41	149.07	2.525		
15,900.00	7,173.00	7,831.32	7,359.68	142.62	37.85	89.58	2,215.88	-8,652.60	333.50	166.20	167.30	1.993		
16,000.00	7,173.00	7,828.52	7,356.88	144.19	37.84	89.08	2,215.83	-8,652.68	317.32	140.88	176.44	1.798		
16,004.45	7,173.00	7,828.39	7,356.76	144.26	37.84	89.05	2,215.83	-8,652.68	317.31	140.80	176.51	1.798	CC, ES, SF	
16,100.00	7,173.00	7,825.72	7,354.08	145.76	37.84	88.57	2,215.79	-8,652.76	331.88	160.63	171.25	1.938		
16,200.00	7,173.00	7,822.92	7,351.28	147.33	37.83	88.06	2,215.75	-8,652.84	373.61	216.97	156.63	2.385		
16,300.00	7,173.00	7,820.12	7,348.49	148.90	37.83	87.56	2,215.71	-8,652.92	434.74	294.08	140.67	3.091		
16,400.00	7,173.00	7,817.33	7,345.69	150.47	37.83	87.06	2,215.67	-8,653.00	508.34	381.10	127.23	3.995		
16,500.00	7,173.00	7,814.53	7,342.90	152.04	37.82	86.55	2,215.62	-8,653.08	589.74	472.93	116.81	5.049		
16,600.00	7,173.00	7,811.74	7,340.11	153.61	37.82	86.05	2,215.58	-8,653.16	676.14	567.32	108.83	6.213		
16,700.00	7,173.00	7,808.94	7,337.31	155.18	37.82	85.55	2,215.54	-8,653.24	765.85	663.21	102.65	7.461		
16,800.00	7,173.00	7,806.15	7,334.52	156.76	37.81	85.04	2,215.50	-8,653.32	857.83	760.05	97.78	8.773		
16,900.00	7,173.00	7,803.36	7,331.73	158.33	37.81	84.54	2,215.45	-8,653.40	951.42	857.54	93.88	10.135		
17,000.00	7,173.00	7,800.57	7,328.95	159.90	37.81	84.04	2,215.41	-8,653.48	1,046.19	955.48	90.70	11.534		
17,100.00	7,173.00	7,797.78	7,326.16	161.48	37.80	83.54	2,215.37	-8,653.56	1,141.84	1,053.76	88.09	12.963		
17,200.00	7,173.00	7,794.99	7,323.37	163.06	37.80	83.05	2,215.33	-8,653.64	1,238.18	1,152.28	85.90	14.414		
17,300.00	7,173.00	7,792.21	7,320.59	164.63	37.80	82.55	2,215.29	-8,653.72	1,335.05	1,250.99	84.06	15.883		
17,400.00	7,173.00	7,789.42	7,317.80	166.21	37.79	82.05	2,215.25	-8,653.80	1,432.34	1,349.86	82.49	17.365		
17,500.00	7,173.00	7,786.64	7,315.02	167.79	37.79	81.56	2,215.20	-8,653.88	1,529.98	1,448.84	81.13	18.857		
17,600.00	7,173.00	7,783.85	7,312.24	169.36	37.79	81.07	2,215.16	-8,653.96	1,627.90	1,547.93	79.96	20.358		
17,700.00	7,173.00	7,781.07	7,309.46	170.94	37.78	80.57	2,215.12	-8,654.04	1,726.05	1,647.11	78.94	21.864		
17,800.00	7,173.00	7,778.29	7,306.68	172.52	37.78	80.08	2,215.08	-8,654.12	1,824.40	1,746.35	78.05	23.374		
17,900.00	7,173.00	7,775.51	7,303.90	174.10	37.78	79.59	2,215.04	-8,654.20	1,922.92	1,845.65	77.26	24.888		
18,000.00	7,173.00	7,772.73	7,301.12	175.68	37.77	79.11	2,214.99	-8,654.28	2,021.58	1,945.01	76.57	26.403		
18,100.00	7,173.00	7,769.95	7,298.35	177.26	37.77	78.62	2,214.95	-8,654.35	2,120.36	2,044.41	75.95	27.919		
18,200.00	7,173.00	7,767.18	7,295.57	178.84	37.77	78.14	2,214.91	-8,654.43	2,219.24	2,143.85	75.39	29.436		
18,300.00	7,173.00	7,764.40	7,292.80	180.42	37.76	77.66	2,214.87	-8,654.51	2,318.22	2,243.32	74.90	30.952		
18,400.00	7,173.00	7,761.63	7,290.02	182.00	37.76	77.18	2,214.83	-8,654.59	2,417.28	2,342.83	74.45	32.467		
18,500.00	7,173.00	7,758.85	7,287.25	183.59	37.76	76.70	2,214.79	-8,654.67	2,516.41	2,442.36	74.05	33.982		
18,600.00	7,173.00	7,756.08	7,284.48	185.17	37.75	76.22	2,214.74	-8,654.75	2,615.60	2,541.91	73.69	35.494		
18,700.00	7,173.00	7,753.31	7,281.71	186.75	37.75	75.75	2,214.70	-8,654.83	2,714.85	2,641.49	73.37	37.004		
18,800.00	7,173.00	7,750.54	7,278.94	188.33	37.75	75.27	2,214.66	-8,654.91	2,814.15	2,741.08	73.07	38.513		
18,900.00	7,173.00	7,747.77	7,276.17	189.92	37.74	74.80	2,214.62	-8,654.99	2,913.50	2,840.70	72.80	40.019		
19,000.00	7,173.00	7,745.00	7,273.41	191.50	37.74	74.33	2,214.58	-8,655.07	3,012.89	2,940.32	72.56	41.522		
19,100.00	7,173.00	7,742.23	7,270.64	193.09	37.74	73.87	2,214.54	-8,655.15	3,112.31	3,039.97	72.34	43.022		
19,200.00	7,173.00	7,739.47	7,267.88	194.67	37.73	73.40	2,214.50	-8,655.23	3,211.76	3,139.62	72.14	44.520		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #006C - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program: 348-APC_ISCWSA REV 2 MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
19,249.41	7,173.00	7,738.10	7,266.51	195.45	37.73	73.18	2,214.47	-8,655.26	3,260.92	3,188.87	72.05	45.259		
19,300.00	7,173.00	7,736.70	7,265.11	196.25	37.73	72.94	2,214.45	-8,655.30	3,311.25	3,239.29	71.96	46.015		
19,384.41	7,173.00	7,734.37	7,262.78	197.34	37.73	72.55	2,214.42	-8,655.37	3,395.25	3,319.90	75.35	45.058		

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program: 200-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	187.00	187.00	0.00	5.60	-82.34	1,371.02	-10,194.80	10,286.57				
125.00	125.00	315.84	315.79	0.06	9.46	-126.85	1,371.87	-10,194.79	10,287.04	10,277.53	9.51	1,081.696	
225.00	224.98	412.14	411.98	0.17	12.35	167.29	1,371.02	-10,194.80	10,288.63	10,276.12	12.51	822.642	
319.00	318.92	508.02	507.84	0.28	15.22	156.47	1,371.88	-10,194.79	10,291.81	10,276.31	15.50	664.116	
400.00	399.86	614.54	614.33	0.37	18.41	156.47	1,370.74	-10,194.80	10,294.69	10,275.91	18.78	548.214	
469.00	468.80	656.09	655.80	0.52	19.66	156.48	1,371.02	-10,194.80	10,297.24	10,277.06	20.18	510.341	
500.00	499.78	687.06	686.78	0.61	20.59	171.50	1,371.02	-10,194.80	10,298.37	10,277.17	21.19	485.898	
600.00	599.71	814.54	814.21	0.92	24.41	-137.08	1,370.74	-10,194.80	10,301.73	10,276.40	25.33	406.710	
700.00	699.55	886.96	886.55	1.26	26.58	-113.16	1,371.02	-10,194.80	10,304.68	10,276.84	27.83	370.215	
800.00	799.19	1,013.70	1,013.24	1.60	30.37	-103.26	1,370.76	-10,194.80	10,307.21	10,275.24	31.98	322.316	
900.00	898.49	1,086.01	1,085.49	1.97	32.54	-98.17	1,371.02	-10,194.80	10,309.34	10,274.83	34.51	298.771	
1,000.00	997.33	1,210.77	1,210.20	2.34	36.28	-95.19	1,370.82	-10,194.80	10,311.08	10,272.46	38.62	266.994	
1,100.00	1,095.61	1,283.26	1,282.61	2.74	38.45	-93.22	1,371.02	-10,194.80	10,312.41	10,271.23	41.18	250.399	
1,196.26	1,189.56	1,399.90	1,399.21	3.13	41.95	-91.95	1,371.02	-10,194.80	10,313.38	10,268.30	45.08	228.801	
1,200.00	1,193.19	1,404.58	1,403.89	3.15	42.09	-91.96	1,370.93	-10,194.80	10,313.40	10,268.17	45.23	228.012	
1,300.00	1,290.42	1,478.19	1,477.42	3.58	44.29	-92.05	1,371.02	-10,194.80	10,314.22	10,266.35	47.87	215.484	
1,400.00	1,387.65	1,596.55	1,595.74	4.01	47.84	-92.21	1,371.07	-10,194.80	10,315.14	10,263.29	51.85	198.953	
1,500.00	1,484.87	1,672.77	1,671.87	4.45	50.12	-92.31	1,371.02	-10,194.80	10,316.05	10,261.48	54.57	189.039	
1,600.00	1,582.10	1,788.69	1,787.76	4.90	53.60	-92.46	1,371.20	-10,194.79	10,317.08	10,258.60	58.49	176.395	
1,700.00	1,679.33	1,867.34	1,866.33	5.34	55.95	-92.56	1,371.02	-10,194.80	10,318.09	10,256.80	61.29	168.344	
1,800.00	1,776.55	1,980.99	1,979.94	5.79	59.36	-92.71	1,371.32	-10,194.79	10,319.24	10,254.09	65.15	158.402	
1,900.00	1,873.78	2,061.92	2,060.78	6.24	61.78	-92.81	1,371.02	-10,194.80	10,320.35	10,252.33	68.02	151.723	
2,000.00	1,971.01	2,173.44	2,172.27	6.69	65.13	-92.95	1,371.42	-10,194.79	10,321.61	10,249.79	71.81	143.726	
2,100.00	2,068.23	2,256.49	2,255.23	7.15	67.61	-93.06	1,371.02	-10,194.80	10,322.81	10,248.06	74.76	138.087	
2,200.00	2,165.46	2,366.04	2,364.75	7.60	70.90	-93.20	1,371.51	-10,194.79	10,324.18	10,245.69	78.49	131.531	
2,300.00	2,262.69	2,451.07	2,449.69	8.06	73.45	-93.32	1,371.02	-10,194.80	10,325.49	10,244.00	81.49	126.703	
2,400.00	2,359.91	2,558.79	2,557.38	8.51	76.67	-93.45	1,371.59	-10,194.79	10,326.97	10,241.79	85.18	121.242	
2,500.00	2,457.14	2,645.64	2,644.14	8.97	79.28	-93.57	1,371.02	-10,194.80	10,328.38	10,240.14	88.23	117.056	
2,600.00	2,554.37	2,751.68	2,750.15	9.42	82.45	-93.70	1,371.66	-10,194.79	10,329.97	10,238.10	91.87	112.444	
2,700.00	2,651.59	2,840.22	2,838.59	9.88	85.11	-93.82	1,371.02	-10,194.80	10,331.48	10,236.50	94.98	108.779	
2,800.00	2,748.82	2,944.70	2,943.06	10.34	88.24	-93.95	1,371.71	-10,194.79	10,333.17	10,234.61	98.56	104.837	
2,900.00	2,846.05	3,034.79	3,033.05	10.80	90.94	-94.07	1,371.02	-10,194.80	10,334.79	10,233.07	101.72	101.601	
3,000.00	2,943.27	3,137.86	3,136.09	11.25	94.02	-94.20	1,371.76	-10,194.79	10,336.59	10,231.32	105.26	98.196	
3,100.00	3,040.50	3,229.37	3,227.50	11.71	96.77	-94.32	1,371.02	-10,194.80	10,338.31	10,229.84	108.46	95.316	
3,200.00	3,137.73	3,331.15	3,329.26	12.17	99.82	-94.45	1,371.80	-10,194.79	10,340.21	10,228.24	111.97	92.347	
3,300.00	3,234.95	3,423.94	3,421.95	12.63	102.60	-94.57	1,371.02	-10,194.80	10,342.04	10,226.83	115.21	89.768	
3,400.00	3,332.18	3,524.57	3,522.56	13.09	105.61	-94.70	1,371.84	-10,194.79	10,344.05	10,225.37	118.68	87.159	
3,500.00	3,429.40	3,618.52	3,616.40	13.55	108.43	-94.83	1,371.02	-10,194.80	10,345.98	10,224.03	121.95	84.836	
3,600.00	3,526.63	3,718.10	3,715.97	14.00	111.41	-94.95	1,371.86	-10,194.79	10,348.09	10,222.70	125.39	82.524	
3,700.00	3,623.86	3,813.09	3,810.86	14.46	114.26	-95.08	1,371.02	-10,194.80	10,350.13	10,221.43	128.70	80.422	
3,800.00	3,721.08	3,911.76	3,909.51	14.92	117.21	-95.20	1,371.88	-10,194.79	10,352.34	10,220.23	132.11	78.360	
3,900.00	3,818.31	4,007.67	4,005.31	15.38	120.09	-95.33	1,371.02	-10,194.80	10,354.49	10,219.05	135.44	76.449	
4,000.00	3,915.54	4,105.53	4,103.16	15.84	123.02	-95.45	1,371.89	-10,194.79	10,356.80	10,217.97	138.83	74.599	
4,100.00	4,012.76	4,202.24	4,199.76	16.30	125.92	-95.58	1,371.02	-10,194.80	10,359.06	10,216.87	142.19	72.854	
4,200.00	4,109.99	4,299.47	4,296.99	16.76	128.83	-95.70	1,371.02	-10,194.80	10,361.42	10,215.87	145.56	71.183	
4,300.00	4,207.22	4,407.68	4,405.16	17.22	132.07	-95.84	1,370.88	-10,194.80	10,363.84	10,214.58	149.26	69.435	
4,400.00	4,304.44	4,494.04	4,491.44	17.68	134.66	-95.95	1,371.02	-10,194.80	10,366.31	10,214.00	152.31	68.063	
4,500.00	4,401.67	4,600.73	4,598.09	18.14	137.86	-96.09	1,371.00	-10,194.80	10,368.83	10,212.87	155.96	66.484	
4,600.00	4,498.90	4,688.62	4,685.90	18.60	140.49	-96.20	1,371.02	-10,194.80	10,371.40	10,212.35	159.05	65.208	
4,700.00	4,596.12	4,793.91	4,791.15	19.06	143.65	-96.34	1,371.12	-10,194.80	10,374.03	10,211.37	162.66	63.776	
4,800.00	4,693.35	4,883.19	4,880.35	19.52	146.32	-96.45	1,371.02	-10,194.80	10,376.70	10,210.91	165.80	62.587	
4,900.00	4,790.58	4,987.20	4,984.32	19.98	149.44	-96.58	1,371.22	-10,194.79	10,379.44	10,210.07	169.37	61.283	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC											Offset Site Error:	0.00 usft
Survey Program: 200-A027Ua_INC-ONLY											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor
Warning												
5,000.00	4,887.80	5,077.77	5,074.80	20.44	152.15	-96.70	1,371.02	-10,194.80	10,382.21	10,209.67	172.54	60.173
5,100.00	4,985.03	5,180.61	5,177.61	20.90	155.23	-96.83	1,371.32	-10,194.79	10,385.05	10,208.98	176.08	58.979
5,200.00	5,082.26	5,272.34	5,269.26	21.36	157.98	-96.95	1,371.02	-10,194.80	10,387.93	10,208.64	179.28	57.941
5,300.00	5,179.48	5,374.14	5,371.02	21.82	161.03	-97.08	1,371.41	-10,194.79	10,390.88	10,208.08	182.79	56.845
5,400.00	5,276.71	5,466.92	5,463.71	22.27	163.81	-97.20	1,371.02	-10,194.80	10,393.85	10,207.82	186.03	55.872
5,500.00	5,373.94	5,567.77	5,564.53	22.73	166.84	-97.33	1,371.49	-10,194.79	10,396.90	10,207.39	189.51	54.863
5,600.00	5,471.16	5,661.49	5,658.16	23.19	169.64	-97.45	1,371.02	-10,194.80	10,399.98	10,207.21	192.77	53.949
5,700.00	5,568.39	5,761.52	5,758.16	23.65	172.64	-97.57	1,371.56	-10,194.79	10,403.14	10,206.91	196.23	53.016
5,800.00	5,665.62	5,856.07	5,852.62	24.11	175.47	-97.70	1,371.02	-10,194.80	10,406.32	10,206.80	199.52	52.158
5,900.00	5,762.84	5,955.36	5,951.89	24.57	178.45	-97.82	1,371.62	-10,194.79	10,409.58	10,206.63	202.95	51.292
6,000.00	5,860.07	6,050.64	6,047.07	25.03	181.30	-97.95	1,371.02	-10,194.80	10,412.86	10,206.60	206.26	50.484
6,100.00	5,957.30	6,149.31	6,145.72	25.50	184.26	-98.07	1,371.68	-10,194.79	10,416.22	10,206.55	209.67	49.678
6,200.00	6,054.52	6,245.22	6,241.52	25.96	187.13	-98.19	1,371.02	-10,194.80	10,419.61	10,206.61	213.00	48.918
6,300.00	6,151.75	6,343.36	6,339.64	26.42	190.08	-98.31	1,371.72	-10,194.79	10,423.07	10,206.67	216.40	48.166
6,400.00	6,248.98	6,439.79	6,435.98	26.88	192.97	-98.44	1,371.02	-10,194.80	10,426.56	10,206.82	219.75	47.448
6,500.00	6,346.20	6,537.51	6,533.67	27.34	195.89	-98.56	1,371.77	-10,194.79	10,430.12	10,206.99	223.13	46.745
6,600.00	6,443.43	6,634.37	6,630.43	27.80	198.80	-98.69	1,371.02	-10,194.80	10,433.72	10,207.24	226.49	46.067
6,696.38	6,537.14	6,728.22	6,724.26	28.24	201.61	-98.80	1,371.82	-10,194.79	10,437.25	10,207.51	229.74	45.431
6,700.00	6,540.66	6,731.75	6,727.79	28.26	201.71	-97.46	1,371.80	-10,194.79	10,437.37	10,207.51	229.86	45.407
6,750.00	6,589.27	6,780.46	6,776.49	28.48	203.17	-78.97	1,371.32	-10,194.79	10,436.97	10,205.43	231.55	45.075
6,800.00	6,637.66	6,828.72	6,824.66	28.71	204.62	-62.98	1,371.02	-10,194.80	10,432.67	10,199.45	233.22	44.733
6,850.00	6,685.53	6,876.60	6,872.53	28.92	206.05	-50.94	1,371.02	-10,194.80	10,424.49	10,189.62	234.88	44.383
6,900.00	6,732.60	6,923.58	6,919.50	29.13	207.46	-42.34	1,371.84	-10,194.79	10,412.49	10,175.99	236.50	44.028
6,950.00	6,778.56	6,969.26	6,965.17	29.32	208.83	-36.23	1,371.47	-10,194.79	10,396.73	10,158.65	238.08	43.670
7,000.00	6,823.13	7,014.32	7,010.13	29.51	210.18	-31.83	1,371.02	-10,194.80	10,377.32	10,137.69	239.63	43.306
7,050.00	6,866.05	7,057.23	7,053.05	29.68	211.47	-28.59	1,371.02	-10,194.80	10,354.37	10,113.26	241.10	42.946
7,100.00	6,907.04	7,098.22	7,094.04	29.85	212.69	-26.20	1,371.02	-10,194.80	10,328.02	10,085.51	242.51	42.587
7,150.00	6,945.85	7,136.55	7,132.35	30.01	213.84	-24.42	1,371.77	-10,194.79	10,298.43	10,054.60	243.83	42.236
7,200.00	6,982.24	7,172.37	7,168.15	30.15	214.92	-23.14	1,371.43	-10,194.79	10,265.80	10,020.74	245.06	41.890
7,250.00	7,016.00	7,207.30	7,203.00	30.29	215.96	-22.26	1,371.02	-10,194.80	10,230.32	9,984.06	246.26	41.543
7,300.00	7,046.90	7,238.20	7,233.90	30.43	216.89	-21.73	1,371.02	-10,194.80	10,192.19	9,944.87	247.32	41.211
7,350.00	7,074.76	7,266.07	7,261.76	30.56	217.72	-21.55	1,371.02	-10,194.80	10,151.67	9,903.39	248.27	40.889
7,400.00	7,099.42	7,290.72	7,286.42	30.69	218.46	-21.74	1,371.02	-10,194.80	10,108.99	9,859.86	249.12	40.579
7,450.00	7,120.70	7,311.75	7,307.42	30.82	219.09	-22.38	1,371.88	-10,194.79	10,064.40	9,814.55	249.85	40.282
7,500.00	7,138.50	7,329.12	7,324.80	30.95	219.61	-23.68	1,371.81	-10,194.79	10,018.21	9,767.76	250.45	40.001
7,550.00	7,152.68	7,342.95	7,338.62	31.10	220.03	-26.06	1,371.73	-10,194.79	9,970.68	9,719.75	250.93	39.734
7,600.00	7,163.18	7,353.16	7,348.83	31.25	220.33	-30.59	1,371.64	-10,194.79	9,922.11	9,670.81	251.30	39.483
7,650.00	7,169.92	7,359.69	7,355.36	31.41	220.53	-40.81	1,371.58	-10,194.79	9,872.79	9,621.25	251.54	39.249
7,700.00	7,172.86	7,362.53	7,358.20	31.59	220.61	-72.42	1,371.55	-10,194.79	9,823.03	9,571.37	251.66	39.033
7,713.53	7,173.00	7,362.66	7,358.33	31.64	220.62	-89.84	1,371.55	-10,194.79	9,809.53	9,557.86	251.68	38.977
7,800.00	7,173.00	7,362.62	7,358.28	31.99	220.62	-89.84	1,371.55	-10,194.79	9,723.22	9,471.50	251.72	38.627
7,900.00	7,173.00	7,362.57	7,358.24	32.47	220.62	-89.83	1,371.55	-10,194.79	9,623.41	9,371.63	251.78	38.221
8,000.00	7,173.00	7,362.52	7,358.19	33.03	220.61	-89.83	1,371.55	-10,194.79	9,523.61	9,271.76	251.84	37.816
8,100.00	7,173.00	7,362.47	7,358.14	33.66	220.61	-89.82	1,371.55	-10,194.79	9,423.80	9,171.90	251.90	37.410
8,200.00	7,173.00	7,362.43	7,358.09	34.36	220.61	-89.82	1,371.55	-10,194.79	9,324.01	9,072.04	251.97	37.005
8,300.00	7,173.00	7,362.38	7,358.05	35.13	220.61	-89.81	1,371.55	-10,194.79	9,224.21	8,972.18	252.04	36.599
8,400.00	7,173.00	7,362.33	7,358.00	35.95	220.61	-89.81	1,371.55	-10,194.79	9,124.43	8,872.32	252.11	36.193
8,500.00	7,173.00	7,362.28	7,357.95	36.82	220.61	-89.80	1,371.55	-10,194.79	9,024.64	8,772.46	252.18	35.787
8,600.00	7,173.00	7,362.24	7,357.90	37.74	220.61	-89.80	1,371.55	-10,194.79	8,924.86	8,672.61	252.25	35.381
8,700.00	7,173.00	7,362.19	7,357.86	38.71	220.60	-89.79	1,371.55	-10,194.79	8,825.09	8,572.76	252.33	34.975
8,800.00	7,173.00	7,362.14	7,357.81	39.71	220.60	-89.79	1,371.55	-10,194.79	8,725.32	8,472.91	252.41	34.568
8,900.00	7,173.00	7,362.09	7,357.76	40.76	220.60	-89.78	1,371.55	-10,194.79	8,625.56	8,373.07	252.49	34.162

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC											Offset Site Error:	0.00 usft
Survey Program: 200-A027Ua_INC-ONLY											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Warning
9,000.00	7,173.00	7,362.05	7,357.71	41.84	220.60	-89.78	1,371.55	-10,194.79	8,525.80	8,273.22	252.57	33.756
9,100.00	7,173.00	7,362.00	7,357.67	42.96	220.60	-89.78	1,371.55	-10,194.79	8,426.04	8,173.38	252.66	33.349
9,200.00	7,173.00	7,361.95	7,357.62	44.10	220.60	-89.77	1,371.55	-10,194.79	8,326.30	8,073.55	252.75	32.943
9,300.00	7,173.00	7,361.91	7,357.57	45.27	220.60	-89.77	1,371.55	-10,194.79	8,226.56	7,973.71	252.85	32.536
9,400.00	7,173.00	7,361.86	7,357.53	46.47	220.59	-89.76	1,371.55	-10,194.79	8,126.82	7,873.88	252.94	32.129
9,500.00	7,173.00	7,361.81	7,357.48	47.70	220.59	-89.76	1,371.56	-10,194.79	8,027.10	7,774.06	253.04	31.723
9,600.00	7,173.00	7,361.77	7,357.43	48.94	220.59	-89.75	1,371.56	-10,194.79	7,927.38	7,674.23	253.14	31.316
9,700.00	7,173.00	7,361.72	7,357.39	50.20	220.59	-89.75	1,371.56	-10,194.79	7,827.66	7,574.41	253.25	30.909
9,800.00	7,173.00	7,361.67	7,357.34	51.49	220.59	-89.74	1,371.56	-10,194.79	7,727.96	7,474.60	253.36	30.502
9,900.00	7,173.00	7,361.63	7,357.29	52.79	220.59	-89.74	1,371.56	-10,194.79	7,628.26	7,374.79	253.47	30.095
10,000.00	7,173.00	7,361.58	7,357.25	54.11	220.59	-89.74	1,371.56	-10,194.79	7,528.57	7,274.98	253.59	29.688
10,100.00	7,173.00	7,361.53	7,357.20	55.44	220.58	-89.73	1,371.56	-10,194.79	7,428.89	7,175.18	253.71	29.281
10,200.00	7,173.00	7,361.49	7,357.16	56.78	220.58	-89.73	1,371.56	-10,194.79	7,329.21	7,075.38	253.83	28.874
10,300.00	7,173.00	7,361.44	7,357.11	58.14	220.58	-89.72	1,371.56	-10,194.79	7,229.55	6,975.59	253.96	28.467
10,400.00	7,173.00	7,361.40	7,357.06	59.51	220.58	-89.72	1,371.56	-10,194.79	7,129.90	6,875.80	254.09	28.060
10,500.00	7,173.00	7,361.35	7,357.02	60.90	220.58	-89.71	1,371.56	-10,194.79	7,030.25	6,776.02	254.23	27.653
10,600.00	7,173.00	7,361.30	7,356.97	62.29	220.58	-89.71	1,371.56	-10,194.79	6,930.62	6,676.24	254.37	27.246
10,700.00	7,173.00	7,361.26	7,356.93	63.69	220.58	-89.70	1,371.56	-10,194.79	6,830.99	6,576.47	254.52	26.839
10,800.00	7,173.00	7,361.21	7,356.88	65.11	220.58	-89.70	1,371.56	-10,194.79	6,731.38	6,476.71	254.67	26.432
10,900.00	7,173.00	7,361.17	7,356.83	66.53	220.57	-89.70	1,371.56	-10,194.79	6,631.78	6,376.95	254.83	26.025
11,000.00	7,173.00	7,361.12	7,356.79	67.96	220.57	-89.69	1,371.56	-10,194.79	6,532.19	6,277.20	254.99	25.617
11,100.00	7,173.00	7,361.07	7,356.74	69.39	220.57	-89.69	1,371.56	-10,194.79	6,432.61	6,177.46	255.16	25.210
11,200.00	7,173.00	7,361.03	7,356.70	70.84	220.57	-89.68	1,371.56	-10,194.79	6,333.05	6,077.72	255.33	24.803
11,300.00	7,173.00	7,360.98	7,356.65	72.29	220.57	-89.68	1,371.56	-10,194.79	6,233.50	5,977.99	255.51	24.396
11,400.00	7,173.00	7,360.94	7,356.61	73.74	220.57	-89.67	1,371.56	-10,194.79	6,133.97	5,878.27	255.70	23.989
11,500.00	7,173.00	7,360.89	7,356.56	75.21	220.57	-89.67	1,371.56	-10,194.79	6,034.45	5,778.56	255.89	23.582
11,600.00	7,173.00	7,360.85	7,356.51	76.68	220.56	-89.67	1,371.57	-10,194.79	5,934.94	5,678.86	256.09	23.175
11,700.00	7,173.00	7,360.80	7,356.47	78.15	220.56	-89.66	1,371.57	-10,194.79	5,835.46	5,579.16	256.29	22.769
11,800.00	7,173.00	7,360.76	7,356.42	79.63	220.56	-89.66	1,371.57	-10,194.79	5,735.99	5,479.48	256.51	22.362
11,900.00	7,173.00	7,360.71	7,356.38	81.11	220.56	-89.65	1,371.57	-10,194.79	5,636.54	5,379.81	256.73	21.955
12,000.00	7,173.00	7,360.67	7,356.33	82.60	220.56	-89.65	1,371.57	-10,194.79	5,537.11	5,280.15	256.96	21.548
12,100.00	7,173.00	7,360.62	7,356.29	84.09	220.56	-89.64	1,371.57	-10,194.79	5,437.70	5,180.50	257.21	21.141
12,200.00	7,173.00	7,360.58	7,356.24	85.59	220.56	-89.64	1,371.57	-10,194.79	5,338.32	5,080.86	257.46	20.735
12,300.00	7,173.00	7,360.53	7,356.20	87.09	220.55	-89.63	1,371.57	-10,194.79	5,238.96	4,981.24	257.72	20.328
12,400.00	7,173.00	7,360.49	7,356.15	88.59	220.55	-89.63	1,371.57	-10,194.79	5,139.62	4,881.63	257.99	19.922
12,500.00	7,173.00	7,360.44	7,356.11	90.10	220.55	-89.63	1,371.57	-10,194.79	5,040.31	4,782.03	258.27	19.515
12,600.00	7,173.00	7,360.40	7,356.07	91.61	220.55	-89.62	1,371.57	-10,194.79	4,941.02	4,682.45	258.57	19.109
12,700.00	7,173.00	7,360.35	7,356.02	93.13	220.55	-89.62	1,371.57	-10,194.79	4,841.77	4,582.89	258.88	18.703
12,800.00	7,173.00	7,360.31	7,355.98	94.64	220.55	-89.61	1,371.57	-10,194.79	4,742.54	4,483.34	259.20	18.297
12,900.00	7,173.00	7,360.26	7,355.93	96.16	220.55	-89.61	1,371.57	-10,194.79	4,643.35	4,383.82	259.54	17.891
13,000.00	7,173.00	7,360.22	7,355.89	97.69	220.55	-89.60	1,371.57	-10,194.79	4,544.20	4,284.31	259.89	17.485
13,100.00	7,173.00	7,360.18	7,355.84	99.21	220.54	-89.60	1,371.57	-10,194.79	4,445.08	4,184.82	260.26	17.079
13,200.00	7,173.00	7,360.13	7,355.80	100.74	220.54	-89.60	1,371.57	-10,194.79	4,346.01	4,085.36	260.65	16.674
13,300.00	7,173.00	7,360.09	7,355.76	102.27	220.54	-89.59	1,371.57	-10,194.79	4,246.97	3,985.92	261.05	16.269
13,400.00	7,173.00	7,360.04	7,355.71	103.80	220.54	-89.59	1,371.57	-10,194.79	4,147.99	3,886.50	261.48	15.863
13,500.00	7,173.00	7,360.00	7,355.67	105.33	220.54	-89.58	1,371.57	-10,194.79	4,049.05	3,787.12	261.93	15.458
13,600.00	7,173.00	7,359.96	7,355.62	106.87	220.54	-89.58	1,371.57	-10,194.79	3,950.17	3,687.76	262.41	15.053
13,700.00	7,173.00	7,359.91	7,355.58	108.41	220.54	-89.58	1,371.58	-10,194.79	3,851.34	3,588.43	262.91	14.649
13,800.00	7,173.00	7,359.87	7,355.54	109.95	220.53	-89.57	1,371.58	-10,194.79	3,752.58	3,489.14	263.44	14.245
13,900.00	7,173.00	7,359.82	7,355.49	111.49	220.53	-89.57	1,371.58	-10,194.79	3,653.88	3,389.88	264.00	13.840
14,000.00	7,173.00	7,359.78	7,355.45	113.03	220.53	-89.56	1,371.58	-10,194.79	3,555.26	3,290.67	264.60	13.437
14,100.00	7,173.00	7,359.74	7,355.40	114.58	220.53	-89.56	1,371.58	-10,194.79	3,456.72	3,191.49	265.23	13.033

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC											Offset Site Error:	0.00 usft
Survey Program: 200-A027Ua_INC-ONLY											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre	+N/-S (usft)	+E/-W (usft)	Distance	Minimum Separation (usft)	Warning
				(usft)	(usft)					Between Centres (usft)	Between Ellipses (usft)	
14,200.00	7,173.00	7,359.69	7,355.36	116.13	220.53	-89.55	1,371.58	-10,194.79	3,358.26	3,092.36	265.90	12.630
14,300.00	7,173.00	7,359.65	7,355.32	117.68	220.53	-89.55	1,371.58	-10,194.79	3,259.90	2,993.29	266.61	12.227
14,400.00	7,173.00	7,359.61	7,355.27	119.23	220.53	-89.55	1,371.58	-10,194.79	3,161.64	2,894.26	267.37	11.825
14,500.00	7,173.00	7,359.56	7,355.23	120.78	220.53	-89.54	1,371.58	-10,194.79	3,063.49	2,795.30	268.18	11.423
14,600.00	7,173.00	7,359.52	7,355.19	122.33	220.52	-89.54	1,371.58	-10,194.79	2,965.46	2,696.41	269.06	11.022
14,700.00	7,173.00	7,359.48	7,355.14	123.88	220.52	-89.53	1,371.58	-10,194.79	2,867.57	2,597.58	269.99	10.621
14,800.00	7,173.00	7,359.43	7,355.10	125.44	220.52	-89.53	1,371.58	-10,194.79	2,769.84	2,498.84	271.00	10.221
14,900.00	7,173.00	7,359.39	7,355.06	127.00	220.52	-89.52	1,371.58	-10,194.79	2,672.27	2,400.19	272.08	9.822
15,000.00	7,173.00	7,359.35	7,355.01	128.55	220.52	-89.52	1,371.58	-10,194.79	2,574.88	2,301.63	273.25	9.423
15,100.00	7,173.00	7,359.30	7,354.97	130.11	220.52	-89.52	1,371.58	-10,194.79	2,477.71	2,203.19	274.52	9.026
15,200.00	7,173.00	7,359.26	7,354.93	131.67	220.52	-89.51	1,371.58	-10,194.79	2,380.77	2,104.87	275.89	8.629
15,300.00	7,173.00	7,359.22	7,354.88	133.23	220.52	-89.51	1,371.58	-10,194.79	2,284.09	2,006.70	277.39	8.234
15,400.00	7,173.00	7,359.17	7,354.84	134.80	220.51	-89.50	1,371.58	-10,194.79	2,187.71	1,908.68	279.03	7.840
15,500.00	7,173.00	7,359.13	7,354.80	136.36	220.51	-89.50	1,371.58	-10,194.79	2,091.67	1,810.85	280.82	7.448
15,600.00	7,173.00	7,359.09	7,354.76	137.92	220.51	-89.50	1,371.58	-10,194.79	1,996.02	1,713.23	282.79	7.058
15,700.00	7,173.00	7,359.05	7,354.71	139.49	220.51	-89.49	1,371.58	-10,194.79	1,900.82	1,615.85	284.96	6.670
15,800.00	7,173.00	7,359.00	7,354.67	141.05	220.51	-89.49	1,371.58	-10,194.79	1,806.13	1,518.77	287.37	6.285
15,900.00	7,173.00	7,358.96	7,354.63	142.62	220.51	-89.48	1,371.59	-10,194.79	1,712.06	1,422.02	290.04	5.903
16,000.00	7,173.00	7,358.92	7,354.59	144.19	220.51	-89.48	1,371.59	-10,194.79	1,618.69	1,325.68	293.01	5.524
16,100.00	7,173.00	7,358.88	7,354.54	145.76	220.51	-89.48	1,371.59	-10,194.79	1,526.16	1,229.82	296.34	5.150
16,200.00	7,173.00	7,358.83	7,354.50	147.33	220.50	-89.47	1,371.59	-10,194.79	1,434.63	1,134.56	300.07	4.781
16,300.00	7,173.00	7,358.79	7,354.46	148.90	220.50	-89.47	1,371.59	-10,194.79	1,344.32	1,040.04	304.28	4.418
16,400.00	7,173.00	7,358.75	7,354.42	150.47	220.50	-89.46	1,371.59	-10,194.79	1,255.47	946.43	309.04	4.063
16,500.00	7,173.00	7,358.71	7,354.37	152.04	220.50	-89.46	1,371.59	-10,194.79	1,168.42	854.00	314.42	3.716
16,600.00	7,173.00	7,358.66	7,354.33	153.61	220.50	-89.46	1,371.59	-10,194.79	1,083.62	763.10	320.52	3.381
16,700.00	7,173.00	7,358.62	7,354.29	155.18	220.50	-89.45	1,371.59	-10,194.79	1,001.62	674.19	327.43	3.059
16,800.00	7,173.00	7,358.58	7,354.25	156.76	220.50	-89.45	1,371.59	-10,194.79	923.18	587.98	335.19	2.754
16,900.00	7,173.00	7,358.54	7,354.21	158.33	220.50	-89.44	1,371.59	-10,194.79	849.28	505.45	343.82	2.470
17,000.00	7,173.00	7,358.50	7,354.17	159.90	220.49	-89.44	1,371.59	-10,194.79	781.21	428.00	353.20	2.212
17,100.00	7,173.00	7,358.45	7,354.12	161.48	220.49	-89.44	1,371.59	-10,194.79	720.62	357.63	362.99	1.985
17,200.00	7,173.00	7,358.41	7,354.08	163.06	220.49	-89.43	1,371.59	-10,194.79	669.56	297.05	372.50	1.797
17,300.00	7,173.00	7,358.37	7,354.04	164.63	220.49	-89.43	1,371.59	-10,194.79	630.33	249.67	380.67	1.656
17,400.00	7,173.00	7,358.33	7,354.00	166.21	220.49	-89.42	1,371.59	-10,194.79	605.26	219.15	386.11	1.568
17,500.00	7,173.00	7,358.29	7,353.96	167.79	220.49	-89.42	1,371.59	-10,194.79	596.11	208.52	387.59	1.538 ES, SF
17,504.93	7,173.00	7,358.29	7,353.95	167.86	220.49	-89.42	1,371.59	-10,194.79	596.09	208.54	387.55	1.538 CC
17,600.00	7,173.00	7,358.25	7,353.92	169.36	220.49	-89.42	1,371.59	-10,194.79	603.62	219.00	384.63	1.569
17,700.00	7,173.00	7,358.21	7,353.87	170.94	220.49	-89.41	1,371.59	-10,194.79	627.20	249.42	377.77	1.660
17,800.00	7,173.00	7,358.16	7,353.83	172.52	220.48	-89.41	1,371.59	-10,194.79	665.12	296.81	368.31	1.806
17,900.00	7,173.00	7,358.12	7,353.79	174.10	220.48	-89.40	1,371.59	-10,194.79	715.12	357.45	357.67	1.999
18,000.00	7,173.00	7,358.08	7,353.75	175.68	220.48	-89.40	1,371.59	-10,194.79	774.86	427.91	346.95	2.233
18,100.00	7,173.00	7,358.04	7,353.71	177.26	220.48	-89.40	1,371.59	-10,194.79	842.27	505.45	336.83	2.501
18,200.00	7,173.00	7,358.00	7,353.67	178.84	220.48	-89.39	1,371.59	-10,194.79	915.66	588.04	327.63	2.795
18,300.00	7,173.00	7,357.96	7,353.63	180.42	220.48	-89.39	1,371.60	-10,194.79	993.71	674.27	319.44	3.111
18,400.00	7,173.00	7,357.92	7,353.59	182.00	220.48	-89.38	1,371.60	-10,194.79	1,075.39	763.15	312.24	3.444
18,500.00	7,173.00	7,357.88	7,353.54	183.59	220.48	-89.38	1,371.60	-10,194.79	1,159.95	854.00	305.95	3.791
18,600.00	7,173.00	7,357.83	7,353.50	185.17	220.47	-89.38	1,371.60	-10,194.79	1,246.79	946.34	300.45	4.150
18,700.00	7,173.00	7,357.79	7,353.46	186.75	220.47	-89.37	1,371.60	-10,194.79	1,335.48	1,039.82	295.66	4.517
18,800.00	7,173.00	7,357.75	7,353.42	188.33	220.47	-89.37	1,371.60	-10,194.79	1,425.66	1,134.20	291.47	4.891
18,900.00	7,173.00	7,357.71	7,353.38	189.92	220.47	-89.36	1,371.60	-10,194.79	1,517.08	1,229.28	287.80	5.271
19,000.00	7,173.00	7,357.67	7,353.34	191.50	220.47	-89.36	1,371.60	-10,194.79	1,609.52	1,324.95	284.57	5.656
19,100.00	7,173.00	7,357.63	7,353.30	193.09	220.47	-89.36	1,371.60	-10,194.79	1,702.81	1,421.08	281.73	6.044
19,200.00	7,173.00	7,357.59	7,353.26	194.67	220.47	-89.35	1,371.60	-10,194.79	1,796.82	1,517.60	279.22	6.435

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #112Y - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program: 200-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
19,249.41	7,173.00	7,357.57	7,353.24	195.45	220.47	-89.35	1,371.60	-10,194.79	1,843.51	1,565.42	278.09	6.629		
19,300.00	7,173.00	7,357.55	7,353.22	196.25	220.47	-89.35	1,371.60	-10,194.79	1,891.45	1,614.45	277.00	6.828		
19,384.41	7,173.00	7,357.52	7,353.18	197.34	220.46	-89.34	1,371.60	-10,194.79	1,971.74	1,693.83	277.91	7.095		

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program: 159-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Rule Assigned:		Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	183.00	183.00	0.00	3.27	-92.21	-320.97	-8,298.35	8,304.56					
125.00	125.00	308.00	308.00	0.06	5.64	-136.73	-320.97	-8,298.35	8,305.00	8,299.31	5.69	1,460.032		
225.00	224.98	407.98	407.98	0.17	7.53	157.42	-320.97	-8,298.35	8,306.68	8,298.99	7.70	1,079.411		
319.00	318.92	501.78	501.78	0.28	9.31	146.60	-320.67	-8,298.35	8,309.51	8,299.93	9.58	867.093		
400.00	399.86	582.51	582.51	0.37	10.83	146.61	-320.73	-8,298.35	8,312.24	8,301.04	11.20	742.288		
469.00	468.80	651.29	651.29	0.52	12.14	146.62	-320.83	-8,298.35	8,314.56	8,301.91	12.65	657.116		
500.00	499.78	682.19	682.19	0.61	12.72	161.64	-320.88	-8,298.35	8,315.62	8,302.29	13.33	623.934		
600.00	599.71	782.75	782.71	0.92	14.78	-146.93	-320.97	-8,298.35	8,319.14	8,303.44	15.70	529.726		
700.00	699.55	882.59	882.55	1.26	16.94	-123.00	-320.97	-8,298.35	8,322.84	8,304.64	18.20	457.301		
800.00	799.19	982.22	982.19	1.60	19.10	-113.07	-320.97	-8,298.35	8,326.73	8,306.03	20.70	402.212		
900.00	898.49	1,080.53	1,080.48	1.97	21.23	-107.96	-319.94	-8,298.35	8,330.77	8,307.58	23.19	359.264		
1,000.00	997.33	1,178.21	1,178.15	2.34	23.34	-104.92	-320.39	-8,298.35	8,335.06	8,309.39	25.68	324.630		
1,100.00	1,095.61	1,278.75	1,278.61	2.74	25.66	-102.93	-320.97	-8,298.35	8,339.58	8,311.19	28.39	293.754		
1,196.26	1,189.56	1,372.70	1,372.56	3.13	28.31	-101.59	-320.97	-8,298.35	8,344.11	8,312.68	31.43	265.490		
1,200.00	1,193.19	1,376.33	1,376.19	3.15	28.41	-101.60	-320.97	-8,298.35	8,344.29	8,312.75	31.55	264.503		
1,300.00	1,290.42	1,473.56	1,473.42	3.58	31.15	-101.75	-320.97	-8,298.35	8,349.16	8,314.45	34.71	240.546		
1,400.00	1,387.65	1,570.01	1,569.85	4.01	33.87	-101.89	-319.53	-8,298.35	8,354.01	8,316.15	37.86	220.675		
1,500.00	1,484.87	1,665.43	1,665.26	4.45	36.55	-102.05	-319.89	-8,298.35	8,359.01	8,318.03	40.98	203.977		
1,600.00	1,582.10	1,760.69	1,760.51	4.90	39.24	-102.20	-320.61	-8,298.35	8,364.10	8,320.00	44.10	189.651		
1,700.00	1,679.33	1,862.81	1,862.33	5.34	42.91	-102.36	-320.97	-8,298.35	8,369.23	8,321.01	48.22	173.555		
1,800.00	1,776.55	1,960.04	1,959.55	5.79	46.82	-102.51	-320.97	-8,298.35	8,374.40	8,321.83	52.57	159.297		
1,900.00	1,873.78	2,057.26	2,056.78	6.24	50.72	-102.67	-320.97	-8,298.35	8,379.64	8,322.72	56.92	147.215		
2,000.00	1,971.01	2,150.54	2,149.95	6.69	54.47	-102.79	-317.95	-8,298.35	8,384.73	8,323.62	61.11	137.198		
2,100.00	2,068.23	2,242.91	2,242.28	7.15	58.18	-102.94	-318.97	-8,298.35	8,390.16	8,324.89	65.27	128.543		
2,200.00	2,165.46	2,349.84	2,348.46	7.60	62.51	-103.12	-320.97	-8,298.35	8,395.72	8,325.67	70.06	119.844		
2,300.00	2,262.69	2,443.11	2,441.68	8.06	67.26	-103.26	-319.68	-8,298.35	8,401.11	8,325.85	75.26	111.631		
2,400.00	2,359.91	2,544.74	2,542.91	8.51	72.44	-103.42	-320.97	-8,298.35	8,406.75	8,325.87	80.88	103.936		
2,500.00	2,457.14	2,641.97	2,640.14	8.97	77.39	-103.57	-320.97	-8,298.35	8,412.36	8,326.08	86.28	97.499		
2,600.00	2,554.37	2,736.12	2,734.10	9.42	82.18	-103.69	-316.78	-8,298.35	8,417.67	8,326.14	91.52	91.972		
2,700.00	2,651.59	2,820.94	2,818.82	9.88	86.49	-103.83	-317.88	-8,298.35	8,423.50	8,327.21	96.29	87.480		
2,800.00	2,748.82	2,934.72	2,931.82	10.34	92.16	-104.03	-320.97	-8,298.35	8,429.54	8,327.13	102.41	82.310		
2,900.00	2,846.05	3,031.95	3,029.05	10.80	96.32	-104.18	-320.97	-8,298.35	8,435.39	8,328.37	107.02	78.821		
3,000.00	2,943.27	3,129.17	3,126.27	11.25	100.47	-104.33	-320.97	-8,298.35	8,441.30	8,329.68	111.63	75.621		
3,100.00	3,040.50	3,226.40	3,223.50	11.71	104.63	-104.48	-320.97	-8,298.35	8,447.28	8,331.04	116.23	72.675		
3,200.00	3,137.73	3,319.15	3,316.06	12.17	108.60	-104.59	-315.94	-8,298.35	8,452.80	8,332.15	120.65	70.061		
3,300.00	3,234.95	3,409.35	3,406.21	12.63	112.45	-104.73	-316.79	-8,298.35	8,458.98	8,334.02	124.96	67.696		
3,400.00	3,332.18	3,499.27	3,496.05	13.09	116.29	-104.88	-318.36	-8,298.35	8,465.30	8,336.05	129.25	65.496		
3,500.00	3,429.40	3,616.40	3,612.40	13.55	121.22	-105.07	-320.97	-8,298.35	8,471.77	8,337.14	134.63	62.928		
3,600.00	3,526.63	3,713.63	3,709.63	14.00	124.88	-105.22	-320.97	-8,298.35	8,478.04	8,339.30	138.74	61.107		
3,700.00	3,623.86	3,810.85	3,806.86	14.46	128.55	-105.37	-320.97	-8,298.35	8,484.37	8,341.52	142.86	59.391		
3,800.00	3,721.08	3,900.53	3,896.43	14.92	131.93	-105.49	-318.19	-8,298.35	8,490.45	8,343.76	146.69	57.882		
3,900.00	3,818.31	3,987.76	3,983.61	15.38	135.21	-105.63	-319.29	-8,298.35	8,497.04	8,346.61	150.42	56.487		
4,000.00	3,915.54	4,103.07	4,098.54	15.84	139.36	-105.81	-320.97	-8,298.35	8,503.73	8,348.71	155.02	54.855		
4,100.00	4,012.76	4,200.30	4,195.76	16.30	142.52	-105.96	-320.97	-8,298.35	8,510.30	8,351.67	158.63	53.648		
4,200.00	4,109.99	4,297.52	4,292.99	16.76	145.68	-106.11	-320.97	-8,298.35	8,516.93	8,354.69	162.24	52.496		
4,300.00	4,207.22	4,394.75	4,390.22	17.22	148.83	-106.26	-320.97	-8,298.35	8,523.62	8,357.77	165.85	51.394		
4,400.00	4,304.44	4,491.98	4,487.44	17.68	151.99	-106.40	-320.97	-8,298.35	8,530.37	8,360.91	169.46	50.340		
4,500.00	4,401.67	4,589.20	4,584.67	18.14	155.15	-106.55	-320.97	-8,298.35	8,537.18	8,364.11	173.06	49.330		
4,600.00	4,498.90	4,686.43	4,681.90	18.60	158.31	-106.70	-320.97	-8,298.35	8,544.04	8,367.37	176.67	48.361		
4,700.00	4,596.12	4,783.66	4,779.12	19.06	161.46	-106.84	-320.97	-8,298.35	8,550.97	8,370.69	180.28	47.432		
4,800.00	4,693.35	4,880.88	4,876.35	19.52	164.62	-106.99	-320.97	-8,298.35	8,557.95	8,374.06	183.89	46.540		
4,900.00	4,790.58	4,978.11	4,973.58	19.98	167.78	-107.13	-320.97	-8,298.35	8,564.99	8,377.50	187.49	45.682		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC											Offset Site Error:	0.00 usft
Survey Program: 159-A027Ua_INC-ONLY											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Warning
5,000.00	4,887.80	5,075.34	5,070.80	20.44	170.94	-107.28	-320.97	-8,298.35	8,572.09	8,380.99	191.10	44.857
5,100.00	4,985.03	5,172.56	5,168.03	20.90	174.09	-107.43	-320.97	-8,298.35	8,579.24	8,384.54	194.71	44.063
5,200.00	5,082.26	5,267.57	5,262.75	21.36	177.18	-107.49	-308.90	-8,298.35	8,584.61	8,386.37	198.24	43.304
5,300.00	5,179.48	5,362.37	5,357.52	21.82	180.26	-107.63	-309.16	-8,298.35	8,591.89	8,390.12	201.77	42.583
5,400.00	5,276.71	5,457.10	5,452.23	22.27	183.34	-107.78	-309.59	-8,298.35	8,599.26	8,393.97	205.29	41.888
5,500.00	5,373.94	5,551.75	5,546.85	22.73	186.41	-107.92	-310.19	-8,298.35	8,606.72	8,397.90	208.82	41.217
5,600.00	5,471.16	5,646.33	5,641.40	23.19	189.48	-108.07	-310.97	-8,298.35	8,614.26	8,401.93	212.34	40.569
5,700.00	5,568.39	5,740.84	5,735.88	23.65	192.55	-108.21	-311.92	-8,298.35	8,621.90	8,406.05	215.85	39.944
5,800.00	5,665.62	5,835.28	5,830.27	24.11	195.62	-108.36	-313.05	-8,298.35	8,629.63	8,410.26	219.37	39.339
5,900.00	5,762.84	5,929.64	5,924.59	24.57	198.68	-108.51	-314.35	-8,298.35	8,637.45	8,414.58	222.88	38.754
6,000.00	5,860.07	6,023.92	6,018.83	25.03	201.74	-108.66	-315.83	-8,298.35	8,645.37	8,418.98	226.38	38.189
6,100.00	5,957.30	6,118.13	6,112.99	25.50	204.80	-108.80	-317.47	-8,298.35	8,653.38	8,423.49	229.89	37.641
6,200.00	6,054.52	6,212.26	6,207.07	25.96	207.86	-108.95	-319.29	-8,298.35	8,661.49	8,428.10	233.39	37.111
6,300.00	6,151.75	6,341.01	6,334.75	26.42	211.92	-109.15	-320.97	-8,298.35	8,669.58	8,431.68	237.90	36.442
6,400.00	6,248.98	6,438.23	6,431.98	26.88	214.83	-109.29	-320.97	-8,298.35	8,677.47	8,436.22	241.26	35.968
6,500.00	6,346.20	6,535.46	6,529.20	27.34	217.73	-109.44	-320.97	-8,298.35	8,685.42	8,440.81	244.61	35.507
6,600.00	6,443.43	6,632.69	6,626.43	27.80	220.64	-109.58	-320.97	-8,298.35	8,693.43	8,445.47	247.96	35.059
6,696.38	6,537.14	6,726.39	6,720.14	28.24	223.44	-109.71	-320.97	-8,298.35	8,701.20	8,450.01	251.19	34.639
6,700.00	6,540.66	6,729.91	6,723.66	28.26	223.55	-108.36	-320.97	-8,298.35	8,701.48	8,450.17	251.32	34.624
6,750.00	6,589.27	6,778.52	6,772.27	28.48	225.00	-89.84	-320.97	-8,298.35	8,703.35	8,450.36	252.99	34.402
6,800.00	6,637.66	6,826.92	6,820.66	28.71	226.45	-73.90	-320.97	-8,298.35	8,701.42	8,446.75	254.67	34.168
6,850.00	6,685.53	6,874.79	6,868.53	28.92	227.88	-61.97	-320.97	-8,298.35	8,695.69	8,439.37	256.32	33.925
6,900.00	6,732.60	6,921.85	6,915.60	29.13	229.29	-53.55	-320.97	-8,298.35	8,686.22	8,428.27	257.95	33.673
6,950.00	6,778.56	6,967.82	6,961.56	29.32	230.66	-47.69	-320.97	-8,298.35	8,673.07	8,413.52	259.55	33.416
7,000.00	6,823.13	7,012.39	7,006.13	29.51	232.00	-43.62	-320.97	-8,298.35	8,656.31	8,395.21	261.10	33.153
7,050.00	6,866.05	7,055.30	7,049.05	29.68	233.28	-40.82	-320.97	-8,298.35	8,636.05	8,373.45	262.60	32.887
7,100.00	6,907.04	7,096.29	7,090.04	29.85	234.51	-38.97	-320.97	-8,298.35	8,612.42	8,348.39	264.03	32.619
7,150.00	6,945.85	7,135.11	7,128.85	30.01	235.67	-37.86	-320.97	-8,298.35	8,585.58	8,320.18	265.39	32.351
7,200.00	6,982.24	7,171.50	7,165.24	30.15	236.75	-37.39	-320.97	-8,298.35	8,555.68	8,289.00	266.68	32.083
7,250.00	7,016.00	7,205.25	7,199.00	30.29	237.76	-37.50	-320.97	-8,298.35	8,522.91	8,255.03	267.87	31.817
7,300.00	7,046.90	7,236.16	7,229.90	30.43	238.69	-38.18	-320.97	-8,298.35	8,487.47	8,218.49	268.98	31.554
7,350.00	7,074.76	7,264.02	7,257.76	30.56	239.52	-39.49	-320.97	-8,298.35	8,449.59	8,179.60	269.99	31.296
7,400.00	7,099.42	7,288.67	7,282.42	30.69	240.26	-41.52	-320.97	-8,298.35	8,409.50	8,138.60	270.89	31.044
7,450.00	7,120.70	7,309.96	7,303.70	30.82	240.89	-44.44	-320.97	-8,298.35	8,367.43	8,095.74	271.69	30.798
7,500.00	7,138.50	7,327.75	7,321.50	30.95	241.43	-48.52	-320.97	-8,298.35	8,323.66	8,051.29	272.38	30.560
7,550.00	7,152.68	7,341.94	7,335.68	31.10	241.85	-54.14	-320.97	-8,298.35	8,278.45	8,005.50	272.95	30.330
7,600.00	7,163.18	7,352.44	7,346.18	31.25	242.16	-61.87	-320.97	-8,298.35	8,232.07	7,958.67	273.40	30.110
7,650.00	7,169.92	7,359.18	7,352.92	31.41	242.37	-72.34	-320.97	-8,298.35	8,184.80	7,911.07	273.74	29.900
7,700.00	7,172.86	7,362.12	7,355.86	31.59	242.45	-85.87	-320.97	-8,298.35	8,136.95	7,862.99	273.95	29.702
7,713.53	7,173.00	7,362.26	7,356.00	31.64	242.46	-90.00	-320.97	-8,298.35	8,123.93	7,849.94	273.99	29.651
7,800.00	7,173.00	7,362.26	7,356.00	31.99	242.46	-90.00	-320.97	-8,298.35	8,040.73	7,766.52	274.20	29.324
7,900.00	7,173.00	7,362.26	7,356.00	32.47	242.46	-90.00	-320.97	-8,298.35	7,944.59	7,670.13	274.46	28.946
8,000.00	7,173.00	7,362.26	7,356.00	33.03	242.46	-90.00	-320.97	-8,298.35	7,848.56	7,573.82	274.73	28.568
8,100.00	7,173.00	7,362.26	7,356.00	33.66	242.46	-90.00	-320.97	-8,298.35	7,752.62	7,477.60	275.02	28.190
8,200.00	7,173.00	7,362.26	7,356.00	34.36	242.46	-90.00	-320.97	-8,298.35	7,656.79	7,381.48	275.31	27.811
8,300.00	7,173.00	7,362.26	7,356.00	35.13	242.46	-90.00	-320.97	-8,298.35	7,561.06	7,285.44	275.62	27.433
8,400.00	7,173.00	7,362.26	7,356.00	35.95	242.46	-90.00	-320.97	-8,298.35	7,465.45	7,189.51	275.94	27.055
8,500.00	7,173.00	7,362.26	7,356.00	36.82	242.46	-90.00	-320.97	-8,298.35	7,369.95	7,093.68	276.27	26.676
8,600.00	7,173.00	7,362.26	7,356.00	37.74	242.46	-90.00	-320.97	-8,298.35	7,274.58	6,997.95	276.62	26.298
8,700.00	7,173.00	7,362.26	7,356.00	38.71	242.46	-90.00	-320.97	-8,298.35	7,179.33	6,902.34	276.98	25.920
8,800.00	7,173.00	7,362.26	7,356.00	39.71	242.46	-90.00	-320.97	-8,298.35	7,084.21	6,806.84	277.36	25.541
8,900.00	7,173.00	7,362.26	7,356.00	40.76	242.46	-90.00	-320.97	-8,298.35	6,989.22	6,711.47	277.76	25.163

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC												Offset Site Error:	0.00 usft
Survey Program:		159-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance				Separation		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
9,000.00	7,173.00	7,362.26	7,356.00	41.84	242.46	-90.00	-320.97	-8,298.35	6,894.38	6,616.22	278.17	24.785	
9,100.00	7,173.00	7,362.26	7,356.00	42.96	242.46	-90.00	-320.97	-8,298.35	6,799.69	6,521.10	278.59	24.407	
9,200.00	7,173.00	7,362.26	7,356.00	44.10	242.46	-90.00	-320.97	-8,298.35	6,705.15	6,426.11	279.04	24.029	
9,300.00	7,173.00	7,362.26	7,356.00	45.27	242.46	-90.00	-320.97	-8,298.35	6,610.77	6,331.27	279.50	23.652	
9,400.00	7,173.00	7,362.26	7,356.00	46.47	242.46	-90.00	-320.97	-8,298.35	6,516.56	6,236.58	279.99	23.275	
9,500.00	7,173.00	7,362.26	7,356.00	47.70	242.46	-90.00	-320.97	-8,298.35	6,422.53	6,142.04	280.49	22.898	
9,600.00	7,173.00	7,362.26	7,356.00	48.94	242.46	-90.00	-320.97	-8,298.35	6,328.67	6,047.66	281.01	22.521	
9,700.00	7,173.00	7,362.26	7,356.00	50.20	242.46	-90.00	-320.97	-8,298.35	6,235.01	5,953.46	281.56	22.145	
9,800.00	7,173.00	7,362.26	7,356.00	51.49	242.46	-90.00	-320.97	-8,298.35	6,141.55	5,859.43	282.12	21.769	
9,900.00	7,173.00	7,362.26	7,356.00	52.79	242.46	-90.00	-320.97	-8,298.35	6,048.30	5,765.58	282.72	21.394	
10,000.00	7,173.00	7,362.26	7,356.00	54.11	242.46	-90.00	-320.97	-8,298.35	5,955.26	5,671.93	283.33	21.019	
10,100.00	7,173.00	7,362.26	7,356.00	55.44	242.46	-90.00	-320.97	-8,298.35	5,862.46	5,578.49	283.97	20.645	
10,200.00	7,173.00	7,362.26	7,356.00	56.78	242.46	-90.00	-320.97	-8,298.35	5,769.90	5,485.26	284.64	20.271	
10,300.00	7,173.00	7,362.26	7,356.00	58.14	242.46	-90.00	-320.97	-8,298.35	5,677.59	5,392.26	285.33	19.898	
10,400.00	7,173.00	7,362.26	7,356.00	59.51	242.46	-90.00	-320.97	-8,298.35	5,585.54	5,299.49	286.05	19.526	
10,500.00	7,173.00	7,362.26	7,356.00	60.90	242.46	-90.00	-320.97	-8,298.35	5,493.77	5,206.97	286.80	19.155	
10,600.00	7,173.00	7,362.26	7,356.00	62.29	242.46	-90.00	-320.97	-8,298.35	5,402.29	5,114.71	287.59	18.785	
10,700.00	7,173.00	7,362.26	7,356.00	63.69	242.46	-90.00	-320.97	-8,298.35	5,311.12	5,022.72	288.40	18.416	
10,800.00	7,173.00	7,362.26	7,356.00	65.11	242.46	-90.00	-320.97	-8,298.35	5,220.28	4,931.03	289.25	18.048	
10,900.00	7,173.00	7,362.26	7,356.00	66.53	242.46	-90.00	-320.97	-8,298.35	5,129.77	4,839.64	290.13	17.681	
11,000.00	7,173.00	7,362.26	7,356.00	67.96	242.46	-90.00	-320.97	-8,298.35	5,039.63	4,748.58	291.05	17.315	
11,100.00	7,173.00	7,362.26	7,356.00	69.39	242.46	-90.00	-320.97	-8,298.35	4,949.86	4,657.85	292.01	16.951	
11,200.00	7,173.00	7,362.26	7,356.00	70.84	242.46	-90.00	-320.97	-8,298.35	4,860.49	4,567.49	293.01	16.588	
11,300.00	7,173.00	7,362.26	7,356.00	72.29	242.46	-90.00	-320.97	-8,298.35	4,771.55	4,477.50	294.05	16.227	
11,400.00	7,173.00	7,362.26	7,356.00	73.74	242.46	-90.00	-320.97	-8,298.35	4,683.05	4,387.92	295.13	15.868	
11,500.00	7,173.00	7,362.26	7,356.00	75.21	242.46	-90.00	-320.97	-8,298.35	4,595.02	4,298.76	296.25	15.510	
11,600.00	7,173.00	7,362.26	7,356.00	76.68	242.46	-90.00	-320.97	-8,298.35	4,507.49	4,210.06	297.43	15.155	
11,700.00	7,173.00	7,362.26	7,356.00	78.15	242.46	-90.00	-320.97	-8,298.35	4,420.49	4,121.84	298.65	14.802	
11,800.00	7,173.00	7,362.26	7,356.00	79.63	242.46	-90.00	-320.97	-8,298.35	4,334.05	4,034.13	299.92	14.451	
11,900.00	7,173.00	7,362.26	7,356.00	81.11	242.46	-90.00	-320.97	-8,298.35	4,248.21	3,946.96	301.25	14.102	
12,000.00	7,173.00	7,362.26	7,356.00	82.60	242.46	-90.00	-320.97	-8,298.35	4,162.99	3,860.37	302.63	13.756	
12,100.00	7,173.00	7,362.26	7,356.00	84.09	242.46	-90.00	-320.97	-8,298.35	4,078.45	3,774.39	304.07	13.413	
12,200.00	7,173.00	7,362.26	7,356.00	85.59	242.46	-90.00	-320.97	-8,298.35	3,994.63	3,689.07	305.56	13.073	
12,300.00	7,173.00	7,362.26	7,356.00	87.09	242.46	-90.00	-320.97	-8,298.35	3,911.56	3,604.44	307.12	12.736	
12,400.00	7,173.00	7,362.26	7,356.00	88.59	242.46	-90.00	-320.97	-8,298.35	3,829.31	3,520.56	308.74	12.403	
12,500.00	7,173.00	7,362.26	7,356.00	90.10	242.46	-90.00	-320.97	-8,298.35	3,747.91	3,437.48	310.43	12.073	
12,600.00	7,173.00	7,362.26	7,356.00	91.61	242.46	-90.00	-320.97	-8,298.35	3,667.44	3,355.26	312.18	11.748	
12,700.00	7,173.00	7,362.26	7,356.00	93.13	242.46	-90.00	-320.97	-8,298.35	3,587.95	3,273.94	314.01	11.426	
12,800.00	7,173.00	7,362.26	7,356.00	94.64	242.46	-90.00	-320.97	-8,298.35	3,509.51	3,193.61	315.90	11.109	
12,900.00	7,173.00	7,362.26	7,356.00	96.16	242.46	-90.00	-320.97	-8,298.35	3,432.19	3,114.32	317.87	10.797	
13,000.00	7,173.00	7,362.26	7,356.00	97.69	242.46	-90.00	-320.97	-8,298.35	3,356.07	3,036.16	319.91	10.491	
13,100.00	7,173.00	7,362.26	7,356.00	99.21	242.46	-90.00	-320.97	-8,298.35	3,281.23	2,959.20	322.03	10.189	
13,200.00	7,173.00	7,362.26	7,356.00	100.74	242.46	-90.00	-320.97	-8,298.35	3,207.76	2,883.54	324.22	9.894	
13,300.00	7,173.00	7,362.26	7,356.00	102.27	242.46	-90.00	-320.97	-8,298.35	3,135.76	2,809.28	326.48	9.605	
13,400.00	7,173.00	7,362.26	7,356.00	103.80	242.46	-90.00	-320.97	-8,298.35	3,065.33	2,736.51	328.82	9.322	
13,500.00	7,173.00	7,362.26	7,356.00	105.33	242.46	-90.00	-320.97	-8,298.35	2,996.58	2,665.35	331.23	9.047	
13,600.00	7,173.00	7,362.26	7,356.00	106.87	242.46	-90.00	-320.97	-8,298.35	2,929.64	2,595.93	333.71	8.779	
13,700.00	7,173.00	7,362.26	7,356.00	108.41	242.46	-90.00	-320.97	-8,298.35	2,864.62	2,528.36	336.26	8.519	
13,800.00	7,173.00	7,362.26	7,356.00	109.95	242.46	-90.00	-320.97	-8,298.35	2,801.66	2,462.80	338.86	8.268	
13,900.00	7,173.00	7,362.26	7,356.00	111.49	242.46	-90.00	-320.97	-8,298.35	2,740.91	2,399.39	341.52	8.026	
14,000.00	7,173.00	7,362.26	7,356.00	113.03	242.46	-90.00	-320.97	-8,298.35	2,682.51	2,338.29	344.22	7.793	
14,100.00	7,173.00	7,362.26	7,356.00	114.58	242.46	-90.00	-320.97	-8,298.35	2,626.62	2,279.67	346.95	7.571	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program:		159-A027Ua_INC-ONLY					Rule Assigned:						Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Offset Wellbore Centre		Distance						Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,200.00	7,173.00	7,362.26	7,356.00	116.13	242.46	-90.00	-320.97	-8,298.35	2,573.40	2,223.70	349.70	7.359		
14,300.00	7,173.00	7,362.26	7,356.00	117.68	242.46	-90.00	-320.97	-8,298.35	2,523.02	2,170.56	352.46	7.158		
14,400.00	7,173.00	7,362.26	7,356.00	119.23	242.46	-90.00	-320.97	-8,298.35	2,475.67	2,120.46	355.21	6.970		
14,500.00	7,173.00	7,362.26	7,356.00	120.78	242.46	-90.00	-320.97	-8,298.35	2,431.50	2,073.58	357.92	6.793		
14,600.00	7,173.00	7,362.26	7,356.00	122.33	242.46	-90.00	-320.97	-8,298.35	2,390.70	2,030.12	360.58	6.630		
14,700.00	7,173.00	7,362.26	7,356.00	123.88	242.46	-90.00	-320.97	-8,298.35	2,353.45	1,990.28	363.17	6.480		
14,800.00	7,173.00	7,362.26	7,356.00	125.44	242.46	-90.00	-320.97	-8,298.35	2,319.91	1,954.26	365.65	6.345		
14,900.00	7,173.00	7,362.26	7,356.00	127.00	242.46	-90.00	-320.97	-8,298.35	2,290.25	1,922.24	368.01	6.223		
15,000.00	7,173.00	7,362.26	7,356.00	128.55	242.46	-90.00	-320.97	-8,298.35	2,264.62	1,894.41	370.22	6.117		
15,100.00	7,173.00	7,362.26	7,356.00	130.11	242.46	-90.00	-320.97	-8,298.35	2,243.17	1,870.92	372.25	6.026		
15,200.00	7,173.00	7,362.26	7,356.00	131.67	242.46	-90.00	-320.97	-8,298.35	2,226.00	1,851.92	374.08	5.951		
15,300.00	7,173.00	7,362.26	7,356.00	133.23	242.46	-90.00	-320.97	-8,298.35	2,213.22	1,837.54	375.68	5.891		
15,400.00	7,173.00	7,362.26	7,356.00	134.80	242.46	-90.00	-320.97	-8,298.35	2,204.90	1,827.86	377.04	5.848		
15,500.00	7,173.00	7,362.26	7,356.00	136.36	242.46	-90.00	-320.97	-8,298.35	2,201.10	1,822.95	378.15	5.821		
15,533.95	7,173.00	7,362.26	7,356.00	136.89	242.46	-90.00	-320.97	-8,298.35	2,200.85	1,822.37	378.47	5.815 CC, ES		
15,600.00	7,173.00	7,362.26	7,356.00	137.92	242.46	-90.00	-320.97	-8,298.35	2,201.85	1,822.85	379.00	5.810 SF		
15,700.00	7,173.00	7,362.26	7,356.00	139.49	242.46	-90.00	-320.97	-8,298.35	2,207.12	1,827.55	379.57	5.815		
15,800.00	7,173.00	7,362.26	7,356.00	141.05	242.46	-90.00	-320.97	-8,298.35	2,216.90	1,837.02	379.88	5.836		
15,900.00	7,173.00	7,362.26	7,356.00	142.62	242.46	-90.00	-320.97	-8,298.35	2,231.13	1,851.20	379.92	5.873		
16,000.00	7,173.00	7,362.26	7,356.00	144.19	242.46	-90.00	-320.97	-8,298.35	2,249.71	1,870.00	379.71	5.925		
16,100.00	7,173.00	7,362.26	7,356.00	145.76	242.46	-90.00	-320.97	-8,298.35	2,272.54	1,893.28	379.26	5.992		
16,200.00	7,173.00	7,362.26	7,356.00	147.33	242.46	-90.00	-320.97	-8,298.35	2,299.51	1,920.92	378.59	6.074		
16,300.00	7,173.00	7,362.26	7,356.00	148.90	242.46	-90.00	-320.97	-8,298.35	2,330.45	1,952.74	377.71	6.170		
16,400.00	7,173.00	7,362.26	7,356.00	150.47	242.46	-90.00	-320.97	-8,298.35	2,365.22	1,988.57	376.65	6.280		
16,500.00	7,173.00	7,362.26	7,356.00	152.04	242.46	-90.00	-320.97	-8,298.35	2,403.65	2,028.22	375.43	6.402		
16,600.00	7,173.00	7,362.26	7,356.00	153.61	242.46	-90.00	-320.97	-8,298.35	2,445.57	2,071.50	374.07	6.538		
16,700.00	7,173.00	7,362.26	7,356.00	155.18	242.46	-90.00	-320.97	-8,298.35	2,490.80	2,118.20	372.60	6.685		
16,800.00	7,173.00	7,362.26	7,356.00	156.76	242.46	-90.00	-320.97	-8,298.35	2,539.16	2,168.13	371.03	6.844		
16,900.00	7,173.00	7,362.26	7,356.00	158.33	242.46	-90.00	-320.97	-8,298.35	2,590.48	2,221.10	369.38	7.013		
17,000.00	7,173.00	7,362.26	7,356.00	159.90	242.46	-90.00	-320.97	-8,298.35	2,644.59	2,276.91	367.68	7.193		
17,100.00	7,173.00	7,362.26	7,356.00	161.48	242.46	-90.00	-320.97	-8,298.35	2,701.32	2,335.38	365.93	7.382		
17,200.00	7,173.00	7,362.26	7,356.00	163.06	242.46	-90.00	-320.97	-8,298.35	2,760.51	2,396.34	364.16	7.580		
17,300.00	7,173.00	7,362.26	7,356.00	164.63	242.46	-90.00	-320.97	-8,298.35	2,822.00	2,459.62	362.38	7.787		
17,400.00	7,173.00	7,362.26	7,356.00	166.21	242.46	-90.00	-320.97	-8,298.35	2,885.64	2,525.05	360.59	8.002		
17,500.00	7,173.00	7,362.26	7,356.00	167.79	242.46	-90.00	-320.97	-8,298.35	2,951.30	2,592.49	358.81	8.225		
17,600.00	7,173.00	7,362.26	7,356.00	169.36	242.46	-90.00	-320.97	-8,298.35	3,018.85	2,661.80	357.05	8.455		
17,700.00	7,173.00	7,362.26	7,356.00	170.94	242.46	-90.00	-320.97	-8,298.35	3,088.16	2,732.85	355.30	8.692		
17,800.00	7,173.00	7,362.26	7,356.00	172.52	242.46	-90.00	-320.97	-8,298.35	3,159.11	2,805.52	353.59	8.934		
17,900.00	7,173.00	7,362.26	7,356.00	174.10	242.46	-90.00	-320.97	-8,298.35	3,231.60	2,879.70	351.90	9.183		
18,000.00	7,173.00	7,362.26	7,356.00	175.68	242.46	-90.00	-320.97	-8,298.35	3,305.53	2,955.27	350.26	9.437		
18,100.00	7,173.00	7,362.26	7,356.00	177.26	242.46	-90.00	-320.97	-8,298.35	3,380.80	3,032.15	348.65	9.697		
18,200.00	7,173.00	7,362.26	7,356.00	178.84	242.46	-90.00	-320.97	-8,298.35	3,457.32	3,110.25	347.07	9.961		
18,300.00	7,173.00	7,362.26	7,356.00	180.42	242.46	-90.00	-320.97	-8,298.35	3,535.02	3,189.47	345.55	10.230		
18,400.00	7,173.00	7,362.26	7,356.00	182.00	242.46	-90.00	-320.97	-8,298.35	3,613.81	3,269.75	344.06	10.503		
18,500.00	7,173.00	7,362.26	7,356.00	183.59	242.46	-90.00	-320.97	-8,298.35	3,693.62	3,351.01	342.61	10.781		
18,600.00	7,173.00	7,362.26	7,356.00	185.17	242.46	-90.00	-320.97	-8,298.35	3,774.40	3,433.19	341.21	11.062		
18,700.00	7,173.00	7,362.26	7,356.00	186.75	242.46	-90.00	-320.97	-8,298.35	3,856.09	3,516.23	339.86	11.346		
18,800.00	7,173.00	7,362.26	7,356.00	188.33	242.46	-90.00	-320.97	-8,298.35	3,938.61	3,600.07	338.54	11.634		
18,900.00	7,173.00	7,362.26	7,356.00	189.92	242.46	-90.00	-320.97	-8,298.35	4,021.93	3,684.67	337.27	11.925		
19,000.00	7,173.00	7,362.26	7,356.00	191.50	242.46	-90.00	-320.97	-8,298.35	4,106.00	3,769.96	336.03	12.219		
19,100.00	7,173.00	7,362.26	7,356.00	193.09	242.46	-90.00	-320.97	-8,298.35	4,190.76	3,855.92	334.84	12.516		
19,200.00	7,173.00	7,362.26	7,356.00	194.67	242.46	-90.00	-320.97	-8,298.35	4,276.18	3,942.49	333.69	12.815		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #184C - OH - OH-INC													Offset Site Error:	0.00 usft
Survey Program: 159-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,249.41	7,173.00	7,362.26	7,356.00	195.45	242.46	-90.00	-320.97	-8,298.35	4,318.62	3,985.49	333.13	12.964		
19,300.00	7,173.00	7,362.26	7,356.00	196.25	242.46	-90.00	-320.97	-8,298.35	4,362.22	4,029.65	332.58	13.116		
19,384.41	7,173.00	7,362.26	7,356.00	197.34	242.46	-90.00	-320.97	-8,298.35	4,435.31	4,102.48	332.83	13.326		

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program: 400-A020Ga_GYRO-NS, 6400-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Rule Assigned:										
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	367.75	367.75	0.00	0.64	96.35	-958.22	8,616.89	8,670.00					
125.00	125.00	494.60	494.60	0.06	1.03	51.84	-958.64	8,616.86	8,669.65	8,668.58	1.08	8,059.645		
225.00	224.98	582.52	582.52	0.17	1.34	-14.01	-959.01	8,616.88	8,668.02	8,666.53	1.49	5,799.362		
319.00	318.92	661.27	661.27	0.28	1.62	-24.85	-959.05	8,617.06	8,665.20	8,663.31	1.89	4,592.691		
400.00	399.86	735.07	735.07	0.37	1.87	-24.86	-959.12	8,617.34	8,662.54	8,660.31	2.23	3,878.318		
469.00	468.80	800.00	800.00	0.52	2.10	-24.86	-959.17	8,617.59	8,660.29	8,657.68	2.61	3,313.468		
500.00	499.78	832.57	832.56	0.61	2.21	-9.85	-959.19	8,617.72	8,659.30	8,656.48	2.82	3,073.788		
600.00	599.71	947.96	947.96	0.92	2.62	41.59	-959.34	8,618.21	8,656.36	8,652.83	3.54	2,447.132		
700.00	699.55	1,054.87	1,054.86	1.26	2.99	65.56	-959.33	8,618.30	8,653.38	8,649.14	4.24	2,038.521		
800.00	799.19	1,139.06	1,139.06	1.60	3.28	75.56	-959.62	8,618.52	8,650.97	8,646.08	4.89	1,770.635		
900.00	898.49	1,248.28	1,248.27	1.97	3.67	80.78	-960.07	8,618.83	8,648.94	8,643.31	5.63	1,536.825		
1,000.00	997.33	1,341.19	1,341.18	2.34	3.99	83.97	-960.86	8,618.91	8,647.16	8,640.83	6.33	1,366.560		
1,100.00	1,095.61	1,412.43	1,412.42	2.74	4.24	86.10	-961.29	8,619.20	8,646.03	8,639.06	6.97	1,240.546		
1,196.26	1,189.56	1,486.63	1,486.61	3.13	4.50	87.61	-961.83	8,619.68	8,645.60	8,637.97	7.63	1,133.644		
1,200.00	1,193.19	1,489.49	1,489.48	3.15	4.51	87.62	-961.86	8,619.70	8,645.59	8,637.94	7.65	1,129.830		
1,300.00	1,290.42	1,628.93	1,628.91	3.58	5.00	87.84	-963.03	8,620.34	8,645.20	8,636.63	8.57	1,009.018		
1,400.00	1,387.65	1,717.93	1,717.90	4.01	5.31	87.98	-963.39	8,620.70	8,644.78	8,635.46	9.31	928.079		
1,500.00	1,484.87	1,834.30	1,834.27	4.45	5.72	88.16	-963.71	8,621.01	8,644.27	8,634.10	10.16	850.628		
1,600.00	1,582.10	1,927.26	1,927.24	4.90	6.04	88.30	-963.61	8,621.29	8,643.81	8,632.88	10.93	790.714		
1,700.00	1,679.33	2,036.93	2,036.90	5.34	6.43	88.47	-963.69	8,621.53	8,643.37	8,631.61	11.76	734.848		
1,800.00	1,776.55	2,137.07	2,137.05	5.79	6.78	88.63	-963.50	8,621.63	8,642.84	8,630.28	12.56	688.062		
1,900.00	1,873.78	2,232.01	2,231.98	6.24	7.11	88.77	-963.29	8,621.85	8,642.50	8,629.15	13.34	647.687		
2,000.00	1,971.01	2,342.61	2,342.58	6.69	7.49	88.94	-962.72	8,621.87	8,641.95	8,627.77	14.18	609.374		
2,100.00	2,068.23	2,419.14	2,419.10	7.15	7.76	89.05	-961.95	8,622.08	8,641.65	8,626.75	14.90	579.889		
2,200.00	2,165.46	2,513.30	2,513.26	7.60	8.09	89.19	-960.96	8,622.45	8,641.53	8,625.85	15.69	550.924		
2,300.00	2,262.69	2,612.77	2,612.73	8.06	8.43	89.34	-959.99	8,622.87	8,641.50	8,625.02	16.49	524.108		
2,400.00	2,359.91	2,733.76	2,733.71	8.51	8.86	89.52	-958.52	8,623.07	8,641.22	8,623.86	17.37	497.597		
2,467.31	2,425.36	2,780.94	2,780.88	8.82	9.02	89.59	-957.94	8,623.19	8,641.14	8,623.30	17.84	484.427		
2,500.00	2,457.14	2,806.61	2,806.55	8.97	9.11	89.63	-957.64	8,623.29	8,641.16	8,623.08	18.08	478.029		
2,600.00	2,554.37	2,926.89	2,926.83	9.42	9.53	89.81	-956.43	8,623.61	8,641.15	8,622.19	18.95	455.926		
2,700.00	2,651.59	3,024.91	3,024.84	9.88	9.87	89.95	-955.37	8,623.67	8,640.98	8,621.23	19.75	437.475		
2,713.40	2,664.62	3,033.42	3,033.35	9.94	9.90	89.96	-955.27	8,623.68	8,640.98	8,621.14	19.84	435.468 CC		
2,800.00	2,748.82	3,100.00	3,099.92	10.34	10.13	90.06	-954.60	8,623.94	8,641.16	8,620.69	20.47	422.104		
2,900.00	2,846.05	3,185.52	3,185.44	10.80	10.43	90.19	-953.73	8,624.42	8,641.59	8,620.37	21.23	407.082		
3,000.00	2,943.27	3,276.86	3,276.77	11.25	10.75	90.32	-952.80	8,624.93	8,642.09	8,620.08	22.01	392.731		
3,100.00	3,040.50	3,383.13	3,383.04	11.71	11.12	90.48	-951.97	8,625.49	8,642.66	8,619.83	22.83	378.492		
3,200.00	3,137.73	3,485.49	3,485.40	12.17	11.48	90.64	-951.18	8,625.92	8,643.19	8,619.54	23.65	365.459		
3,300.00	3,234.95	3,572.03	3,571.93	12.63	11.78	90.76	-950.47	8,626.32	8,643.80	8,619.39	24.41	354.096 ES		
3,400.00	3,332.18	3,630.04	3,629.94	13.09	11.99	90.85	-950.14	8,626.69	8,644.72	8,619.64	25.07	344.797		
3,500.00	3,429.40	3,700.00	3,699.89	13.55	12.23	90.96	-949.85	8,627.67	8,646.34	8,620.56	25.77	335.459		
3,600.00	3,526.63	3,740.16	3,740.04	14.00	12.37	91.02	-949.72	8,628.42	8,648.40	8,622.03	26.37	327.940		
3,700.00	3,623.86	3,826.29	3,826.16	14.46	12.67	91.15	-949.56	8,630.08	8,650.77	8,623.63	27.13	318.845		
3,800.00	3,721.08	3,907.45	3,907.30	14.92	12.96	91.27	-949.67	8,631.75	8,653.38	8,625.51	27.87	310.451		
3,900.00	3,818.31	4,025.21	4,025.03	15.38	13.37	91.45	-949.66	8,634.12	8,655.98	8,627.23	28.75	301.124		
4,000.00	3,915.54	4,123.66	4,123.46	15.84	13.72	91.60	-949.74	8,636.01	8,658.57	8,629.02	29.55	293.023		
4,100.00	4,012.76	4,241.78	4,241.57	16.30	14.13	91.79	-950.33	8,638.00	8,661.08	8,630.65	30.42	284.693		
4,200.00	4,109.99	4,337.40	4,337.17	16.76	14.46	91.94	-950.70	8,639.47	8,663.49	8,632.28	31.22	277.533		
4,300.00	4,207.22	4,417.23	4,416.99	17.22	14.74	92.06	-951.27	8,640.79	8,666.14	8,634.19	31.95	271.211		
4,400.00	4,304.44	4,500.00	4,499.75	17.68	15.03	92.19	-951.18	8,642.39	8,668.97	8,636.27	32.70	265.096		
4,500.00	4,401.67	4,570.05	4,569.77	18.14	15.28	92.29	-950.38	8,644.07	8,672.10	8,638.70	33.40	259.615		
4,600.00	4,498.90	4,666.14	4,665.80	18.60	15.62	92.42	-948.47	8,646.85	8,675.58	8,641.38	34.20	253.676		
4,700.00	4,596.12	5,042.43	5,041.78	19.06	16.93	92.91	-935.08	8,651.42	8,676.35	8,640.37	35.98	241.116		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		400-A020Ga_GYRO-NS, 6400-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,800.00	4,693.35	5,181.68	5,181.02	19.52	17.42	93.11	-933.05	8,650.18	8,676.39	8,639.46	36.93	234.970		
4,894.23	4,784.97	5,270.62	5,269.95	19.95	17.73	93.25	-932.39	8,648.96	8,676.20	8,638.54	37.67	230.339		
4,900.00	4,790.58	5,274.28	5,273.61	19.98	17.74	93.25	-932.38	8,648.91	8,676.20	8,638.50	37.71	230.099		
5,000.00	4,887.80	5,334.93	5,334.25	20.44	17.95	93.35	-932.57	8,648.19	8,676.46	8,638.08	38.38	226.082		
5,100.00	4,985.03	5,400.00	5,399.31	20.90	18.18	93.45	-933.01	8,647.66	8,677.21	8,638.15	39.06	222.132		
5,200.00	5,082.26	5,469.87	5,469.19	21.36	18.42	93.56	-933.38	8,647.37	8,678.36	8,638.60	39.77	218.239		
5,300.00	5,179.48	5,500.00	5,499.31	21.82	18.52	93.61	-933.40	8,647.32	8,679.96	8,639.63	40.33	215.234		
5,400.00	5,276.71	5,569.42	5,568.73	22.27	18.77	93.72	-933.43	8,647.59	8,682.02	8,640.99	41.03	211.614		
5,500.00	5,373.94	5,642.03	5,641.34	22.73	19.02	93.83	-933.61	8,648.45	8,684.79	8,643.05	41.74	208.076		
5,600.00	5,471.16	5,735.49	5,734.79	23.19	19.35	93.97	-933.82	8,649.43	8,687.54	8,645.02	42.52	204.299		
5,700.00	5,568.39	5,800.00	5,799.29	23.65	19.57	94.07	-934.21	8,650.31	8,690.72	8,647.51	43.21	201.149		
5,800.00	5,665.62	6,019.28	6,018.56	24.11	20.34	94.42	-935.55	8,651.67	8,693.09	8,648.65	44.44	195.630		
5,900.00	5,762.84	6,133.56	6,132.84	24.57	20.72	94.60	-936.11	8,651.90	8,695.33	8,650.05	45.28	192.042		
6,000.00	5,860.07	6,230.79	6,230.07	25.03	21.02	94.74	-936.11	8,651.90	8,697.28	8,651.25	46.03	188.949		
6,100.00	5,957.30	6,347.66	6,346.94	25.50	21.37	94.93	-936.32	8,652.00	8,699.48	8,652.64	46.84	185.724		
6,200.00	6,054.52	6,425.25	6,424.52	25.96	21.76	95.04	-936.11	8,651.90	8,701.39	8,653.70	47.69	182.472		
6,300.00	6,151.75	6,522.48	6,521.75	26.42	22.64	95.19	-936.11	8,651.90	8,703.53	8,654.50	49.03	177.520		
6,400.00	6,248.98	6,605.30	6,604.55	26.88	23.39	95.32	-935.43	8,651.90	8,705.58	8,655.34	50.24	173.283		
6,500.00	6,346.20	6,716.97	6,716.20	27.34	24.53	95.49	-936.11	8,651.90	8,708.01	8,656.17	51.84	167.994		
6,600.00	6,443.43	6,814.19	6,813.43	27.80	25.69	95.64	-936.11	8,651.90	8,710.34	8,656.89	53.45	162.951		
6,696.38	6,537.14	6,907.54	6,906.78	28.24	26.81	95.78	-935.87	8,651.90	8,712.59	8,657.58	55.01	158.384		
6,700.00	6,540.66	6,910.99	6,910.22	28.26	26.85	97.14	-935.87	8,651.90	8,712.68	8,657.62	55.07	158.220		
6,750.00	6,589.27	6,958.50	6,957.74	28.48	27.41	115.83	-935.89	8,651.90	8,716.10	8,660.24	55.86	156.037		
6,800.00	6,637.66	7,005.80	7,005.03	28.71	27.98	132.10	-935.93	8,651.90	8,723.35	8,666.71	56.64	154.009		
6,850.00	6,685.53	7,052.58	7,051.81	28.92	28.54	144.52	-936.00	8,651.90	8,734.39	8,676.98	57.41	152.146		
6,900.00	6,732.60	7,098.55	7,097.78	29.13	29.09	153.60	-936.08	8,651.90	8,749.13	8,690.98	58.15	150.451		
6,950.00	6,778.56	7,149.35	7,148.56	29.32	29.83	160.32	-936.11	8,651.90	8,767.47	8,708.39	59.08	148.402		
7,000.00	6,823.13	7,193.92	7,193.13	29.51	30.52	165.47	-936.11	8,651.90	8,789.30	8,729.37	59.93	146.648		
7,050.00	6,866.05	7,236.84	7,236.05	29.68	31.18	169.60	-936.11	8,651.90	8,814.49	8,753.74	60.75	145.095		
7,100.00	6,907.04	7,277.83	7,277.04	29.85	31.81	173.07	-936.11	8,651.90	8,842.88	8,781.37	61.52	143.743		
7,150.00	6,945.85	7,316.64	7,315.85	30.01	32.41	176.17	-936.11	8,651.90	8,874.30	8,812.07	62.24	142.589		
7,200.00	6,982.24	7,352.59	7,351.79	30.15	32.96	179.06	-935.07	8,651.90	8,908.28	8,845.38	62.89	141.640		
7,250.00	7,016.00	7,383.60	7,382.80	30.29	33.44	-178.04	-935.09	8,651.90	8,945.15	8,881.70	63.46	140.967		
7,300.00	7,046.90	7,411.98	7,411.18	30.43	33.88	-174.99	-935.15	8,651.90	8,984.43	8,920.47	63.96	140.472		
7,350.00	7,074.76	7,437.56	7,436.75	30.56	34.27	-171.56	-935.22	8,651.90	9,025.86	8,961.46	64.40	140.153		
7,400.00	7,099.42	7,460.17	7,459.36	30.69	34.62	-167.49	-935.30	8,651.90	9,069.20	9,004.42	64.78	140.006 SF		
7,450.00	7,120.70	7,479.68	7,478.88	30.82	34.92	-162.38	-935.39	8,651.90	9,114.17	9,049.08	65.09	140.026		
7,500.00	7,138.50	7,495.99	7,495.18	30.95	35.17	-155.62	-935.47	8,651.90	9,160.49	9,095.15	65.33	140.209		
7,550.00	7,152.68	7,508.98	7,508.17	31.10	35.37	-146.26	-935.55	8,651.90	9,207.88	9,142.37	65.51	140.552		
7,600.00	7,163.18	7,518.58	7,517.77	31.25	35.52	-133.07	-935.61	8,651.90	9,256.05	9,190.43	65.62	141.050		
7,650.00	7,169.92	7,524.74	7,523.93	31.41	35.62	-115.33	-935.65	8,651.90	9,304.71	9,239.04	65.67	141.696		
7,700.00	7,172.86	7,527.42	7,526.61	31.59	35.66	-94.93	-935.66	8,651.90	9,353.55	9,287.90	65.64	142.487		
7,713.53	7,173.00	7,527.55	7,526.74	31.64	35.66	-89.54	-935.66	8,651.90	9,366.75	9,301.12	65.63	142.725		
7,800.00	7,173.00	7,527.52	7,526.71	31.99	35.66	-89.54	-935.66	8,651.90	9,451.16	9,385.65	65.51	144.276		
7,900.00	7,173.00	7,527.50	7,526.69	32.47	35.66	-89.54	-935.66	8,651.90	9,548.81	9,483.43	65.37	146.063		
8,000.00	7,173.00	7,527.47	7,526.66	33.03	35.66	-89.54	-935.66	8,651.90	9,646.51	9,581.26	65.25	147.844		
8,100.00	7,173.00	7,527.44	7,526.63	33.66	35.66	-89.54	-935.66	8,651.90	9,744.26	9,679.13	65.13	149.619		
8,200.00	7,173.00	7,527.41	7,526.60	34.36	35.66	-89.54	-935.66	8,651.90	9,842.05	9,777.04	65.01	151.387		
8,300.00	7,173.00	7,527.39	7,526.57	35.13	35.66	-89.54	-935.66	8,651.90	9,939.89	9,874.98	64.90	153.149		
8,400.00	7,173.00	7,527.36	7,526.55	35.95	35.66	-89.54	-935.66	8,651.90	10,037.77	9,972.97	64.80	154.904		
8,500.00	7,173.00	7,527.33	7,526.52	36.82	35.66	-89.54	-935.66	8,651.90	10,135.69	10,070.99	64.70	156.653		
8,600.00	7,173.00	7,527.30	7,526.49	37.74	35.66	-89.54	-935.66	8,651.90	10,233.65	10,169.04	64.61	158.395		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program:		400-A020Ga_GYRO-NS, 6400-A027Ua_INC-ONLY						Rule Assigned:				Offset Well Error:	0.00 usft	
Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
8,700.00	7,173.00	7,527.27	7,526.46	38.71	35.66	-89.54	-935.66	8,651.90	10,331.65	10,267.13	64.52	160.129		
8,800.00	7,173.00	7,527.25	7,526.44	39.71	35.65	-89.54	-935.66	8,651.90	10,429.69	10,365.25	64.44	161.857		
8,900.00	7,173.00	7,527.22	7,526.41	40.76	35.65	-89.54	-935.66	8,651.90	10,527.76	10,463.40	64.36	163.578		
9,000.00	7,173.00	7,527.19	7,526.38	41.84	35.65	-89.53	-935.66	8,651.90	10,625.87	10,561.59	64.29	165.291		
9,100.00	7,173.00	7,527.16	7,526.35	42.96	35.65	-89.53	-935.66	8,651.90	10,724.02	10,659.80	64.22	166.998		
9,200.00	7,173.00	7,527.14	7,526.33	44.10	35.65	-89.53	-935.66	8,651.90	10,822.20	10,758.05	64.15	168.697		
9,300.00	7,173.00	7,527.11	7,526.30	45.27	35.65	-89.53	-935.66	8,651.90	10,920.41	10,856.32	64.09	170.388		
9,400.00	7,173.00	7,527.08	7,526.27	46.47	35.65	-89.53	-935.66	8,651.90	11,018.66	10,954.62	64.03	172.073		
9,500.00	7,173.00	7,527.05	7,526.24	47.70	35.65	-89.53	-935.66	8,651.90	11,116.93	11,052.95	63.98	173.750		
9,600.00	7,173.00	7,527.03	7,526.22	48.94	35.65	-89.53	-935.66	8,651.90	11,215.24	11,151.31	63.93	175.419		
9,700.00	7,173.00	7,527.00	7,526.19	50.20	35.65	-89.53	-935.66	8,651.90	11,313.58	11,249.69	63.89	177.081		
9,800.00	7,173.00	7,526.97	7,526.16	51.49	35.65	-89.53	-935.66	8,651.90	11,411.94	11,348.10	63.85	178.736		
9,900.00	7,173.00	7,526.94	7,526.13	52.79	35.65	-89.53	-935.66	8,651.90	11,510.34	11,446.53	63.81	180.383		
10,000.00	7,173.00	7,526.92	7,526.11	54.11	35.65	-89.53	-935.66	8,651.90	11,608.76	11,544.98	63.78	182.023		
10,100.00	7,173.00	7,526.89	7,526.08	55.44	35.65	-89.53	-935.66	8,651.90	11,707.21	11,643.46	63.75	183.654		
10,200.00	7,173.00	7,526.86	7,526.05	56.78	35.65	-89.53	-935.66	8,651.90	11,805.68	11,741.96	63.72	185.279		
10,300.00	7,173.00	7,526.83	7,526.02	58.14	35.65	-89.52	-935.66	8,651.90	11,904.18	11,840.48	63.69	186.896		
10,400.00	7,173.00	7,526.81	7,526.00	59.51	35.65	-89.52	-935.66	8,651.90	12,002.70	11,939.03	63.67	188.505		
10,500.00	7,173.00	7,526.78	7,525.97	60.90	35.65	-89.52	-935.66	8,651.90	12,101.25	12,037.60	63.66	190.106		
10,600.00	7,173.00	7,526.75	7,525.94	62.29	35.65	-89.52	-935.66	8,651.90	12,199.82	12,136.18	63.64	191.700		
10,700.00	7,173.00	7,526.72	7,525.91	63.69	35.65	-89.52	-935.66	8,651.90	12,298.42	12,234.79	63.63	193.286		
10,800.00	7,173.00	7,526.70	7,525.89	65.11	35.65	-89.52	-935.66	8,651.90	12,397.04	12,333.42	63.62	194.865		
10,900.00	7,173.00	7,526.67	7,525.86	66.53	35.65	-89.52	-935.66	8,651.90	12,495.68	12,432.06	63.61	196.436		
11,000.00	7,173.00	7,526.64	7,525.83	67.96	35.65	-89.52	-935.66	8,651.90	12,594.34	12,530.73	63.61	197.999		
11,100.00	7,173.00	7,526.61	7,525.80	69.39	35.65	-89.52	-935.66	8,651.90	12,693.02	12,629.41	63.61	199.555		
11,200.00	7,173.00	7,526.59	7,525.78	70.84	35.64	-89.52	-935.66	8,651.90	12,791.72	12,728.11	63.61	201.103		
11,300.00	7,173.00	7,526.56	7,525.75	72.29	35.64	-89.52	-935.66	8,651.90	12,890.44	12,826.83	63.61	202.644		
11,400.00	7,173.00	7,526.53	7,525.72	73.74	35.64	-89.52	-935.66	8,651.90	12,989.18	12,925.57	63.62	204.177		
11,500.00	7,173.00	7,526.50	7,525.69	75.21	35.64	-89.52	-935.66	8,651.90	13,087.95	13,024.32	63.63	205.702		
11,600.00	7,173.00	7,526.48	7,525.67	76.68	35.64	-89.51	-935.66	8,651.90	13,186.73	13,123.09	63.64	207.220		
11,700.00	7,173.00	7,526.45	7,525.64	78.15	35.64	-89.51	-935.66	8,651.90	13,285.52	13,221.87	63.65	208.730		
11,800.00	7,173.00	7,526.42	7,525.61	79.63	35.64	-89.51	-935.66	8,651.90	13,384.34	13,320.68	63.66	210.233		
11,900.00	7,173.00	7,526.39	7,525.58	81.11	35.64	-89.51	-935.66	8,651.90	13,483.17	13,419.49	63.68	211.729		
12,000.00	7,173.00	7,526.37	7,525.56	82.60	35.64	-89.51	-935.66	8,651.90	13,582.02	13,518.32	63.70	213.216		
12,100.00	7,173.00	7,526.34	7,525.53	84.09	35.64	-89.51	-935.66	8,651.90	13,680.89	13,617.17	63.72	214.697		
12,200.00	7,173.00	7,526.31	7,525.50	85.59	35.64	-89.51	-935.66	8,651.90	13,779.77	13,716.03	63.75	216.170		
12,300.00	7,173.00	7,526.29	7,525.47	87.09	35.64	-89.51	-935.66	8,651.90	13,878.67	13,814.90	63.77	217.635		
12,400.00	7,173.00	7,526.26	7,525.45	88.59	35.64	-89.51	-935.66	8,651.90	13,977.59	13,913.79	63.80	219.093		
12,500.00	7,173.00	7,526.23	7,525.42	90.10	35.64	-89.51	-935.66	8,651.90	14,076.52	14,012.69	63.83	220.544		
12,600.00	7,173.00	7,526.20	7,525.39	91.61	35.64	-89.51	-935.66	8,651.90	14,175.46	14,111.61	63.86	221.987		
12,700.00	7,173.00	7,526.18	7,525.37	93.13	35.64	-89.51	-935.66	8,651.90	14,274.42	14,210.53	63.89	223.423		
12,800.00	7,173.00	7,526.15	7,525.34	94.64	35.64	-89.51	-935.66	8,651.90	14,373.40	14,309.47	63.92	224.852		
12,900.00	7,173.00	7,526.12	7,525.31	96.16	35.64	-89.50	-935.66	8,651.90	14,472.39	14,408.43	63.96	226.273		
13,000.00	7,173.00	7,526.09	7,525.28	97.69	35.64	-89.50	-935.66	8,651.90	14,571.39	14,507.39	64.00	227.688		
13,100.00	7,173.00	7,526.07	7,525.26	99.21	35.64	-89.50	-935.65	8,651.90	14,670.41	14,606.37	64.04	229.095		
13,200.00	7,173.00	7,526.04	7,525.23	100.74	35.64	-89.50	-935.65	8,651.90	14,769.44	14,705.36	64.08	230.495		
13,300.00	7,173.00	7,526.01	7,525.20	102.27	35.64	-89.50	-935.65	8,651.90	14,868.48	14,804.36	64.12	231.887		
13,400.00	7,173.00	7,525.99	7,525.17	103.80	35.64	-89.50	-935.65	8,651.90	14,967.53	14,903.37	64.16	233.273		
13,500.00	7,173.00	7,525.96	7,525.15	105.33	35.63	-89.50	-935.65	8,651.90	15,066.60	15,002.39	64.21	234.651		
13,600.00	7,173.00	7,525.93	7,525.12	106.87	35.63	-89.50	-935.65	8,651.90	15,165.68	15,101.42	64.26	236.023		
13,700.00	7,173.00	7,525.90	7,525.09	108.41	35.63	-89.50	-935.65	8,651.90	15,264.77	15,200.47	64.30	237.387		
13,800.00	7,173.00	7,525.88	7,525.07	109.95	35.63	-89.50	-935.65	8,651.90	15,363.87	15,299.52	64.35	238.745		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY											Offset Site Error:	0.00 usft
Survey Program: 400-A020Ga_GYRO-NS, 6400-A027Ua_INC-ONLY											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Semi Major Axis Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Warning
13,900.00	7,173.00	7,525.85	7,525.04	111.49	35.63	-89.50	-935.65	8,651.90	15,462.99	15,398.59	64.40	240.095
14,000.00	7,173.00	7,525.82	7,525.01	113.03	35.63	-89.50	-935.65	8,651.90	15,562.12	15,497.66	64.46	241.439
14,100.00	7,173.00	7,525.79	7,524.98	114.58	35.63	-89.50	-935.65	8,651.90	15,661.25	15,596.74	64.51	242.776
14,200.00	7,173.00	7,525.77	7,524.96	116.13	35.63	-89.49	-935.65	8,651.90	15,760.40	15,695.84	64.56	244.106
14,300.00	7,173.00	7,525.74	7,524.93	117.68	35.63	-89.49	-935.65	8,651.90	15,859.56	15,794.94	64.62	245.429
14,400.00	7,173.00	7,525.71	7,524.90	119.23	35.63	-89.49	-935.65	8,651.90	15,958.73	15,894.05	64.68	246.745
14,500.00	7,173.00	7,525.69	7,524.88	120.78	35.63	-89.49	-935.65	8,651.90	16,057.91	15,993.17	64.74	248.054
14,600.00	7,173.00	7,525.66	7,524.85	122.33	35.63	-89.49	-935.65	8,651.90	16,157.10	16,092.30	64.80	249.357
14,700.00	7,173.00	7,525.63	7,524.82	123.88	35.63	-89.49	-935.65	8,651.90	16,256.30	16,191.44	64.86	250.653
14,800.00	7,173.00	7,525.60	7,524.79	125.44	35.63	-89.49	-935.65	8,651.90	16,355.51	16,290.59	64.92	251.942
14,900.00	7,173.00	7,525.58	7,524.77	127.00	35.63	-89.49	-935.65	8,651.90	16,454.73	16,389.75	64.98	253.225
15,000.00	7,173.00	7,525.55	7,524.74	128.55	35.63	-89.49	-935.65	8,651.90	16,553.96	16,488.91	65.04	254.501
15,100.00	7,173.00	7,525.52	7,524.71	130.11	35.63	-89.49	-935.65	8,651.90	16,653.20	16,588.09	65.11	255.771
15,200.00	7,173.00	7,525.50	7,524.69	131.67	35.63	-89.49	-935.65	8,651.90	16,752.44	16,687.27	65.18	257.034
15,300.00	7,173.00	7,525.47	7,524.66	133.23	35.63	-89.49	-935.65	8,651.90	16,851.70	16,786.45	65.24	258.291
15,400.00	7,173.00	7,525.44	7,524.63	134.80	35.63	-89.49	-935.65	8,651.90	16,950.96	16,885.65	65.31	259.541
15,500.00	7,173.00	7,525.42	7,524.60	136.36	35.63	-89.48	-935.65	8,651.90	17,050.24	16,984.85	65.38	260.785
15,600.00	7,173.00	7,525.39	7,524.58	137.92	35.63	-89.48	-935.65	8,651.90	17,149.52	17,084.07	65.45	262.022
15,700.00	7,173.00	7,525.36	7,524.55	139.49	35.63	-89.48	-935.65	8,651.90	17,248.81	17,183.29	65.52	263.253
15,800.00	7,173.00	7,525.33	7,524.52	141.05	35.63	-89.48	-935.65	8,651.90	17,348.10	17,282.51	65.59	264.478
15,900.00	7,173.00	7,525.31	7,524.50	142.62	35.62	-89.48	-935.65	8,651.90	17,447.41	17,381.74	65.67	265.696
16,000.00	7,173.00	7,525.28	7,524.47	144.19	35.62	-89.48	-935.65	8,651.90	17,546.72	17,480.98	65.74	266.909
16,100.00	7,173.00	7,525.25	7,524.44	145.76	35.62	-89.48	-935.65	8,651.90	17,646.05	17,580.23	65.82	268.115
16,200.00	7,173.00	7,525.23	7,524.42	147.33	35.62	-89.48	-935.65	8,651.90	17,745.38	17,679.48	65.89	269.314
16,300.00	7,173.00	7,525.20	7,524.39	148.90	35.62	-89.48	-935.65	8,651.90	17,844.71	17,778.75	65.97	270.508
16,400.00	7,173.00	7,525.17	7,524.36	150.47	35.62	-89.48	-935.65	8,651.90	17,944.06	17,878.01	66.04	271.696
16,500.00	7,173.00	7,525.14	7,524.33	152.04	35.62	-89.48	-935.65	8,651.90	18,043.41	17,977.29	66.12	272.877
16,600.00	7,173.00	7,525.12	7,524.31	153.61	35.62	-89.48	-935.65	8,651.90	18,142.77	18,076.56	66.20	274.053
16,700.00	7,173.00	7,525.09	7,524.28	155.18	35.62	-89.48	-935.65	8,651.90	18,242.13	18,175.85	66.28	275.222
16,800.00	7,173.00	7,525.06	7,524.25	156.76	35.62	-89.48	-935.65	8,651.90	18,341.50	18,275.14	66.36	276.386
16,900.00	7,173.00	7,525.04	7,524.23	158.33	35.62	-89.47	-935.65	8,651.90	18,440.88	18,374.44	66.44	277.543
17,000.00	7,173.00	7,525.01	7,524.20	159.90	35.62	-89.47	-935.65	8,651.90	18,540.27	18,473.74	66.53	278.695
17,100.00	7,173.00	7,524.98	7,524.17	161.48	35.62	-89.47	-935.65	8,651.90	18,639.66	18,573.05	66.61	279.841
17,200.00	7,173.00	7,524.96	7,524.15	163.06	35.62	-89.47	-935.65	8,651.90	18,739.06	18,672.37	66.69	280.981
17,300.00	7,173.00	7,524.93	7,524.12	164.63	35.62	-89.47	-935.65	8,651.90	18,838.47	18,771.69	66.78	282.115
17,400.00	7,173.00	7,524.90	7,524.09	166.21	35.62	-89.47	-935.65	8,651.90	18,937.88	18,871.02	66.86	283.243
17,500.00	7,173.00	7,524.88	7,524.06	167.79	35.62	-89.47	-935.65	8,651.90	19,037.30	18,970.35	66.95	284.366
17,600.00	7,173.00	7,524.85	7,524.04	169.36	35.62	-89.47	-935.65	8,651.90	19,136.72	19,069.69	67.03	285.483
17,700.00	7,173.00	7,524.82	7,524.01	170.94	35.62	-89.47	-935.65	8,651.90	19,236.15	19,169.03	67.12	286.594
17,800.00	7,173.00	7,524.79	7,523.98	172.52	35.62	-89.47	-935.65	8,651.90	19,335.58	19,268.38	67.21	287.700
17,900.00	7,173.00	7,524.77	7,523.96	174.10	35.62	-89.47	-935.65	8,651.90	19,435.03	19,367.73	67.30	288.800
18,000.00	7,173.00	7,524.74	7,523.93	175.68	35.62	-89.47	-935.65	8,651.90	19,534.47	19,467.09	67.38	289.894
18,100.00	7,173.00	7,524.71	7,523.90	177.26	35.62	-89.47	-935.65	8,651.90	19,633.93	19,566.45	67.47	290.983
18,200.00	7,173.00	7,524.69	7,523.88	178.84	35.62	-89.46	-935.65	8,651.90	19,733.38	19,665.82	67.56	292.066
18,300.00	7,173.00	7,524.66	7,523.85	180.42	35.61	-89.46	-935.65	8,651.90	19,832.85	19,765.19	67.66	293.144
18,400.00	7,173.00	7,524.63	7,523.82	182.00	35.61	-89.46	-935.65	8,651.90	19,932.32	19,864.57	67.75	294.217
18,500.00	7,173.00	7,524.61	7,523.80	183.59	35.61	-89.46	-935.65	8,651.90	20,031.79	19,963.95	67.84	295.284
18,600.00	7,173.00	7,524.58	7,523.77	185.17	35.61	-89.46	-935.65	8,651.90	20,131.27	20,063.34	67.93	296.346
18,700.00	7,173.00	7,524.55	7,523.74	186.75	35.61	-89.46	-935.64	8,651.90	20,230.76	20,162.73	68.02	297.402
18,800.00	7,173.00	7,524.53	7,523.72	188.33	35.61	-89.46	-935.64	8,651.90	20,330.25	20,262.13	68.12	298.453
18,900.00	7,173.00	7,524.50	7,523.69	189.92	35.61	-89.46	-935.64	8,651.90	20,429.74	20,361.53	68.21	299.499
19,000.00	7,173.00	7,524.47	7,523.66	191.50	35.61	-89.46	-935.64	8,651.90	20,529.24	20,460.93	68.31	300.539

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Rosa Unit #601 - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program: 400-A020Ga_GYRO-NS, 6400-A027Ua_INC-ONLY													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,100.00	7,173.00	7,524.45	7,523.64	193.09	35.61	-89.46	-935.64	8,651.90	20,628.74	20,560.34	68.40	301.575		
19,200.00	7,173.00	7,524.42	7,523.61	194.67	35.61	-89.46	-935.64	8,651.90	20,728.25	20,659.75	68.50	302.605		
19,249.41	7,173.00	7,524.41	7,523.60	195.45	35.61	-89.46	-935.64	8,651.90	20,777.43	20,708.88	68.55	303.112		
19,300.00	7,173.00	7,524.39	7,523.58	196.25	35.61	-89.46	-935.64	8,651.90	20,827.77	20,759.17	68.60	303.630		
19,384.41	7,173.00	7,524.37	7,523.56	197.34	35.61	-89.46	-935.64	8,651.90	20,911.77	20,838.28	73.49	284.540		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY													Offset Site Error: 0.00 usft
Survey Program: 293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM													Offset Well Error: 0.00 usft
Reference	Offset	Semi Major Axis	Rule Assigned:										
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	293.38	293.36	0.00	0.55	97.79	-1,436.70	10,499.42	10,597.67				
125.00	125.00	393.60	393.57	0.06	0.90	53.29	-1,438.47	10,500.28	10,598.65	10,597.71	0.93	N/A	
225.00	224.98	502.43	502.37	0.17	1.28	-12.55	-1,440.61	10,501.18	10,598.03	10,596.60	1.43	7,436.999	
319.00	318.92	590.97	590.89	0.28	1.59	-23.37	-1,442.37	10,501.84	10,595.91	10,594.06	1.85	5,719.840	
400.00	399.86	655.09	655.00	0.37	1.81	-23.37	-1,443.47	10,502.43	10,593.85	10,591.69	2.16	4,900.112	
469.00	468.80	732.13	732.02	0.52	2.08	-23.37	-1,444.61	10,503.24	10,592.15	10,589.57	2.58	4,098.912	
500.00	499.78	772.44	772.33	0.61	2.22	-8.36	-1,445.19	10,503.61	10,591.37	10,588.55	2.81	3,763.762	
600.00	599.71	878.06	877.93	0.92	2.59	43.07	-1,446.64	10,504.53	10,589.06	10,585.56	3.50	3,024.300	
700.00	699.55	985.38	985.24	1.26	2.96	67.02	-1,447.99	10,505.41	10,587.11	10,582.90	4.21	2,513.440	
800.00	799.19	1,086.46	1,086.31	1.60	3.32	77.01	-1,449.17	10,506.19	10,585.53	10,580.62	4.91	2,154.599	
900.00	898.49	1,178.97	1,178.81	1.97	3.64	82.19	-1,450.19	10,506.95	10,584.44	10,578.85	5.60	1,891.420	
1,000.00	997.33	1,271.72	1,271.55	2.34	3.96	85.34	-1,451.18	10,507.78	10,583.87	10,577.57	6.30	1,681.275	
1,059.58	1,055.96	1,327.30	1,327.12	2.58	4.16	86.69	-1,451.79	10,508.29	10,583.78	10,577.05	6.72	1,574.182 CC	
1,100.00	1,095.61	1,364.87	1,364.70	2.74	4.29	87.46	-1,452.21	10,508.65	10,583.82	10,576.81	7.01	1,509.065	
1,196.26	1,189.56	1,454.85	1,454.67	3.13	4.60	88.95	-1,453.28	10,509.52	10,584.28	10,576.55	7.73	1,370.076	
1,200.00	1,193.19	1,458.41	1,458.23	3.15	4.61	88.95	-1,453.33	10,509.55	10,584.31	10,576.55	7.75	1,365.095	
1,300.00	1,290.42	1,553.58	1,553.37	3.58	4.95	89.08	-1,454.76	10,510.45	10,585.08	10,576.56	8.52	1,243.091	
1,400.00	1,387.65	1,652.58	1,652.36	4.01	5.29	89.22	-1,456.58	10,511.34	10,585.92	10,576.62	9.30	1,138.592	
1,500.00	1,484.87	1,760.40	1,760.16	4.45	5.67	89.36	-1,458.37	10,512.27	10,586.75	10,576.63	10.12	1,046.582	
1,600.00	1,582.10	1,873.42	1,873.17	4.90	6.06	89.51	-1,459.82	10,513.16	10,587.52	10,576.57	10.96	966.453	
1,700.00	1,679.33	1,990.83	1,990.57	5.34	6.47	89.66	-1,460.91	10,513.95	10,588.17	10,576.36	11.81	896.388	
1,800.00	1,776.55	2,117.84	2,117.57	5.79	6.91	89.83	-1,461.77	10,514.54	10,588.65	10,575.95	12.70	833.478	
1,900.00	1,873.78	2,232.29	2,232.02	6.24	7.31	89.98	-1,462.45	10,514.79	10,588.93	10,575.37	13.55	781.233	
2,000.00	1,971.01	2,327.74	2,327.47	6.69	7.65	90.10	-1,462.83	10,514.99	10,589.22	10,574.88	14.34	738.468	
2,100.00	2,068.23	2,444.64	2,444.37	7.15	8.06	90.25	-1,463.03	10,515.24	10,589.54	10,574.34	15.20	696.692	
2,200.00	2,165.46	2,589.85	2,589.58	7.60	8.56	90.43	-1,462.99	10,515.05	10,589.55	10,573.39	16.16	655.372	
2,300.00	2,262.69	2,685.69	2,685.42	8.06	8.89	90.55	-1,462.82	10,514.76	10,589.42	10,572.47	16.94	624.946	
2,400.00	2,359.91	2,794.19	2,793.92	8.51	9.27	90.69	-1,462.51	10,514.40	10,589.29	10,571.52	17.78	595.701	
2,500.00	2,457.14	2,931.24	2,930.96	8.97	9.74	90.86	-1,462.04	10,513.59	10,588.96	10,570.25	18.71	566.048	
2,600.00	2,554.37	3,042.83	3,042.55	9.42	10.13	91.00	-1,461.61	10,512.63	10,588.40	10,568.85	19.55	541.598	
2,700.00	2,651.59	3,148.65	3,148.37	9.88	10.50	91.13	-1,461.15	10,511.63	10,587.82	10,567.44	20.37	519.664	
2,800.00	2,748.82	3,282.10	3,281.80	10.34	10.97	91.30	-1,460.65	10,510.07	10,587.07	10,565.78	21.29	497.180	
2,900.00	2,846.05	3,389.13	3,388.83	10.80	11.34	91.44	-1,460.49	10,508.48	10,586.12	10,564.00	22.12	478.502	
3,000.00	2,943.27	3,435.00	3,434.69	11.25	11.50	91.49	-1,460.45	10,507.77	10,585.32	10,562.58	22.74	465.448	
3,067.98	3,009.37	3,449.36	3,449.05	11.57	11.55	91.51	-1,460.21	10,507.66	10,585.18	10,562.08	23.10	458.141	
3,100.00	3,040.50	3,452.63	3,452.31	11.71	11.56	91.52	-1,460.11	10,507.66	10,585.26	10,562.00	23.26	455.025 ES	
3,200.00	3,137.73	3,467.00	3,466.67	12.17	11.61	91.53	-1,459.48	10,507.83	10,586.08	10,562.31	23.77	445.328	
3,300.00	3,234.95	3,467.00	3,466.67	12.63	11.61	91.53	-1,459.48	10,507.83	10,587.75	10,563.52	24.23	436.999	
3,400.00	3,332.18	3,467.00	3,466.67	13.09	11.61	91.53	-1,459.48	10,507.83	10,590.36	10,565.68	24.68	429.049	
3,500.00	3,429.40	3,467.00	3,466.67	13.55	11.61	91.53	-1,459.48	10,507.83	10,593.92	10,568.78	25.14	421.456	
3,600.00	3,526.63	3,467.00	3,466.67	14.00	11.61	91.53	-1,459.48	10,507.83	10,598.41	10,572.83	25.59	414.201	
3,700.00	3,623.86	3,467.00	3,466.67	14.46	11.61	91.53	-1,459.48	10,507.83	10,603.85	10,577.82	26.04	407.268	
3,800.00	3,721.08	3,467.00	3,466.67	14.92	11.61	91.53	-1,459.48	10,507.83	10,610.23	10,583.75	26.48	400.639	
3,900.00	3,818.31	3,467.00	3,466.67	15.38	11.61	91.53	-1,459.48	10,507.83	10,617.55	10,590.62	26.93	394.300	
4,000.00	3,915.54	3,467.00	3,466.67	15.84	11.61	91.53	-1,459.48	10,507.83	10,625.80	10,598.43	27.37	388.235	
4,100.00	4,012.76	3,467.00	3,466.67	16.30	11.61	91.53	-1,459.48	10,507.83	10,634.99	10,607.18	27.81	382.433	
4,200.00	4,109.99	3,467.00	3,466.67	16.76	11.61	91.53	-1,459.48	10,507.83	10,645.11	10,616.87	28.25	376.879	
4,300.00	4,207.22	3,467.00	3,466.67	17.22	11.61	91.53	-1,459.48	10,507.83	10,656.16	10,627.48	28.68	371.562	
4,400.00	4,304.44	3,467.00	3,466.67	17.68	11.61	91.53	-1,459.48	10,507.83	10,668.13	10,639.02	29.11	366.472	
4,500.00	4,401.67	3,467.00	3,466.67	18.14	11.61	91.53	-1,459.48	10,507.83	10,681.03	10,651.49	29.54	361.596	
4,600.00	4,498.90	3,469.00	3,468.64	18.60	11.65	91.53	-1,459.38	10,508.11	10,694.83	10,664.87	29.97	356.894	
4,700.00	4,596.12	3,469.00	3,468.64	19.06	11.65	91.53	-1,459.38	10,508.11	10,709.55	10,679.16	30.39	352.443	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY											Offset Site Error:	0.00 usft
Survey Program: 293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference Offset (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)		Minimum Separation (usft)	Separation Factor
							+N/-S (usft)	+E/-W (usft)	Between Ellipses (usft)			Warning
4,800.00	4,693.35	3,469.00	3,468.64	19.52	11.65	91.53	-1,459.38	10,508.11	10,725.17	10,694.37	30.80	348.179
4,900.00	4,790.58	3,469.00	3,468.64	19.98	11.65	91.53	-1,459.38	10,508.11	10,741.71	10,710.49	31.22	344.093
5,000.00	4,887.80	3,469.00	3,468.64	20.44	11.65	91.53	-1,459.38	10,508.11	10,759.15	10,727.52	31.63	340.177
5,100.00	4,985.03	3,469.00	3,468.64	20.90	11.65	91.53	-1,459.38	10,508.11	10,777.49	10,745.45	32.04	336.424
5,200.00	5,082.26	3,469.00	3,468.64	21.36	11.65	91.53	-1,459.38	10,508.11	10,796.72	10,764.28	32.44	332.828
5,300.00	5,179.48	3,469.00	3,468.64	21.82	11.65	91.53	-1,459.38	10,508.11	10,816.84	10,784.00	32.84	329.381
5,400.00	5,276.71	3,469.00	3,468.64	22.27	11.65	91.53	-1,459.38	10,508.11	10,837.85	10,804.61	33.24	326.077
5,500.00	5,373.94	3,469.00	3,468.64	22.73	11.65	91.53	-1,459.38	10,508.11	10,859.74	10,826.11	33.63	322.911
5,600.00	5,471.16	3,469.00	3,468.64	23.19	11.65	91.53	-1,459.38	10,508.11	10,882.50	10,848.48	34.02	319.877
5,700.00	5,568.39	3,469.00	3,468.64	23.65	11.65	91.53	-1,459.38	10,508.11	10,906.14	10,871.73	34.41	316.969
5,800.00	5,665.62	3,469.00	3,468.64	24.11	11.65	91.53	-1,459.38	10,508.11	10,930.64	10,895.85	34.79	314.182
5,900.00	5,762.84	3,469.00	3,468.64	24.57	11.65	91.53	-1,459.38	10,508.11	10,955.99	10,920.82	35.17	311.513
6,000.00	5,860.07	3,469.00	3,468.64	25.03	11.65	91.53	-1,459.38	10,508.11	10,982.20	10,946.65	35.55	308.955
6,100.00	5,957.30	3,469.00	3,468.64	25.50	11.65	91.53	-1,459.38	10,508.11	11,009.25	10,973.33	35.92	306.505
6,200.00	6,054.52	3,469.00	3,468.64	25.96	11.65	91.53	-1,459.38	10,508.11	11,037.15	11,000.86	36.29	304.158
6,300.00	6,151.75	3,502.00	3,500.18	26.42	11.67	91.56	-1,458.09	10,517.73	11,065.79	11,029.11	36.68	301.674
6,400.00	6,248.98	3,502.00	3,500.18	26.88	11.67	91.56	-1,458.09	10,517.73	11,095.06	11,058.02	37.04	299.516
6,500.00	6,346.20	3,502.00	3,500.18	27.34	11.67	91.56	-1,458.09	10,517.73	11,125.15	11,087.75	37.40	297.449
6,600.00	6,443.43	3,502.00	3,500.18	27.80	11.67	91.56	-1,458.09	10,517.73	11,156.06	11,118.31	37.76	295.472
6,696.38	6,537.14	3,502.00	3,500.18	28.24	11.67	91.56	-1,458.09	10,517.73	11,186.62	11,148.52	38.10	293.647
6,700.00	6,540.66	3,502.00	3,500.18	28.26	11.67	92.92	-1,458.09	10,517.73	11,187.79	11,149.68	38.11	293.579
6,750.00	6,589.27	3,502.00	3,500.18	28.48	11.67	111.73	-1,458.09	10,517.73	11,206.03	11,167.75	38.28	292.736
6,800.00	6,637.66	3,502.00	3,500.18	28.71	11.67	128.11	-1,458.09	10,517.73	11,228.02	11,189.57	38.44	292.055
6,850.00	6,685.53	3,502.00	3,500.18	28.92	11.67	140.66	-1,458.09	10,517.73	11,253.59	11,214.99	38.60	291.561
6,900.00	6,732.60	3,502.00	3,500.18	29.13	11.67	149.89	-1,458.09	10,517.73	11,282.56	11,243.82	38.74	291.256
6,950.00	6,778.56	3,502.00	3,500.18	29.32	11.67	156.78	-1,458.09	10,517.73	11,314.73	11,275.87	38.86	291.137 SF
7,000.00	6,823.13	3,502.00	3,500.18	29.51	11.67	162.17	-1,458.09	10,517.73	11,349.88	11,310.90	38.98	291.204
7,050.00	6,866.05	3,502.00	3,500.18	29.68	11.67	166.64	-1,458.09	10,517.73	11,387.76	11,348.69	39.07	291.450
7,100.00	6,907.04	3,502.00	3,500.18	29.85	11.67	170.62	-1,458.09	10,517.73	11,428.11	11,388.95	39.15	291.872
7,150.00	6,945.85	3,502.00	3,500.18	30.01	11.67	174.47	-1,458.09	10,517.73	11,470.66	11,431.44	39.22	292.461
7,200.00	6,982.24	3,502.00	3,500.18	30.15	11.67	178.57	-1,458.09	10,517.73	11,515.12	11,475.85	39.27	293.211
7,250.00	7,016.00	3,502.00	3,500.18	30.29	11.67	-176.58	-1,458.09	10,517.73	11,561.20	11,521.89	39.31	294.112
7,300.00	7,046.90	3,502.00	3,500.18	30.43	11.67	-170.09	-1,458.09	10,517.73	11,608.60	11,569.27	39.33	295.153
7,350.00	7,074.76	3,502.00	3,500.18	30.56	11.67	-160.21	-1,458.09	10,517.73	11,657.01	11,617.67	39.34	296.322
7,400.00	7,099.42	3,502.00	3,500.18	30.69	11.67	-143.21	-1,458.09	10,517.73	11,706.12	11,666.79	39.33	297.604
7,450.00	7,120.70	3,502.00	3,500.18	30.82	11.67	-113.86	-1,458.09	10,517.73	11,755.63	11,716.31	39.32	298.985
7,500.00	7,138.50	3,502.00	3,500.18	30.95	11.67	-79.46	-1,458.09	10,517.73	11,805.21	11,765.92	39.29	300.446
7,550.00	7,152.68	3,502.00	3,500.18	31.10	11.67	-56.57	-1,458.09	10,517.73	11,854.58	11,815.32	39.26	301.969
7,600.00	7,163.18	3,502.00	3,500.18	31.25	11.67	-44.07	-1,458.09	10,517.73	11,903.42	11,864.21	39.22	303.533
7,650.00	7,169.92	3,502.00	3,500.18	31.41	11.67	-36.87	-1,458.09	10,517.73	11,951.45	11,912.28	39.17	305.116
7,700.00	7,172.86	3,502.00	3,500.18	31.59	11.67	-32.38	-1,458.09	10,517.73	11,998.39	11,959.26	39.12	306.694
7,713.53	7,173.00	3,502.00	3,500.18	31.64	11.67	-31.46	-1,458.09	10,517.73	12,010.86	11,971.75	39.11	307.130
7,800.00	7,173.00	3,502.00	3,500.18	31.99	11.67	-31.46	-1,458.09	10,517.73	12,090.31	12,051.27	39.03	309.757
7,900.00	7,173.00	3,502.00	3,500.18	32.47	11.67	-31.46	-1,458.09	10,517.73	12,182.30	12,143.35	38.95	312.751
8,000.00	7,173.00	3,502.00	3,500.18	33.03	11.67	-31.46	-1,458.09	10,517.73	12,274.42	12,235.54	38.88	315.704
8,100.00	7,173.00	3,502.00	3,500.18	33.66	11.67	-31.46	-1,458.09	10,517.73	12,366.66	12,327.85	38.81	318.616
8,200.00	7,173.00	3,502.00	3,500.18	34.36	11.67	-31.46	-1,458.09	10,517.73	12,459.02	12,420.27	38.75	321.487
8,300.00	7,173.00	3,502.00	3,500.18	35.13	11.67	-31.46	-1,458.09	10,517.73	12,551.50	12,512.80	38.70	324.317
8,400.00	7,173.00	3,502.00	3,500.18	35.95	11.67	-31.46	-1,458.09	10,517.73	12,644.09	12,605.44	38.65	327.105
8,500.00	7,173.00	3,502.00	3,500.18	36.82	11.67	-31.46	-1,458.09	10,517.73	12,736.80	12,698.18	38.61	329.851
8,600.00	7,173.00	3,502.00	3,500.18	37.74	11.67	-31.46	-1,458.09	10,517.73	12,829.61	12,791.03	38.58	332.556
8,700.00	7,173.00	3,502.00	3,500.18	38.71	11.67	-31.46	-1,458.09	10,517.73	12,922.53	12,883.98	38.55	335.220

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Semi Major Axis Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,800.00	7,173.00	3,502.00	3,500.18	39.71	11.67	-31.46	-1,458.09	10,517.73	13,015.56	12,977.03	38.53	337.842	
8,900.00	7,173.00	3,502.00	3,500.18	40.76	11.67	-31.46	-1,458.09	10,517.73	13,108.69	13,070.18	38.51	340.422	
9,000.00	7,173.00	3,502.00	3,500.18	41.84	11.67	-31.46	-1,458.09	10,517.73	13,201.92	13,163.42	38.49	342.962	
9,100.00	7,173.00	3,502.00	3,500.18	42.96	11.67	-31.46	-1,458.09	10,517.73	13,295.24	13,256.76	38.49	345.461	
9,200.00	7,173.00	3,502.00	3,500.18	44.10	11.67	-31.46	-1,458.09	10,517.73	13,388.67	13,350.19	38.48	347.919	
9,300.00	7,173.00	3,502.00	3,500.18	45.27	11.67	-31.46	-1,458.09	10,517.73	13,482.19	13,443.70	38.48	350.338	
9,400.00	7,173.00	3,502.00	3,500.18	46.47	11.67	-31.46	-1,458.09	10,517.73	13,575.80	13,537.31	38.49	352.717	
9,500.00	7,173.00	3,502.00	3,500.18	47.70	11.67	-31.46	-1,458.09	10,517.73	13,669.50	13,631.00	38.50	355.057	
9,600.00	7,173.00	3,502.00	3,500.18	48.94	11.67	-31.46	-1,458.09	10,517.73	13,763.29	13,724.78	38.51	357.358	
9,700.00	7,173.00	3,502.00	3,500.18	50.20	11.67	-31.46	-1,458.09	10,517.73	13,857.17	13,818.63	38.53	359.622	
9,800.00	7,173.00	3,502.00	3,500.18	51.49	11.67	-31.46	-1,458.09	10,517.73	13,951.13	13,912.57	38.56	361.847	
9,900.00	7,173.00	3,502.00	3,500.18	52.79	11.67	-31.46	-1,458.09	10,517.73	14,045.17	14,006.59	38.58	364.036	
10,000.00	7,173.00	3,502.00	3,500.18	54.11	11.67	-31.46	-1,458.09	10,517.73	14,139.30	14,100.69	38.61	366.188	
10,100.00	7,173.00	3,502.00	3,500.18	55.44	11.67	-31.46	-1,458.09	10,517.73	14,233.51	14,194.86	38.65	368.304	
10,200.00	7,173.00	3,502.00	3,500.18	56.78	11.67	-31.46	-1,458.09	10,517.73	14,327.79	14,289.11	38.68	370.385	
10,300.00	7,173.00	3,502.00	3,500.18	58.14	11.67	-31.46	-1,458.09	10,517.73	14,422.16	14,383.43	38.72	372.432	
10,400.00	7,173.00	3,502.00	3,500.18	59.51	11.67	-31.46	-1,458.09	10,517.73	14,516.60	14,477.83	38.77	374.444	
10,500.00	7,173.00	3,502.00	3,500.18	60.90	11.67	-31.46	-1,458.09	10,517.73	14,611.11	14,572.29	38.82	376.423	
10,600.00	7,173.00	3,485.52	3,484.51	62.29	11.66	-31.37	-1,458.68	10,512.66	14,705.40	14,666.54	38.86	378.408	
10,700.00	7,173.00	3,469.00	3,468.64	63.69	11.65	-31.28	-1,459.38	10,508.11	14,800.29	14,761.38	38.91	380.371	
10,800.00	7,173.00	3,469.00	3,468.64	65.11	11.65	-31.28	-1,459.38	10,508.11	14,894.95	14,855.98	38.97	382.244	
10,900.00	7,173.00	3,469.00	3,468.64	66.53	11.65	-31.28	-1,459.38	10,508.11	14,989.68	14,950.65	39.03	384.086	
11,000.00	7,173.00	3,469.00	3,468.64	67.96	11.65	-31.28	-1,459.38	10,508.11	15,084.48	15,045.39	39.09	385.898	
11,100.00	7,173.00	3,469.00	3,468.64	69.39	11.65	-31.28	-1,459.38	10,508.11	15,179.35	15,140.19	39.15	387.681	
11,200.00	7,173.00	3,469.00	3,468.64	70.84	11.65	-31.28	-1,459.38	10,508.11	15,274.28	15,235.06	39.22	389.435	
11,300.00	7,173.00	3,469.00	3,468.64	72.29	11.65	-31.28	-1,459.38	10,508.11	15,369.27	15,329.98	39.29	391.161	
11,400.00	7,173.00	3,469.00	3,468.64	73.74	11.65	-31.28	-1,459.38	10,508.11	15,464.33	15,424.97	39.36	392.860	
11,500.00	7,173.00	3,469.00	3,468.64	75.21	11.65	-31.28	-1,459.38	10,508.11	15,559.45	15,520.02	39.44	394.532	
11,600.00	7,173.00	3,469.00	3,468.64	76.68	11.65	-31.28	-1,459.38	10,508.11	15,654.64	15,615.12	39.51	396.178	
11,700.00	7,173.00	3,469.00	3,468.64	78.15	11.65	-31.28	-1,459.38	10,508.11	15,749.88	15,710.28	39.59	397.799	
11,800.00	7,173.00	3,469.00	3,468.64	79.63	11.65	-31.28	-1,459.38	10,508.11	15,845.18	15,805.50	39.67	399.394	
11,900.00	7,173.00	3,469.00	3,468.64	81.11	11.65	-31.28	-1,459.38	10,508.11	15,940.54	15,900.78	39.76	400.966	
12,000.00	7,173.00	3,469.00	3,468.64	82.60	11.65	-31.28	-1,459.38	10,508.11	16,035.95	15,996.11	39.84	402.514	
12,100.00	7,173.00	3,469.00	3,468.64	84.09	11.65	-31.28	-1,459.38	10,508.11	16,131.42	16,091.49	39.93	404.039	
12,200.00	7,173.00	3,469.00	3,468.64	85.59	11.65	-31.28	-1,459.38	10,508.11	16,226.94	16,186.93	40.01	405.541	
12,300.00	7,173.00	3,469.00	3,468.64	87.09	11.65	-31.28	-1,459.38	10,508.11	16,322.52	16,282.42	40.10	407.022	
12,400.00	7,173.00	3,469.00	3,468.64	88.59	11.65	-31.28	-1,459.38	10,508.11	16,418.15	16,377.96	40.19	408.481	
12,500.00	7,173.00	3,469.00	3,468.64	90.10	11.65	-31.28	-1,459.38	10,508.11	16,513.84	16,473.55	40.29	409.920	
12,600.00	7,173.00	3,469.00	3,468.64	91.61	11.65	-31.28	-1,459.38	10,508.11	16,609.57	16,569.19	40.38	411.338	
12,700.00	7,173.00	3,469.00	3,468.64	93.13	11.65	-31.28	-1,459.38	10,508.11	16,705.35	16,664.88	40.47	412.737	
12,800.00	7,173.00	3,469.00	3,468.64	94.64	11.65	-31.28	-1,459.38	10,508.11	16,801.18	16,760.61	40.57	414.116	
12,900.00	7,173.00	3,469.00	3,468.64	96.16	11.65	-31.28	-1,459.38	10,508.11	16,897.07	16,856.40	40.67	415.477	
13,000.00	7,173.00	3,469.00	3,468.64	97.69	11.65	-31.28	-1,459.38	10,508.11	16,992.99	16,952.23	40.77	416.820	
13,100.00	7,173.00	3,469.00	3,468.64	99.21	11.65	-31.28	-1,459.38	10,508.11	17,088.97	17,048.10	40.87	418.145	
13,200.00	7,173.00	3,469.00	3,468.64	100.74	11.65	-31.28	-1,459.38	10,508.11	17,184.99	17,144.02	40.97	419.453	
13,300.00	7,173.00	3,469.00	3,468.64	102.27	11.65	-31.28	-1,459.38	10,508.11	17,281.06	17,239.98	41.07	420.743	
13,400.00	7,173.00	3,469.00	3,468.64	103.80	11.65	-31.28	-1,459.38	10,508.11	17,377.17	17,335.99	41.18	422.018	
13,500.00	7,173.00	3,469.00	3,468.64	105.33	11.65	-31.28	-1,459.38	10,508.11	17,473.32	17,432.04	41.28	423.276	
13,600.00	7,173.00	3,469.00	3,468.64	106.87	11.65	-31.28	-1,459.38	10,508.11	17,569.52	17,528.13	41.39	424.519	
13,700.00	7,173.00	3,469.00	3,468.64	108.41	11.65	-31.28	-1,459.38	10,508.11	17,665.76	17,624.26	41.49	425.747	
13,800.00	7,173.00	3,469.00	3,468.64	109.95	11.65	-31.28	-1,459.38	10,508.11	17,762.04	17,720.44	41.60	426.960	
13,900.00	7,173.00	3,469.00	3,468.64	111.49	11.65	-31.28	-1,459.38	10,508.11	17,858.36	17,816.65	41.71	428.159	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY											Offset Site Error:	0.00 usft
Survey Program: 293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Semi Major Axis Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Warning
14,000.00	7,173.00	3,469.00	3,468.64	113.03	11.65	-31.28	-1,459.38	10,508.11	17,954.72	17,912.90	41.82	429.343
14,100.00	7,173.00	3,469.00	3,468.64	114.58	11.65	-31.28	-1,459.38	10,508.11	18,051.12	18,009.19	41.93	430.514
14,200.00	7,173.00	3,469.00	3,468.64	116.13	11.65	-31.28	-1,459.38	10,508.11	18,147.56	18,105.52	42.04	431.672
14,300.00	7,173.00	3,469.00	3,468.64	117.68	11.65	-31.28	-1,459.38	10,508.11	18,244.04	18,201.89	42.15	432.817
14,400.00	7,173.00	3,469.00	3,468.64	119.23	11.65	-31.28	-1,459.38	10,508.11	18,340.56	18,298.29	42.26	433.949
14,500.00	7,173.00	3,469.00	3,468.64	120.78	11.65	-31.28	-1,459.38	10,508.11	18,437.11	18,394.73	42.38	435.068
14,600.00	7,173.00	3,469.00	3,468.64	122.33	11.65	-31.28	-1,459.38	10,508.11	18,533.70	18,491.21	42.49	436.176
14,700.00	7,173.00	3,469.00	3,468.64	123.88	11.65	-31.28	-1,459.38	10,508.11	18,630.33	18,587.72	42.61	437.272
14,800.00	7,173.00	3,469.00	3,468.64	125.44	11.65	-31.28	-1,459.38	10,508.11	18,726.99	18,684.27	42.72	438.356
14,900.00	7,173.00	3,469.00	3,468.64	127.00	11.65	-31.28	-1,459.38	10,508.11	18,823.69	18,780.85	42.84	439.430
15,000.00	7,173.00	3,469.00	3,468.64	128.55	11.65	-31.28	-1,459.38	10,508.11	18,920.42	18,877.46	42.95	440.492
15,100.00	7,173.00	3,469.00	3,468.64	130.11	11.65	-31.28	-1,459.38	10,508.11	19,017.18	18,974.11	43.07	441.544
15,200.00	7,173.00	3,469.00	3,468.64	131.67	11.65	-31.28	-1,459.38	10,508.11	19,113.98	19,070.79	43.19	442.585
15,300.00	7,173.00	3,469.00	3,468.64	133.23	11.65	-31.28	-1,459.38	10,508.11	19,210.81	19,167.51	43.31	443.616
15,400.00	7,173.00	3,469.00	3,468.64	134.80	11.65	-31.28	-1,459.38	10,508.11	19,307.67	19,264.25	43.42	444.637
15,500.00	7,173.00	3,469.00	3,468.64	136.36	11.65	-31.28	-1,459.38	10,508.11	19,404.57	19,361.03	43.54	445.648
15,600.00	7,173.00	3,469.00	3,468.64	137.92	11.65	-31.28	-1,459.38	10,508.11	19,501.49	19,457.83	43.66	446.650
15,700.00	7,173.00	3,469.00	3,468.64	139.49	11.65	-31.28	-1,459.38	10,508.11	19,598.45	19,554.67	43.78	447.643
15,800.00	7,173.00	3,469.00	3,468.64	141.05	11.65	-31.28	-1,459.38	10,508.11	19,695.44	19,651.54	43.90	448.627
15,900.00	7,173.00	3,469.00	3,468.64	142.62	11.65	-31.28	-1,459.38	10,508.11	19,792.46	19,748.43	44.02	449.602
16,000.00	7,173.00	3,469.00	3,468.64	144.19	11.65	-31.28	-1,459.38	10,508.11	19,889.50	19,845.36	44.14	450.568
16,100.00	7,173.00	3,469.00	3,468.64	145.76	11.65	-31.28	-1,459.38	10,508.11	19,986.58	19,942.31	44.26	451.525
16,200.00	7,173.00	3,469.00	3,468.64	147.33	11.65	-31.28	-1,459.38	10,508.11	20,083.68	20,039.30	44.39	452.475
16,300.00	7,173.00	3,469.00	3,468.64	148.90	11.65	-31.28	-1,459.38	10,508.11	20,180.82	20,136.31	44.51	453.416
16,400.00	7,173.00	3,469.00	3,468.64	150.47	11.65	-31.28	-1,459.38	10,508.11	20,277.98	20,233.35	44.63	454.349
16,500.00	7,173.00	3,469.00	3,468.64	152.04	11.65	-31.28	-1,459.38	10,508.11	20,375.17	20,330.41	44.75	455.275
16,600.00	7,173.00	3,469.00	3,468.64	153.61	11.65	-31.28	-1,459.38	10,508.11	20,472.38	20,427.51	44.88	456.193
16,700.00	7,173.00	3,469.00	3,468.64	155.18	11.65	-31.28	-1,459.38	10,508.11	20,569.62	20,524.62	45.00	457.103
16,800.00	7,173.00	3,469.00	3,468.64	156.76	11.65	-31.28	-1,459.38	10,508.11	20,666.89	20,621.77	45.12	458.006
16,900.00	7,173.00	3,469.00	3,468.64	158.33	11.65	-31.28	-1,459.38	10,508.11	20,764.19	20,718.94	45.25	458.902
17,000.00	7,173.00	3,469.00	3,468.64	159.90	11.65	-31.28	-1,459.38	10,508.11	20,861.51	20,816.14	45.37	459.791
17,100.00	7,173.00	3,469.00	3,468.64	161.48	11.65	-31.28	-1,459.38	10,508.11	20,958.85	20,913.36	45.50	460.673
17,200.00	7,173.00	3,469.00	3,468.64	163.06	11.65	-31.28	-1,459.38	10,508.11	21,056.22	21,010.60	45.62	461.548
17,300.00	7,173.00	3,469.00	3,468.64	164.63	11.65	-31.28	-1,459.38	10,508.11	21,153.62	21,107.87	45.75	462.416
17,400.00	7,173.00	3,469.00	3,468.64	166.21	11.65	-31.28	-1,459.38	10,508.11	21,251.04	21,205.17	45.87	463.278
17,500.00	7,173.00	3,469.00	3,468.64	167.79	11.65	-31.28	-1,459.38	10,508.11	21,348.48	21,302.48	46.00	464.134
17,600.00	7,173.00	3,469.00	3,468.64	169.36	11.65	-31.28	-1,459.38	10,508.11	21,445.95	21,399.82	46.12	464.983
17,700.00	7,173.00	3,469.00	3,468.64	170.94	11.65	-31.28	-1,459.38	10,508.11	21,543.44	21,497.19	46.25	465.826
17,800.00	7,173.00	3,469.00	3,468.64	172.52	11.65	-31.28	-1,459.38	10,508.11	21,640.95	21,594.57	46.37	466.663
17,900.00	7,173.00	3,469.00	3,468.64	174.10	11.65	-31.28	-1,459.38	10,508.11	21,738.48	21,691.98	46.50	467.494
18,000.00	7,173.00	3,469.00	3,468.64	175.68	11.65	-31.28	-1,459.38	10,508.11	21,836.04	21,789.41	46.63	468.319
18,100.00	7,173.00	3,469.00	3,468.64	177.26	11.65	-31.28	-1,459.38	10,508.11	21,933.62	21,886.87	46.75	469.139
18,200.00	7,173.00	3,469.00	3,468.64	178.84	11.65	-31.28	-1,459.38	10,508.11	22,031.22	21,984.34	46.88	469.952
18,300.00	7,173.00	3,469.00	3,468.64	180.42	11.65	-31.28	-1,459.38	10,508.11	22,128.84	22,081.84	47.01	470.760
18,400.00	7,173.00	3,469.00	3,468.64	182.00	11.65	-31.28	-1,459.38	10,508.11	22,226.49	22,179.35	47.13	471.563
18,500.00	7,173.00	3,469.00	3,468.64	183.59	11.65	-31.28	-1,459.38	10,508.11	22,324.15	22,276.89	47.26	472.360
18,600.00	7,173.00	3,469.00	3,468.64	185.17	11.65	-31.28	-1,459.38	10,508.11	22,421.84	22,374.45	47.39	473.152
18,700.00	7,173.00	3,469.00	3,468.64	186.75	11.65	-31.28	-1,459.38	10,508.11	22,519.54	22,472.03	47.52	473.939
18,800.00	7,173.00	3,469.00	3,468.64	188.33	11.65	-31.28	-1,459.38	10,508.11	22,617.27	22,569.62	47.64	474.720
18,900.00	7,173.00	3,469.00	3,468.64	189.92	11.65	-31.28	-1,459.38	10,508.11	22,715.01	22,667.24	47.77	475.496
19,000.00	7,173.00	3,469.00	3,468.64	191.50	11.65	-31.28	-1,459.38	10,508.11	22,812.78	22,764.88	47.90	476.268
19,100.00	7,173.00	3,469.00	3,468.64	193.09	11.65	-31.28	-1,459.38	10,508.11	22,910.56	22,862.54	48.03	477.034

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #001A - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program: 293-A020Ga_GYRO-NS, 3469-B001Mb_MWD+HRGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,200.00	7,173.00	3,469.00	3,468.64	194.67	11.65	-31.28	-1,459.38	10,508.11	23,008.37	22,960.21	48.16	477.795		
19,249.41	7,173.00	3,469.00	3,468.64	195.45	11.65	-31.28	-1,459.38	10,508.11	23,056.70	23,008.48	48.22	478.170		
19,300.00	7,173.00	3,469.00	3,468.64	196.25	11.65	-31.28	-1,459.38	10,508.11	23,106.19	23,057.90	48.28	478.552		
19,384.41	7,173.00	3,469.00	3,468.64	197.34	11.65	-31.28	-1,459.38	10,508.11	23,188.78	23,136.92	51.85	447.202		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program: 100-B001Mb_MWD+HRGM												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	364.00	364.00	0.00	1.30	104.02	-2,665.88	10,675.92	11,003.74				
125.00	125.00	489.00	489.00	0.06	1.75	59.51	-2,665.88	10,675.92	11,003.43	11,001.64	1.80	6,127.688	
225.00	224.98	588.98	588.98	0.17	2.11	-6.34	-2,665.88	10,675.92	11,001.75	10,999.49	2.26	4,864.152	
319.00	318.92	682.92	682.92	0.28	2.45	-17.17	-2,665.88	10,675.92	10,998.59	10,995.87	2.72	4,047.171	
400.00	399.86	763.86	763.86	0.37	2.74	-17.18	-2,665.88	10,675.92	10,995.47	10,992.37	3.10	3,545.238	
469.00	468.80	832.80	832.80	0.52	2.99	-17.18	-2,665.88	10,675.92	10,992.81	10,989.31	3.50	3,139.598	
500.00	499.78	863.78	863.78	0.61	3.10	-2.16	-2,665.88	10,675.92	10,991.65	10,987.95	3.70	2,969.603	
600.00	599.71	963.71	963.71	0.92	3.45	49.28	-2,665.88	10,675.92	10,988.44	10,984.07	4.38	2,511.387	
700.00	699.55	1,063.55	1,063.55	1.26	3.81	73.23	-2,665.88	10,675.92	10,986.03	10,980.96	5.07	2,167.646	
800.00	799.19	1,163.19	1,163.19	1.60	4.17	83.21	-2,665.88	10,675.92	10,984.42	10,978.65	5.77	1,902.672	
900.00	898.49	1,262.49	1,262.49	1.97	4.53	88.38	-2,665.88	10,675.92	10,983.63	10,977.14	6.49	1,692.306	
946.19	944.21	1,308.21	1,308.21	2.14	4.69	90.00	-2,665.88	10,675.92	10,983.54	10,976.71	6.83	1,608.622	CC
1,000.00	997.33	1,361.33	1,361.33	2.34	4.88	91.51	-2,665.88	10,675.92	10,983.66	10,976.44	7.22	1,521.065	ES
1,100.00	1,095.61	1,459.61	1,459.61	2.74	5.23	93.61	-2,665.88	10,675.92	10,984.54	10,976.57	7.97	1,378.729	
1,196.26	1,189.56	1,553.56	1,553.56	3.13	5.57	95.08	-2,665.88	10,675.92	10,986.18	10,977.48	8.70	1,262.526	
1,200.00	1,193.19	1,557.19	1,557.19	3.15	5.58	95.08	-2,665.88	10,675.92	10,986.26	10,977.53	8.73	1,258.358	
1,300.00	1,290.42	1,654.42	1,654.42	3.58	5.93	95.20	-2,665.88	10,675.92	10,988.42	10,978.91	9.51	1,155.767	
1,400.00	1,387.65	1,751.65	1,751.65	4.01	6.28	95.32	-2,665.88	10,675.92	10,990.62	10,980.33	10.29	1,067.951	
1,500.00	1,484.87	1,848.87	1,848.87	4.45	6.63	95.44	-2,665.88	10,675.92	10,992.87	10,981.79	11.08	992.128	
1,600.00	1,582.10	1,946.10	1,946.10	4.90	6.98	95.55	-2,665.88	10,675.92	10,995.18	10,983.30	11.87	926.107	
1,700.00	1,679.33	2,043.33	2,043.33	5.34	7.32	95.67	-2,665.88	10,675.92	10,997.53	10,984.86	12.67	868.168	
1,800.00	1,776.55	2,140.55	2,140.55	5.79	7.67	95.79	-2,665.88	10,675.92	10,999.93	10,986.47	13.46	816.952	
1,900.00	1,873.78	2,237.78	2,237.78	6.24	8.02	95.91	-2,665.88	10,675.92	11,002.38	10,988.12	14.26	771.379	
2,000.00	1,971.01	2,335.01	2,335.01	6.69	8.37	96.03	-2,665.88	10,675.92	11,004.88	10,989.82	15.06	730.581	
2,100.00	2,068.23	2,432.23	2,432.23	7.15	8.72	96.14	-2,665.88	10,675.92	11,007.43	10,991.57	15.86	693.857	
2,200.00	2,165.46	2,529.46	2,529.46	7.60	9.07	96.26	-2,665.88	10,675.92	11,010.03	10,993.36	16.67	660.634	
2,300.00	2,262.69	2,626.69	2,626.69	8.06	9.42	96.38	-2,665.88	10,675.92	11,012.67	10,995.21	17.47	630.440	
2,400.00	2,359.91	2,723.91	2,723.91	8.51	9.76	96.50	-2,665.88	10,675.92	11,015.37	10,997.10	18.27	602.883	
2,500.00	2,457.14	2,821.14	2,821.14	8.97	10.11	96.61	-2,665.88	10,675.92	11,018.11	10,999.04	19.07	577.635	
2,600.00	2,554.37	2,918.37	2,918.37	9.42	10.46	96.73	-2,665.88	10,675.92	11,020.91	11,001.03	19.88	554.421	
2,700.00	2,651.59	3,015.59	3,015.59	9.88	10.81	96.85	-2,665.88	10,675.92	11,023.75	11,003.07	20.68	533.005	
2,800.00	2,748.82	3,112.82	3,112.82	10.34	11.16	96.97	-2,665.88	10,675.92	11,026.64	11,005.16	21.49	513.188	
2,900.00	2,846.05	3,210.05	3,210.05	10.80	11.51	97.08	-2,665.88	10,675.92	11,029.58	11,007.29	22.29	494.798	
3,000.00	2,943.27	3,307.27	3,307.27	11.25	11.86	97.20	-2,665.88	10,675.92	11,032.57	11,009.48	23.10	477.689	
3,100.00	3,040.50	3,404.50	3,404.50	11.71	12.20	97.32	-2,665.88	10,675.92	11,035.61	11,011.71	23.90	461.731	
3,200.00	3,137.73	3,459.00	3,459.00	12.17	12.40	97.38	-2,665.88	10,675.92	11,038.78	11,014.23	24.55	449.616	
3,300.00	3,234.95	3,459.00	3,459.00	12.63	12.40	97.38	-2,665.88	10,675.92	11,042.72	11,017.71	25.01	441.620	
3,400.00	3,332.18	3,459.00	3,459.00	13.09	12.40	97.38	-2,665.88	10,675.92	11,047.56	11,022.11	25.46	433.976	
3,500.00	3,429.40	3,459.00	3,459.00	13.55	12.40	97.38	-2,665.88	10,675.92	11,053.31	11,027.40	25.91	426.666	
3,600.00	3,526.63	3,459.00	3,459.00	14.00	12.40	97.38	-2,665.88	10,675.92	11,059.96	11,033.60	26.35	419.673	
3,700.00	3,623.86	3,459.00	3,459.00	14.46	12.40	97.38	-2,665.88	10,675.92	11,067.50	11,040.70	26.80	412.981	
3,800.00	3,721.08	3,459.00	3,459.00	14.92	12.40	97.38	-2,665.88	10,675.92	11,075.95	11,048.71	27.24	406.576	
3,900.00	3,818.31	3,478.95	3,478.94	15.38	12.47	97.41	-2,665.88	10,676.59	11,084.64	11,056.88	27.76	399.345	
4,000.00	3,915.54	3,500.00	3,499.87	15.84	12.55	97.43	-2,665.89	10,678.72	11,095.24	11,066.96	28.27	392.424	
4,100.00	4,012.76	3,500.00	3,499.87	16.30	12.55	97.43	-2,665.89	10,678.72	11,106.00	11,077.29	28.71	386.836	
4,200.00	4,109.99	3,500.00	3,499.87	16.76	12.55	97.43	-2,665.89	10,678.72	11,117.66	11,088.51	29.14	381.481	
4,300.00	4,207.22	3,500.00	3,499.87	17.22	12.55	97.43	-2,665.89	10,678.72	11,130.20	11,100.62	29.57	376.347	
4,400.00	4,304.44	3,500.00	3,499.87	17.68	12.55	97.43	-2,665.89	10,678.72	11,143.62	11,113.62	30.00	371.425	
4,500.00	4,401.67	3,500.00	3,499.87	18.14	12.55	97.43	-2,665.89	10,678.72	11,157.93	11,127.50	30.43	366.704	
4,600.00	4,498.90	3,500.00	3,499.87	18.60	12.55	97.43	-2,665.89	10,678.72	11,173.11	11,142.26	30.85	362.177	
4,700.00	4,596.12	3,500.00	3,499.87	19.06	12.55	97.43	-2,665.89	10,678.72	11,189.17	11,157.90	31.27	357.834	
4,800.00	4,693.35	3,500.00	3,499.87	19.52	12.55	97.43	-2,665.89	10,678.72	11,206.09	11,174.40	31.69	353.667	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY											Offset Site Error:	0.00 usft
Survey Program: 100-B001Mb_MWD+HRGM											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor
				Reference	Offset		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		
4,900.00	4,790.58	3,500.00	3,499.87	19.98	12.55	97.43	-2,665.89	10,678.72	11,223.88	11,191.78	32.10	349.669
5,000.00	4,887.80	3,500.00	3,499.87	20.44	12.55	97.43	-2,665.89	10,678.72	11,242.53	11,210.02	32.51	345.833
5,100.00	4,985.03	3,500.00	3,499.87	20.90	12.55	97.43	-2,665.89	10,678.72	11,262.04	11,229.12	32.92	342.151
5,200.00	5,082.26	3,500.00	3,499.87	21.36	12.55	97.43	-2,665.89	10,678.72	11,282.40	11,249.08	33.32	338.618
5,300.00	5,179.48	3,500.00	3,499.87	21.82	12.55	97.43	-2,665.89	10,678.72	11,303.61	11,269.89	33.72	335.227
5,400.00	5,276.71	3,500.00	3,499.87	22.27	12.55	97.43	-2,665.89	10,678.72	11,325.66	11,291.54	34.12	331.972
5,500.00	5,373.94	3,500.00	3,499.87	22.73	12.55	97.43	-2,665.89	10,678.72	11,348.55	11,314.04	34.51	328.849
5,600.00	5,471.16	3,500.00	3,499.87	23.19	12.55	97.43	-2,665.89	10,678.72	11,372.28	11,337.37	34.90	325.851
5,700.00	5,568.39	3,500.00	3,499.87	23.65	12.55	97.43	-2,665.89	10,678.72	11,396.83	11,361.54	35.29	322.974
5,800.00	5,665.62	3,500.00	3,499.87	24.11	12.55	97.43	-2,665.89	10,678.72	11,422.20	11,386.53	35.67	320.213
5,900.00	5,762.84	3,500.00	3,499.87	24.57	12.55	97.43	-2,665.89	10,678.72	11,448.39	11,412.34	36.05	317.564
6,000.00	5,860.07	3,500.00	3,499.87	25.03	12.55	97.43	-2,665.89	10,678.72	11,475.40	11,438.97	36.43	315.022
6,100.00	5,957.30	3,500.00	3,499.87	25.50	12.55	97.43	-2,665.89	10,678.72	11,503.21	11,466.41	36.80	312.583
6,200.00	6,054.52	3,500.00	3,499.87	25.96	12.55	97.43	-2,665.89	10,678.72	11,531.82	11,494.65	37.17	310.243
6,300.00	6,151.75	3,500.00	3,499.87	26.42	12.55	97.43	-2,665.89	10,678.72	11,561.22	11,523.68	37.54	307.998
6,400.00	6,248.98	3,500.00	3,499.87	26.88	12.55	97.43	-2,665.89	10,678.72	11,591.41	11,553.51	37.90	305.846
6,500.00	6,346.20	3,500.00	3,499.87	27.34	12.55	97.43	-2,665.89	10,678.72	11,622.39	11,584.13	38.26	303.781
6,600.00	6,443.43	3,549.48	3,548.12	27.80	12.72	97.47	-2,665.96	10,689.46	11,650.20	11,611.37	38.82	300.083
6,696.38	6,537.14	3,600.00	3,594.87	28.24	12.90	97.50	-2,666.09	10,708.45	11,684.86	11,645.48	39.38	296.743
6,700.00	6,540.66	3,600.00	3,594.87	28.26	12.90	98.88	-2,666.09	10,708.45	11,686.03	11,646.64	39.39	296.676
6,750.00	6,589.27	3,600.00	3,594.87	28.48	12.90	117.86	-2,666.09	10,708.45	11,704.22	11,664.66	39.56	295.840
6,800.00	6,637.66	3,600.00	3,594.87	28.71	12.90	134.48	-2,666.09	10,708.45	11,726.07	11,686.35	39.73	295.175
6,850.00	6,685.53	3,600.00	3,594.87	28.92	12.90	147.32	-2,666.09	10,708.45	11,751.43	11,711.55	39.88	294.702
6,900.00	6,732.60	3,600.00	3,594.87	29.13	12.90	156.90	-2,666.09	10,708.45	11,780.12	11,740.11	40.01	294.425
6,950.00	6,778.56	3,600.00	3,594.87	29.32	12.90	164.25	-2,666.09	10,708.45	11,811.93	11,771.80	40.13	294.342 SF
7,000.00	6,823.13	3,600.00	3,594.87	29.51	12.90	170.19	-2,666.09	10,708.45	11,846.66	11,806.42	40.23	294.450
7,050.00	6,866.05	3,600.00	3,594.87	29.68	12.90	175.34	-2,666.09	10,708.45	11,884.05	11,843.73	40.32	294.747
7,100.00	6,907.04	3,600.00	3,594.87	29.85	12.90	-179.84	-2,666.09	10,708.45	11,923.86	11,883.47	40.39	295.226
7,150.00	6,945.85	3,600.00	3,594.87	30.01	12.90	-174.92	-2,666.09	10,708.45	11,965.81	11,925.37	40.44	295.882
7,200.00	6,982.24	3,600.00	3,594.87	30.15	12.90	-169.49	-2,666.09	10,708.45	12,009.63	11,969.16	40.48	296.708
7,250.00	7,016.00	3,600.00	3,594.87	30.29	12.90	-163.00	-2,666.09	10,708.45	12,055.03	12,014.54	40.49	297.694
7,300.00	7,046.90	3,600.00	3,594.87	30.43	12.90	-154.66	-2,666.09	10,708.45	12,101.71	12,061.21	40.50	298.831
7,350.00	7,074.76	3,600.00	3,594.87	30.56	12.90	-143.38	-2,666.09	10,708.45	12,149.37	12,108.89	40.48	300.106
7,400.00	7,099.42	3,600.00	3,594.87	30.69	12.90	-128.01	-2,666.09	10,708.45	12,197.71	12,157.25	40.46	301.506
7,450.00	7,120.70	3,600.00	3,594.87	30.82	12.90	-108.64	-2,666.09	10,708.45	12,246.42	12,206.01	40.42	303.014
7,500.00	7,138.50	3,600.00	3,594.87	30.95	12.90	-88.42	-2,666.09	10,708.45	12,295.20	12,254.84	40.36	304.615
7,550.00	7,152.68	3,600.00	3,594.87	31.10	12.90	-71.45	-2,666.09	10,708.45	12,343.75	12,303.45	40.30	306.288
7,600.00	7,163.18	3,600.00	3,594.87	31.25	12.90	-59.07	-2,666.09	10,708.45	12,391.78	12,351.55	40.23	308.012
7,650.00	7,169.92	3,600.00	3,594.87	31.41	12.90	-50.42	-2,666.09	10,708.45	12,438.99	12,398.84	40.16	309.765
7,700.00	7,172.86	3,600.00	3,594.87	31.59	12.90	-44.36	-2,666.09	10,708.45	12,485.11	12,445.04	40.08	311.523
7,713.53	7,173.00	3,600.00	3,594.87	31.64	12.90	-43.04	-2,666.09	10,708.45	12,497.37	12,457.31	40.05	312.010
7,800.00	7,173.00	3,600.00	3,594.87	31.99	12.90	-43.04	-2,666.09	10,708.45	12,575.43	12,535.50	39.93	314.954
7,900.00	7,173.00	3,600.00	3,594.87	32.47	12.90	-43.04	-2,666.09	10,708.45	12,665.83	12,626.04	39.79	318.299
8,000.00	7,173.00	3,600.00	3,594.87	33.03	12.90	-43.04	-2,666.09	10,708.45	12,756.39	12,716.72	39.67	321.586
8,100.00	7,173.00	3,600.00	3,594.87	33.66	12.90	-43.04	-2,666.09	10,708.45	12,847.08	12,807.52	39.55	324.812
8,200.00	7,173.00	3,600.00	3,594.87	34.36	12.90	-43.04	-2,666.09	10,708.45	12,937.90	12,898.46	39.45	327.978
8,300.00	7,173.00	3,600.00	3,594.87	35.13	12.90	-43.04	-2,666.09	10,708.45	13,028.87	12,989.51	39.35	331.081
8,400.00	7,173.00	3,600.00	3,594.87	35.95	12.90	-43.04	-2,666.09	10,708.45	13,119.96	13,080.69	39.27	334.121
8,500.00	7,173.00	3,600.00	3,594.87	36.82	12.90	-43.04	-2,666.09	10,708.45	13,211.18	13,171.99	39.19	337.098
8,600.00	7,173.00	3,600.00	3,594.87	37.74	12.90	-43.04	-2,666.09	10,708.45	13,302.53	13,263.41	39.12	340.010
8,700.00	7,173.00	3,600.00	3,594.87	38.71	12.90	-43.04	-2,666.09	10,708.45	13,394.00	13,354.94	39.07	342.858
8,800.00	7,173.00	3,600.00	3,594.87	39.71	12.90	-43.04	-2,666.09	10,708.45	13,485.60	13,446.58	39.02	345.641

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY													Offset Site Error: 0.00 usft	
Survey Program: 100-B001Mb_MWD+HRGM		Reference Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,900.00	7,173.00	3,600.00	3,594.87	40.76	12.90	-43.04	-2,666.09	10,708.45	13,577.31	13,538.33	38.97	348.360		
9,000.00	7,173.00	3,600.00	3,594.87	41.84	12.90	-43.04	-2,666.09	10,708.45	13,669.14	13,630.19	38.94	351.014		
9,100.00	7,173.00	3,600.00	3,594.87	42.96	12.90	-43.04	-2,666.09	10,708.45	13,761.08	13,722.16	38.92	353.603		
9,200.00	7,173.00	3,551.02	3,549.58	44.10	12.73	-42.72	-2,665.97	10,689.93	13,849.24	13,810.54	38.70	357.834		
9,300.00	7,173.00	3,550.35	3,548.95	45.27	12.72	-42.72	-2,665.97	10,689.73	13,941.30	13,902.61	38.69	360.319		
9,400.00	7,173.00	3,549.70	3,548.32	46.47	12.72	-42.71	-2,665.97	10,689.53	14,033.46	13,994.77	38.69	362.740		
9,500.00	7,173.00	3,549.05	3,547.71	47.70	12.72	-42.71	-2,665.96	10,689.34	14,125.73	14,087.04	38.69	365.097		
9,600.00	7,173.00	3,500.00	3,499.87	48.94	12.55	-42.37	-2,665.89	10,678.72	14,221.91	14,183.39	38.51	369.280		
9,700.00	7,173.00	3,500.00	3,499.87	50.20	12.55	-42.37	-2,665.89	10,678.72	14,314.28	14,275.75	38.53	371.485		
9,800.00	7,173.00	3,500.00	3,499.87	51.49	12.55	-42.37	-2,665.89	10,678.72	14,406.76	14,368.20	38.56	373.628		
9,900.00	7,173.00	3,500.00	3,499.87	52.79	12.55	-42.37	-2,665.89	10,678.72	14,499.34	14,460.74	38.59	375.712		
10,000.00	7,173.00	3,500.00	3,499.87	54.11	12.55	-42.37	-2,665.89	10,678.72	14,592.01	14,553.38	38.63	377.737		
10,100.00	7,173.00	3,500.00	3,499.87	55.44	12.55	-42.37	-2,665.89	10,678.72	14,684.78	14,646.11	38.67	379.705		
10,200.00	7,173.00	3,500.00	3,499.87	56.78	12.55	-42.37	-2,665.89	10,678.72	14,777.65	14,738.92	38.72	381.617		
10,300.00	7,173.00	3,500.00	3,499.87	58.14	12.55	-42.37	-2,665.89	10,678.72	14,870.61	14,831.83	38.78	383.474		
10,400.00	7,173.00	3,500.00	3,499.87	59.51	12.55	-42.37	-2,665.89	10,678.72	14,963.66	14,924.82	38.84	385.278		
10,500.00	7,173.00	3,500.00	3,499.87	60.90	12.55	-42.37	-2,665.89	10,678.72	15,056.79	15,017.89	38.90	387.031		
10,600.00	7,173.00	3,500.00	3,499.87	62.29	12.55	-42.37	-2,665.89	10,678.72	15,150.02	15,111.05	38.97	388.734		
10,700.00	7,173.00	3,500.00	3,499.87	63.69	12.55	-42.37	-2,665.89	10,678.72	15,243.33	15,204.28	39.05	390.387		
10,800.00	7,173.00	3,500.00	3,499.87	65.11	12.55	-42.37	-2,665.89	10,678.72	15,336.73	15,297.60	39.12	391.994		
10,900.00	7,173.00	3,500.00	3,499.87	66.53	12.55	-42.37	-2,665.89	10,678.72	15,430.21	15,391.00	39.21	393.554		
11,000.00	7,173.00	3,500.00	3,499.87	67.96	12.55	-42.37	-2,665.89	10,678.72	15,523.77	15,484.47	39.29	395.071		
11,100.00	7,173.00	3,500.00	3,499.87	69.39	12.55	-42.37	-2,665.89	10,678.72	15,617.40	15,578.02	39.38	396.544		
11,200.00	7,173.00	3,500.00	3,499.87	70.84	12.55	-42.37	-2,665.89	10,678.72	15,711.12	15,671.65	39.48	397.976		
11,300.00	7,173.00	3,500.00	3,499.87	72.29	12.55	-42.37	-2,665.89	10,678.72	15,804.92	15,765.34	39.57	399.368		
11,400.00	7,173.00	3,500.00	3,499.87	73.74	12.55	-42.37	-2,665.89	10,678.72	15,898.79	15,859.11	39.68	400.722		
11,500.00	7,173.00	3,500.00	3,499.87	75.21	12.55	-42.37	-2,665.89	10,678.72	15,992.73	15,952.95	39.78	402.038		
11,600.00	7,173.00	3,500.00	3,499.87	76.68	12.55	-42.37	-2,665.89	10,678.72	16,086.75	16,046.87	39.89	403.318		
11,700.00	7,173.00	3,500.00	3,499.87	78.15	12.55	-42.37	-2,665.89	10,678.72	16,180.84	16,140.85	40.00	404.565		
11,800.00	7,173.00	3,500.00	3,499.87	79.63	12.55	-42.37	-2,665.89	10,678.72	16,275.00	16,234.89	40.11	405.777		
11,900.00	7,173.00	3,500.00	3,499.87	81.11	12.55	-42.37	-2,665.89	10,678.72	16,369.23	16,329.01	40.22	406.959		
12,000.00	7,173.00	3,500.00	3,499.87	82.60	12.55	-42.37	-2,665.89	10,678.72	16,463.53	16,423.19	40.34	408.109		
12,100.00	7,173.00	3,500.00	3,499.87	84.09	12.55	-42.37	-2,665.89	10,678.72	16,557.89	16,517.43	40.46	409.230		
12,200.00	7,173.00	3,500.00	3,499.87	85.59	12.55	-42.37	-2,665.89	10,678.72	16,652.32	16,611.74	40.58	410.323		
12,300.00	7,173.00	3,500.00	3,499.87	87.09	12.55	-42.37	-2,665.89	10,678.72	16,746.82	16,706.11	40.71	411.389		
12,400.00	7,173.00	3,500.00	3,499.87	88.59	12.55	-42.37	-2,665.89	10,678.72	16,841.38	16,800.54	40.83	412.429		
12,500.00	7,173.00	3,500.00	3,499.87	90.10	12.55	-42.37	-2,665.89	10,678.72	16,936.00	16,895.03	40.96	413.444		
12,600.00	7,173.00	3,500.00	3,499.87	91.61	12.55	-42.37	-2,665.89	10,678.72	17,030.68	16,989.59	41.09	414.436		
12,700.00	7,173.00	3,500.00	3,499.87	93.13	12.55	-42.37	-2,665.89	10,678.72	17,125.42	17,084.20	41.23	415.404		
12,800.00	7,173.00	3,500.00	3,499.87	94.64	12.55	-42.37	-2,665.89	10,678.72	17,220.23	17,178.87	41.36	416.351		
12,900.00	7,173.00	3,500.00	3,499.87	96.16	12.55	-42.37	-2,665.89	10,678.72	17,315.09	17,273.59	41.50	417.277		
13,000.00	7,173.00	3,500.00	3,499.87	97.69	12.55	-42.37	-2,665.89	10,678.72	17,410.01	17,368.37	41.63	418.183		
13,100.00	7,173.00	3,500.00	3,499.87	99.21	12.55	-42.37	-2,665.89	10,678.72	17,504.98	17,463.21	41.77	419.070		
13,200.00	7,173.00	3,500.00	3,499.87	100.74	12.55	-42.37	-2,665.89	10,678.72	17,600.01	17,558.10	41.91	419.938		
13,300.00	7,173.00	3,500.00	3,499.87	102.27	12.55	-42.37	-2,665.89	10,678.72	17,695.10	17,653.04	42.05	420.790		
13,400.00	7,173.00	3,500.00	3,499.87	103.80	12.55	-42.37	-2,665.89	10,678.72	17,790.24	17,748.04	42.19	421.624		
13,500.00	7,173.00	3,500.00	3,499.87	105.33	12.55	-42.37	-2,665.89	10,678.72	17,885.43	17,843.09	42.34	422.443		
13,600.00	7,173.00	3,500.00	3,499.87	106.87	12.55	-42.37	-2,665.89	10,678.72	17,980.67	17,938.19	42.48	423.247		
13,700.00	7,173.00	3,500.00	3,499.87	108.41	12.55	-42.37	-2,665.89	10,678.72	18,075.97	18,033.34	42.63	424.036		
13,800.00	7,173.00	3,500.00	3,499.87	109.95	12.55	-42.37	-2,665.89	10,678.72	18,171.31	18,128.54	42.78	424.811		
13,900.00	7,173.00	3,500.00	3,499.87	111.49	12.55	-42.37	-2,665.89	10,678.72	18,266.71	18,223.79	42.92	425.573		
14,000.00	7,173.00	3,500.00	3,499.87	113.03	12.55	-42.37	-2,665.89	10,678.72	18,362.16	18,319.08	43.07	426.322		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY												Offset Site Error:	0.00 usft
Survey Program:		100-B001Mb_MWD+HRGM						Rule Assigned:				Offset Well Error:	0.00 usft
Measured Depth (usft)	Reference Vertical Depth (usft)	Measured Depth (usft)	Offset Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,100.00	7,173.00	3,500.00	3,499.87	114.58	12.55	-42.37	-2,665.89	10,678.72	18,457.65	18,414.43	43.22	427.060	
14,200.00	7,173.00	3,500.00	3,499.87	116.13	12.55	-42.37	-2,665.89	10,678.72	18,553.19	18,509.82	43.37	427.786	
14,300.00	7,173.00	3,500.00	3,499.87	117.68	12.55	-42.37	-2,665.89	10,678.72	18,648.78	18,605.26	43.52	428.501	
14,400.00	7,173.00	3,500.00	3,499.87	119.23	12.55	-42.37	-2,665.89	10,678.72	18,744.41	18,700.74	43.67	429.206	
14,500.00	7,173.00	3,500.00	3,499.87	120.78	12.55	-42.37	-2,665.89	10,678.72	18,840.09	18,796.27	43.82	429.900	
14,600.00	7,173.00	3,500.00	3,499.87	122.33	12.55	-42.37	-2,665.89	10,678.72	18,935.81	18,891.84	43.98	430.586	
14,700.00	7,173.00	3,500.00	3,499.87	123.88	12.55	-42.37	-2,665.89	10,678.72	19,031.58	18,987.45	44.13	431.262	
14,800.00	7,173.00	3,500.00	3,499.87	125.44	12.55	-42.37	-2,665.89	10,678.72	19,127.39	19,083.11	44.28	431.930	
14,900.00	7,173.00	3,500.00	3,499.87	127.00	12.55	-42.37	-2,665.89	10,678.72	19,223.25	19,178.81	44.44	432.589	
15,000.00	7,173.00	3,500.00	3,499.87	128.55	12.55	-42.37	-2,665.89	10,678.72	19,319.14	19,274.55	44.59	433.241	
15,100.00	7,173.00	3,500.00	3,499.87	130.11	12.55	-42.37	-2,665.89	10,678.72	19,415.08	19,370.33	44.75	433.885	
15,200.00	7,173.00	3,500.00	3,499.87	131.67	12.55	-42.37	-2,665.89	10,678.72	19,511.06	19,466.16	44.90	434.522	
15,300.00	7,173.00	3,500.00	3,499.87	133.23	12.55	-42.37	-2,665.89	10,678.72	19,607.08	19,562.02	45.06	435.153	
15,400.00	7,173.00	3,500.00	3,499.87	134.80	12.55	-42.37	-2,665.89	10,678.72	19,703.13	19,657.92	45.21	435.777	
15,500.00	7,173.00	3,500.00	3,499.87	136.36	12.55	-42.37	-2,665.89	10,678.72	19,799.23	19,753.86	45.37	436.394	
15,600.00	7,173.00	3,500.00	3,499.87	137.92	12.55	-42.37	-2,665.89	10,678.72	19,895.37	19,849.84	45.53	437.006	
15,700.00	7,173.00	3,500.00	3,499.87	139.49	12.55	-42.37	-2,665.89	10,678.72	19,991.54	19,945.86	45.68	437.613	
15,800.00	7,173.00	3,500.00	3,499.87	141.05	12.55	-42.37	-2,665.89	10,678.72	20,087.75	20,041.91	45.84	438.214	
15,900.00	7,173.00	3,500.00	3,499.87	142.62	12.55	-42.37	-2,665.89	10,678.72	20,184.00	20,138.00	46.00	438.810	
16,000.00	7,173.00	3,500.00	3,499.87	144.19	12.55	-42.37	-2,665.89	10,678.72	20,280.28	20,234.13	46.15	439.401	
16,100.00	7,173.00	3,500.00	3,499.87	145.76	12.55	-42.37	-2,665.89	10,678.72	20,376.60	20,330.29	46.31	439.988	
16,200.00	7,173.00	3,500.00	3,499.87	147.33	12.55	-42.37	-2,665.89	10,678.72	20,472.95	20,426.48	46.47	440.570	
16,300.00	7,173.00	3,500.00	3,499.87	148.90	12.55	-42.37	-2,665.89	10,678.72	20,569.34	20,522.72	46.63	441.148	
16,400.00	7,173.00	3,500.00	3,499.87	150.47	12.55	-42.37	-2,665.89	10,678.72	20,665.77	20,618.98	46.78	441.722	
16,500.00	7,173.00	3,500.00	3,499.87	152.04	12.55	-42.37	-2,665.89	10,678.72	20,762.23	20,715.28	46.94	442.292	
16,600.00	7,173.00	3,500.00	3,499.87	153.61	12.55	-42.37	-2,665.89	10,678.72	20,858.72	20,811.62	47.10	442.858	
16,700.00	7,173.00	3,500.00	3,499.87	155.18	12.55	-42.37	-2,665.89	10,678.72	20,955.24	20,907.98	47.26	443.421	
16,800.00	7,173.00	3,500.00	3,499.87	156.76	12.55	-42.37	-2,665.89	10,678.72	21,051.80	21,004.38	47.42	443.981	
16,900.00	7,173.00	3,500.00	3,499.87	158.33	12.55	-42.37	-2,665.89	10,678.72	21,148.39	21,100.81	47.57	444.537	
17,000.00	7,173.00	3,500.00	3,499.87	159.90	12.55	-42.37	-2,665.89	10,678.72	21,245.01	21,197.27	47.73	445.091	
17,100.00	7,173.00	3,500.00	3,499.87	161.48	12.55	-42.37	-2,665.89	10,678.72	21,341.66	21,293.77	47.89	445.641	
17,200.00	7,173.00	3,500.00	3,499.87	163.06	12.55	-42.37	-2,665.89	10,678.72	21,438.34	21,390.29	48.05	446.189	
17,300.00	7,173.00	3,500.00	3,499.87	164.63	12.55	-42.37	-2,665.89	10,678.72	21,535.05	21,486.84	48.21	446.734	
17,400.00	7,173.00	3,500.00	3,499.87	166.21	12.55	-42.37	-2,665.89	10,678.72	21,631.79	21,583.43	48.36	447.277	
17,500.00	7,173.00	3,500.00	3,499.87	167.79	12.55	-42.37	-2,665.89	10,678.72	21,728.56	21,680.04	48.52	447.817	
17,600.00	7,173.00	3,500.00	3,499.87	169.36	12.55	-42.37	-2,665.89	10,678.72	21,825.36	21,776.69	48.68	448.355	
17,700.00	7,173.00	3,500.00	3,499.87	170.94	12.55	-42.37	-2,665.89	10,678.72	21,922.19	21,873.36	48.84	448.890	
17,800.00	7,173.00	3,500.00	3,499.87	172.52	12.55	-42.37	-2,665.89	10,678.72	22,019.05	21,970.06	48.99	449.423	
17,900.00	7,173.00	3,500.00	3,499.87	174.10	12.55	-42.37	-2,665.89	10,678.72	22,115.94	22,066.79	49.15	449.955	
18,000.00	7,173.00	3,500.00	3,499.87	175.68	12.55	-42.37	-2,665.89	10,678.72	22,212.85	22,163.54	49.31	450.484	
18,100.00	7,173.00	3,500.00	3,499.87	177.26	12.55	-42.37	-2,665.89	10,678.72	22,309.79	22,260.33	49.47	451.011	
18,200.00	7,173.00	3,500.00	3,499.87	178.84	12.55	-42.37	-2,665.89	10,678.72	22,406.76	22,357.14	49.62	451.537	
18,300.00	7,173.00	3,500.00	3,499.87	180.42	12.55	-42.37	-2,665.89	10,678.72	22,503.75	22,453.97	49.78	452.061	
18,400.00	7,173.00	3,500.00	3,499.87	182.00	12.55	-42.37	-2,665.89	10,678.72	22,600.77	22,550.84	49.94	452.583	
18,500.00	7,173.00	3,500.00	3,499.87	183.59	12.55	-42.37	-2,665.89	10,678.72	22,697.82	22,647.72	50.09	453.103	
18,600.00	7,173.00	3,500.00	3,499.87	185.17	12.55	-42.37	-2,665.89	10,678.72	22,794.89	22,744.64	50.25	453.622	
18,700.00	7,173.00	3,500.00	3,499.87	186.75	12.55	-42.37	-2,665.89	10,678.72	22,891.99	22,841.58	50.41	454.139	
18,800.00	7,173.00	3,500.00	3,499.87	188.33	12.55	-42.37	-2,665.89	10,678.72	22,989.11	22,938.55	50.56	454.655	
18,900.00	7,173.00	3,500.00	3,499.87	189.92	12.55	-42.37	-2,665.89	10,678.72	23,086.26	23,035.54	50.72	455.170	
19,000.00	7,173.00	3,500.00	3,499.87	191.50	12.55	-42.37	-2,665.89	10,678.72	23,183.43	23,132.55	50.88	455.683	
19,100.00	7,173.00	3,500.00	3,499.87	193.09	12.55	-42.37	-2,665.89	10,678.72	23,280.62	23,229.59	51.03	456.194	
19,200.00	7,173.00	3,500.00	3,499.87	194.67	12.55	-42.37	-2,665.89	10,678.72	23,377.84	23,326.65	51.19	456.705	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - (O) Schalk 32 #003H - OH - OH-SVY													Offset Site Error:	0.00 usft
Survey Program: 100-B001Mb_MWD+HRGM							Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,249.41	7,173.00	3,500.00	3,499.87	195.45	12.55	-42.37	-2,665.89	10,678.72	23,425.89	23,374.62	51.27	456.957		
19,300.00	7,173.00	3,500.00	3,499.87	196.25	12.55	-42.37	-2,665.89	10,678.72	23,475.08	23,423.74	51.34	457.214		
19,384.41	7,173.00	3,500.00	3,499.87	197.34	12.55	-42.37	-2,665.89	10,678.72	23,557.18	23,502.50	54.68	430.782		

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 830H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104							Rule Assigned:						Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)		Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
319.07	318.99	319.00	318.92	0.00	0.00	0.00	-1.19	5.01	0.07	0.07	0.00	34.478	CC, ES, SF	
400.00	399.86	319.00	318.92	0.17	0.00	0.00	-1.19	5.01	81.00	78.66	2.34	34.615		
469.00	468.80	319.00	318.92	0.40	0.00	0.00	-1.19	5.01	150.00	147.64	2.36	63.664		
500.00	499.78	319.00	318.92	0.51	0.00	-105.27	-1.19	5.01	181.00	178.64	2.36	76.561		
600.00	599.71	319.00	318.92	0.87	0.00	-53.91	-1.19	5.01	280.97	278.58	2.39	117.422		
700.00	699.55	319.00	318.92	1.23	0.00	-30.03	-1.19	5.01	380.86	378.44	2.43	157.004		
800.00	799.19	319.00	318.92	1.59	0.00	-20.12	-1.19	5.01	480.64	478.18	2.46	195.152		
900.00	898.49	319.00	318.92	1.95	0.00	-15.03	-1.19	5.01	580.28	577.77	2.50	231.738		
1,000.00	997.33	319.00	318.92	2.33	0.00	-11.97	-1.19	5.01	679.74	677.19	2.55	266.664		
1,100.00	1,095.61	319.00	318.92	2.72	0.00	-9.95	-1.19	5.01	778.99	776.39	2.60	299.860		
1,196.26	1,189.56	319.00	318.92	3.12	0.00	-8.56	-1.19	5.01	874.31	871.66	2.65	330.158		
1,200.00	1,193.19	319.00	318.92	3.14	0.00	-8.56	-1.19	5.01	878.01	875.36	2.65	331.800		
1,300.00	1,290.42	319.00	318.92	3.56	0.00	-8.56	-1.19	5.01	977.02	974.31	2.71	360.345		
1,400.00	1,387.65	319.00	318.92	4.00	0.00	-8.56	-1.19	5.01	1,076.22	1,073.45	2.78	387.229		
1,500.00	1,484.87	319.00	318.92	4.44	0.00	-8.56	-1.19	5.01	1,175.56	1,172.71	2.85	412.442		
1,600.00	1,582.10	319.00	318.92	4.89	0.00	-8.56	-1.19	5.01	1,275.00	1,272.07	2.92	436.002		
1,700.00	1,679.33	319.00	318.92	5.33	0.00	-8.56	-1.19	5.01	1,374.52	1,371.52	3.00	457.945		
1,800.00	1,776.55	319.00	318.92	5.78	0.00	-8.56	-1.19	5.01	1,474.10	1,471.02	3.08	478.322		
1,900.00	1,873.78	319.00	318.92	6.23	0.00	-8.56	-1.19	5.01	1,573.74	1,570.58	3.17	497.193		
2,000.00	1,971.01	319.00	318.92	6.69	0.00	-8.56	-1.19	5.01	1,673.42	1,670.17	3.25	514.625		
2,100.00	2,068.23	319.00	318.92	7.14	0.00	-8.56	-1.19	5.01	1,773.14	1,769.80	3.34	530.687		
2,200.00	2,165.46	319.00	318.92	7.60	0.00	-8.56	-1.19	5.01	1,872.89	1,869.45	3.43	545.453		
2,300.00	2,262.69	319.00	318.92	8.05	0.00	-8.56	-1.19	5.01	1,972.66	1,969.13	3.53	558.993		
2,400.00	2,359.91	319.00	318.92	8.51	0.00	-8.56	-1.19	5.01	2,072.46	2,068.83	3.63	571.380		
2,500.00	2,457.14	319.00	318.92	8.96	0.00	-8.56	-1.19	5.01	2,172.27	2,168.54	3.73	582.682		
2,600.00	2,554.37	319.00	318.92	9.42	0.00	-8.56	-1.19	5.01	2,272.10	2,268.27	3.83	592.968		
2,700.00	2,651.59	319.00	318.92	9.88	0.00	-8.56	-1.19	5.01	2,371.94	2,368.01	3.94	602.301		
2,800.00	2,748.82	319.00	318.92	10.33	0.00	-8.56	-1.19	5.01	2,471.80	2,467.75	4.05	610.742		
2,900.00	2,846.05	319.00	318.92	10.79	0.00	-8.56	-1.19	5.01	2,571.67	2,567.51	4.16	618.350		
3,000.00	2,943.27	319.00	318.92	11.25	0.00	-8.56	-1.19	5.01	2,671.55	2,667.27	4.27	625.181		
3,100.00	3,040.50	319.00	318.92	11.71	0.00	-8.56	-1.19	5.01	2,771.43	2,767.04	4.39	631.285		
3,200.00	3,137.73	319.00	318.92	12.17	0.00	-8.56	-1.19	5.01	2,871.33	2,866.82	4.51	636.711		
3,300.00	3,234.95	319.00	318.92	12.62	0.00	-8.56	-1.19	5.01	2,971.23	2,966.60	4.63	641.505		
3,400.00	3,332.18	319.00	318.92	13.08	0.00	-8.56	-1.19	5.01	3,071.14	3,066.38	4.76	645.710		
3,500.00	3,429.40	319.00	318.92	13.54	0.00	-8.56	-1.19	5.01	3,171.05	3,166.17	4.88	649.365		
3,600.00	3,526.63	319.00	318.92	14.00	0.00	-8.56	-1.19	5.01	3,270.97	3,265.96	5.01	652.509		
3,700.00	3,623.86	319.00	318.92	14.46	0.00	-8.56	-1.19	5.01	3,370.89	3,365.75	5.15	655.175		
3,800.00	3,721.08	319.00	318.92	14.92	0.00	-8.56	-1.19	5.01	3,470.82	3,465.54	5.28	657.397		
3,900.00	3,818.31	319.00	318.92	15.38	0.00	-8.56	-1.19	5.01	3,570.75	3,565.34	5.42	659.204		
4,000.00	3,915.54	319.00	318.92	15.84	0.00	-8.56	-1.19	5.01	3,670.69	3,665.13	5.56	660.626		
4,100.00	4,012.76	319.00	318.92	16.30	0.00	-8.56	-1.19	5.01	3,770.63	3,764.93	5.70	661.688		
4,200.00	4,109.99	319.00	318.92	16.76	0.00	-8.56	-1.19	5.01	3,870.57	3,864.73	5.84	662.415		
4,300.00	4,207.22	319.00	318.92	17.22	0.00	-8.56	-1.19	5.01	3,970.52	3,964.53	5.99	662.831		
4,400.00	4,304.44	319.00	318.92	17.67	0.00	-8.56	-1.19	5.01	4,070.47	4,064.33	6.14	662.956		
4,500.00	4,401.67	319.00	318.92	18.13	0.00	-8.56	-1.19	5.01	4,170.42	4,164.12	6.29	662.812		
4,600.00	4,498.90	319.00	318.92	18.59	0.00	-8.56	-1.19	5.01	4,270.37	4,263.92	6.45	662.416		
4,700.00	4,596.12	319.00	318.92	19.05	0.00	-8.56	-1.19	5.01	4,370.32	4,363.72	6.60	661.786		
4,800.00	4,693.35	319.00	318.92	19.51	0.00	-8.56	-1.19	5.01	4,470.28	4,463.52	6.76	660.938		
4,900.00	4,790.58	319.00	318.92	19.97	0.00	-8.56	-1.19	5.01	4,570.24	4,563.32	6.93	659.889		
5,000.00	4,887.80	319.00	318.92	20.43	0.00	-8.56	-1.19	5.01	4,670.20	4,663.11	7.09	658.652		
5,100.00	4,985.03	319.00	318.92	20.89	0.00	-8.56	-1.19	5.01	4,770.16	4,762.91	7.26	657.240		
5,200.00	5,082.26	319.00	318.92	21.35	0.00	-8.56	-1.19	5.01	4,870.13	4,862.70	7.43	655.667		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 830H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104							Rule Assigned:					Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,300.00	5,179.48	319.00	318.92	21.81	0.00	-8.56	-1.19	5.01	4,970.09	4,962.49	7.60	653.943	
5,400.00	5,276.71	319.00	318.92	22.27	0.00	-8.56	-1.19	5.01	5,070.06	5,062.28	7.78	652.081	
5,500.00	5,373.94	319.00	318.92	22.73	0.00	-8.56	-1.19	5.01	5,170.03	5,162.08	7.95	650.090	
5,600.00	5,471.16	319.00	318.92	23.19	0.00	-8.56	-1.19	5.01	5,270.00	5,261.86	8.13	647.979	
5,700.00	5,568.39	319.00	318.92	23.65	0.00	-8.56	-1.19	5.01	5,369.97	5,361.65	8.32	645.759	
5,800.00	5,665.62	319.00	318.92	24.11	0.00	-8.56	-1.19	5.01	5,469.94	5,461.44	8.50	643.438	
5,900.00	5,762.84	319.00	318.92	24.57	0.00	-8.56	-1.19	5.01	5,569.91	5,561.22	8.69	641.022	
6,000.00	5,860.07	319.00	318.92	25.03	0.00	-8.56	-1.19	5.01	5,669.88	5,661.01	8.88	638.521	
6,100.00	5,957.30	319.00	318.92	25.49	0.00	-8.56	-1.19	5.01	5,769.86	5,760.79	9.07	635.941	
6,200.00	6,054.52	319.00	318.92	25.95	0.00	-8.56	-1.19	5.01	5,869.83	5,860.57	9.27	633.288	
6,300.00	6,151.75	319.00	318.92	26.41	0.00	-8.56	-1.19	5.01	5,969.81	5,960.34	9.47	630.570	
6,400.00	6,248.98	319.00	318.92	26.87	0.00	-8.56	-1.19	5.01	6,069.79	6,060.12	9.67	627.790	
6,500.00	6,346.20	319.00	318.92	27.33	0.00	-8.56	-1.19	5.01	6,169.77	6,159.89	9.87	624.956	
6,600.00	6,443.43	319.00	318.92	27.79	0.00	-8.56	-1.19	5.01	6,269.74	6,259.66	10.08	622.072	
6,696.38	6,537.14	319.00	318.92	28.24	0.00	-8.56	-1.19	5.01	6,366.10	6,355.82	10.28	619.249	
6,700.00	6,540.66	319.00	318.92	28.25	0.00	-22.67	-1.19	5.01	6,369.72	6,359.43	10.29	619.142	
6,750.00	6,589.27	319.00	318.92	28.48	0.00	-63.11	-1.19	5.01	6,419.65	6,409.26	10.39	617.720	
6,800.00	6,637.66	319.00	318.92	28.70	0.00	-53.40	-1.19	5.01	6,469.24	6,458.75	10.49	616.435	
6,850.00	6,685.53	319.00	318.92	28.92	0.00	-43.53	-1.19	5.01	6,518.22	6,507.63	10.59	615.324	
6,900.00	6,732.60	319.00	318.92	29.12	0.00	-35.98	-1.19	5.01	6,566.28	6,555.60	10.69	614.374	
6,950.00	6,778.56	319.00	318.92	29.32	0.00	-30.42	-1.19	5.01	6,613.17	6,602.39	10.78	613.570	
7,000.00	6,823.13	319.00	318.92	29.51	0.00	-26.31	-1.19	5.01	6,658.61	6,647.75	10.86	612.885	
7,050.00	6,866.05	319.00	318.92	29.68	0.00	-23.21	-1.19	5.01	6,702.37	6,691.42	10.95	612.283	
7,100.00	6,907.04	319.00	318.92	29.85	0.00	-20.83	-1.19	5.01	6,744.19	6,733.17	11.03	611.713	
7,150.00	6,945.85	319.00	318.92	30.01	0.00	-18.96	-1.19	5.01	6,783.88	6,772.78	11.10	611.114	
7,200.00	6,982.24	319.00	318.92	30.15	0.00	-17.48	-1.19	5.01	6,821.21	6,810.04	11.17	610.409	
7,250.00	7,016.00	319.00	318.92	30.29	0.00	-16.30	-1.19	5.01	6,856.01	6,844.76	11.25	609.512	
7,300.00	7,046.90	319.00	318.92	30.43	0.00	-15.34	-1.19	5.01	6,888.09	6,876.76	11.32	608.327	
7,350.00	7,074.76	319.00	318.92	30.56	0.00	-14.57	-1.19	5.01	6,917.30	6,905.89	11.40	606.756	
7,400.00	7,099.42	319.00	318.92	30.69	0.00	-13.95	-1.19	5.01	6,943.49	6,932.00	11.48	604.698	
7,450.00	7,120.70	319.00	318.92	30.82	0.00	-13.45	-1.19	5.01	6,966.54	6,954.97	11.57	602.065	
7,500.00	7,138.50	319.00	318.92	30.95	0.00	-13.06	-1.19	5.01	6,986.33	6,974.67	11.67	598.777	
7,550.00	7,152.68	319.00	318.92	31.09	0.00	-12.77	-1.19	5.01	7,002.78	6,991.01	11.77	594.780	
7,600.00	7,163.18	319.00	318.92	31.25	0.00	-12.56	-1.19	5.01	7,015.81	7,003.92	11.89	590.040	
7,650.00	7,169.92	319.00	318.92	31.41	0.00	-12.44	-1.19	5.01	7,025.35	7,013.33	12.02	584.556	
7,700.00	7,172.86	319.00	318.92	31.58	0.00	-12.38	-1.19	5.01	7,031.36	7,019.20	12.16	578.355	
7,713.53	7,173.00	319.00	318.92	31.64	0.00	-12.38	-1.19	5.01	7,032.38	7,020.18	12.20	576.605	
7,800.00	7,173.00	319.00	318.92	31.99	0.00	-12.38	-1.19	5.01	7,038.57	7,026.09	12.47	564.235	
7,900.00	7,173.00	319.00	318.92	32.47	0.00	-12.38	-1.19	5.01	7,047.04	7,034.20	12.84	548.788	
8,000.00	7,173.00	319.00	318.92	33.03	0.00	-12.38	-1.19	5.01	7,056.92	7,043.67	13.25	532.574	
8,100.00	7,173.00	319.00	318.92	33.66	0.00	-12.38	-1.19	5.01	7,068.20	7,054.50	13.70	515.990	
8,200.00	7,173.00	319.00	318.92	34.36	0.00	-12.38	-1.19	5.01	7,080.87	7,066.69	14.18	499.367	
8,300.00	7,173.00	319.00	318.92	35.12	0.00	-12.38	-1.19	5.01	7,094.93	7,080.24	14.69	482.963	
8,400.00	7,173.00	319.00	318.92	35.94	0.00	-12.38	-1.19	5.01	7,110.37	7,095.14	15.23	466.972	
8,500.00	7,173.00	319.00	318.92	36.82	0.00	-12.38	-1.19	5.01	7,127.18	7,111.40	15.78	451.536	
8,600.00	7,173.00	319.00	318.92	37.74	0.00	-12.38	-1.19	5.01	7,145.35	7,128.99	16.36	436.745	
8,700.00	7,173.00	319.00	318.92	38.70	0.00	-12.38	-1.19	5.01	7,164.87	7,147.92	16.95	422.658	
8,800.00	7,173.00	319.00	318.92	39.71	0.00	-12.38	-1.19	5.01	7,185.73	7,168.17	17.56	409.303	
8,900.00	7,173.00	319.00	318.92	40.76	0.00	-12.38	-1.19	5.01	7,207.91	7,189.74	18.17	396.685	
9,000.00	7,173.00	319.00	318.92	41.84	0.00	-12.38	-1.19	5.01	7,231.41	7,212.62	18.79	384.798	
9,100.00	7,173.00	319.00	318.92	42.96	0.00	-12.38	-1.19	5.01	7,256.22	7,236.80	19.42	373.622	
9,200.00	7,173.00	319.00	318.92	44.10	0.00	-12.38	-1.19	5.01	7,282.31	7,262.25	20.05	363.131	

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SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 830H - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: Reference		125-Standard Keeper 104						Rule Assigned:					Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
9,300.00	7,173.00	319.00	318.92	45.27	0.00	-12.38	-1.19	5.01	7,309.67	7,288.98	20.69	353.294		
9,400.00	7,173.00	319.00	318.92	46.47	0.00	-12.38	-1.19	5.01	7,338.30	7,316.97	21.33	344.078		
9,500.00	7,173.00	319.00	318.92	47.69	0.00	-12.38	-1.19	5.01	7,368.17	7,346.21	21.97	335.449		
9,600.00	7,173.00	319.00	318.92	48.94	0.00	-12.38	-1.19	5.01	7,399.28	7,376.68	22.60	327.373		
9,700.00	7,173.00	319.00	318.92	50.20	0.00	-12.38	-1.19	5.01	7,431.60	7,408.36	23.24	319.815		
9,800.00	7,173.00	319.00	318.92	51.49	0.00	-12.38	-1.19	5.01	7,465.12	7,441.25	23.87	312.744		
9,900.00	7,173.00	319.00	318.92	52.79	0.00	-12.38	-1.19	5.01	7,499.82	7,475.32	24.50	306.128		
10,000.00	7,173.00	319.00	318.92	54.10	0.00	-12.38	-1.19	5.01	7,535.69	7,510.57	25.12	299.938		
10,100.00	7,173.00	319.00	318.92	55.44	0.00	-12.38	-1.19	5.01	7,572.71	7,546.97	25.74	294.146		
10,200.00	7,173.00	319.00	318.92	56.78	0.00	-12.38	-1.19	5.01	7,610.87	7,584.51	26.36	288.727		
10,300.00	7,173.00	319.00	318.92	58.14	0.00	-12.38	-1.19	5.01	7,650.14	7,623.17	26.97	283.655		
10,400.00	7,173.00	319.00	318.92	59.51	0.00	-12.38	-1.19	5.01	7,690.51	7,662.94	27.57	278.909		
10,500.00	7,173.00	319.00	318.92	60.90	0.00	-12.38	-1.19	5.01	7,731.97	7,703.79	28.17	274.468		
10,600.00	7,173.00	319.00	318.92	62.29	0.00	-12.38	-1.19	5.01	7,774.49	7,745.72	28.76	270.311		
10,700.00	7,173.00	319.00	318.92	63.69	0.00	-12.38	-1.19	5.01	7,818.05	7,788.71	29.34	266.421		
10,800.00	7,173.00	319.00	318.92	65.11	0.00	-12.38	-1.19	5.01	7,862.65	7,832.73	29.92	262.782		
10,900.00	7,173.00	319.00	318.92	66.53	0.00	-12.38	-1.19	5.01	7,908.26	7,877.77	30.49	259.376		
11,000.00	7,173.00	319.00	318.92	67.96	0.00	-12.38	-1.19	5.01	7,954.87	7,923.82	31.05	256.191		
11,100.00	7,173.00	319.00	318.92	69.39	0.00	-12.38	-1.19	5.01	8,002.45	7,970.85	31.60	253.211		
11,200.00	7,173.00	319.00	318.92	70.84	0.00	-12.38	-1.19	5.01	8,051.00	8,018.85	32.15	250.426		
11,300.00	7,173.00	319.00	318.92	72.29	0.00	-12.38	-1.19	5.01	8,100.49	8,067.80	32.69	247.823		
11,400.00	7,173.00	319.00	318.92	73.74	0.00	-12.38	-1.19	5.01	8,150.91	8,117.69	33.22	245.392		
11,500.00	7,173.00	319.00	318.92	75.21	0.00	-12.38	-1.19	5.01	8,202.23	8,168.49	33.74	243.123		
11,600.00	7,173.00	319.00	318.92	76.68	0.00	-12.38	-1.19	5.01	8,254.45	8,220.20	34.25	241.006		
11,700.00	7,173.00	319.00	318.92	78.15	0.00	-12.38	-1.19	5.01	8,307.54	8,272.79	34.75	239.033		
11,800.00	7,173.00	319.00	318.92	79.63	0.00	-12.38	-1.19	5.01	8,361.49	8,326.24	35.25	237.196		
11,900.00	7,173.00	319.00	318.92	81.11	0.00	-12.38	-1.19	5.01	8,416.29	8,380.55	35.74	235.487		
12,000.00	7,173.00	319.00	318.92	82.60	0.00	-12.38	-1.19	5.01	8,471.91	8,435.69	36.22	233.899		
12,100.00	7,173.00	319.00	318.92	84.09	0.00	-12.38	-1.19	5.01	8,528.34	8,491.65	36.69	232.427		
12,200.00	7,173.00	319.00	318.92	85.59	0.00	-12.38	-1.19	5.01	8,585.56	8,548.41	37.16	231.062		
12,300.00	7,173.00	319.00	318.92	87.09	0.00	-12.38	-1.19	5.01	8,643.57	8,605.95	37.61	229.801		
12,400.00	7,173.00	319.00	318.92	88.59	0.00	-12.38	-1.19	5.01	8,702.33	8,664.27	38.06	228.638		
12,500.00	7,173.00	319.00	318.92	90.10	0.00	-12.38	-1.19	5.01	8,761.84	8,723.34	38.50	227.567		
12,600.00	7,173.00	319.00	318.92	91.61	0.00	-12.38	-1.19	5.01	8,822.09	8,783.15	38.94	226.584		
12,700.00	7,173.00	319.00	318.92	93.13	0.00	-12.38	-1.19	5.01	8,883.05	8,843.69	39.36	225.685		
12,800.00	7,173.00	319.00	318.92	94.64	0.00	-12.38	-1.19	5.01	8,944.71	8,904.93	39.78	224.865		
12,900.00	7,173.00	319.00	318.92	96.16	0.00	-12.38	-1.19	5.01	9,007.06	8,966.88	40.19	224.121		
13,000.00	7,173.00	319.00	318.92	97.69	0.00	-12.38	-1.19	5.01	9,070.09	9,029.50	40.59	223.449		
13,100.00	7,173.00	319.00	318.92	99.21	0.00	-12.38	-1.19	5.01	9,133.78	9,092.79	40.99	222.845		
13,200.00	7,173.00	319.00	318.92	100.74	0.00	-12.38	-1.19	5.01	9,198.11	9,156.73	41.38	222.307		
13,300.00	7,173.00	319.00	318.92	102.27	0.00	-12.38	-1.19	5.01	9,263.07	9,221.32	41.76	221.831		
13,400.00	7,173.00	319.00	318.92	103.80	0.00	-12.38	-1.19	5.01	9,328.66	9,286.53	42.13	221.415		
13,500.00	7,173.00	319.00	318.92	105.33	0.00	-12.38	-1.19	5.01	9,394.85	9,352.35	42.50	221.055		
13,600.00	7,173.00	319.00	318.92	106.87	0.00	-12.38	-1.19	5.01	9,461.63	9,418.77	42.86	220.750		
13,700.00	7,173.00	319.00	318.92	108.41	0.00	-12.38	-1.19	5.01	9,529.00	9,485.78	43.22	220.496		
13,800.00	7,173.00	319.00	318.92	109.95	0.00	-12.38	-1.19	5.01	9,596.93	9,553.37	43.56	220.292		
13,900.00	7,173.00	319.00	318.92	111.49	0.00	-12.38	-1.19	5.01	9,665.43	9,621.52	43.91	220.135		
14,000.00	7,173.00	319.00	318.92	113.03	0.00	-12.38	-1.19	5.01	9,734.47	9,690.22	44.24	220.024		
14,100.00	7,173.00	319.00	318.92	114.58	0.00	-12.38	-1.19	5.01	9,804.04	9,759.46	44.57	219.956		
14,200.00	7,173.00	319.00	318.92	116.13	0.00	-12.38	-1.19	5.01	9,874.13	9,829.23	44.90	219.929		
14,300.00	7,173.00	319.00	318.92	117.68	0.00	-12.38	-1.19	5.01	9,944.74	9,899.52	45.22	219.943		
14,400.00	7,173.00	319.00	318.92	119.23	0.00	-12.38	-1.19	5.01	10,015.84	9,970.32	45.53	219.994		

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SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 830H - OH - OH												Offset Site Error: 0.00 usft	
Survey Program: Reference		125-Standard Keeper 104 Offset						Rule Assigned: Distance				Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,500.00	7,173.00	319.00	318.92	120.78	0.00	-12.38	-1.19	5.01	10,087.44	10,041.61	45.83	220.082	
14,600.00	7,173.00	319.00	318.92	122.33	0.00	-12.38	-1.19	5.01	10,159.52	10,113.38	46.14	220.205	
14,700.00	7,173.00	319.00	318.92	123.88	0.00	-12.38	-1.19	5.01	10,232.06	10,185.63	46.43	220.362	
14,800.00	7,173.00	319.00	318.92	125.44	0.00	-12.38	-1.19	5.01	10,305.07	10,258.35	46.72	220.551	
14,900.00	7,173.00	319.00	318.92	127.00	0.00	-12.38	-1.19	5.01	10,378.53	10,331.51	47.01	220.771	
15,000.00	7,173.00	319.00	318.92	128.55	0.00	-12.38	-1.19	5.01	10,452.42	10,405.13	47.29	221.021	
15,100.00	7,173.00	319.00	318.92	130.11	0.00	-12.38	-1.19	5.01	10,526.75	10,479.18	47.57	221.299	
15,200.00	7,173.00	319.00	318.92	131.67	0.00	-12.38	-1.19	5.01	10,601.50	10,553.66	47.84	221.605	
15,300.00	7,173.00	319.00	318.92	133.23	0.00	-12.38	-1.19	5.01	10,676.66	10,628.55	48.11	221.937	
15,400.00	7,173.00	319.00	318.92	134.80	0.00	-12.38	-1.19	5.01	10,752.23	10,703.86	48.37	222.295	
15,500.00	7,173.00	319.00	318.92	136.36	0.00	-12.38	-1.19	5.01	10,828.19	10,779.57	48.63	222.677	
15,600.00	7,173.00	319.00	318.92	137.92	0.00	-12.38	-1.19	5.01	10,904.54	10,855.66	48.88	223.082	
15,700.00	7,173.00	319.00	318.92	139.49	0.00	-12.38	-1.19	5.01	10,981.28	10,932.14	49.13	223.510	
15,800.00	7,173.00	319.00	318.92	141.05	0.00	-12.38	-1.19	5.01	11,058.38	11,009.00	49.38	223.960	
15,900.00	7,173.00	319.00	318.92	142.62	0.00	-12.38	-1.19	5.01	11,135.85	11,086.23	49.62	224.431	
16,000.00	7,173.00	319.00	318.92	144.19	0.00	-12.38	-1.19	5.01	11,213.67	11,163.81	49.86	224.922	
16,100.00	7,173.00	319.00	318.92	145.76	0.00	-12.38	-1.19	5.01	11,291.84	11,241.75	50.09	225.432	
16,200.00	7,173.00	319.00	318.92	147.33	0.00	-12.38	-1.19	5.01	11,370.36	11,320.04	50.32	225.961	
16,300.00	7,173.00	319.00	318.92	148.90	0.00	-12.38	-1.19	5.01	11,449.21	11,398.66	50.55	226.508	
16,400.00	7,173.00	319.00	318.92	150.47	0.00	-12.38	-1.19	5.01	11,528.39	11,477.62	50.77	227.073	
16,500.00	7,173.00	319.00	318.92	152.04	0.00	-12.38	-1.19	5.01	11,607.89	11,556.90	50.99	227.654	
16,600.00	7,173.00	319.00	318.92	153.61	0.00	-12.38	-1.19	5.01	11,687.70	11,636.50	51.21	228.251	
16,700.00	7,173.00	319.00	318.92	155.18	0.00	-12.38	-1.19	5.01	11,767.83	11,716.41	51.42	228.863	
16,800.00	7,173.00	319.00	318.92	156.76	0.00	-12.38	-1.19	5.01	11,848.25	11,796.62	51.63	229.491	
16,900.00	7,173.00	319.00	318.92	158.33	0.00	-12.38	-1.19	5.01	11,928.97	11,877.14	51.84	230.133	
17,000.00	7,173.00	319.00	318.92	159.90	0.00	-12.38	-1.19	5.01	12,009.98	11,957.94	52.04	230.788	
17,100.00	7,173.00	319.00	318.92	161.48	0.00	-12.38	-1.19	5.01	12,091.28	12,039.04	52.24	231.457	
17,200.00	7,173.00	319.00	318.92	163.05	0.00	-12.38	-1.19	5.01	12,172.85	12,120.42	52.44	232.139	
17,300.00	7,173.00	319.00	318.92	164.63	0.00	-12.38	-1.19	5.01	12,254.70	12,202.07	52.63	232.834	
17,400.00	7,173.00	319.00	318.92	166.21	0.00	-12.38	-1.19	5.01	12,336.82	12,283.99	52.83	233.540	
17,500.00	7,173.00	319.00	318.92	167.79	0.00	-12.38	-1.19	5.01	12,419.19	12,366.18	53.01	234.258	
17,600.00	7,173.00	319.00	318.92	169.36	0.00	-12.38	-1.19	5.01	12,501.83	12,448.62	53.20	234.987	
17,700.00	7,173.00	319.00	318.92	170.94	0.00	-12.38	-1.19	5.01	12,584.71	12,531.33	53.39	235.727	
17,800.00	7,173.00	319.00	318.92	172.52	0.00	-12.38	-1.19	5.01	12,667.85	12,614.28	53.57	236.477	
17,900.00	7,173.00	319.00	318.92	174.10	0.00	-12.38	-1.19	5.01	12,751.22	12,697.47	53.75	237.237	
18,000.00	7,173.00	319.00	318.92	175.68	0.00	-12.38	-1.19	5.01	12,834.84	12,780.91	53.93	238.007	
18,100.00	7,173.00	319.00	318.92	177.26	0.00	-12.38	-1.19	5.01	12,918.68	12,864.58	54.10	238.786	
18,200.00	7,173.00	319.00	318.92	178.84	0.00	-12.38	-1.19	5.01	13,002.76	12,948.48	54.27	239.574	
18,300.00	7,173.00	319.00	318.92	180.42	0.00	-12.38	-1.19	5.01	13,087.05	13,032.61	54.45	240.370	
18,400.00	7,173.00	319.00	318.92	182.00	0.00	-12.38	-1.19	5.01	13,171.57	13,116.96	54.61	241.175	
18,500.00	7,173.00	319.00	318.92	183.59	0.00	-12.38	-1.19	5.01	13,256.31	13,201.52	54.78	241.988	
18,600.00	7,173.00	319.00	318.92	185.17	0.00	-12.38	-1.19	5.01	13,341.25	13,286.30	54.95	242.808	
18,700.00	7,173.00	319.00	318.92	186.75	0.00	-12.38	-1.19	5.01	13,426.40	13,371.29	55.11	243.636	
18,800.00	7,173.00	319.00	318.92	188.33	0.00	-12.38	-1.19	5.01	13,511.76	13,456.49	55.27	244.471	
18,900.00	7,173.00	319.00	318.92	189.92	0.00	-12.38	-1.19	5.01	13,597.31	13,541.89	55.43	245.313	
19,000.00	7,173.00	319.00	318.92	191.50	0.00	-12.38	-1.19	5.01	13,683.07	13,627.48	55.59	246.161	
19,100.00	7,173.00	319.00	318.92	193.09	0.00	-12.38	-1.19	5.01	13,769.01	13,713.27	55.74	247.016	
19,200.00	7,173.00	319.00	318.92	194.67	0.00	-12.38	-1.19	5.01	13,855.14	13,799.25	55.90	247.877	
19,249.41	7,173.00	319.00	318.92	195.45	0.00	-12.38	-1.19	5.01	13,897.77	13,841.80	55.97	248.304	
19,300.00	7,173.00	319.00	318.92	196.25	0.00	-12.38	-1.19	5.01	13,941.46	13,885.41	56.05	248.743	
19,384.41	7,173.00	319.00	318.92	197.34	0.00	-12.38	-1.19	5.01	14,014.46	13,957.45	57.01	245.823	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104							Rule Assigned:						Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
0.00	0.00	0.00	0.00	0.00	0.00	-146.43	-12.34	-8.19	14.81					
125.00	125.00	124.99	124.99	0.06	0.06	168.76	-12.47	-8.04	15.43	15.33	0.10	161.786		
225.00	224.98	224.96	224.96	0.17	0.19	106.16	-12.87	-7.62	16.35	16.08	0.26	61.733		
319.00	318.92	318.94	318.94	0.28	0.32	103.27	-13.43	-6.99	17.14	16.74	0.41	42.201		
400.00	399.86	322.00	321.99	0.37	0.32	103.57	-13.44	-6.97	79.96	77.32	2.64	30.283 SF		
469.00	468.80	322.00	321.99	0.52	0.32	103.57	-13.44	-6.97	148.09	145.39	2.70	54.854		
500.00	499.78	322.00	321.99	0.61	0.32	122.96	-13.44	-6.97	178.93	176.21	2.71	65.928		
600.00	599.71	322.00	321.99	0.92	0.32	-156.48	-13.44	-6.97	278.72	275.97	2.75	101.329		
700.00	699.55	322.00	321.99	1.26	0.32	-83.49	-13.44	-6.97	378.65	375.86	2.79	135.870		
800.00	799.19	322.00	321.99	1.60	0.32	-46.72	-13.44	-6.97	478.54	475.71	2.83	169.381		
900.00	898.49	322.00	321.99	1.97	0.32	-30.78	-13.44	-6.97	578.32	575.46	2.87	201.727		
1,000.00	997.33	322.00	321.99	2.34	0.32	-22.50	-13.44	-6.97	677.95	675.04	2.91	232.813		
1,100.00	1,095.61	322.00	321.99	2.74	0.32	-17.54	-13.44	-6.97	777.39	774.43	2.96	262.569		
1,196.26	1,189.56	322.00	321.99	3.13	0.32	-14.38	-13.44	-6.97	872.89	869.88	3.01	289.926		
1,200.00	1,193.19	322.00	321.99	3.15	0.32	-14.38	-13.44	-6.97	876.59	873.58	3.01	291.305		
1,300.00	1,290.42	322.00	321.99	3.58	0.32	-14.38	-13.44	-6.97	975.78	972.71	3.07	317.521		
1,400.00	1,387.65	322.00	321.99	4.01	0.32	-14.38	-13.44	-6.97	1,075.13	1,071.99	3.14	342.385		
1,500.00	1,484.87	322.00	321.99	4.45	0.32	-14.38	-13.44	-6.97	1,174.58	1,171.37	3.21	365.880		
1,600.00	1,582.10	322.00	321.99	4.90	0.32	-14.38	-13.44	-6.97	1,274.12	1,270.83	3.28	388.011		
1,700.00	1,679.33	322.00	321.99	5.34	0.32	-14.38	-13.44	-6.97	1,373.72	1,370.36	3.36	408.798		
1,800.00	1,776.55	322.00	321.99	5.79	0.32	-14.38	-13.44	-6.97	1,473.38	1,469.94	3.44	428.272		
1,900.00	1,873.78	322.00	321.99	6.24	0.32	-14.38	-13.44	-6.97	1,573.08	1,569.56	3.52	446.473		
2,000.00	1,971.01	322.00	321.99	6.69	0.32	-14.38	-13.44	-6.97	1,672.82	1,669.21	3.61	463.446		
2,100.00	2,068.23	322.00	321.99	7.15	0.32	-14.38	-13.44	-6.97	1,772.59	1,768.89	3.70	479.240		
2,200.00	2,165.46	322.00	321.99	7.60	0.32	-14.38	-13.44	-6.97	1,872.38	1,868.59	3.79	493.909		
2,300.00	2,262.69	322.00	321.99	8.06	0.32	-14.38	-13.44	-6.97	1,972.20	1,968.31	3.89	507.505		
2,400.00	2,359.91	322.00	321.99	8.51	0.32	-14.38	-13.44	-6.97	2,072.03	2,068.04	3.98	520.082		
2,500.00	2,457.14	322.00	321.99	8.97	0.32	-14.38	-13.44	-6.97	2,171.87	2,167.79	4.08	531.693		
2,600.00	2,554.37	322.00	321.99	9.42	0.32	-14.38	-13.44	-6.97	2,271.73	2,267.55	4.19	542.389		
2,700.00	2,651.59	322.00	321.99	9.88	0.32	-14.38	-13.44	-6.97	2,371.61	2,367.31	4.29	552.222		
2,800.00	2,748.82	322.00	321.99	10.34	0.32	-14.38	-13.44	-6.97	2,471.49	2,467.08	4.40	561.240		
2,900.00	2,846.05	322.00	321.99	10.80	0.32	-14.38	-13.44	-6.97	2,571.38	2,566.86	4.52	569.489		
3,000.00	2,943.27	322.00	321.99	11.25	0.32	-14.38	-13.44	-6.97	2,671.28	2,666.65	4.63	577.016		
3,100.00	3,040.50	322.00	321.99	11.71	0.32	-14.38	-13.44	-6.97	2,771.19	2,766.44	4.75	583.861		
3,200.00	3,137.73	322.00	321.99	12.17	0.32	-14.38	-13.44	-6.97	2,871.10	2,866.23	4.87	590.067		
3,300.00	3,234.95	322.00	321.99	12.63	0.32	-14.38	-13.44	-6.97	2,971.02	2,966.03	4.99	595.671		
3,400.00	3,332.18	322.00	321.99	13.09	0.32	-14.38	-13.44	-6.97	3,070.94	3,065.83	5.11	600.710		
3,500.00	3,429.40	322.00	321.99	13.55	0.32	-14.38	-13.44	-6.97	3,170.87	3,165.63	5.24	605.217		
3,600.00	3,526.63	322.00	321.99	14.00	0.32	-14.38	-13.44	-6.97	3,270.81	3,265.44	5.37	609.226		
3,700.00	3,623.86	322.00	321.99	14.46	0.32	-14.38	-13.44	-6.97	3,370.74	3,365.24	5.50	612.766		
3,800.00	3,721.08	322.00	321.99	14.92	0.32	-14.38	-13.44	-6.97	3,470.68	3,465.05	5.64	615.867		
3,900.00	3,818.31	322.00	321.99	15.38	0.32	-14.38	-13.44	-6.97	3,570.63	3,564.86	5.77	618.556		
4,000.00	3,915.54	322.00	321.99	15.84	0.32	-14.38	-13.44	-6.97	3,670.58	3,664.66	5.91	620.857		
4,100.00	4,012.76	322.00	321.99	16.30	0.32	-14.38	-13.44	-6.97	3,770.53	3,764.47	6.05	622.795		
4,200.00	4,109.99	322.00	321.99	16.76	0.32	-14.38	-13.44	-6.97	3,870.48	3,864.28	6.20	624.392		
4,300.00	4,207.22	322.00	321.99	17.22	0.32	-14.38	-13.44	-6.97	3,970.43	3,964.09	6.35	625.670		
4,400.00	4,304.44	322.00	321.99	17.68	0.32	-14.38	-13.44	-6.97	4,070.39	4,063.90	6.50	626.648		
4,500.00	4,401.67	322.00	321.99	18.14	0.32	-14.38	-13.44	-6.97	4,170.35	4,163.70	6.65	627.346		
4,600.00	4,498.90	322.00	321.99	18.60	0.32	-14.38	-13.44	-6.97	4,270.31	4,263.51	6.80	627.780		
4,700.00	4,596.12	322.00	321.99	19.06	0.32	-14.38	-13.44	-6.97	4,370.28	4,363.32	6.96	627.967		
4,800.00	4,693.35	322.00	321.99	19.52	0.32	-14.38	-13.44	-6.97	4,470.24	4,463.12	7.12	627.923		
4,900.00	4,790.58	322.00	321.99	19.98	0.32	-14.38	-13.44	-6.97	4,570.21	4,562.93	7.28	627.663		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,000.00	4,887.80	322.00	321.99	20.44	0.32	-14.38	-13.44	-6.97	4,670.17	4,662.73	7.45	627.200	
5,100.00	4,985.03	322.00	321.99	20.90	0.32	-14.38	-13.44	-6.97	4,770.14	4,762.53	7.61	626.548	
5,200.00	5,082.26	322.00	321.99	21.36	0.32	-14.38	-13.44	-6.97	4,870.11	4,862.33	7.78	625.718	
5,300.00	5,179.48	322.00	321.99	21.82	0.32	-14.38	-13.44	-6.97	4,970.09	4,962.13	7.96	624.722	
5,400.00	5,276.71	322.00	321.99	22.27	0.32	-14.38	-13.44	-6.97	5,070.06	5,061.93	8.13	623.572	
5,500.00	5,373.94	322.00	321.99	22.73	0.32	-14.38	-13.44	-6.97	5,170.03	5,161.72	8.31	622.277	
5,600.00	5,471.16	322.00	321.99	23.19	0.32	-14.38	-13.44	-6.97	5,270.01	5,261.52	8.49	620.847	
5,700.00	5,568.39	322.00	321.99	23.65	0.32	-14.38	-13.44	-6.97	5,369.98	5,361.31	8.67	619.291	
5,800.00	5,665.62	322.00	321.99	24.11	0.32	-14.38	-13.44	-6.97	5,469.96	5,461.10	8.86	617.617	
5,900.00	5,762.84	322.00	321.99	24.57	0.32	-14.38	-13.44	-6.97	5,569.94	5,560.89	9.04	615.835	
6,000.00	5,860.07	322.00	321.99	25.03	0.32	-14.38	-13.44	-6.97	5,669.91	5,660.68	9.24	613.951	
6,100.00	5,957.30	322.00	321.99	25.50	0.32	-14.38	-13.44	-6.97	5,769.89	5,760.47	9.43	611.972	
6,200.00	6,054.52	322.00	321.99	25.96	0.32	-14.38	-13.44	-6.97	5,869.87	5,860.25	9.62	609.906	
6,300.00	6,151.75	322.00	321.99	26.42	0.32	-14.38	-13.44	-6.97	5,969.85	5,960.03	9.82	607.759	
6,400.00	6,248.98	322.00	321.99	26.88	0.32	-14.38	-13.44	-6.97	6,069.83	6,059.81	10.02	605.537	
6,500.00	6,346.20	322.00	321.99	27.34	0.32	-14.38	-13.44	-6.97	6,169.82	6,159.59	10.23	603.245	
6,600.00	6,443.43	322.00	321.99	27.80	0.32	-14.38	-13.44	-6.97	6,269.80	6,259.36	10.43	600.889	
6,696.38	6,537.14	322.00	321.99	28.24	0.32	-14.38	-13.44	-6.97	6,366.16	6,355.53	10.64	598.563	
6,700.00	6,540.66	322.00	321.99	28.26	0.32	-29.36	-13.44	-6.97	6,369.78	6,359.14	10.64	598.475	
6,750.00	6,589.27	322.00	321.99	28.48	0.32	-64.67	-13.44	-6.97	6,419.70	6,408.96	10.75	597.302	
6,800.00	6,637.66	322.00	321.99	28.71	0.32	-54.18	-13.44	-6.97	6,469.29	6,458.44	10.85	596.255	
6,850.00	6,685.53	322.00	321.99	28.92	0.32	-44.05	-13.44	-6.97	6,518.25	6,507.30	10.95	595.363	
6,900.00	6,732.60	322.00	321.99	29.13	0.32	-36.36	-13.44	-6.97	6,566.29	6,555.25	11.04	594.618	
6,950.00	6,778.56	322.00	321.99	29.32	0.32	-30.73	-13.44	-6.97	6,613.15	6,602.02	11.13	594.003	
7,000.00	6,823.13	322.00	321.99	29.51	0.32	-26.57	-13.44	-6.97	6,658.56	6,647.34	11.22	593.495	
7,050.00	6,866.05	322.00	321.99	29.68	0.32	-23.43	-13.44	-6.97	6,702.27	6,690.97	11.30	593.058	
7,100.00	6,907.04	322.00	321.99	29.85	0.32	-21.02	-13.44	-6.97	6,744.06	6,732.68	11.38	592.647	
7,150.00	6,945.85	322.00	321.99	30.01	0.32	-19.14	-13.44	-6.97	6,783.69	6,772.24	11.46	592.201	
7,200.00	6,982.24	322.00	321.99	30.15	0.32	-17.64	-13.44	-6.97	6,820.97	6,809.44	11.53	591.651	
7,250.00	7,016.00	322.00	321.99	30.29	0.32	-16.45	-13.44	-6.97	6,855.71	6,844.10	11.60	590.914	
7,300.00	7,046.90	322.00	321.99	30.43	0.32	-15.48	-13.44	-6.97	6,887.72	6,876.05	11.68	589.900	
7,350.00	7,074.76	322.00	321.99	30.56	0.32	-14.70	-13.44	-6.97	6,916.87	6,905.11	11.75	588.514	
7,400.00	7,099.42	322.00	321.99	30.69	0.32	-14.07	-13.44	-6.97	6,942.99	6,931.15	11.83	586.665	
7,450.00	7,120.70	322.00	321.99	30.82	0.32	-13.57	-13.44	-6.97	6,965.97	6,954.04	11.92	584.264	
7,500.00	7,138.50	322.00	321.99	30.95	0.32	-13.18	-13.44	-6.97	6,985.69	6,973.67	12.02	581.238	
7,550.00	7,152.68	322.00	321.99	31.10	0.32	-12.88	-13.44	-6.97	7,002.06	6,989.94	12.12	577.534	
7,600.00	7,163.18	322.00	321.99	31.25	0.32	-12.67	-13.44	-6.97	7,015.01	7,002.77	12.24	573.121	
7,650.00	7,169.92	322.00	321.99	31.41	0.32	-12.54	-13.44	-6.97	7,024.47	7,012.10	12.37	567.994	
7,700.00	7,172.86	322.00	321.99	31.59	0.32	-12.49	-13.44	-6.97	7,030.40	7,017.90	12.51	562.178	
7,713.53	7,173.00	322.00	321.99	31.64	0.32	-12.49	-13.44	-6.97	7,031.40	7,018.85	12.54	560.533	
7,800.00	7,173.00	322.00	321.99	31.99	0.32	-12.49	-13.44	-6.97	7,037.44	7,024.62	12.82	548.895	
7,900.00	7,173.00	322.00	321.99	32.47	0.32	-12.49	-13.44	-6.97	7,045.76	7,032.57	13.19	534.327	
8,000.00	7,173.00	322.00	321.99	33.03	0.32	-12.49	-13.44	-6.97	7,055.47	7,041.88	13.59	518.995	
8,100.00	7,173.00	322.00	321.99	33.66	0.32	-12.49	-13.44	-6.97	7,066.59	7,052.55	14.04	503.278	
8,200.00	7,173.00	322.00	321.99	34.36	0.32	-12.49	-13.44	-6.97	7,079.11	7,064.59	14.52	487.488	
8,300.00	7,173.00	322.00	321.99	35.13	0.32	-12.49	-13.44	-6.97	7,093.01	7,077.98	15.03	471.874	
8,400.00	7,173.00	322.00	321.99	35.95	0.32	-12.49	-13.44	-6.97	7,108.30	7,092.73	15.57	456.624	
8,500.00	7,173.00	322.00	321.99	36.82	0.32	-12.49	-13.44	-6.97	7,124.95	7,108.83	16.12	441.874	
8,600.00	7,173.00	322.00	321.99	37.74	0.32	-12.49	-13.44	-6.97	7,142.97	7,126.27	16.70	427.719	
8,700.00	7,173.00	322.00	321.99	38.71	0.32	-12.49	-13.44	-6.97	7,162.33	7,145.04	17.29	414.215	
8,800.00	7,173.00	322.00	321.99	39.71	0.32	-12.49	-13.44	-6.97	7,183.04	7,165.15	17.90	401.393	
8,900.00	7,173.00	322.00	321.99	40.76	0.32	-12.49	-13.44	-6.97	7,205.08	7,186.57	18.51	389.263	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104							Rule Assigned:					Offset Well Error:	0.00 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,000.00	7,173.00	322.00	321.99	41.84	0.32	-12.49	-13.44	-6.97	7,228.43	7,209.30	19.13	377.821	
9,100.00	7,173.00	322.00	321.99	42.96	0.32	-12.49	-13.44	-6.97	7,253.08	7,233.32	19.76	367.050	
9,200.00	7,173.00	322.00	321.99	44.10	0.32	-12.49	-13.44	-6.97	7,279.03	7,258.64	20.39	356.929	
9,300.00	7,173.00	322.00	321.99	45.27	0.32	-12.49	-13.44	-6.97	7,306.25	7,285.22	21.03	347.429	
9,400.00	7,173.00	322.00	321.99	46.47	0.32	-12.49	-13.44	-6.97	7,334.74	7,313.07	21.67	338.521	
9,500.00	7,173.00	322.00	321.99	47.70	0.32	-12.49	-13.44	-6.97	7,364.47	7,342.16	22.30	330.173	
9,600.00	7,173.00	322.00	321.99	48.94	0.32	-12.49	-13.44	-6.97	7,395.43	7,372.49	22.94	322.354	
9,700.00	7,173.00	322.00	321.99	50.20	0.32	-12.49	-13.44	-6.97	7,427.62	7,404.04	23.58	315.031	
9,800.00	7,173.00	322.00	321.99	51.49	0.32	-12.49	-13.44	-6.97	7,461.00	7,436.79	24.21	308.175	
9,900.00	7,173.00	322.00	321.99	52.79	0.32	-12.49	-13.44	-6.97	7,495.57	7,470.73	24.84	301.757	
10,000.00	7,173.00	322.00	321.99	54.11	0.32	-12.49	-13.44	-6.97	7,531.31	7,505.84	25.47	295.749	
10,100.00	7,173.00	322.00	321.99	55.44	0.32	-12.49	-13.44	-6.97	7,568.20	7,542.12	26.09	290.124	
10,200.00	7,173.00	322.00	321.99	56.78	0.32	-12.49	-13.44	-6.97	7,606.23	7,579.53	26.70	284.859	
10,300.00	7,173.00	322.00	321.99	58.14	0.32	-12.49	-13.44	-6.97	7,645.38	7,618.06	27.31	279.930	
10,400.00	7,173.00	322.00	321.99	59.51	0.32	-12.49	-13.44	-6.97	7,685.62	7,657.71	27.92	275.315	
10,500.00	7,173.00	322.00	321.99	60.90	0.32	-12.49	-13.44	-6.97	7,726.96	7,698.44	28.51	270.995	
10,600.00	7,173.00	322.00	321.99	62.29	0.32	-12.49	-13.44	-6.97	7,769.36	7,740.25	29.10	266.951	
10,700.00	7,173.00	322.00	321.99	63.69	0.32	-12.49	-13.44	-6.97	7,812.81	7,783.12	29.69	263.166	
10,800.00	7,173.00	322.00	321.99	65.11	0.32	-12.49	-13.44	-6.97	7,857.29	7,827.03	30.26	259.623	
10,900.00	7,173.00	322.00	321.99	66.53	0.32	-12.49	-13.44	-6.97	7,902.79	7,871.95	30.83	256.308	
11,000.00	7,173.00	322.00	321.99	67.96	0.32	-12.49	-13.44	-6.97	7,949.28	7,917.89	31.39	253.207	
11,100.00	7,173.00	322.00	321.99	69.39	0.32	-12.49	-13.44	-6.97	7,996.76	7,964.81	31.95	250.306	
11,200.00	7,173.00	322.00	321.99	70.84	0.32	-12.49	-13.44	-6.97	8,045.20	8,012.70	32.49	247.594	
11,300.00	7,173.00	322.00	321.99	72.29	0.32	-12.49	-13.44	-6.97	8,094.58	8,061.55	33.03	245.060	
11,400.00	7,173.00	322.00	321.99	73.74	0.32	-12.49	-13.44	-6.97	8,144.89	8,111.33	33.56	242.693	
11,500.00	7,173.00	322.00	321.99	75.21	0.32	-12.49	-13.44	-6.97	8,196.12	8,162.03	34.08	240.483	
11,600.00	7,173.00	322.00	321.99	76.68	0.32	-12.49	-13.44	-6.97	8,248.23	8,213.64	34.60	238.423	
11,700.00	7,173.00	322.00	321.99	78.15	0.32	-12.49	-13.44	-6.97	8,301.23	8,266.13	35.10	236.502	
11,800.00	7,173.00	322.00	321.99	79.63	0.32	-12.49	-13.44	-6.97	8,355.09	8,319.49	35.60	234.714	
11,900.00	7,173.00	322.00	321.99	81.11	0.32	-12.49	-13.44	-6.97	8,409.79	8,373.70	36.09	233.052	
12,000.00	7,173.00	322.00	321.99	82.60	0.32	-12.49	-13.44	-6.97	8,465.31	8,428.75	36.57	231.508	
12,100.00	7,173.00	322.00	321.99	84.09	0.32	-12.49	-13.44	-6.97	8,521.65	8,484.62	37.04	230.076	
12,200.00	7,173.00	322.00	321.99	85.59	0.32	-12.49	-13.44	-6.97	8,578.79	8,541.29	37.50	228.751	
12,300.00	7,173.00	322.00	321.99	87.09	0.32	-12.49	-13.44	-6.97	8,636.71	8,598.75	37.96	227.526	
12,400.00	7,173.00	322.00	321.99	88.59	0.32	-12.49	-13.44	-6.97	8,695.39	8,656.98	38.41	226.397	
12,500.00	7,173.00	322.00	321.99	90.10	0.32	-12.49	-13.44	-6.97	8,754.81	8,715.97	38.85	225.359	
12,600.00	7,173.00	322.00	321.99	91.61	0.32	-12.49	-13.44	-6.97	8,814.98	8,775.70	39.28	224.407	
12,700.00	7,173.00	322.00	321.99	93.13	0.32	-12.49	-13.44	-6.97	8,875.86	8,836.15	39.71	223.537	
12,800.00	7,173.00	322.00	321.99	94.64	0.32	-12.49	-13.44	-6.97	8,937.44	8,897.32	40.12	222.744	
12,900.00	7,173.00	322.00	321.99	96.16	0.32	-12.49	-13.44	-6.97	8,999.72	8,959.19	40.53	222.026	
13,000.00	7,173.00	322.00	321.99	97.69	0.32	-12.49	-13.44	-6.97	9,062.67	9,021.73	40.94	221.379	
13,100.00	7,173.00	322.00	321.99	99.21	0.32	-12.49	-13.44	-6.97	9,126.28	9,084.95	41.33	220.799	
13,200.00	7,173.00	322.00	321.99	100.74	0.32	-12.49	-13.44	-6.97	9,190.54	9,148.82	41.72	220.283	
13,300.00	7,173.00	322.00	321.99	102.27	0.32	-12.49	-13.44	-6.97	9,255.44	9,213.34	42.10	219.828	
13,400.00	7,173.00	322.00	321.99	103.80	0.32	-12.49	-13.44	-6.97	9,320.95	9,278.48	42.48	219.431	
13,500.00	7,173.00	322.00	321.99	105.33	0.32	-12.49	-13.44	-6.97	9,387.08	9,344.23	42.85	219.090	
13,600.00	7,173.00	322.00	321.99	106.87	0.32	-12.49	-13.44	-6.97	9,453.80	9,410.59	43.21	218.803	
13,700.00	7,173.00	322.00	321.99	108.41	0.32	-12.49	-13.44	-6.97	9,521.10	9,477.54	43.56	218.566	
13,800.00	7,173.00	322.00	321.99	109.95	0.32	-12.49	-13.44	-6.97	9,588.97	9,545.06	43.91	218.378	
13,900.00	7,173.00	322.00	321.99	111.49	0.32	-12.49	-13.44	-6.97	9,657.40	9,613.15	44.25	218.237	
14,000.00	7,173.00	322.00	321.99	113.03	0.32	-12.49	-13.44	-6.97	9,726.38	9,681.79	44.59	218.140	
14,100.00	7,173.00	322.00	321.99	114.58	0.32	-12.49	-13.44	-6.97	9,795.89	9,750.97	44.92	218.086	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,200.00	7,173.00	322.00	321.99	116.13	0.32	-12.49	-13.44	-6.97	9,865.93	9,820.69	45.24	218.072	
14,300.00	7,173.00	322.00	321.99	117.68	0.32	-12.49	-13.44	-6.97	9,936.48	9,890.92	45.56	218.098	
14,400.00	7,173.00	322.00	321.99	119.23	0.32	-12.49	-13.44	-6.97	10,007.53	9,961.66	45.87	218.161	
14,500.00	7,173.00	322.00	321.99	120.78	0.32	-12.49	-13.44	-6.97	10,079.07	10,032.89	46.18	218.260	
14,600.00	7,173.00	322.00	321.99	122.33	0.32	-12.49	-13.44	-6.97	10,151.10	10,104.61	46.48	218.394	
14,700.00	7,173.00	322.00	321.99	123.88	0.32	-12.49	-13.44	-6.97	10,223.59	10,176.81	46.78	218.561	
14,800.00	7,173.00	322.00	321.99	125.44	0.32	-12.49	-13.44	-6.97	10,296.54	10,249.48	47.07	218.760	
14,900.00	7,173.00	322.00	321.99	127.00	0.32	-12.49	-13.44	-6.97	10,369.95	10,322.60	47.35	218.989	
15,000.00	7,173.00	322.00	321.99	128.55	0.32	-12.49	-13.44	-6.97	10,443.80	10,396.16	47.63	219.247	
15,100.00	7,173.00	322.00	321.99	130.11	0.32	-12.49	-13.44	-6.97	10,518.08	10,470.17	47.91	219.534	
15,200.00	7,173.00	322.00	321.99	131.67	0.32	-12.49	-13.44	-6.97	10,592.78	10,544.60	48.18	219.848	
15,300.00	7,173.00	322.00	321.99	133.23	0.32	-12.49	-13.44	-6.97	10,667.90	10,619.45	48.45	220.187	
15,400.00	7,173.00	322.00	321.99	134.80	0.32	-12.49	-13.44	-6.97	10,743.42	10,694.71	48.71	220.552	
15,500.00	7,173.00	322.00	321.99	136.36	0.32	-12.49	-13.44	-6.97	10,819.34	10,770.37	48.97	220.941	
15,600.00	7,173.00	322.00	321.99	137.92	0.32	-12.49	-13.44	-6.97	10,895.65	10,846.43	49.22	221.353	
15,700.00	7,173.00	322.00	321.99	139.49	0.32	-12.49	-13.44	-6.97	10,972.34	10,922.87	49.47	221.787	
15,800.00	7,173.00	322.00	321.99	141.05	0.32	-12.49	-13.44	-6.97	11,049.40	10,999.68	49.72	222.243	
15,900.00	7,173.00	322.00	321.99	142.62	0.32	-12.49	-13.44	-6.97	11,126.83	11,076.87	49.96	222.719	
16,000.00	7,173.00	322.00	321.99	144.19	0.32	-12.49	-13.44	-6.97	11,204.61	11,154.42	50.20	223.215	
16,100.00	7,173.00	322.00	321.99	145.76	0.32	-12.49	-13.44	-6.97	11,282.75	11,232.32	50.43	223.730	
16,200.00	7,173.00	322.00	321.99	147.33	0.32	-12.49	-13.44	-6.97	11,361.23	11,310.57	50.66	224.264	
16,300.00	7,173.00	322.00	321.99	148.90	0.32	-12.49	-13.44	-6.97	11,440.04	11,389.15	50.89	224.815	
16,400.00	7,173.00	322.00	321.99	150.47	0.32	-12.49	-13.44	-6.97	11,519.18	11,468.07	51.11	225.384	
16,500.00	7,173.00	322.00	321.99	152.04	0.32	-12.49	-13.44	-6.97	11,598.65	11,547.32	51.33	225.969	
16,600.00	7,173.00	322.00	321.99	153.61	0.32	-12.49	-13.44	-6.97	11,678.43	11,626.88	51.54	226.570	
16,700.00	7,173.00	322.00	321.99	155.18	0.32	-12.49	-13.44	-6.97	11,758.52	11,706.76	51.76	227.186	
16,800.00	7,173.00	322.00	321.99	156.76	0.32	-12.49	-13.44	-6.97	11,838.91	11,786.94	51.97	227.817	
16,900.00	7,173.00	322.00	321.99	158.33	0.32	-12.49	-13.44	-6.97	11,919.60	11,867.42	52.17	228.462	
17,000.00	7,173.00	322.00	321.99	159.90	0.32	-12.49	-13.44	-6.97	12,000.58	11,948.20	52.38	229.120	
17,100.00	7,173.00	322.00	321.99	161.48	0.32	-12.49	-13.44	-6.97	12,081.84	12,029.26	52.58	229.792	
17,200.00	7,173.00	322.00	321.99	163.06	0.32	-12.49	-13.44	-6.97	12,163.39	12,110.61	52.77	230.477	
17,300.00	7,173.00	322.00	321.99	164.63	0.32	-12.49	-13.44	-6.97	12,245.20	12,192.23	52.97	231.174	
17,400.00	7,173.00	322.00	321.99	166.21	0.32	-12.49	-13.44	-6.97	12,327.29	12,274.13	53.16	231.883	
17,500.00	7,173.00	322.00	321.99	167.79	0.32	-12.49	-13.44	-6.97	12,409.64	12,356.29	53.35	232.603	
17,600.00	7,173.00	322.00	321.99	169.36	0.32	-12.49	-13.44	-6.97	12,492.24	12,438.70	53.54	233.334	
17,700.00	7,173.00	322.00	321.99	170.94	0.32	-12.49	-13.44	-6.97	12,575.10	12,521.38	53.72	234.075	
17,800.00	7,173.00	322.00	321.99	172.52	0.32	-12.49	-13.44	-6.97	12,658.21	12,604.30	53.90	234.827	
17,900.00	7,173.00	322.00	321.99	174.10	0.32	-12.49	-13.44	-6.97	12,741.56	12,687.47	54.08	235.589	
18,000.00	7,173.00	322.00	321.99	175.68	0.32	-12.49	-13.44	-6.97	12,825.14	12,770.88	54.26	236.360	
18,100.00	7,173.00	322.00	321.99	177.26	0.32	-12.49	-13.44	-6.97	12,908.96	12,854.53	54.44	237.141	
18,200.00	7,173.00	322.00	321.99	178.84	0.32	-12.49	-13.44	-6.97	12,993.01	12,938.40	54.61	237.930	
18,300.00	7,173.00	322.00	321.99	180.42	0.32	-12.49	-13.44	-6.97	13,077.29	13,022.51	54.78	238.727	
18,400.00	7,173.00	322.00	321.99	182.00	0.32	-12.49	-13.44	-6.97	13,161.78	13,106.83	54.95	239.533	
18,500.00	7,173.00	322.00	321.99	183.59	0.32	-12.49	-13.44	-6.97	13,246.49	13,191.38	55.11	240.347	
18,600.00	7,173.00	322.00	321.99	185.17	0.32	-12.49	-13.44	-6.97	13,331.41	13,276.13	55.28	241.168	
18,700.00	7,173.00	322.00	321.99	186.75	0.32	-12.49	-13.44	-6.97	13,416.54	13,361.10	55.44	241.997	
18,800.00	7,173.00	322.00	321.99	188.33	0.32	-12.49	-13.44	-6.97	13,501.88	13,446.27	55.60	242.832	
18,900.00	7,173.00	322.00	321.99	189.92	0.32	-12.49	-13.44	-6.97	13,587.41	13,531.65	55.76	243.675	
19,000.00	7,173.00	322.00	321.99	191.50	0.32	-12.49	-13.44	-6.97	13,673.14	13,617.22	55.92	244.524	
19,100.00	7,173.00	322.00	321.99	193.09	0.32	-12.49	-13.44	-6.97	13,759.06	13,702.99	56.07	245.379	
19,200.00	7,173.00	322.00	321.99	194.67	0.32	-12.49	-13.44	-6.97	13,845.17	13,788.95	56.23	246.240	
19,249.41	7,173.00	322.00	321.99	195.45	0.32	-12.49	-13.44	-6.97	13,887.79	13,831.49	56.30	246.668	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned:				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
19,300.00	7,173.00	322.00	321.99	196.25	0.32	-12.49	-13.44	-6.97	13,931.47	13,875.09	56.38	247.107	
19,384.41	7,173.00	322.00	321.99	197.34	0.32	-12.49	-13.44	-6.97	14,004.46	13,947.12	57.34	244.242	

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design:		Rosa Unit 42 - Rosa Unit 832H - OH - Plan #3											Offset Site Error:		0.00 usft
Survey Program:		125-Standard Keeper 104, 322-B001Mb_MWD+HRGM						Rule Assigned:		Offset Well Error:		0.00 usft			
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	-146.43	-12.34	-8.19	14.81						
125.00	125.00	124.99	124.99	0.06	0.06	168.76	-12.47	-8.04	15.43	15.33	0.10	161.786			
225.00	224.98	224.96	224.96	0.17	0.19	106.16	-12.87	-7.62	16.35	16.08	0.26	61.733			
319.00	318.92	318.94	318.94	0.28	0.32	103.27	-13.43	-6.99	17.14	16.74	0.41	42.201			
400.00	399.86	399.90	399.90	0.37	0.40	111.03	-13.90	-6.42	17.99	17.42	0.57	31.658			
469.00	468.80	468.87	468.86	0.52	0.54	117.01	-14.31	-5.92	18.95	18.01	0.94	20.139			
500.00	499.78	499.93	499.91	0.61	0.62	134.45	-14.35	-5.72	19.48	18.34	1.14	17.152			
600.00	599.71	600.09	600.05	0.92	0.92	-166.89	-12.24	-5.38	21.73	19.93	1.80	12.090			
700.00	699.55	700.17	699.96	1.26	1.26	-136.85	-6.66	-5.51	24.77	22.29	2.48	9.981			
800.00	799.19	800.16	799.54	1.60	1.61	-122.01	2.35	-6.13	28.55	25.37	3.19	8.956			
900.00	898.49	900.06	898.66	1.97	1.97	-113.07	14.80	-7.22	33.01	29.09	3.92	8.420			
1,000.00	997.33	999.88	997.19	2.34	2.35	-107.06	30.64	-8.79	38.10	33.41	4.69	8.130			
1,100.00	1,095.61	1,099.60	1,095.02	2.74	2.76	-102.79	49.85	-10.83	43.76	38.27	5.49	7.974			
1,196.26	1,189.56	1,195.68	1,188.97	3.13	3.17	-101.74	69.85	-13.00	49.55	43.26	6.29	7.874			
1,200.00	1,193.19	1,199.41	1,192.62	3.15	3.19	-101.83	70.63	-13.08	49.78	43.45	6.32	7.871			
1,300.00	1,290.42	1,299.20	1,290.20	3.58	3.63	-103.91	91.40	-15.34	55.93	48.75	7.18	7.789			
1,400.00	1,387.65	1,399.00	1,387.78	4.01	4.07	-105.57	112.18	-17.59	62.13	54.09	8.05	7.722			
1,500.00	1,484.87	1,498.79	1,485.36	4.45	4.51	-106.94	132.96	-19.85	68.38	59.46	8.92	7.666			
1,600.00	1,582.10	1,598.58	1,582.94	4.90	4.95	-108.07	153.73	-22.10	74.66	64.87	9.80	7.620			
1,700.00	1,679.33	1,698.37	1,680.52	5.34	5.40	-109.03	174.51	-24.36	80.97	70.29	10.68	7.582			
1,800.00	1,776.55	1,798.17	1,778.10	5.79	5.85	-109.85	195.28	-26.61	87.30	75.73	11.56	7.549			
1,900.00	1,873.78	1,897.96	1,875.68	6.24	6.30	-110.56	216.06	-28.87	93.64	81.19	12.45	7.521			
2,000.00	1,971.01	1,997.75	1,973.26	6.69	6.75	-111.18	236.84	-31.13	99.99	86.65	13.34	7.496			
2,100.00	2,068.23	2,097.54	2,070.83	7.15	7.20	-111.72	257.61	-33.38	106.36	92.13	14.23	7.475			
2,200.00	2,165.46	2,197.34	2,168.41	7.60	7.65	-112.21	278.39	-35.64	112.73	97.61	15.12	7.456			
2,300.00	2,262.69	2,297.13	2,265.99	8.06	8.11	-112.64	299.16	-37.89	119.11	103.10	16.01	7.440			
2,400.00	2,359.91	2,396.92	2,363.57	8.51	8.56	-113.03	319.94	-40.15	125.49	108.59	16.90	7.425			
2,500.00	2,457.14	2,496.71	2,461.15	8.97	9.01	-113.38	340.72	-42.40	131.89	114.09	17.79	7.412			
2,600.00	2,554.37	2,596.51	2,558.73	9.42	9.47	-113.69	361.49	-44.66	138.28	119.59	18.69	7.400			
2,700.00	2,651.59	2,696.30	2,656.31	9.88	9.92	-113.98	382.27	-46.92	144.68	125.10	19.58	7.389			
2,800.00	2,748.82	2,796.09	2,753.89	10.34	10.37	-114.25	403.04	-49.17	151.08	130.61	20.47	7.379			
2,900.00	2,846.05	2,895.88	2,851.47	10.80	10.83	-114.49	423.82	-51.43	157.49	136.12	21.37	7.371			
3,000.00	2,943.27	2,995.68	2,949.05	11.25	11.28	-114.72	444.59	-53.68	163.90	141.63	22.26	7.362			
3,100.00	3,040.50	3,095.47	3,046.63	11.71	11.74	-114.92	465.37	-55.94	170.31	147.15	23.16	7.355			
3,200.00	3,137.73	3,195.26	3,144.21	12.17	12.19	-115.12	486.15	-58.19	176.72	152.67	24.05	7.348			
3,300.00	3,234.95	3,295.05	3,241.79	12.63	12.65	-115.30	506.92	-60.45	183.13	158.19	24.94	7.342			
3,400.00	3,332.18	3,394.85	3,339.37	13.09	13.10	-115.46	527.70	-62.70	189.55	163.71	25.84	7.336			
3,500.00	3,429.40	3,494.64	3,436.95	13.55	13.56	-115.62	548.47	-64.96	195.97	169.23	26.73	7.330			
3,600.00	3,526.63	3,594.43	3,534.53	14.00	14.01	-115.76	569.25	-67.22	202.39	174.76	27.63	7.325			
3,700.00	3,623.86	3,694.22	3,632.11	14.46	14.47	-115.90	590.03	-69.47	208.81	180.28	28.52	7.320			
3,800.00	3,721.08	3,794.02	3,729.69	14.92	14.92	-116.03	610.80	-71.73	215.23	185.81	29.42	7.316			
3,900.00	3,818.31	3,893.81	3,827.27	15.38	15.38	-116.15	631.58	-73.98	221.65	191.33	30.32	7.311			
4,000.00	3,915.54	3,993.60	3,924.85	15.84	15.83	-116.27	652.35	-76.24	228.07	196.86	31.21	7.308			
4,100.00	4,012.76	4,093.39	4,022.43	16.30	16.29	-116.37	673.13	-78.49	234.50	202.39	32.11	7.304			
4,200.00	4,109.99	4,193.19	4,120.01	16.76	16.75	-116.48	693.91	-80.75	240.92	207.92	33.00	7.300			
4,300.00	4,207.22	4,292.98	4,217.59	17.22	17.20	-116.57	714.68	-83.00	247.35	213.45	33.90	7.297			
4,400.00	4,304.44	4,392.77	4,315.17	17.68	17.66	-116.67	735.46	-85.26	253.77	218.98	34.79	7.294			
4,500.00	4,401.67	4,492.56	4,412.75	18.14	18.11	-116.75	756.23	-87.52	260.20	224.51	35.69	7.291			
4,600.00	4,498.90	4,592.36	4,510.33	18.60	18.57	-116.84	777.01	-89.77	266.63	230.04	36.58	7.288			
4,700.00	4,596.12	4,692.15	4,607.91	19.06	19.02	-116.92	797.79	-92.03	273.06	235.58	37.48	7.285			
4,800.00	4,693.35	4,791.94	4,705.49	19.52	19.48	-116.99	818.56	-94.28	279.48	241.11	38.38	7.283			
4,900.00	4,790.58	4,891.73	4,803.07	19.98	19.94	-117.07	839.34	-96.54	285.91	246.64	39.27	7.280			

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - Plan #3														Offset Site Error: 0.00 usft
Survey Program: 125-Standard Keeper 104, 322-B001Mb_MWD+HRGM														Offset Well Error: 0.00 usft
Rule Assigned:														
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,000.00	4,887.80	4,991.53	4,900.65	20.44	20.39	-117.14	860.11	-98.79	292.34	252.17	40.17	7.278		
5,100.00	4,985.03	5,091.32	4,998.23	20.90	20.85	-117.20	880.89	-101.05	298.77	257.71	41.06	7.276		
5,200.00	5,082.26	5,191.11	5,095.81	21.36	21.30	-117.27	901.66	-103.31	305.20	263.24	41.96	7.274		
5,300.00	5,179.48	5,290.90	5,193.39	21.82	21.76	-117.33	922.44	-105.56	311.63	268.78	42.86	7.272		
5,400.00	5,276.71	5,390.70	5,290.97	22.27	22.22	-117.38	943.22	-107.82	318.06	274.31	43.75	7.270		
5,500.00	5,373.94	5,490.49	5,388.55	22.73	22.67	-117.44	963.99	-110.07	324.50	279.85	44.65	7.268		
5,600.00	5,471.16	5,590.28	5,486.13	23.19	23.13	-117.49	984.77	-112.33	330.93	285.38	45.54	7.266		
5,700.00	5,568.39	5,690.07	5,583.71	23.65	23.58	-117.55	1,005.54	-114.58	337.36	290.92	46.44	7.264		
5,800.00	5,665.62	5,789.87	5,681.29	24.11	24.04	-117.60	1,026.32	-116.84	343.79	296.45	47.34	7.263		
5,900.00	5,762.84	5,889.66	5,778.87	24.57	24.50	-117.64	1,047.10	-119.09	350.22	301.99	48.23	7.261		
6,000.00	5,860.07	5,989.45	5,876.45	25.03	24.95	-117.69	1,067.87	-121.35	356.66	307.53	49.13	7.260		
6,100.00	5,957.30	6,089.24	5,974.03	25.50	25.41	-117.74	1,088.65	-123.61	363.09	313.06	50.03	7.258		
6,200.00	6,054.52	6,189.04	6,071.61	25.96	25.86	-117.78	1,109.42	-125.86	369.52	318.60	50.92	7.257		
6,300.00	6,151.75	6,288.83	6,169.19	26.42	26.32	-117.82	1,130.20	-128.12	375.95	324.14	51.82	7.255		
6,400.00	6,248.98	6,388.62	6,266.77	26.88	26.78	-117.86	1,150.98	-130.37	382.39	329.67	52.71	7.254		
6,500.00	6,346.20	6,488.41	6,364.35	27.34	27.23	-117.90	1,171.75	-132.63	388.82	335.21	53.61	7.253		
6,600.00	6,443.43	6,588.21	6,461.93	27.80	27.69	-117.94	1,192.53	-134.88	395.25	340.75	54.51	7.251		
6,696.38	6,537.14	6,714.96	6,585.86	28.24	28.26	-118.08	1,218.90	-135.67	400.66	345.20	55.46	7.224		
6,700.00	6,540.66	6,723.86	6,594.55	28.26	28.30	-116.78	1,220.75	-135.09	400.58	345.10	55.48	7.220		
6,750.00	6,589.27	6,843.17	6,709.50	28.48	28.80	-99.95	1,245.11	-115.42	392.85	338.01	54.84	7.164		
6,800.00	6,637.66	6,947.50	6,805.58	28.71	29.19	-87.84	1,265.37	-80.51	373.89	320.86	53.02	7.052		
6,850.00	6,685.53	7,030.81	6,877.50	28.92	29.46	-82.18	1,280.46	-41.42	346.30	295.42	50.88	6.806		
6,900.00	6,732.60	7,093.30	6,927.85	29.13	29.65	-82.68	1,290.99	-5.97	312.99	263.90	49.09	6.376		
6,950.00	6,778.56	7,138.19	6,961.80	29.32	29.77	-88.01	1,298.06	22.52	276.61	228.65	47.97	5.767		
7,000.00	6,823.13	7,169.19	6,984.07	29.51	29.85	-95.79	1,302.69	43.59	239.63	191.92	47.71	5.023		
7,050.00	6,866.05	7,189.56	6,998.13	29.68	29.91	-103.19	1,305.61	58.03	204.70	156.33	48.37	4.232		
7,100.00	6,907.04	7,201.80	7,006.37	29.85	29.94	-108.28	1,307.31	66.92	175.24	125.34	49.90	3.512		
7,150.00	6,945.85	7,207.81	7,010.35	30.01	29.95	-110.41	1,308.14	71.35	155.80	104.02	51.78	3.009		
7,189.76	6,974.99	7,209.09	7,011.19	30.12	29.96	-110.04	1,308.31	72.29	150.64	98.02	52.62	2.863 SF		
7,200.00	6,982.24	7,208.99	7,011.13	30.15	29.96	-109.67	1,308.30	72.22	150.99	98.33	52.65	2.868		
7,250.00	7,016.00	7,206.38	7,009.41	30.29	29.95	-106.33	1,307.94	70.29	162.24	110.41	51.83	3.130		
7,300.00	7,046.90	7,200.00	7,005.17	30.43	29.93	-100.38	1,307.06	65.60	186.47	136.33	50.14	3.719		
7,350.00	7,074.76	7,192.70	7,000.27	30.56	29.91	-93.07	1,306.05	60.30	219.04	170.22	48.81	4.487		
7,400.00	7,099.42	7,182.68	6,993.43	30.69	29.89	-84.21	1,304.63	53.10	256.33	208.40	47.93	5.348		
7,450.00	7,120.70	7,171.03	6,985.36	30.82	29.86	-74.93	1,302.96	44.88	296.08	248.56	47.52	6.231		
7,500.00	7,138.50	7,158.04	6,976.17	30.95	29.83	-66.10	1,301.05	35.89	336.93	289.47	47.46	7.100		
7,550.00	7,152.68	7,150.00	6,970.40	31.10	29.81	-59.31	1,299.85	30.42	378.10	329.99	48.10	7.860		
7,600.00	7,163.18	7,128.83	6,954.89	31.25	29.75	-51.73	1,296.63	16.39	418.82	370.90	47.92	8.739		
7,650.00	7,169.92	7,112.94	6,942.95	31.41	29.70	-46.37	1,294.14	6.20	458.95	410.61	48.34	9.495		
7,700.00	7,172.86	7,100.00	6,933.04	31.59	29.67	-42.33	1,292.07	-1.87	498.15	449.11	49.05	10.157		
7,713.53	7,173.00	7,100.00	6,933.04	31.64	29.67	-41.61	1,292.07	-1.87	508.66	459.20	49.46	10.285		
7,800.00	7,173.00	7,064.01	6,904.68	31.99	29.56	-39.35	1,286.15	-23.21	576.24	526.38	49.86	11.558		
7,900.00	7,173.00	7,035.81	6,881.66	32.47	29.48	-37.74	1,281.33	-38.76	657.63	606.84	50.79	12.949		
8,000.00	7,173.00	7,000.00	6,851.50	33.03	29.36	-35.89	1,275.01	-56.99	741.88	690.72	51.16	14.500		
8,100.00	7,173.00	7,000.00	6,851.50	33.66	29.36	-35.89	1,275.01	-56.99	828.10	775.47	52.64	15.732		
8,200.00	7,173.00	6,970.30	6,825.75	34.36	29.26	-34.50	1,269.61	-70.77	915.97	863.08	52.89	17.319		
8,300.00	7,173.00	6,950.00	6,807.81	35.13	29.20	-33.62	1,265.83	-79.48	1,005.46	952.14	53.32	18.858		
8,400.00	7,173.00	6,950.00	6,807.81	35.95	29.20	-33.62	1,265.83	-79.48	1,096.31	1,042.19	54.12	20.258		
8,500.00	7,173.00	6,924.33	6,784.74	36.82	29.10	-32.58	1,260.98	-89.65	1,187.84	1,133.62	54.23	21.905		
8,600.00	7,173.00	6,900.00	6,762.53	37.74	29.02	-31.67	1,256.30	-98.40	1,280.59	1,226.26	54.33	23.571		
8,700.00	7,173.00	6,900.00	6,762.53	38.71	29.02	-31.67	1,256.30	-98.40	1,373.74	1,318.91	54.84	25.052		
8,800.00	7,173.00	6,900.00	6,762.53	39.71	29.02	-31.67	1,256.30	-98.40	1,467.80	1,412.54	55.26	26.564		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - Plan #3											Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 322-B001Mb_MWD+HRGM											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor
8,900.00	7,173.00	6,881.32	6,745.26	40.76	28.95	-31.01	1,252.66	-104.53	1,562.21	1,506.88	55.33	28.234
9,000.00	7,173.00	6,872.80	6,737.33	41.84	28.91	-30.72	1,250.98	-107.15	1,657.20	1,601.66	55.53	29.842
9,100.00	7,173.00	6,850.00	6,715.95	42.96	28.83	-29.99	1,246.47	-113.63	1,752.85	1,697.33	55.52	31.573
9,200.00	7,173.00	6,850.00	6,715.95	44.10	28.83	-29.99	1,246.47	-113.63	1,848.45	1,792.67	55.78	33.137
9,300.00	7,173.00	6,850.00	6,715.95	45.27	28.83	-29.99	1,246.47	-113.63	1,944.50	1,888.49	56.01	34.716
9,400.00	7,173.00	6,850.00	6,715.95	46.47	28.83	-29.99	1,246.47	-113.63	2,040.93	1,984.71	56.22	36.305
9,500.00	7,173.00	6,850.00	6,715.95	47.70	28.83	-29.99	1,246.47	-113.63	2,137.68	2,081.29	56.40	37.904
9,600.00	7,173.00	6,850.00	6,715.95	48.94	28.83	-29.99	1,246.47	-113.63	2,234.73	2,178.17	56.56	39.511
9,700.00	7,173.00	6,828.70	6,695.78	50.20	28.74	-29.34	1,242.20	-118.97	2,331.57	2,275.07	56.50	41.266
9,800.00	7,173.00	6,824.00	6,691.30	51.49	28.72	-29.20	1,241.26	-120.06	2,428.86	2,372.26	56.60	42.913
9,900.00	7,173.00	6,800.00	6,668.34	52.79	28.63	-28.53	1,236.40	-125.08	2,526.71	2,470.19	56.51	44.709
10,000.00	7,173.00	6,800.00	6,668.34	54.11	28.63	-28.53	1,236.40	-125.08	2,624.19	2,567.54	56.64	46.328
10,100.00	7,173.00	6,800.00	6,668.34	55.44	28.63	-28.53	1,236.40	-125.08	2,721.85	2,665.09	56.76	47.952
10,200.00	7,173.00	6,800.00	6,668.34	56.78	28.63	-28.53	1,236.40	-125.08	2,819.68	2,762.80	56.87	49.578
10,300.00	7,173.00	6,800.00	6,668.34	58.14	28.63	-28.53	1,236.40	-125.08	2,917.65	2,860.67	56.98	51.208
10,400.00	7,173.00	6,800.00	6,668.34	59.51	28.63	-28.53	1,236.40	-125.08	3,015.76	2,958.68	57.07	52.840
10,500.00	7,173.00	6,800.00	6,668.34	60.90	28.63	-28.53	1,236.40	-125.08	3,113.99	3,056.82	57.17	54.473
10,600.00	7,173.00	6,800.00	6,668.34	62.29	28.63	-28.53	1,236.40	-125.08	3,212.32	3,155.07	57.25	56.107
10,700.00	7,173.00	6,800.00	6,668.34	63.69	28.63	-28.53	1,236.40	-125.08	3,310.76	3,253.42	57.34	57.743
10,800.00	7,173.00	6,800.00	6,668.34	65.11	28.63	-28.53	1,236.40	-125.08	3,409.29	3,351.87	57.42	59.379
10,900.00	7,173.00	6,800.00	6,668.34	66.53	28.63	-28.53	1,236.40	-125.08	3,507.90	3,450.41	57.49	61.015
11,000.00	7,173.00	6,800.00	6,668.34	67.96	28.63	-28.53	1,236.40	-125.08	3,606.59	3,549.02	57.57	62.651
11,100.00	7,173.00	6,800.00	6,668.34	69.39	28.63	-28.53	1,236.40	-125.08	3,705.34	3,647.71	57.64	64.286
11,200.00	7,173.00	6,800.00	6,668.34	70.84	28.63	-28.53	1,236.40	-125.08	3,804.17	3,746.46	57.71	65.921
11,300.00	7,173.00	6,777.95	6,647.10	72.29	28.54	-27.95	1,231.90	-128.90	3,902.61	3,844.97	57.63	67.716
11,400.00	7,173.00	6,775.93	6,645.14	73.74	28.53	-27.89	1,231.48	-129.22	4,001.46	3,943.77	57.69	69.364
11,500.00	7,173.00	6,773.99	6,643.27	75.21	28.52	-27.85	1,231.09	-129.51	4,100.36	4,042.62	57.74	71.011
11,600.00	7,173.00	6,772.13	6,641.47	76.68	28.51	-27.80	1,230.71	-129.79	4,199.31	4,141.52	57.80	72.656
11,700.00	7,173.00	6,750.00	6,620.01	78.15	28.42	-27.26	1,226.15	-132.67	4,298.68	4,240.95	57.73	74.466
11,800.00	7,173.00	6,750.00	6,620.01	79.63	28.42	-27.26	1,226.15	-132.67	4,397.65	4,339.86	57.79	76.094
11,900.00	7,173.00	6,750.00	6,620.01	81.11	28.42	-27.26	1,226.15	-132.67	4,496.67	4,438.81	57.86	77.721
12,000.00	7,173.00	6,750.00	6,620.01	82.60	28.42	-27.26	1,226.15	-132.67	4,595.73	4,537.80	57.92	79.345
12,100.00	7,173.00	6,750.00	6,620.01	84.09	28.42	-27.26	1,226.15	-132.67	4,694.82	4,636.84	57.98	80.967
12,200.00	7,173.00	6,750.00	6,620.01	85.59	28.42	-27.26	1,226.15	-132.67	4,793.96	4,735.91	58.05	82.588
12,300.00	7,173.00	6,750.00	6,620.01	87.09	28.42	-27.26	1,226.15	-132.67	4,893.13	4,835.02	58.11	84.206
12,400.00	7,173.00	6,750.00	6,620.01	88.59	28.42	-27.26	1,226.15	-132.67	4,992.34	4,934.17	58.17	85.822
12,500.00	7,173.00	6,750.00	6,620.01	90.10	28.42	-27.26	1,226.15	-132.67	5,091.57	5,033.34	58.23	87.435
12,600.00	7,173.00	6,750.00	6,620.01	91.61	28.42	-27.26	1,226.15	-132.67	5,190.84	5,132.54	58.29	89.046
12,700.00	7,173.00	6,750.00	6,620.01	93.13	28.42	-27.26	1,226.15	-132.67	5,290.13	5,231.78	58.36	90.654
12,800.00	7,173.00	6,750.00	6,620.01	94.64	28.42	-27.26	1,226.15	-132.67	5,389.45	5,331.03	58.42	92.259
12,900.00	7,173.00	6,750.00	6,620.01	96.16	28.42	-27.26	1,226.15	-132.67	5,488.79	5,430.32	58.48	93.862
13,000.00	7,173.00	6,750.00	6,620.01	97.69	28.42	-27.26	1,226.15	-132.67	5,588.16	5,529.62	58.54	95.461
13,100.00	7,173.00	6,750.00	6,620.01	99.21	28.42	-27.26	1,226.15	-132.67	5,687.55	5,628.95	58.60	97.058
13,200.00	7,173.00	6,750.00	6,620.01	100.74	28.42	-27.26	1,226.15	-132.67	5,786.96	5,728.30	58.66	98.652
13,300.00	7,173.00	6,750.00	6,620.01	102.27	28.42	-27.26	1,226.15	-132.67	5,886.39	5,827.67	58.72	100.242
13,400.00	7,173.00	6,750.00	6,620.01	103.80	28.42	-27.26	1,226.15	-132.67	5,985.84	5,927.06	58.78	101.829
13,500.00	7,173.00	6,750.00	6,620.01	105.33	28.42	-27.26	1,226.15	-132.67	6,085.31	6,026.46	58.85	103.412
13,600.00	7,173.00	6,750.00	6,620.01	106.87	28.42	-27.26	1,226.15	-132.67	6,184.79	6,125.89	58.91	104.993
13,700.00	7,173.00	6,750.00	6,620.01	108.41	28.42	-27.26	1,226.15	-132.67	6,284.29	6,225.33	58.97	106.570
13,800.00	7,173.00	6,750.00	6,620.01	109.95	28.42	-27.26	1,226.15	-132.67	6,383.81	6,324.78	59.03	108.143
13,900.00	7,173.00	6,750.00	6,620.01	111.49	28.42	-27.26	1,226.15	-132.67	6,483.34	6,424.25	59.09	109.712
14,000.00	7,173.00	6,750.00	6,620.01	113.03	28.42	-27.26	1,226.15	-132.67	6,582.89	6,523.73	59.16	111.279

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - Plan #3												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 322-B001Mb_MWD+HRGM												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,100.00	7,173.00	6,750.00	6,620.01	114.58	28.42	-27.26	1,226.15	-132.67	6,682.45	6,623.23	59.22	112.841	
14,200.00	7,173.00	6,750.00	6,620.01	116.13	28.42	-27.26	1,226.15	-132.67	6,782.02	6,722.74	59.28	114.399	
14,300.00	7,173.00	6,750.00	6,620.01	117.68	28.42	-27.26	1,226.15	-132.67	6,881.60	6,822.26	59.35	115.954	
14,400.00	7,173.00	6,750.00	6,620.01	119.23	28.42	-27.26	1,226.15	-132.67	6,981.20	6,921.79	59.41	117.505	
14,500.00	7,173.00	6,750.00	6,620.01	120.78	28.42	-27.26	1,226.15	-132.67	7,080.81	7,021.33	59.48	119.052	
14,600.00	7,173.00	6,750.00	6,620.01	122.33	28.42	-27.26	1,226.15	-132.67	7,180.43	7,120.88	59.54	120.595	
14,700.00	7,173.00	6,750.00	6,620.01	123.88	28.42	-27.26	1,226.15	-132.67	7,280.06	7,220.45	59.61	122.134	
14,800.00	7,173.00	6,750.00	6,620.01	125.44	28.42	-27.26	1,226.15	-132.67	7,379.70	7,320.02	59.67	123.668	
14,900.00	7,173.00	6,750.00	6,620.01	127.00	28.42	-27.26	1,226.15	-132.67	7,479.34	7,419.60	59.74	125.199	
15,000.00	7,173.00	6,750.00	6,620.01	128.55	28.42	-27.26	1,226.15	-132.67	7,579.00	7,519.20	59.81	126.726	
15,100.00	7,173.00	6,750.00	6,620.01	130.11	28.42	-27.26	1,226.15	-132.67	7,678.67	7,618.80	59.87	128.248	
15,200.00	7,173.00	6,750.00	6,620.01	131.67	28.42	-27.26	1,226.15	-132.67	7,778.34	7,718.40	59.94	129.766	
15,300.00	7,173.00	6,750.00	6,620.01	133.23	28.42	-27.26	1,226.15	-132.67	7,878.03	7,818.02	60.01	131.280	
15,400.00	7,173.00	6,750.00	6,620.01	134.80	28.42	-27.26	1,226.15	-132.67	7,977.72	7,917.64	60.08	132.790	
15,500.00	7,173.00	6,750.00	6,620.01	136.36	28.42	-27.26	1,226.15	-132.67	8,077.42	8,017.27	60.15	134.295	
15,600.00	7,173.00	6,750.00	6,620.01	137.92	28.42	-27.26	1,226.15	-132.67	8,177.13	8,116.91	60.22	135.796	
15,700.00	7,173.00	6,750.00	6,620.01	139.49	28.42	-27.26	1,226.15	-132.67	8,276.84	8,216.55	60.29	137.292	
15,800.00	7,173.00	6,750.00	6,620.01	141.05	28.42	-27.26	1,226.15	-132.67	8,376.56	8,316.20	60.36	138.784	
15,900.00	7,173.00	6,750.00	6,620.01	142.62	28.42	-27.26	1,226.15	-132.67	8,476.29	8,415.86	60.43	140.272	
16,000.00	7,173.00	6,750.00	6,620.01	144.19	28.42	-27.26	1,226.15	-132.67	8,576.02	8,515.52	60.50	141.755	
16,100.00	7,173.00	6,750.00	6,620.01	145.76	28.42	-27.26	1,226.15	-132.67	8,675.76	8,615.19	60.57	143.233	
16,200.00	7,173.00	6,750.00	6,620.01	147.33	28.42	-27.26	1,226.15	-132.67	8,775.51	8,714.86	60.64	144.707	
16,300.00	7,173.00	6,750.00	6,620.01	148.90	28.42	-27.26	1,226.15	-132.67	8,875.26	8,814.54	60.72	146.176	
16,400.00	7,173.00	6,750.00	6,620.01	150.47	28.42	-27.26	1,226.15	-132.67	8,975.01	8,914.22	60.79	147.641	
16,500.00	7,173.00	6,750.00	6,620.01	152.04	28.42	-27.26	1,226.15	-132.67	9,074.78	9,013.91	60.86	149.101	
16,600.00	7,173.00	6,750.00	6,620.01	153.61	28.42	-27.26	1,226.15	-132.67	9,174.54	9,113.61	60.94	150.557	
16,700.00	7,173.00	6,750.00	6,620.01	155.18	28.42	-27.26	1,226.15	-132.67	9,274.32	9,213.30	61.01	152.008	
16,800.00	7,173.00	6,726.38	6,597.01	156.76	28.31	-26.71	1,221.27	-134.90	9,373.63	9,312.65	60.97	153.731	
16,900.00	7,173.00	6,725.96	6,596.60	158.33	28.31	-26.71	1,221.18	-134.94	9,473.39	9,412.34	61.05	155.179	
17,000.00	7,173.00	6,725.55	6,596.20	159.90	28.31	-26.70	1,221.10	-134.97	9,573.16	9,512.04	61.12	156.622	
17,100.00	7,173.00	6,725.14	6,595.80	161.48	28.31	-26.69	1,221.02	-135.00	9,672.94	9,611.74	61.20	158.061	
17,200.00	7,173.00	6,724.75	6,595.42	163.06	28.31	-26.68	1,220.93	-135.03	9,772.71	9,711.44	61.27	159.494	
17,300.00	7,173.00	6,724.36	6,595.04	164.63	28.31	-26.67	1,220.85	-135.05	9,872.50	9,811.15	61.35	160.923	
17,400.00	7,173.00	6,723.98	6,594.66	166.21	28.30	-26.66	1,220.77	-135.08	9,972.29	9,910.86	61.43	162.347	
17,500.00	7,173.00	6,723.60	6,594.30	167.79	28.30	-26.65	1,220.70	-135.11	10,072.08	10,010.57	61.50	163.766	
17,600.00	7,173.00	6,700.00	6,571.25	169.36	28.20	-26.15	1,215.80	-136.36	10,172.32	10,110.85	61.47	165.480	
17,700.00	7,173.00	6,700.00	6,571.25	170.94	28.20	-26.15	1,215.80	-136.36	10,272.11	10,210.55	61.55	166.886	
17,800.00	7,173.00	6,700.00	6,571.25	172.52	28.20	-26.15	1,215.80	-136.36	10,371.89	10,310.26	61.63	168.287	
17,900.00	7,173.00	6,700.00	6,571.25	174.10	28.20	-26.15	1,215.80	-136.36	10,471.69	10,409.97	61.71	169.684	
18,000.00	7,173.00	6,700.00	6,571.25	175.68	28.20	-26.15	1,215.80	-136.36	10,571.48	10,509.69	61.79	171.076	
18,100.00	7,173.00	6,700.00	6,571.25	177.26	28.20	-26.15	1,215.80	-136.36	10,671.29	10,609.41	61.88	172.462	
18,200.00	7,173.00	6,700.00	6,571.25	178.84	28.20	-26.15	1,215.80	-136.36	10,771.09	10,709.13	61.96	173.844	
18,300.00	7,173.00	6,700.00	6,571.25	180.42	28.20	-26.15	1,215.80	-136.36	10,870.90	10,808.86	62.04	175.221	
18,400.00	7,173.00	6,700.00	6,571.25	182.00	28.20	-26.15	1,215.80	-136.36	10,970.71	10,908.58	62.12	176.593	
18,500.00	7,173.00	6,700.00	6,571.25	183.59	28.20	-26.15	1,215.80	-136.36	11,070.52	11,008.32	62.21	177.960	
18,600.00	7,173.00	6,700.00	6,571.25	185.17	28.20	-26.15	1,215.80	-136.36	11,170.34	11,108.05	62.29	179.322	
18,700.00	7,173.00	6,700.00	6,571.25	186.75	28.20	-26.15	1,215.80	-136.36	11,270.16	11,207.79	62.38	180.679	
18,800.00	7,173.00	6,700.00	6,571.25	188.33	28.20	-26.15	1,215.80	-136.36	11,369.99	11,307.53	62.46	182.031	
18,900.00	7,173.00	6,700.00	6,571.25	189.92	28.20	-26.15	1,215.80	-136.36	11,469.82	11,407.27	62.55	183.378	
19,000.00	7,173.00	6,700.00	6,571.25	191.50	28.20	-26.15	1,215.80	-136.36	11,569.65	11,507.01	62.63	184.721	
19,100.00	7,173.00	6,700.00	6,571.25	193.09	28.20	-26.15	1,215.80	-136.36	11,669.48	11,606.76	62.72	186.058	
19,200.00	7,173.00	6,700.00	6,571.25	194.67	28.20	-26.15	1,215.80	-136.36	11,769.32	11,706.51	62.81	187.390	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 832H - OH - Plan #3													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 322-B001Mb_MWD+HRGM							Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,249.41	7,173.00	6,700.00	6,571.25	195.45	28.20	-26.15	1,215.80	-136.36	11,818.65	11,755.80	62.85	188.047		
19,300.00	7,173.00	6,700.00	6,571.25	196.25	28.20	-26.15	1,215.80	-136.36	11,869.15	11,806.26	62.89	188.717		
19,384.41	7,173.00	6,700.00	6,571.25	197.34	28.20	-26.15	1,215.80	-136.36	11,953.43	11,885.99	67.44	177.247		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	-145.57	-37.14	-25.45	45.02					
125.00	125.00	125.34	125.34	0.06	0.05	170.41	-36.58	-25.42	45.13	45.02	0.12	381.905		
225.00	224.98	225.32	225.31	0.17	0.19	107.04	-35.69	-25.37	45.26	44.92	0.33	136.141		
225.28	225.26	225.60	225.60	0.17	0.19	107.05	-35.69	-25.37	45.26	44.92	0.33	135.941 ES		
319.00	318.92	290.00	289.99	0.28	0.28	99.07	-35.19	-25.29	53.96	53.41	0.54	99.496		
400.00	399.86	290.00	289.99	0.37	0.28	99.07	-35.19	-25.29	119.20	116.72	2.48	48.063 SF		
469.00	468.80	290.00	289.99	0.52	0.28	99.07	-35.19	-25.29	184.89	182.28	2.61	70.925		
500.00	499.78	290.00	289.99	0.61	0.28	115.82	-35.19	-25.29	215.10	212.47	2.64	81.579		
600.00	599.71	290.00	289.99	0.92	0.28	176.41	-35.19	-25.29	313.84	311.14	2.70	116.304		
700.00	699.55	290.00	289.99	1.26	0.28	-141.33	-35.19	-25.29	413.39	410.64	2.75	150.573		
800.00	799.19	290.00	289.99	1.60	0.28	-100.39	-35.19	-25.29	513.18	510.40	2.79	184.003		
900.00	898.49	290.00	289.99	1.97	0.28	-64.52	-35.19	-25.29	613.02	610.18	2.83	216.352		
1,000.00	997.33	290.00	289.99	2.34	0.28	-43.08	-35.19	-25.29	712.78	709.90	2.88	247.475		
1,100.00	1,095.61	290.00	289.99	2.74	0.28	-31.14	-35.19	-25.29	812.39	809.46	2.93	277.279		
1,196.26	1,189.56	290.00	289.99	3.13	0.28	-24.17	-35.19	-25.29	908.09	905.11	2.98	304.676		
1,200.00	1,193.19	290.00	289.99	3.15	0.28	-24.17	-35.19	-25.29	911.80	908.82	2.98	306.014		
1,300.00	1,290.42	290.00	289.99	3.58	0.28	-24.17	-35.19	-25.29	1,011.18	1,008.14	3.04	332.332		
1,400.00	1,387.65	290.00	289.99	4.01	0.28	-24.17	-35.19	-25.29	1,110.67	1,107.56	3.11	357.235		
1,500.00	1,484.87	290.00	289.99	4.45	0.28	-24.17	-35.19	-25.29	1,210.24	1,207.06	3.18	380.720		
1,600.00	1,582.10	290.00	289.99	4.90	0.28	-24.17	-35.19	-25.29	1,309.88	1,306.63	3.25	402.797		
1,700.00	1,679.33	290.00	289.99	5.34	0.28	-24.17	-35.19	-25.29	1,409.57	1,406.25	3.33	423.495		
1,800.00	1,776.55	290.00	289.99	5.79	0.28	-24.17	-35.19	-25.29	1,509.31	1,505.90	3.41	442.849		
1,900.00	1,873.78	290.00	289.99	6.24	0.28	-24.17	-35.19	-25.29	1,609.07	1,605.58	3.49	460.904		
2,000.00	1,971.01	290.00	289.99	6.69	0.28	-24.17	-35.19	-25.29	1,708.86	1,705.28	3.58	477.709		
2,100.00	2,068.23	290.00	289.99	7.15	0.28	-24.17	-35.19	-25.29	1,808.68	1,805.01	3.67	493.319		
2,200.00	2,165.46	290.00	289.99	7.60	0.28	-24.17	-35.19	-25.29	1,908.51	1,904.75	3.76	507.787		
2,300.00	2,262.69	290.00	289.99	8.06	0.28	-24.17	-35.19	-25.29	2,008.36	2,004.51	3.85	521.170		
2,400.00	2,359.91	290.00	289.99	8.51	0.28	-24.17	-35.19	-25.29	2,108.23	2,104.28	3.95	533.524		
2,500.00	2,457.14	290.00	289.99	8.97	0.28	-24.17	-35.19	-25.29	2,208.11	2,204.05	4.05	544.903		
2,600.00	2,554.37	290.00	289.99	9.42	0.28	-24.17	-35.19	-25.29	2,307.99	2,303.84	4.16	555.363		
2,700.00	2,651.59	290.00	289.99	9.88	0.28	-24.17	-35.19	-25.29	2,407.89	2,403.63	4.26	564.954		
2,800.00	2,748.82	290.00	289.99	10.34	0.28	-24.17	-35.19	-25.29	2,507.80	2,503.42	4.37	573.728		
2,900.00	2,846.05	290.00	289.99	10.80	0.28	-24.17	-35.19	-25.29	2,607.71	2,603.23	4.48	581.732		
3,000.00	2,943.27	290.00	289.99	11.25	0.28	-24.17	-35.19	-25.29	2,707.63	2,703.03	4.60	589.012		
3,100.00	3,040.50	290.00	289.99	11.71	0.28	-24.17	-35.19	-25.29	2,807.55	2,802.84	4.71	595.611		
3,200.00	3,137.73	290.00	289.99	12.17	0.28	-24.17	-35.19	-25.29	2,907.48	2,902.65	4.83	601.572		
3,300.00	3,234.95	290.00	289.99	12.63	0.28	-24.17	-35.19	-25.29	3,007.42	3,002.46	4.96	606.932		
3,400.00	3,332.18	290.00	289.99	13.09	0.28	-24.17	-35.19	-25.29	3,107.36	3,102.28	5.08	611.729		
3,500.00	3,429.40	290.00	289.99	13.55	0.28	-24.17	-35.19	-25.29	3,207.30	3,202.09	5.21	615.998		
3,600.00	3,526.63	290.00	289.99	14.00	0.28	-24.17	-35.19	-25.29	3,307.25	3,301.91	5.34	619.771		
3,700.00	3,623.86	290.00	289.99	14.46	0.28	-24.17	-35.19	-25.29	3,407.19	3,401.73	5.47	623.079		
3,800.00	3,721.08	290.00	289.99	14.92	0.28	-24.17	-35.19	-25.29	3,507.15	3,501.54	5.60	625.952		
3,900.00	3,818.31	290.00	289.99	15.38	0.28	-24.17	-35.19	-25.29	3,607.10	3,601.36	5.74	628.415		
4,000.00	3,915.54	290.00	289.99	15.84	0.28	-24.17	-35.19	-25.29	3,707.06	3,701.18	5.88	630.496		
4,100.00	4,012.76	290.00	289.99	16.30	0.28	-24.17	-35.19	-25.29	3,807.02	3,801.00	6.02	632.218		
4,200.00	4,109.99	290.00	289.99	16.76	0.28	-24.17	-35.19	-25.29	3,906.98	3,900.81	6.17	633.604		
4,300.00	4,207.22	290.00	289.99	17.22	0.28	-24.17	-35.19	-25.29	4,006.94	4,000.63	6.31	634.674		
4,400.00	4,304.44	290.00	289.99	17.68	0.28	-24.17	-35.19	-25.29	4,106.91	4,100.45	6.46	635.449		
4,500.00	4,401.67	290.00	289.99	18.14	0.28	-24.17	-35.19	-25.29	4,206.88	4,200.26	6.62	635.948		
4,600.00	4,498.90	290.00	289.99	18.60	0.28	-24.17	-35.19	-25.29	4,306.84	4,300.08	6.77	636.188		
4,700.00	4,596.12	290.00	289.99	19.06	0.28	-24.17	-35.19	-25.29	4,406.81	4,399.89	6.93	636.186		
4,800.00	4,693.35	290.00	289.99	19.52	0.28	-24.17	-35.19	-25.29	4,506.79	4,499.70	7.09	635.957		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Rule Assigned:												Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
4,900.00	4,790.58	290.00	289.99	19.98	0.28	-24.17	-35.19	-25.29	4,606.76	4,599.51	7.25	635.516	
5,000.00	4,887.80	290.00	289.99	20.44	0.28	-24.17	-35.19	-25.29	4,706.73	4,699.32	7.41	634.876	
5,100.00	4,985.03	290.00	289.99	20.90	0.28	-24.17	-35.19	-25.29	4,806.71	4,799.13	7.58	634.052	
5,200.00	5,082.26	290.00	289.99	21.36	0.28	-24.17	-35.19	-25.29	4,906.68	4,898.93	7.75	633.054	
5,300.00	5,179.48	290.00	289.99	21.82	0.28	-24.17	-35.19	-25.29	5,006.66	4,998.74	7.92	631.895	
5,400.00	5,276.71	290.00	289.99	22.27	0.28	-24.17	-35.19	-25.29	5,106.64	5,098.54	8.10	630.585	
5,500.00	5,373.94	290.00	289.99	22.73	0.28	-24.17	-35.19	-25.29	5,206.62	5,198.34	8.28	629.135	
5,600.00	5,471.16	290.00	289.99	23.19	0.28	-24.17	-35.19	-25.29	5,306.60	5,298.14	8.46	627.553	
5,700.00	5,568.39	290.00	289.99	23.65	0.28	-24.17	-35.19	-25.29	5,406.58	5,397.94	8.64	625.849	
5,800.00	5,665.62	290.00	289.99	24.11	0.28	-24.17	-35.19	-25.29	5,506.56	5,497.73	8.82	624.032	
5,900.00	5,762.84	290.00	289.99	24.57	0.28	-24.17	-35.19	-25.29	5,606.54	5,597.53	9.01	622.109	
6,000.00	5,860.07	290.00	289.99	25.03	0.28	-24.17	-35.19	-25.29	5,706.52	5,697.32	9.20	620.089	
6,100.00	5,957.30	290.00	289.99	25.50	0.28	-24.17	-35.19	-25.29	5,806.50	5,797.11	9.40	617.977	
6,200.00	6,054.52	290.00	289.99	25.96	0.28	-24.17	-35.19	-25.29	5,906.49	5,896.89	9.59	615.782	
6,300.00	6,151.75	290.00	289.99	26.42	0.28	-24.17	-35.19	-25.29	6,006.47	5,996.68	9.79	613.508	
6,400.00	6,248.98	290.00	289.99	26.88	0.28	-24.17	-35.19	-25.29	6,106.45	6,096.46	9.99	611.163	
6,500.00	6,346.20	290.00	289.99	27.34	0.28	-24.17	-35.19	-25.29	6,206.44	6,196.24	10.20	608.752	
6,600.00	6,443.43	290.00	289.99	27.80	0.28	-24.17	-35.19	-25.29	6,306.42	6,296.02	10.40	606.279	
6,696.38	6,537.14	290.00	289.99	28.24	0.28	-24.17	-35.19	-25.29	6,402.79	6,392.19	10.60	603.843	
6,700.00	6,540.66	290.00	289.99	28.26	0.28	-39.21	-35.19	-25.29	6,406.41	6,395.80	10.61	603.752	
6,750.00	6,589.27	290.00	289.99	28.48	0.28	-66.46	-35.19	-25.29	6,456.33	6,445.61	10.72	602.527	
6,800.00	6,637.66	290.00	289.99	28.71	0.28	-55.07	-35.19	-25.29	6,505.90	6,495.09	10.82	601.433	
6,850.00	6,685.53	290.00	289.99	28.92	0.28	-44.64	-35.19	-25.29	6,554.84	6,543.92	10.92	600.499	
6,900.00	6,732.60	290.00	289.99	29.13	0.28	-36.80	-35.19	-25.29	6,602.85	6,591.84	11.01	599.717	
6,950.00	6,778.56	290.00	289.99	29.32	0.28	-31.08	-35.19	-25.29	6,649.67	6,638.57	11.10	599.070	
7,000.00	6,823.13	290.00	289.99	29.51	0.28	-26.86	-35.19	-25.29	6,695.02	6,683.84	11.19	598.534	
7,050.00	6,866.05	290.00	289.99	29.68	0.28	-23.69	-35.19	-25.29	6,738.68	6,727.41	11.27	598.076	
7,100.00	6,907.04	290.00	289.99	29.85	0.28	-21.25	-35.19	-25.29	6,780.39	6,769.05	11.35	597.648	
7,150.00	6,945.85	290.00	289.99	30.01	0.28	-19.34	-35.19	-25.29	6,819.95	6,808.53	11.42	597.191	
7,200.00	6,982.24	290.00	289.99	30.15	0.28	-17.83	-35.19	-25.29	6,857.15	6,845.66	11.49	596.633	
7,250.00	7,016.00	290.00	289.99	30.29	0.28	-16.62	-35.19	-25.29	6,891.80	6,880.23	11.57	595.892	
7,300.00	7,046.90	290.00	289.99	30.43	0.28	-15.64	-35.19	-25.29	6,923.72	6,912.08	11.64	594.875	
7,350.00	7,074.76	290.00	289.99	30.56	0.28	-14.85	-35.19	-25.29	6,952.76	6,941.04	11.72	593.488	
7,400.00	7,099.42	290.00	289.99	30.69	0.28	-14.21	-35.19	-25.29	6,978.77	6,966.98	11.80	591.637	
7,450.00	7,120.70	290.00	289.99	30.82	0.28	-13.71	-35.19	-25.29	7,001.63	6,989.75	11.88	589.233	
7,500.00	7,138.50	290.00	289.99	30.95	0.28	-13.31	-35.19	-25.29	7,021.24	7,009.26	11.98	586.202	
7,550.00	7,152.68	290.00	289.99	31.10	0.28	-13.01	-35.19	-25.29	7,037.49	7,025.40	12.08	582.489	
7,600.00	7,163.18	290.00	289.99	31.25	0.28	-12.80	-35.19	-25.29	7,050.30	7,038.11	12.20	578.062	
7,650.00	7,169.92	290.00	289.99	31.41	0.28	-12.67	-35.19	-25.29	7,059.63	7,047.31	12.32	572.917	
7,700.00	7,172.86	290.00	289.99	31.59	0.28	-12.61	-35.19	-25.29	7,065.43	7,052.97	12.46	567.078	
7,713.53	7,173.00	290.00	289.99	31.64	0.28	-12.61	-35.19	-25.29	7,066.38	7,053.89	12.50	565.426	
7,800.00	7,173.00	290.00	289.99	31.99	0.28	-12.61	-35.19	-25.29	7,072.19	7,059.42	12.77	553.733	
7,900.00	7,173.00	290.00	289.99	32.47	0.28	-12.61	-35.19	-25.29	7,080.22	7,067.08	13.13	539.069	
8,000.00	7,173.00	290.00	289.99	33.03	0.28	-12.61	-35.19	-25.29	7,089.64	7,076.10	13.54	523.614	
8,100.00	7,173.00	290.00	289.99	33.66	0.28	-12.61	-35.19	-25.29	7,100.47	7,086.48	13.98	507.752	
8,200.00	7,173.00	290.00	289.99	34.36	0.28	-12.61	-35.19	-25.29	7,112.68	7,098.22	14.46	491.801	
8,300.00	7,173.00	290.00	289.99	35.13	0.28	-12.61	-35.19	-25.29	7,126.27	7,111.30	14.97	476.015	
8,400.00	7,173.00	290.00	289.99	35.95	0.28	-12.61	-35.19	-25.29	7,141.24	7,125.74	15.50	460.589	
8,500.00	7,173.00	290.00	289.99	36.82	0.28	-12.61	-35.19	-25.29	7,157.58	7,141.52	16.06	445.663	
8,600.00	7,173.00	290.00	289.99	37.74	0.28	-12.61	-35.19	-25.29	7,175.27	7,158.64	16.64	431.332	
8,700.00	7,173.00	290.00	289.99	38.71	0.28	-12.61	-35.19	-25.29	7,194.31	7,177.09	17.23	417.656	
8,800.00	7,173.00	290.00	289.99	39.71	0.28	-12.61	-35.19	-25.29	7,214.69	7,196.86	17.83	404.668	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,900.00	7,173.00	290.00	289.99	40.76	0.28	-12.61	-35.19	-25.29	7,236.39	7,217.94	18.44	392.378	
9,000.00	7,173.00	290.00	289.99	41.84	0.28	-12.61	-35.19	-25.29	7,259.40	7,240.34	19.06	380.782	
9,100.00	7,173.00	290.00	289.99	42.96	0.28	-12.61	-35.19	-25.29	7,283.71	7,264.02	19.69	369.866	
9,200.00	7,173.00	290.00	289.99	44.10	0.28	-12.61	-35.19	-25.29	7,309.31	7,288.99	20.33	359.606	
9,300.00	7,173.00	290.00	289.99	45.27	0.28	-12.61	-35.19	-25.29	7,336.19	7,315.22	20.96	349.975	
9,400.00	7,173.00	290.00	289.99	46.47	0.28	-12.61	-35.19	-25.29	7,364.32	7,342.72	21.60	340.943	
9,500.00	7,173.00	290.00	289.99	47.70	0.28	-12.61	-35.19	-25.29	7,393.70	7,371.46	22.24	332.478	
9,600.00	7,173.00	290.00	289.99	48.94	0.28	-12.61	-35.19	-25.29	7,424.31	7,401.43	22.88	324.547	
9,700.00	7,173.00	290.00	289.99	50.20	0.28	-12.61	-35.19	-25.29	7,456.14	7,432.62	23.51	317.119	
9,800.00	7,173.00	290.00	289.99	51.49	0.28	-12.61	-35.19	-25.29	7,489.16	7,465.02	24.15	310.165	
9,900.00	7,173.00	290.00	289.99	52.79	0.28	-12.61	-35.19	-25.29	7,523.37	7,498.60	24.78	303.653	
10,000.00	7,173.00	290.00	289.99	54.11	0.28	-12.61	-35.19	-25.29	7,558.75	7,533.35	25.40	297.556	
10,100.00	7,173.00	290.00	289.99	55.44	0.28	-12.61	-35.19	-25.29	7,595.28	7,569.26	26.02	291.848	
10,200.00	7,173.00	290.00	289.99	56.78	0.28	-12.61	-35.19	-25.29	7,632.95	7,606.31	26.64	286.503	
10,300.00	7,173.00	290.00	289.99	58.14	0.28	-12.61	-35.19	-25.29	7,671.73	7,644.48	27.25	281.499	
10,400.00	7,173.00	290.00	289.99	59.51	0.28	-12.61	-35.19	-25.29	7,711.62	7,683.76	27.86	276.813	
10,500.00	7,173.00	290.00	289.99	60.90	0.28	-12.61	-35.19	-25.29	7,752.59	7,724.13	28.46	272.426	
10,600.00	7,173.00	290.00	289.99	62.29	0.28	-12.61	-35.19	-25.29	7,794.63	7,765.58	29.05	268.318	
10,700.00	7,173.00	290.00	289.99	63.69	0.28	-12.61	-35.19	-25.29	7,837.72	7,808.08	29.64	264.471	
10,800.00	7,173.00	290.00	289.99	65.11	0.28	-12.61	-35.19	-25.29	7,881.84	7,851.63	30.21	260.870	
10,900.00	7,173.00	290.00	289.99	66.53	0.28	-12.61	-35.19	-25.29	7,926.98	7,896.19	30.78	257.500	
11,000.00	7,173.00	290.00	289.99	67.96	0.28	-12.61	-35.19	-25.29	7,973.12	7,941.77	31.35	254.346	
11,100.00	7,173.00	290.00	289.99	69.39	0.28	-12.61	-35.19	-25.29	8,020.23	7,988.33	31.90	251.394	
11,200.00	7,173.00	290.00	289.99	70.84	0.28	-12.61	-35.19	-25.29	8,068.32	8,035.87	32.45	248.634	
11,300.00	7,173.00	290.00	289.99	72.29	0.28	-12.61	-35.19	-25.29	8,117.35	8,084.36	32.99	246.054	
11,400.00	7,173.00	290.00	289.99	73.74	0.28	-12.61	-35.19	-25.29	8,167.31	8,133.79	33.52	243.643	
11,500.00	7,173.00	290.00	289.99	75.21	0.28	-12.61	-35.19	-25.29	8,218.18	8,184.14	34.05	241.391	
11,600.00	7,173.00	290.00	289.99	76.68	0.28	-12.61	-35.19	-25.29	8,269.95	8,235.39	34.56	239.290	
11,700.00	7,173.00	290.00	289.99	78.15	0.28	-12.61	-35.19	-25.29	8,322.60	8,287.53	35.07	237.331	
11,800.00	7,173.00	290.00	289.99	79.63	0.28	-12.61	-35.19	-25.29	8,376.11	8,340.55	35.57	235.506	
11,900.00	7,173.00	290.00	289.99	81.11	0.28	-12.61	-35.19	-25.29	8,430.47	8,394.41	36.06	233.808	
12,000.00	7,173.00	290.00	289.99	82.60	0.28	-12.61	-35.19	-25.29	8,485.66	8,449.12	36.54	232.229	
12,100.00	7,173.00	290.00	289.99	84.09	0.28	-12.61	-35.19	-25.29	8,541.66	8,504.65	37.01	230.765	
12,200.00	7,173.00	290.00	289.99	85.59	0.28	-12.61	-35.19	-25.29	8,598.46	8,560.98	37.48	229.407	
12,300.00	7,173.00	290.00	289.99	87.09	0.28	-12.61	-35.19	-25.29	8,656.05	8,618.11	37.94	228.152	
12,400.00	7,173.00	290.00	289.99	88.59	0.28	-12.61	-35.19	-25.29	8,714.40	8,676.01	38.39	226.993	
12,500.00	7,173.00	290.00	289.99	90.10	0.28	-12.61	-35.19	-25.29	8,773.50	8,734.67	38.83	225.926	
12,600.00	7,173.00	290.00	289.99	91.61	0.28	-12.61	-35.19	-25.29	8,833.34	8,794.07	39.27	224.946	
12,700.00	7,173.00	290.00	289.99	93.13	0.28	-12.61	-35.19	-25.29	8,893.90	8,854.21	39.70	224.049	
12,800.00	7,173.00	290.00	289.99	94.64	0.28	-12.61	-35.19	-25.29	8,955.17	8,915.05	40.12	223.231	
12,900.00	7,173.00	290.00	289.99	96.16	0.28	-12.61	-35.19	-25.29	9,017.13	8,976.60	40.53	222.488	
13,000.00	7,173.00	290.00	289.99	97.69	0.28	-12.61	-35.19	-25.29	9,079.77	9,038.84	40.93	221.816	
13,100.00	7,173.00	290.00	289.99	99.21	0.28	-12.61	-35.19	-25.29	9,143.08	9,101.74	41.33	221.213	
13,200.00	7,173.00	290.00	289.99	100.74	0.28	-12.61	-35.19	-25.29	9,207.03	9,165.31	41.72	220.674	
13,300.00	7,173.00	290.00	289.99	102.27	0.28	-12.61	-35.19	-25.29	9,271.62	9,229.52	42.11	220.197	
13,400.00	7,173.00	290.00	289.99	103.80	0.28	-12.61	-35.19	-25.29	9,336.84	9,294.36	42.48	219.779	
13,500.00	7,173.00	290.00	289.99	105.33	0.28	-12.61	-35.19	-25.29	9,402.67	9,359.82	42.85	219.417	
13,600.00	7,173.00	290.00	289.99	106.87	0.28	-12.61	-35.19	-25.29	9,469.10	9,425.88	43.22	219.109	
13,700.00	7,173.00	290.00	289.99	108.41	0.28	-12.61	-35.19	-25.29	9,536.11	9,492.53	43.57	218.853	
13,800.00	7,173.00	290.00	289.99	109.95	0.28	-12.61	-35.19	-25.29	9,603.69	9,559.77	43.92	218.646	
13,900.00	7,173.00	290.00	289.99	111.49	0.28	-12.61	-35.19	-25.29	9,671.84	9,627.57	44.27	218.486	
14,000.00	7,173.00	290.00	289.99	113.03	0.28	-12.61	-35.19	-25.29	9,740.54	9,695.93	44.61	218.371	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: Reference		125-Standard Keeper 104 Offset						Rule Assigned: Distance					Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
14,100.00	7,173.00	290.00	289.99	114.58	0.28	-12.61	-35.19	-25.29	9,809.78	9,764.84	44.94	218.299		
14,200.00	7,173.00	290.00	289.99	116.13	0.28	-12.61	-35.19	-25.29	9,879.54	9,834.27	45.26	218.269		
14,300.00	7,173.00	290.00	289.99	117.68	0.28	-12.61	-35.19	-25.29	9,949.82	9,904.23	45.58	218.278		
14,400.00	7,173.00	290.00	289.99	119.23	0.28	-12.61	-35.19	-25.29	10,020.60	9,974.70	45.90	218.325		
14,500.00	7,173.00	290.00	289.99	120.78	0.28	-12.61	-35.19	-25.29	10,091.88	10,045.67	46.21	218.408		
14,600.00	7,173.00	290.00	289.99	122.33	0.28	-12.61	-35.19	-25.29	10,163.64	10,117.13	46.51	218.526		
14,700.00	7,173.00	290.00	289.99	123.88	0.28	-12.61	-35.19	-25.29	10,235.88	10,189.07	46.81	218.678		
14,800.00	7,173.00	290.00	289.99	125.44	0.28	-12.61	-35.19	-25.29	10,308.58	10,261.48	47.10	218.862		
14,900.00	7,173.00	290.00	289.99	127.00	0.28	-12.61	-35.19	-25.29	10,381.73	10,334.34	47.39	219.077		
15,000.00	7,173.00	290.00	289.99	128.55	0.28	-12.61	-35.19	-25.29	10,455.33	10,407.66	47.67	219.321		
15,100.00	7,173.00	290.00	289.99	130.11	0.28	-12.61	-35.19	-25.29	10,529.37	10,481.42	47.95	219.594		
15,200.00	7,173.00	290.00	289.99	131.67	0.28	-12.61	-35.19	-25.29	10,603.83	10,555.60	48.22	219.894		
15,300.00	7,173.00	290.00	289.99	133.23	0.28	-12.61	-35.19	-25.29	10,678.70	10,630.21	48.49	220.221		
15,400.00	7,173.00	290.00	289.99	134.80	0.28	-12.61	-35.19	-25.29	10,753.99	10,705.23	48.75	220.573		
15,500.00	7,173.00	290.00	289.99	136.36	0.28	-12.61	-35.19	-25.29	10,829.68	10,780.66	49.01	220.949		
15,600.00	7,173.00	290.00	289.99	137.92	0.28	-12.61	-35.19	-25.29	10,905.75	10,856.48	49.27	221.349		
15,700.00	7,173.00	290.00	289.99	139.49	0.28	-12.61	-35.19	-25.29	10,982.21	10,932.69	49.52	221.771		
15,800.00	7,173.00	290.00	289.99	141.05	0.28	-12.61	-35.19	-25.29	11,059.05	11,009.28	49.77	222.215		
15,900.00	7,173.00	290.00	289.99	142.62	0.28	-12.61	-35.19	-25.29	11,136.26	11,086.25	50.01	222.680		
16,000.00	7,173.00	290.00	289.99	144.19	0.28	-12.61	-35.19	-25.29	11,213.82	11,163.57	50.25	223.165		
16,100.00	7,173.00	290.00	289.99	145.76	0.28	-12.61	-35.19	-25.29	11,291.74	11,241.26	50.48	223.669		
16,200.00	7,173.00	290.00	289.99	147.33	0.28	-12.61	-35.19	-25.29	11,370.00	11,319.29	50.72	224.192		
16,300.00	7,173.00	290.00	289.99	148.90	0.28	-12.61	-35.19	-25.29	11,448.60	11,397.66	50.94	224.733		
16,400.00	7,173.00	290.00	289.99	150.47	0.28	-12.61	-35.19	-25.29	11,527.54	11,476.37	51.17	225.291		
16,500.00	7,173.00	290.00	289.99	152.04	0.28	-12.61	-35.19	-25.29	11,606.80	11,555.41	51.39	225.866		
16,600.00	7,173.00	290.00	289.99	153.61	0.28	-12.61	-35.19	-25.29	11,686.37	11,634.77	51.61	226.457		
16,700.00	7,173.00	290.00	289.99	155.18	0.28	-12.61	-35.19	-25.29	11,766.26	11,714.44	51.82	227.063		
16,800.00	7,173.00	290.00	289.99	156.76	0.28	-12.61	-35.19	-25.29	11,846.45	11,794.42	52.03	227.684		
16,900.00	7,173.00	290.00	289.99	158.33	0.28	-12.61	-35.19	-25.29	11,926.95	11,874.71	52.24	228.320		
17,000.00	7,173.00	290.00	289.99	159.90	0.28	-12.61	-35.19	-25.29	12,007.73	11,955.29	52.44	228.970		
17,100.00	7,173.00	290.00	289.99	161.48	0.28	-12.61	-35.19	-25.29	12,088.81	12,036.16	52.64	229.632		
17,200.00	7,173.00	290.00	289.99	163.06	0.28	-12.61	-35.19	-25.29	12,170.16	12,117.32	52.84	230.308		
17,300.00	7,173.00	290.00	289.99	164.63	0.28	-12.61	-35.19	-25.29	12,251.79	12,198.75	53.04	230.996		
17,400.00	7,173.00	290.00	289.99	166.21	0.28	-12.61	-35.19	-25.29	12,333.69	12,280.46	53.23	231.697		
17,500.00	7,173.00	290.00	289.99	167.79	0.28	-12.61	-35.19	-25.29	12,415.86	12,362.44	53.42	232.408		
17,600.00	7,173.00	290.00	289.99	169.36	0.28	-12.61	-35.19	-25.29	12,498.29	12,444.68	53.61	233.131		
17,700.00	7,173.00	290.00	289.99	170.94	0.28	-12.61	-35.19	-25.29	12,580.97	12,527.17	53.80	233.865		
17,800.00	7,173.00	290.00	289.99	172.52	0.28	-12.61	-35.19	-25.29	12,663.90	12,609.92	53.98	234.609		
17,900.00	7,173.00	290.00	289.99	174.10	0.28	-12.61	-35.19	-25.29	12,747.07	12,692.91	54.16	235.363		
18,000.00	7,173.00	290.00	289.99	175.68	0.28	-12.61	-35.19	-25.29	12,830.49	12,776.15	54.34	236.126		
18,100.00	7,173.00	290.00	289.99	177.26	0.28	-12.61	-35.19	-25.29	12,914.14	12,859.63	54.51	236.899		
18,200.00	7,173.00	290.00	289.99	178.84	0.28	-12.61	-35.19	-25.29	12,998.02	12,943.34	54.69	237.681		
18,300.00	7,173.00	290.00	289.99	180.42	0.28	-12.61	-35.19	-25.29	13,082.13	13,027.28	54.86	238.471		
18,400.00	7,173.00	290.00	289.99	182.00	0.28	-12.61	-35.19	-25.29	13,166.47	13,111.44	55.03	239.270		
18,500.00	7,173.00	290.00	289.99	183.59	0.28	-12.61	-35.19	-25.29	13,251.02	13,195.82	55.19	240.077		
18,600.00	7,173.00	290.00	289.99	185.17	0.28	-12.61	-35.19	-25.29	13,335.78	13,280.42	55.36	240.891		
18,700.00	7,173.00	290.00	289.99	186.75	0.28	-12.61	-35.19	-25.29	13,420.75	13,365.23	55.52	241.713		
18,800.00	7,173.00	290.00	289.99	188.33	0.28	-12.61	-35.19	-25.29	13,505.93	13,450.25	55.68	242.542		
18,900.00	7,173.00	290.00	289.99	189.92	0.28	-12.61	-35.19	-25.29	13,591.31	13,535.47	55.84	243.378		
19,000.00	7,173.00	290.00	289.99	191.50	0.28	-12.61	-35.19	-25.29	13,676.89	13,620.89	56.00	244.220		
19,100.00	7,173.00	290.00	289.99	193.09	0.28	-12.61	-35.19	-25.29	13,762.66	13,706.51	56.16	245.069		
19,200.00	7,173.00	290.00	289.99	194.67	0.28	-12.61	-35.19	-25.29	13,848.63	13,792.32	56.31	245.924		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (")	Offset Wellbore Centre		Distance		Rule Assigned:		Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
19,249.41	7,173.00	290.00	289.99	195.45	0.28	-12.61	-35.19	-25.29	13,891.17	13,834.79	56.39	246.349	
19,300.00	7,173.00	290.00	289.99	196.25	0.28	-12.61	-35.19	-25.29	13,934.78	13,878.31	56.47	246.785	
19,384.41	7,173.00	290.00	289.99	197.34	0.28	-12.61	-35.19	-25.29	14,007.65	13,950.24	57.41	243.994	

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #4													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 290-B001Mb_MWD+HRGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	-145.57	-37.14	-25.45	45.02					
125.00	125.00	125.34	125.34	0.06	0.05	170.41	-36.58	-25.42	45.13	45.02	0.12	381.905		
225.00	224.98	225.32	225.31	0.17	0.19	107.04	-35.69	-25.37	45.26	44.92	0.33	136.141		
319.00	318.92	319.21	319.21	0.28	0.32	100.63	-35.00	-25.23	45.36	44.85	0.52	87.737		
400.00	399.86	400.14	400.13	0.37	0.47	104.95	-34.48	-25.06	45.59	44.84	0.75	60.600 ES		
469.00	468.80	468.67	468.66	0.52	0.68	108.48	-34.16	-24.98	46.12	44.97	1.15	40.238		
500.00	499.78	499.20	499.19	0.61	0.78	124.64	-34.40	-25.10	46.88	45.54	1.34	34.908		
600.00	599.71	597.51	597.45	0.92	1.10	176.36	-37.18	-26.35	52.83	50.83	2.01	26.316		
700.00	699.55	695.02	694.74	1.26	1.44	-163.19	-43.00	-28.89	64.14	61.44	2.70	23.764 SF		
800.00	799.19	791.06	790.31	1.60	1.78	-158.11	-51.72	-32.66	81.28	77.88	3.40	23.920		
900.00	898.49	885.04	883.46	1.97	2.13	-157.67	-63.09	-37.56	104.66	100.57	4.10	25.554		
1,000.00	997.33	976.39	973.57	2.34	2.50	-158.47	-76.84	-43.46	134.40	129.62	4.78	28.108		
1,100.00	1,095.61	1,067.01	1,062.52	2.74	2.88	-159.54	-92.80	-50.29	170.07	164.61	5.46	31.131		
1,196.26	1,189.56	1,155.15	1,148.95	3.13	3.26	-160.49	-108.66	-57.09	207.87	201.74	6.13	33.917		
1,200.00	1,193.19	1,158.55	1,152.28	3.15	3.27	-160.59	-109.28	-57.35	209.39	203.23	6.16	33.974		
1,300.00	1,290.42	1,249.44	1,241.42	3.58	3.67	-162.71	-125.64	-64.36	250.34	243.51	6.83	36.654		
1,400.00	1,387.65	1,340.34	1,330.56	4.01	4.07	-164.24	-142.01	-71.37	291.50	283.99	7.51	38.802		
1,500.00	1,484.87	1,431.24	1,419.70	4.45	4.48	-165.39	-158.37	-78.38	332.79	324.59	8.20	40.593		
1,600.00	1,582.10	1,522.14	1,508.83	4.90	4.88	-166.29	-174.73	-85.39	374.17	365.28	8.89	42.098		
1,700.00	1,679.33	1,613.04	1,597.97	5.34	5.29	-167.01	-191.10	-92.40	415.61	406.03	9.58	43.377		
1,800.00	1,776.55	1,703.94	1,687.11	5.79	5.70	-167.60	-207.46	-99.41	457.09	446.81	10.28	44.476		
1,900.00	1,873.78	1,794.84	1,776.25	6.24	6.11	-168.09	-223.83	-106.42	498.61	487.63	10.98	45.428		
2,000.00	1,971.01	1,885.74	1,865.39	6.69	6.52	-168.50	-240.19	-113.43	540.15	528.47	11.68	46.261		
2,100.00	2,068.23	1,976.63	1,954.53	7.15	6.94	-168.86	-256.56	-120.44	581.71	569.33	12.38	46.995		
2,200.00	2,165.46	2,067.53	2,043.66	7.60	7.35	-169.17	-272.92	-127.45	623.29	610.21	13.08	47.647		
2,300.00	2,262.69	2,158.43	2,132.80	8.06	7.76	-169.44	-289.29	-134.46	664.88	651.09	13.79	48.229		
2,400.00	2,359.91	2,249.33	2,221.94	8.51	8.17	-169.68	-305.65	-141.47	706.48	691.99	14.49	48.751		
2,500.00	2,457.14	2,340.23	2,311.08	8.97	8.59	-169.89	-322.02	-148.48	748.09	732.89	15.20	49.223		
2,600.00	2,554.37	2,431.13	2,400.22	9.42	9.00	-170.08	-338.38	-155.49	789.71	773.80	15.91	49.650		
2,700.00	2,651.59	2,522.03	2,489.36	9.88	9.42	-170.25	-354.75	-162.50	831.33	814.72	16.61	50.040		
2,800.00	2,748.82	2,612.92	2,578.49	10.34	9.83	-170.40	-371.11	-169.51	872.96	855.64	17.32	50.396		
2,900.00	2,846.05	2,703.82	2,667.63	10.80	10.24	-170.54	-387.48	-176.52	914.60	896.57	18.03	50.722		
3,000.00	2,943.27	2,794.72	2,756.77	11.25	10.66	-170.67	-403.84	-183.53	956.24	937.50	18.74	51.023		
3,100.00	3,040.50	2,885.62	2,845.91	11.71	11.07	-170.79	-420.20	-190.54	997.88	978.43	19.45	51.301		
3,200.00	3,137.73	2,976.52	2,935.05	12.17	11.49	-170.90	-436.57	-197.55	1,039.53	1,019.36	20.16	51.558		
3,300.00	3,234.95	3,067.42	3,024.18	12.63	11.90	-171.00	-452.93	-204.56	1,081.18	1,060.30	20.87	51.797		
3,400.00	3,332.18	3,158.32	3,113.32	13.09	12.32	-171.09	-469.30	-211.57	1,122.83	1,101.24	21.58	52.019		
3,500.00	3,429.40	3,249.22	3,202.46	13.55	12.74	-171.17	-485.66	-218.58	1,164.48	1,142.18	22.30	52.226		
3,600.00	3,526.63	3,340.11	3,291.60	14.00	13.15	-171.25	-502.03	-225.59	1,206.14	1,183.13	23.01	52.420		
3,700.00	3,623.86	3,431.01	3,380.74	14.46	13.57	-171.33	-518.39	-232.60	1,247.79	1,224.07	23.72	52.602		
3,800.00	3,721.08	3,521.91	3,469.88	14.92	13.98	-171.40	-534.76	-239.61	1,289.45	1,265.02	24.43	52.772		
3,900.00	3,818.31	3,612.81	3,559.01	15.38	14.40	-171.46	-551.12	-246.62	1,331.11	1,305.97	25.15	52.932		
4,000.00	3,915.54	3,703.71	3,648.15	15.84	14.81	-171.53	-567.49	-253.63	1,372.77	1,346.91	25.86	53.083		
4,100.00	4,012.76	3,794.61	3,737.29	16.30	15.23	-171.58	-583.85	-260.64	1,414.44	1,387.86	26.57	53.225		
4,200.00	4,109.99	3,885.51	3,826.43	16.76	15.65	-171.64	-600.22	-267.65	1,456.10	1,428.81	27.29	53.359		
4,300.00	4,207.22	3,976.40	3,915.57	17.22	16.06	-171.69	-616.58	-274.66	1,497.77	1,469.76	28.00	53.486		
4,400.00	4,304.44	4,067.30	4,004.71	17.68	16.48	-171.74	-632.94	-281.67	1,539.43	1,510.72	28.72	53.606		
4,500.00	4,401.67	4,158.20	4,093.84	18.14	16.89	-171.78	-649.31	-288.68	1,581.10	1,551.67	29.43	53.720		
4,600.00	4,498.90	4,249.10	4,182.98	18.60	17.31	-171.83	-665.67	-295.69	1,622.77	1,592.62	30.15	53.828		
4,700.00	4,596.12	4,340.00	4,272.12	19.06	17.73	-171.87	-682.04	-302.70	1,664.44	1,633.57	30.86	53.930		
4,800.00	4,693.35	4,430.90	4,361.26	19.52	18.14	-171.91	-698.40	-309.71	1,706.11	1,674.53	31.58	54.028		
4,900.00	4,790.58	4,521.80	4,450.40	19.98	18.56	-171.95	-714.77	-316.72	1,747.78	1,715.48	32.29	54.121		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #4													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 290-B001Mb_MWD+HRGM													Offset Well Error:	0.00 usft
Reference													Rule Assigned:	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
5,000.00	4,887.80	4,612.70	4,539.53	20.44	18.97	-171.98	-731.13	-323.73	1,789.45	1,756.44	33.01	54.209		
5,100.00	4,985.03	4,703.59	4,628.67	20.90	19.39	-172.02	-747.50	-330.74	1,831.12	1,797.39	33.73	54.294		
5,200.00	5,082.26	4,794.49	4,717.81	21.36	19.81	-172.05	-763.86	-337.75	1,872.79	1,838.35	34.44	54.374		
5,300.00	5,179.48	4,885.39	4,806.95	21.82	20.22	-172.08	-780.23	-344.76	1,914.46	1,879.30	35.16	54.451		
5,400.00	5,276.71	4,976.29	4,896.09	22.27	20.64	-172.11	-796.59	-351.77	1,956.13	1,920.26	35.88	54.525		
5,500.00	5,373.94	5,067.19	4,985.23	22.73	21.06	-172.14	-812.96	-358.78	1,997.81	1,961.21	36.59	54.595		
5,600.00	5,471.16	5,158.09	5,074.36	23.19	21.47	-172.17	-829.32	-365.79	2,039.48	2,002.17	37.31	54.662		
5,700.00	5,568.39	5,248.99	5,163.50	23.65	21.89	-172.19	-845.69	-372.79	2,081.15	2,043.12	38.03	54.727		
5,800.00	5,665.62	5,339.88	5,252.64	24.11	22.30	-172.22	-862.05	-379.80	2,122.83	2,084.08	38.75	54.788		
5,900.00	5,762.84	5,430.78	5,341.78	24.57	22.72	-172.24	-878.41	-386.81	2,164.50	2,125.04	39.46	54.848		
6,000.00	5,860.07	5,521.68	5,430.92	25.03	23.14	-172.27	-894.78	-393.82	2,206.17	2,165.99	40.18	54.904		
6,100.00	5,957.30	5,612.58	5,520.06	25.50	23.55	-172.29	-911.14	-400.83	2,247.85	2,206.95	40.90	54.959		
6,200.00	6,054.52	5,703.48	5,609.19	25.96	23.97	-172.31	-927.51	-407.84	2,289.52	2,247.91	41.62	55.011		
6,300.00	6,151.75	5,794.38	5,698.33	26.42	24.39	-172.33	-943.87	-414.85	2,331.20	2,288.86	42.34	55.061		
6,400.00	6,248.98	5,885.28	5,787.47	26.88	24.80	-172.35	-960.24	-421.86	2,372.88	2,329.82	43.06	55.109		
6,500.00	6,346.20	5,976.18	5,876.61	27.34	25.22	-172.37	-976.60	-428.87	2,414.55	2,370.77	43.78	55.156		
6,600.00	6,443.43	6,067.07	5,965.75	27.80	25.64	-172.39	-992.97	-435.88	2,456.23	2,411.73	44.50	55.200		
6,696.38	6,537.14	6,154.68	6,051.66	28.24	26.04	-172.41	-1,008.74	-442.64	2,496.40	2,451.21	45.19	55.242		
6,700.00	6,540.66	6,157.97	6,054.89	28.26	26.05	-170.91	-1,009.33	-442.89	2,497.90	2,452.69	45.22	55.243		
6,750.00	6,589.27	6,203.57	6,099.60	28.48	26.26	-150.49	-1,017.54	-446.41	2,518.22	2,472.64	45.58	55.252		
6,800.00	6,637.66	6,249.24	6,144.39	28.71	26.47	-132.77	-1,025.76	-449.93	2,537.55	2,491.61	45.94	55.239		
6,850.00	6,685.53	6,294.69	6,188.96	28.92	26.68	-119.19	-1,033.95	-453.44	2,555.81	2,509.51	46.30	55.204		
6,900.00	6,732.60	6,339.65	6,233.04	29.13	26.88	-109.25	-1,042.04	-456.90	2,572.91	2,526.26	46.65	55.149		
6,950.00	6,778.56	6,383.82	6,276.36	29.32	27.09	-101.96	-1,049.99	-460.31	2,588.83	2,541.82	47.01	55.075		
7,000.00	6,823.13	6,426.96	6,318.66	29.51	27.28	-96.53	-1,057.76	-463.64	2,603.51	2,556.16	47.35	54.982		
7,050.00	6,866.05	6,468.78	6,359.67	29.68	27.48	-92.41	-1,065.29	-466.86	2,616.96	2,569.27	47.69	54.873		
7,100.00	6,907.04	6,509.03	6,399.14	29.85	27.66	-89.25	-1,072.53	-469.97	2,629.18	2,581.16	48.02	54.748		
7,150.00	6,945.85	6,547.46	6,436.83	30.01	27.84	-86.79	-1,079.45	-472.93	2,640.19	2,591.85	48.35	54.609		
7,200.00	6,982.24	6,583.84	6,472.51	30.15	28.00	-84.88	-1,086.00	-475.74	2,650.02	2,601.36	48.66	54.456		
7,250.00	7,016.00	6,707.71	6,594.10	30.29	28.52	-85.00	-1,108.49	-473.99	2,658.20	2,608.63	49.57	53.621		
7,300.00	7,046.90	6,783.63	6,667.60	30.43	28.78	-84.88	-1,122.25	-461.09	2,664.74	2,614.63	50.11	53.173		
7,350.00	7,074.76	6,823.97	6,705.88	30.56	28.90	-84.39	-1,129.47	-450.63	2,670.37	2,619.93	50.44	52.942		
7,400.00	7,099.42	6,844.05	6,724.67	30.69	28.96	-83.72	-1,133.02	-444.52	2,675.35	2,624.69	50.66	52.811		
7,450.00	7,120.70	6,851.91	6,731.97	30.82	28.98	-82.97	-1,134.41	-441.96	2,679.80	2,628.98	50.82	52.729		
7,500.00	7,138.50	6,851.97	6,732.03	30.95	28.98	-82.21	-1,134.42	-441.94	2,683.73	2,632.77	50.95	52.673		
7,550.00	7,152.68	6,846.81	6,727.24	31.10	28.97	-81.50	-1,133.51	-443.63	2,687.11	2,636.05	51.06	52.627		
7,600.00	7,163.18	6,838.03	6,719.05	31.25	28.94	-80.85	-1,131.96	-446.41	2,689.91	2,638.75	51.16	52.582		
7,650.00	7,169.92	6,826.63	6,708.38	31.41	28.91	-80.28	-1,129.94	-449.86	2,692.09	2,640.84	51.25	52.532		
7,700.00	7,172.86	6,813.30	6,695.82	31.59	28.87	-79.82	-1,127.57	-453.64	2,693.60	2,642.26	51.33	52.472		
7,713.53	7,173.00	6,809.43	6,692.16	31.64	28.86	-79.72	-1,126.87	-454.69	2,693.88	2,642.53	51.36	52.454		
7,800.00	7,173.00	6,787.39	6,671.20	31.99	28.79	-79.26	-1,122.92	-460.22	2,696.84	2,645.30	51.54	52.325		
7,900.00	7,173.00	6,767.78	6,652.39	32.47	28.73	-78.86	-1,119.39	-464.52	2,703.52	2,651.70	51.82	52.169		
8,000.00	7,173.00	6,750.00	6,635.24	33.03	28.67	-78.49	-1,116.17	-467.90	2,713.74	2,661.59	52.15	52.036		
8,100.00	7,173.00	6,740.26	6,625.81	33.66	28.64	-78.28	-1,114.41	-469.55	2,727.49	2,674.93	52.56	51.889		
8,200.00	7,173.00	6,730.26	6,616.09	34.36	28.60	-78.07	-1,112.59	-471.09	2,744.75	2,691.75	53.00	51.788		
8,300.00	7,173.00	6,721.94	6,607.99	35.13	28.57	-77.90	-1,111.08	-472.25	2,765.47	2,712.00	53.47	51.722		
8,400.00	7,173.00	6,714.90	6,601.13	35.95	28.55	-77.75	-1,109.80	-473.15	2,789.58	2,735.62	53.96	51.696		
8,500.00	7,173.00	6,700.00	6,586.57	36.82	28.49	-77.44	-1,107.08	-474.80	2,817.04	2,762.64	54.40	51.782		
8,600.00	7,173.00	6,700.00	6,586.57	37.74	28.49	-77.44	-1,107.08	-474.80	2,847.67	2,792.70	54.96	51.811		
8,700.00	7,173.00	6,700.00	6,586.57	38.71	28.49	-77.44	-1,107.08	-474.80	2,881.44	2,825.92	55.52	51.896		
8,800.00	7,173.00	6,700.00	6,586.57	39.71	28.49	-77.44	-1,107.08	-474.80	2,918.25	2,862.17	56.08	52.038		
8,900.00	7,173.00	6,700.00	6,586.57	40.76	28.49	-77.44	-1,107.08	-474.80	2,957.99	2,901.36	56.63	52.236		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #4												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 290-B001Mb_MWD+HRGM												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,000.00	7,173.00	6,700.00	6,586.57	41.84	28.49	-77.44	-1,107.08	-474.80	3,000.53	2,943.37	57.16	52.489	
9,100.00	7,173.00	6,700.00	6,586.57	42.96	28.49	-77.44	-1,107.08	-474.80	3,045.77	2,988.08	57.69	52.797	
9,200.00	7,173.00	6,700.00	6,586.57	44.10	28.49	-77.44	-1,107.08	-474.80	3,093.57	3,035.38	58.20	53.158	
9,300.00	7,173.00	6,680.52	6,567.48	45.27	28.42	-77.02	-1,103.53	-476.43	3,143.63	3,085.09	58.53	53.707	
9,400.00	7,173.00	6,678.37	6,565.38	46.47	28.41	-76.98	-1,103.14	-476.58	3,196.17	3,137.18	58.99	54.182	
9,500.00	7,173.00	6,676.40	6,563.44	47.70	28.40	-76.94	-1,102.78	-476.70	3,250.94	3,191.51	59.43	54.703	
9,600.00	7,173.00	6,674.59	6,561.67	48.94	28.39	-76.90	-1,102.46	-476.81	3,307.82	3,247.97	59.85	55.269	
9,700.00	7,173.00	6,672.92	6,560.03	50.20	28.39	-76.86	-1,102.15	-476.91	3,366.71	3,306.45	60.25	55.876	
9,800.00	7,173.00	6,671.38	6,558.52	51.49	28.38	-76.83	-1,101.87	-477.00	3,427.50	3,366.86	60.64	56.524	
9,900.00	7,173.00	6,669.95	6,557.11	52.79	28.37	-76.80	-1,101.61	-477.07	3,490.09	3,429.09	61.01	57.210	
10,000.00	7,173.00	6,650.00	6,537.51	54.11	28.29	-76.38	-1,097.98	-477.79	3,554.62	3,493.41	61.21	58.073	
10,100.00	7,173.00	6,650.00	6,537.51	55.44	28.29	-76.38	-1,097.98	-477.79	3,620.51	3,558.96	61.55	58.820	
10,200.00	7,173.00	6,650.00	6,537.51	56.78	28.29	-76.38	-1,097.98	-477.79	3,687.94	3,626.07	61.88	59.600	
10,300.00	7,173.00	6,650.00	6,537.51	58.14	28.29	-76.38	-1,097.98	-477.79	3,756.83	3,694.64	62.19	60.413	
10,400.00	7,173.00	6,650.00	6,537.51	59.51	28.29	-76.38	-1,097.98	-477.79	3,827.08	3,764.60	62.48	61.254	
10,500.00	7,173.00	6,650.00	6,537.51	60.90	28.29	-76.38	-1,097.98	-477.79	3,898.64	3,835.88	62.76	62.124	
10,600.00	7,173.00	6,650.00	6,537.51	62.29	28.29	-76.38	-1,097.98	-477.79	3,971.42	3,908.41	63.02	63.020	
10,700.00	7,173.00	6,650.00	6,537.51	63.69	28.29	-76.38	-1,097.98	-477.79	4,045.37	3,982.10	63.27	63.941	
10,800.00	7,173.00	6,650.00	6,537.51	65.11	28.29	-76.38	-1,097.98	-477.79	4,120.42	4,056.91	63.50	64.885	
10,900.00	7,173.00	6,650.00	6,537.51	66.53	28.29	-76.38	-1,097.98	-477.79	4,196.51	4,132.78	63.73	65.852	
11,000.00	7,173.00	6,650.00	6,537.51	67.96	28.29	-76.38	-1,097.98	-477.79	4,273.58	4,209.64	63.94	66.838	
11,100.00	7,173.00	6,650.00	6,537.51	69.39	28.29	-76.38	-1,097.98	-477.79	4,351.59	4,287.44	64.14	67.845	
11,200.00	7,173.00	6,650.00	6,537.51	70.84	28.29	-76.38	-1,097.98	-477.79	4,430.48	4,366.14	64.33	68.869	
11,300.00	7,173.00	6,650.00	6,537.51	72.29	28.29	-76.38	-1,097.98	-477.79	4,510.20	4,445.69	64.51	69.911	
11,400.00	7,173.00	6,650.00	6,537.51	73.74	28.29	-76.38	-1,097.98	-477.79	4,590.72	4,526.04	64.69	70.969	
11,500.00	7,173.00	6,650.00	6,537.51	75.21	28.29	-76.38	-1,097.98	-477.79	4,672.00	4,607.15	64.85	72.042	
11,600.00	7,173.00	6,650.00	6,537.51	76.68	28.29	-76.38	-1,097.98	-477.79	4,753.99	4,688.98	65.01	73.129	
11,700.00	7,173.00	6,650.00	6,537.51	78.15	28.29	-76.38	-1,097.98	-477.79	4,836.65	4,771.49	65.16	74.229	
11,800.00	7,173.00	6,650.00	6,537.51	79.63	28.29	-76.38	-1,097.98	-477.79	4,919.96	4,854.66	65.30	75.342	
11,900.00	7,173.00	6,650.00	6,537.51	81.11	28.29	-76.38	-1,097.98	-477.79	5,003.88	4,938.44	65.44	76.467	
12,000.00	7,173.00	6,650.00	6,537.51	82.60	28.29	-76.38	-1,097.98	-477.79	5,088.38	5,022.82	65.57	77.603	
12,100.00	7,173.00	6,650.00	6,537.51	84.09	28.29	-76.38	-1,097.98	-477.79	5,173.44	5,107.74	65.69	78.750	
12,200.00	7,173.00	6,650.00	6,537.51	85.59	28.29	-76.38	-1,097.98	-477.79	5,259.02	5,193.20	65.82	79.906	
12,300.00	7,173.00	6,650.00	6,537.51	87.09	28.29	-76.38	-1,097.98	-477.79	5,345.10	5,279.17	65.93	81.071	
12,400.00	7,173.00	6,650.00	6,537.51	88.59	28.29	-76.38	-1,097.98	-477.79	5,431.66	5,365.62	66.04	82.245	
12,500.00	7,173.00	6,650.00	6,537.51	90.10	28.29	-76.38	-1,097.98	-477.79	5,518.67	5,452.52	66.15	83.427	
12,600.00	7,173.00	6,650.00	6,537.51	91.61	28.29	-76.38	-1,097.98	-477.79	5,606.12	5,539.87	66.25	84.617	
12,700.00	7,173.00	6,650.00	6,537.51	93.13	28.29	-76.38	-1,097.98	-477.79	5,693.98	5,627.62	66.35	85.813	
12,800.00	7,173.00	6,650.00	6,537.51	94.64	28.29	-76.38	-1,097.98	-477.79	5,782.23	5,715.78	66.45	87.016	
12,900.00	7,173.00	6,650.00	6,537.51	96.16	28.29	-76.38	-1,097.98	-477.79	5,870.86	5,804.32	66.54	88.225	
13,000.00	7,173.00	6,650.00	6,537.51	97.69	28.29	-76.38	-1,097.98	-477.79	5,959.85	5,893.22	66.63	89.440	
13,100.00	7,173.00	6,650.00	6,537.51	99.21	28.29	-76.38	-1,097.98	-477.79	6,049.19	5,982.46	66.72	90.661	
13,200.00	7,173.00	6,650.00	6,537.51	100.74	28.29	-76.38	-1,097.98	-477.79	6,138.85	6,072.04	66.81	91.886	
13,300.00	7,173.00	6,650.00	6,537.51	102.27	28.29	-76.38	-1,097.98	-477.79	6,228.83	6,161.93	66.89	93.116	
13,400.00	7,173.00	6,650.00	6,537.51	103.80	28.29	-76.38	-1,097.98	-477.79	6,319.11	6,252.13	66.97	94.350	
13,500.00	7,173.00	6,650.00	6,537.51	105.33	28.29	-76.38	-1,097.98	-477.79	6,409.67	6,342.62	67.05	95.589	
13,600.00	7,173.00	6,650.00	6,537.51	106.87	28.29	-76.38	-1,097.98	-477.79	6,500.52	6,433.39	67.13	96.831	
13,700.00	7,173.00	6,650.00	6,537.51	108.41	28.29	-76.38	-1,097.98	-477.79	6,591.63	6,524.42	67.21	98.076	
13,800.00	7,173.00	6,650.00	6,537.51	109.95	28.29	-76.38	-1,097.98	-477.79	6,682.99	6,615.71	67.28	99.325	
13,900.00	7,173.00	6,650.00	6,537.51	111.49	28.29	-76.38	-1,097.98	-477.79	6,774.60	6,707.24	67.36	100.576	
14,000.00	7,173.00	6,650.00	6,537.51	113.03	28.29	-76.38	-1,097.98	-477.79	6,866.44	6,799.01	67.43	101.830	
14,100.00	7,173.00	6,650.00	6,537.51	114.58	28.29	-76.38	-1,097.98	-477.79	6,958.51	6,891.01	67.50	103.087	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #4												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 290-B001Mb_MWD+HRGM												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,200.00	7,173.00	6,650.00	6,537.51	116.13	28.29	-76.38	-1,097.98	-477.79	7,050.79	6,983.22	67.57	104.345	
14,300.00	7,173.00	6,650.00	6,537.51	117.68	28.29	-76.38	-1,097.98	-477.79	7,143.28	7,075.64	67.64	105.606	
14,400.00	7,173.00	6,650.00	6,537.51	119.23	28.29	-76.38	-1,097.98	-477.79	7,235.97	7,168.26	67.71	106.868	
14,500.00	7,173.00	6,650.00	6,537.51	120.78	28.29	-76.38	-1,097.98	-477.79	7,328.85	7,261.08	67.78	108.132	
14,600.00	7,173.00	6,650.00	6,537.51	122.33	28.29	-76.38	-1,097.98	-477.79	7,421.92	7,354.08	67.84	109.397	
14,700.00	7,173.00	6,650.00	6,537.51	123.88	28.29	-76.38	-1,097.98	-477.79	7,515.17	7,447.26	67.91	110.664	
14,800.00	7,173.00	6,650.00	6,537.51	125.44	28.29	-76.38	-1,097.98	-477.79	7,608.58	7,540.61	67.98	111.931	
14,900.00	7,173.00	6,650.00	6,537.51	127.00	28.29	-76.38	-1,097.98	-477.79	7,702.17	7,634.13	68.04	113.200	
15,000.00	7,173.00	6,650.00	6,537.51	128.55	28.29	-76.38	-1,097.98	-477.79	7,795.91	7,727.80	68.11	114.469	
15,100.00	7,173.00	6,650.00	6,537.51	130.11	28.29	-76.38	-1,097.98	-477.79	7,889.80	7,821.64	68.17	115.738	
15,200.00	7,173.00	6,650.00	6,537.51	131.67	28.29	-76.38	-1,097.98	-477.79	7,983.85	7,915.62	68.23	117.008	
15,300.00	7,173.00	6,650.00	6,537.51	133.23	28.29	-76.38	-1,097.98	-477.79	8,078.03	8,009.74	68.30	118.279	
15,400.00	7,173.00	6,650.00	6,537.51	134.80	28.29	-76.38	-1,097.98	-477.79	8,172.36	8,104.00	68.36	119.549	
15,500.00	7,173.00	6,650.00	6,537.51	136.36	28.29	-76.38	-1,097.98	-477.79	8,266.82	8,198.40	68.42	120.820	
15,600.00	7,173.00	6,650.00	6,537.51	137.92	28.29	-76.38	-1,097.98	-477.79	8,361.41	8,292.92	68.49	122.090	
15,700.00	7,173.00	6,650.00	6,537.51	139.49	28.29	-76.38	-1,097.98	-477.79	8,456.12	8,387.57	68.55	123.360	
15,800.00	7,173.00	6,650.00	6,537.51	141.05	28.29	-76.38	-1,097.98	-477.79	8,550.95	8,482.34	68.61	124.630	
15,900.00	7,173.00	6,650.00	6,537.51	142.62	28.29	-76.38	-1,097.98	-477.79	8,645.90	8,577.22	68.67	125.899	
16,000.00	7,173.00	6,650.00	6,537.51	144.19	28.29	-76.38	-1,097.98	-477.79	8,740.96	8,672.22	68.74	127.168	
16,100.00	7,173.00	6,650.00	6,537.51	145.76	28.29	-76.38	-1,097.98	-477.79	8,836.13	8,767.33	68.80	128.436	
16,200.00	7,173.00	6,650.00	6,537.51	147.33	28.29	-76.38	-1,097.98	-477.79	8,931.41	8,862.55	68.86	129.703	
16,300.00	7,173.00	6,650.00	6,537.51	148.90	28.29	-76.38	-1,097.98	-477.79	9,026.78	8,957.86	68.92	130.969	
16,400.00	7,173.00	6,650.00	6,537.51	150.47	28.29	-76.38	-1,097.98	-477.79	9,122.26	9,053.28	68.99	132.235	
16,500.00	7,173.00	6,650.00	6,537.51	152.04	28.29	-76.38	-1,097.98	-477.79	9,217.83	9,148.79	69.05	133.499	
16,600.00	7,173.00	6,650.00	6,537.51	153.61	28.29	-76.38	-1,097.98	-477.79	9,313.50	9,244.39	69.11	134.763	
16,700.00	7,173.00	6,650.00	6,537.51	155.18	28.29	-76.38	-1,097.98	-477.79	9,409.26	9,340.08	69.17	136.025	
16,800.00	7,173.00	6,650.00	6,537.51	156.76	28.29	-76.38	-1,097.98	-477.79	9,505.10	9,435.86	69.24	137.286	
16,900.00	7,173.00	6,650.00	6,537.51	158.33	28.29	-76.38	-1,097.98	-477.79	9,601.03	9,531.73	69.30	138.545	
17,000.00	7,173.00	6,650.00	6,537.51	159.90	28.29	-76.38	-1,097.98	-477.79	9,697.04	9,627.68	69.36	139.803	
17,100.00	7,173.00	6,650.00	6,537.51	161.48	28.29	-76.38	-1,097.98	-477.79	9,793.13	9,723.70	69.43	141.060	
17,200.00	7,173.00	6,650.00	6,537.51	163.06	28.29	-76.38	-1,097.98	-477.79	9,889.30	9,819.81	69.49	142.314	
17,300.00	7,173.00	6,650.00	6,537.51	164.63	28.29	-76.38	-1,097.98	-477.79	9,985.54	9,915.99	69.55	143.568	
17,400.00	7,173.00	6,650.00	6,537.51	166.21	28.29	-76.38	-1,097.98	-477.79	10,081.86	10,012.24	69.62	144.819	
17,500.00	7,173.00	6,650.00	6,537.51	167.79	28.29	-76.38	-1,097.98	-477.79	10,178.24	10,108.56	69.68	146.069	
17,600.00	7,173.00	6,650.00	6,537.51	169.36	28.29	-76.38	-1,097.98	-477.79	10,274.70	10,204.95	69.75	147.317	
17,700.00	7,173.00	6,650.00	6,537.51	170.94	28.29	-76.38	-1,097.98	-477.79	10,371.22	10,301.41	69.81	148.563	
17,800.00	7,173.00	6,650.00	6,537.51	172.52	28.29	-76.38	-1,097.98	-477.79	10,467.81	10,397.94	69.88	149.807	
17,900.00	7,173.00	6,650.00	6,537.51	174.10	28.29	-76.38	-1,097.98	-477.79	10,564.46	10,494.52	69.94	151.050	
18,000.00	7,173.00	6,650.00	6,537.51	175.68	28.29	-76.38	-1,097.98	-477.79	10,661.18	10,591.17	70.01	152.290	
18,100.00	7,173.00	6,650.00	6,537.51	177.26	28.29	-76.38	-1,097.98	-477.79	10,757.95	10,687.88	70.07	153.528	
18,200.00	7,173.00	6,650.00	6,537.51	178.84	28.29	-76.38	-1,097.98	-477.79	10,854.79	10,784.65	70.14	154.764	
18,300.00	7,173.00	6,650.00	6,537.51	180.42	28.29	-76.38	-1,097.98	-477.79	10,951.68	10,881.47	70.20	155.997	
18,400.00	7,173.00	6,650.00	6,537.51	182.00	28.29	-76.38	-1,097.98	-477.79	11,048.62	10,978.35	70.27	157.229	
18,500.00	7,173.00	6,650.00	6,537.51	183.59	28.29	-76.38	-1,097.98	-477.79	11,145.62	11,075.28	70.34	158.458	
18,600.00	7,173.00	6,650.00	6,537.51	185.17	28.29	-76.38	-1,097.98	-477.79	11,242.67	11,172.27	70.41	159.685	
18,700.00	7,173.00	6,650.00	6,537.51	186.75	28.29	-76.38	-1,097.98	-477.79	11,339.77	11,269.30	70.47	160.909	
18,800.00	7,173.00	6,650.00	6,537.51	188.33	28.29	-76.38	-1,097.98	-477.79	11,436.93	11,366.39	70.54	162.132	
18,900.00	7,173.00	6,650.00	6,537.51	189.92	28.29	-76.38	-1,097.98	-477.79	11,534.13	11,463.52	70.61	163.351	
19,000.00	7,173.00	6,650.00	6,537.51	191.50	28.29	-76.38	-1,097.98	-477.79	11,631.38	11,560.70	70.68	164.568	
19,100.00	7,173.00	6,650.00	6,537.51	193.09	28.29	-76.38	-1,097.98	-477.79	11,728.67	11,657.92	70.75	165.783	
19,200.00	7,173.00	6,650.00	6,537.51	194.67	28.29	-76.38	-1,097.98	-477.79	11,826.01	11,755.20	70.82	166.995	
19,249.41	7,173.00	6,650.00	6,537.51	195.45	28.29	-76.38	-1,097.98	-477.79	11,874.13	11,803.28	70.85	167.593	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 834H - OH - Plan #4													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 290-B001Mb_MWD+HRGM							Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,300.00	7,173.00	6,650.00	6,537.51	196.25	28.29	-76.38	-1,097.98	-477.79	11,923.40	11,852.51	70.89	168.205		
19,384.41	7,173.00	6,650.00	6,537.51	197.34	28.29	-76.38	-1,097.98	-477.79	12,005.63	11,931.35	74.29	161.607		

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		125-Standard Keeper 104						Rule Assigned:					Offset Well Error:	0.00 usft
Measured Depth	Reference	Measured Depth	Offset	Semi Major Axis	Highside	Offset Wellbore Centre			Distance			Warning		
Depth (usft)	Depth (usft)	Depth (usft)	Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor	
0.00	0.00	0.00	0.00	0.00	0.00	-145.57	-24.76	-16.97	30.01					
125.00	125.00	124.96	124.96	0.06	0.06	169.33	-25.06	-16.67	30.69	30.59	0.10	317.732		
225.00	224.98	225.21	225.21	0.17	0.17	105.15	-25.15	-16.01	31.22	30.95	0.27	117.099		
231.94	231.91	232.13	232.13	0.18	0.18	104.37	-25.13	-15.96	31.22	30.94	0.28	112.945		
319.00	318.92	312.00	311.99	0.28	0.28	98.76	-25.19	-15.45	32.29	31.86	0.43	74.922		
400.00	399.86	312.00	311.99	0.37	0.28	98.76	-25.19	-15.45	93.59	91.05	2.54	36.833 SF		
469.00	468.80	312.00	311.99	0.52	0.28	98.76	-25.19	-15.45	160.25	157.60	2.66	60.318		
500.00	499.78	312.00	311.99	0.61	0.28	116.00	-25.19	-15.45	190.77	188.09	2.68	71.153		
600.00	599.71	312.00	311.99	0.92	0.28	-179.62	-25.19	-15.45	290.07	287.34	2.73	106.181		
700.00	699.55	312.00	311.99	1.26	0.28	-126.98	-25.19	-15.45	389.85	387.08	2.77	140.567		
800.00	799.19	312.00	311.99	1.60	0.28	-77.05	-25.19	-15.45	489.74	486.92	2.81	174.023		
900.00	898.49	312.00	311.99	1.97	0.28	-47.04	-25.19	-15.45	589.58	586.73	2.86	206.362		
1,000.00	997.33	312.00	311.99	2.34	0.28	-32.14	-25.19	-15.45	689.31	686.41	2.90	237.465		
1,100.00	1,095.61	312.00	311.99	2.74	0.28	-23.93	-25.19	-15.45	788.87	785.92	2.95	267.253		
1,196.26	1,189.56	312.00	311.99	3.13	0.28	-19.00	-25.19	-15.45	884.51	881.50	3.00	294.648		
1,200.00	1,193.19	312.00	311.99	3.15	0.28	-19.00	-25.19	-15.45	888.21	885.21	3.00	295.999		
1,300.00	1,290.42	312.00	311.99	3.58	0.28	-19.00	-25.19	-15.45	987.53	984.47	3.06	322.310		
1,400.00	1,387.65	312.00	311.99	4.01	0.28	-19.00	-25.19	-15.45	1,086.97	1,083.84	3.13	347.240		
1,500.00	1,484.87	312.00	311.99	4.45	0.28	-19.00	-25.19	-15.45	1,186.51	1,183.31	3.20	370.776		
1,600.00	1,582.10	312.00	311.99	4.90	0.28	-19.00	-25.19	-15.45	1,286.11	1,282.84	3.27	392.929		
1,700.00	1,679.33	312.00	311.99	5.34	0.28	-19.00	-25.19	-15.45	1,385.78	1,382.43	3.35	413.720		
1,800.00	1,776.55	312.00	311.99	5.79	0.28	-19.00	-25.19	-15.45	1,485.48	1,482.06	3.43	433.183		
1,900.00	1,873.78	312.00	311.99	6.24	0.28	-19.00	-25.19	-15.45	1,585.23	1,581.72	3.51	451.361		
2,000.00	1,971.01	312.00	311.99	6.69	0.28	-19.00	-25.19	-15.45	1,685.01	1,681.41	3.60	468.301		
2,100.00	2,068.23	312.00	311.99	7.15	0.28	-19.00	-25.19	-15.45	1,784.81	1,781.12	3.69	484.053		
2,200.00	2,165.46	312.00	311.99	7.60	0.28	-19.00	-25.19	-15.45	1,884.63	1,880.85	3.78	498.672		
2,300.00	2,262.69	312.00	311.99	8.06	0.28	-19.00	-25.19	-15.45	1,984.47	1,980.59	3.87	512.211		
2,400.00	2,359.91	312.00	311.99	8.51	0.28	-19.00	-25.19	-15.45	2,084.32	2,080.35	3.97	524.726		
2,500.00	2,457.14	312.00	311.99	8.97	0.28	-19.00	-25.19	-15.45	2,184.19	2,180.12	4.07	536.269		
2,600.00	2,554.37	312.00	311.99	9.42	0.28	-19.00	-25.19	-15.45	2,284.07	2,279.90	4.18	546.895		
2,700.00	2,651.59	312.00	311.99	9.88	0.28	-19.00	-25.19	-15.45	2,383.96	2,379.68	4.28	556.655		
2,800.00	2,748.82	312.00	311.99	10.34	0.28	-19.00	-25.19	-15.45	2,483.86	2,479.47	4.39	565.597		
2,900.00	2,846.05	312.00	311.99	10.80	0.28	-19.00	-25.19	-15.45	2,583.77	2,579.26	4.50	573.769		
3,000.00	2,943.27	312.00	311.99	11.25	0.28	-19.00	-25.19	-15.45	2,683.68	2,679.06	4.62	581.217		
3,100.00	3,040.50	312.00	311.99	11.71	0.28	-19.00	-25.19	-15.45	2,783.60	2,778.87	4.73	587.984		
3,200.00	3,137.73	312.00	311.99	12.17	0.28	-19.00	-25.19	-15.45	2,883.53	2,878.67	4.85	594.109		
3,300.00	3,234.95	312.00	311.99	12.63	0.28	-19.00	-25.19	-15.45	2,983.46	2,978.48	4.98	599.633		
3,400.00	3,332.18	312.00	311.99	13.09	0.28	-19.00	-25.19	-15.45	3,083.39	3,078.29	5.10	604.592		
3,500.00	3,429.40	312.00	311.99	13.55	0.28	-19.00	-25.19	-15.45	3,183.33	3,178.10	5.23	609.020		
3,600.00	3,526.63	312.00	311.99	14.00	0.28	-19.00	-25.19	-15.45	3,283.27	3,277.92	5.36	612.950		
3,700.00	3,623.86	312.00	311.99	14.46	0.28	-19.00	-25.19	-15.45	3,383.22	3,377.73	5.49	616.412		
3,800.00	3,721.08	312.00	311.99	14.92	0.28	-19.00	-25.19	-15.45	3,483.17	3,477.55	5.62	619.435		
3,900.00	3,818.31	312.00	311.99	15.38	0.28	-19.00	-25.19	-15.45	3,583.12	3,577.36	5.76	622.047		
4,000.00	3,915.54	312.00	311.99	15.84	0.28	-19.00	-25.19	-15.45	3,683.08	3,677.18	5.90	624.273		
4,100.00	4,012.76	312.00	311.99	16.30	0.28	-19.00	-25.19	-15.45	3,783.03	3,776.99	6.04	626.137		
4,200.00	4,109.99	312.00	311.99	16.76	0.28	-19.00	-25.19	-15.45	3,882.99	3,876.81	6.19	627.662		
4,300.00	4,207.22	312.00	311.99	17.22	0.28	-19.00	-25.19	-15.45	3,982.95	3,976.62	6.33	628.868		
4,400.00	4,304.44	312.00	311.99	17.68	0.28	-19.00	-25.19	-15.45	4,082.92	4,076.43	6.48	629.776		
4,500.00	4,401.67	312.00	311.99	18.14	0.28	-19.00	-25.19	-15.45	4,182.88	4,176.25	6.64	630.404		
4,600.00	4,498.90	312.00	311.99	18.60	0.28	-19.00	-25.19	-15.45	4,282.85	4,276.06	6.79	630.771		
4,700.00	4,596.12	312.00	311.99	19.06	0.28	-19.00	-25.19	-15.45	4,382.82	4,375.87	6.95	630.892		
4,800.00	4,693.35	312.00	311.99	19.52	0.28	-19.00	-25.19	-15.45	4,482.79	4,475.68	7.11	630.784		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor
				(usft)	(usft)			+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		Warning
4,900.00	4,790.58	312.00	311.99	19.98	0.28	-19.00		-25.19	-15.45	4,582.76	4,575.49	7.27	630.460
5,000.00	4,887.80	312.00	311.99	20.44	0.28	-19.00		-25.19	-15.45	4,682.73	4,675.29	7.43	629.936
5,100.00	4,985.03	312.00	311.99	20.90	0.28	-19.00		-25.19	-15.45	4,782.70	4,775.10	7.60	629.223
5,200.00	5,082.26	312.00	311.99	21.36	0.28	-19.00		-25.19	-15.45	4,882.68	4,874.91	7.77	628.334
5,300.00	5,179.48	312.00	311.99	21.82	0.28	-19.00		-25.19	-15.45	4,982.65	4,974.71	7.94	627.281
5,400.00	5,276.71	312.00	311.99	22.27	0.28	-19.00		-25.19	-15.45	5,082.63	5,074.51	8.12	626.074
5,500.00	5,373.94	312.00	311.99	22.73	0.28	-19.00		-25.19	-15.45	5,182.60	5,174.31	8.30	624.724
5,600.00	5,471.16	312.00	311.99	23.19	0.28	-19.00		-25.19	-15.45	5,282.58	5,274.11	8.48	623.241
5,700.00	5,568.39	312.00	311.99	23.65	0.28	-19.00		-25.19	-15.45	5,382.56	5,373.90	8.66	621.633
5,800.00	5,665.62	312.00	311.99	24.11	0.28	-19.00		-25.19	-15.45	5,482.54	5,473.70	8.84	619.908
5,900.00	5,762.84	312.00	311.99	24.57	0.28	-19.00		-25.19	-15.45	5,582.52	5,573.49	9.03	618.076
6,000.00	5,860.07	312.00	311.99	25.03	0.28	-19.00		-25.19	-15.45	5,682.50	5,673.28	9.22	616.144
6,100.00	5,957.30	312.00	311.99	25.50	0.28	-19.00		-25.19	-15.45	5,782.49	5,773.07	9.42	614.118
6,200.00	6,054.52	312.00	311.99	25.96	0.28	-19.00		-25.19	-15.45	5,882.47	5,872.86	9.61	612.006
6,300.00	6,151.75	312.00	311.99	26.42	0.28	-19.00		-25.19	-15.45	5,982.45	5,972.64	9.81	609.814
6,400.00	6,248.98	312.00	311.99	26.88	0.28	-19.00		-25.19	-15.45	6,082.43	6,072.42	10.01	607.548
6,500.00	6,346.20	312.00	311.99	27.34	0.28	-19.00		-25.19	-15.45	6,182.42	6,172.20	10.22	605.214
6,600.00	6,443.43	312.00	311.99	27.80	0.28	-19.00		-25.19	-15.45	6,282.40	6,271.98	10.42	602.817
6,696.38	6,537.14	312.00	311.99	28.24	0.28	-19.00		-25.19	-15.45	6,378.77	6,368.15	10.62	600.451
6,700.00	6,540.66	312.00	311.99	28.26	0.28	-34.45		-25.19	-15.45	6,382.39	6,371.76	10.63	600.362
6,750.00	6,589.27	312.00	311.99	28.48	0.28	-65.77		-25.19	-15.45	6,432.31	6,421.57	10.74	599.171
6,800.00	6,637.66	312.00	311.99	28.71	0.28	-54.74		-25.19	-15.45	6,481.89	6,471.05	10.84	598.108
6,850.00	6,685.53	312.00	311.99	28.92	0.28	-44.42		-25.19	-15.45	6,530.84	6,519.90	10.94	597.203
6,900.00	6,732.60	312.00	311.99	29.13	0.28	-36.64		-25.19	-15.45	6,578.87	6,567.84	11.03	596.447
6,950.00	6,778.56	312.00	311.99	29.32	0.28	-30.96		-25.19	-15.45	6,625.71	6,614.59	11.12	595.823
7,000.00	6,823.13	312.00	311.99	29.51	0.28	-26.76		-25.19	-15.45	6,671.09	6,659.89	11.21	595.309
7,050.00	6,866.05	312.00	311.99	29.68	0.28	-23.60		-25.19	-15.45	6,714.78	6,703.49	11.29	594.869
7,100.00	6,907.04	312.00	311.99	29.85	0.28	-21.17		-25.19	-15.45	6,756.53	6,745.17	11.37	594.456
7,150.00	6,945.85	312.00	311.99	30.01	0.28	-19.27		-25.19	-15.45	6,796.13	6,784.69	11.44	594.013
7,200.00	6,982.24	312.00	311.99	30.15	0.28	-17.76		-25.19	-15.45	6,833.37	6,821.86	11.51	593.466
7,250.00	7,016.00	312.00	311.99	30.29	0.28	-16.55		-25.19	-15.45	6,868.07	6,856.48	11.59	592.735
7,300.00	7,046.90	312.00	311.99	30.43	0.28	-15.58		-25.19	-15.45	6,900.04	6,888.38	11.66	591.727
7,350.00	7,074.76	312.00	311.99	30.56	0.28	-14.80		-25.19	-15.45	6,929.14	6,917.40	11.74	590.350
7,400.00	7,099.42	312.00	311.99	30.69	0.28	-14.16		-25.19	-15.45	6,955.21	6,943.39	11.82	588.508
7,450.00	7,120.70	312.00	311.99	30.82	0.28	-13.66		-25.19	-15.45	6,978.13	6,966.23	11.91	586.114
7,500.00	7,138.50	312.00	311.99	30.95	0.28	-13.26		-25.19	-15.45	6,997.80	6,985.80	12.00	583.096
7,550.00	7,152.68	312.00	311.99	31.10	0.28	-12.97		-25.19	-15.45	7,014.12	7,002.02	12.11	579.397
7,600.00	7,163.18	312.00	311.99	31.25	0.28	-12.75		-25.19	-15.45	7,027.01	7,014.79	12.22	574.986
7,650.00	7,169.92	312.00	311.99	31.41	0.28	-12.62		-25.19	-15.45	7,036.41	7,024.07	12.35	569.860
7,700.00	7,172.86	312.00	311.99	31.59	0.28	-12.57		-25.19	-15.45	7,042.28	7,029.80	12.49	564.043
7,713.53	7,173.00	312.00	311.99	31.64	0.28	-12.57		-25.19	-15.45	7,043.26	7,030.74	12.52	562.397
7,800.00	7,173.00	312.00	311.99	31.99	0.28	-12.57		-25.19	-15.45	7,049.20	7,036.40	12.80	550.749
7,900.00	7,173.00	312.00	311.99	32.47	0.28	-12.57		-25.19	-15.45	7,057.38	7,044.22	13.16	536.153
8,000.00	7,173.00	312.00	311.99	33.03	0.28	-12.57		-25.19	-15.45	7,066.98	7,053.41	13.57	520.780
8,100.00	7,173.00	312.00	311.99	33.66	0.28	-12.57		-25.19	-15.45	7,077.97	7,063.95	14.02	505.010
8,200.00	7,173.00	312.00	311.99	34.36	0.28	-12.57		-25.19	-15.45	7,090.35	7,075.85	14.50	489.158
8,300.00	7,173.00	312.00	311.99	35.13	0.28	-12.57		-25.19	-15.45	7,104.12	7,089.12	15.00	473.476
8,400.00	7,173.00	312.00	311.99	35.95	0.28	-12.57		-25.19	-15.45	7,119.27	7,103.73	15.54	458.156
8,500.00	7,173.00	312.00	311.99	36.82	0.28	-12.57		-25.19	-15.45	7,135.79	7,119.69	16.10	443.335
8,600.00	7,173.00	312.00	311.99	37.74	0.28	-12.57		-25.19	-15.45	7,153.66	7,136.99	16.67	429.107
8,700.00	7,173.00	312.00	311.99	38.71	0.28	-12.57		-25.19	-15.45	7,172.89	7,155.63	17.26	415.533
8,800.00	7,173.00	312.00	311.99	39.71	0.28	-12.57		-25.19	-15.45	7,193.46	7,175.59	17.87	402.642

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Semi Major Axis Offset	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
8,900.00	7,173.00	312.00	311.99	40.76	0.28	-12.57	-25.19	-15.45	7,215.35	7,196.87	18.48	390.446	
9,000.00	7,173.00	312.00	311.99	41.84	0.28	-12.57	-25.19	-15.45	7,238.56	7,219.46	19.10	378.940	
9,100.00	7,173.00	312.00	311.99	42.96	0.28	-12.57	-25.19	-15.45	7,263.07	7,243.34	19.73	368.109	
9,200.00	7,173.00	312.00	311.99	44.10	0.28	-12.57	-25.19	-15.45	7,288.87	7,268.51	20.36	357.930	
9,300.00	7,173.00	312.00	311.99	45.27	0.28	-12.57	-25.19	-15.45	7,315.95	7,294.95	21.00	348.376	
9,400.00	7,173.00	312.00	311.99	46.47	0.28	-12.57	-25.19	-15.45	7,344.29	7,322.65	21.64	339.416	
9,500.00	7,173.00	312.00	311.99	47.70	0.28	-12.57	-25.19	-15.45	7,373.88	7,351.60	22.28	331.019	
9,600.00	7,173.00	312.00	311.99	48.94	0.28	-12.57	-25.19	-15.45	7,404.69	7,381.78	22.91	323.153	
9,700.00	7,173.00	312.00	311.99	50.20	0.28	-12.57	-25.19	-15.45	7,436.73	7,413.18	23.55	315.787	
9,800.00	7,173.00	312.00	311.99	51.49	0.28	-12.57	-25.19	-15.45	7,469.97	7,445.78	24.18	308.890	
9,900.00	7,173.00	312.00	311.99	52.79	0.28	-12.57	-25.19	-15.45	7,504.39	7,479.58	24.81	302.433	
10,000.00	7,173.00	312.00	311.99	54.11	0.28	-12.57	-25.19	-15.45	7,539.98	7,514.54	25.44	296.388	
10,100.00	7,173.00	312.00	311.99	55.44	0.28	-12.57	-25.19	-15.45	7,576.73	7,550.67	26.06	290.729	
10,200.00	7,173.00	312.00	311.99	56.78	0.28	-12.57	-25.19	-15.45	7,614.61	7,587.93	26.68	285.431	
10,300.00	7,173.00	312.00	311.99	58.14	0.28	-12.57	-25.19	-15.45	7,653.61	7,626.32	27.29	280.471	
10,400.00	7,173.00	312.00	311.99	59.51	0.28	-12.57	-25.19	-15.45	7,693.71	7,665.82	27.89	275.827	
10,500.00	7,173.00	312.00	311.99	60.90	0.28	-12.57	-25.19	-15.45	7,734.90	7,706.41	28.49	271.480	
10,600.00	7,173.00	312.00	311.99	62.29	0.28	-12.57	-25.19	-15.45	7,777.15	7,748.07	29.08	267.409	
10,700.00	7,173.00	312.00	311.99	63.69	0.28	-12.57	-25.19	-15.45	7,820.46	7,790.79	29.67	263.599	
10,800.00	7,173.00	312.00	311.99	65.11	0.28	-12.57	-25.19	-15.45	7,864.80	7,834.55	30.25	260.033	
10,900.00	7,173.00	312.00	311.99	66.53	0.28	-12.57	-25.19	-15.45	7,910.15	7,879.33	30.82	256.695	
11,000.00	7,173.00	312.00	311.99	67.96	0.28	-12.57	-25.19	-15.45	7,956.50	7,925.12	31.38	253.572	
11,100.00	7,173.00	312.00	311.99	69.39	0.28	-12.57	-25.19	-15.45	8,003.84	7,971.90	31.93	250.650	
11,200.00	7,173.00	312.00	311.99	70.84	0.28	-12.57	-25.19	-15.45	8,052.13	8,019.65	32.48	247.919	
11,300.00	7,173.00	312.00	311.99	72.29	0.28	-12.57	-25.19	-15.45	8,101.38	8,068.36	33.02	245.365	
11,400.00	7,173.00	312.00	311.99	73.74	0.28	-12.57	-25.19	-15.45	8,151.55	8,118.00	33.55	242.980	
11,500.00	7,173.00	312.00	311.99	75.21	0.28	-12.57	-25.19	-15.45	8,202.63	8,168.56	34.07	240.754	
11,600.00	7,173.00	312.00	311.99	76.68	0.28	-12.57	-25.19	-15.45	8,254.62	8,220.03	34.58	238.677	
11,700.00	7,173.00	312.00	311.99	78.15	0.28	-12.57	-25.19	-15.45	8,307.47	8,272.38	35.09	236.740	
11,800.00	7,173.00	312.00	311.99	79.63	0.28	-12.57	-25.19	-15.45	8,361.20	8,325.61	35.59	234.937	
11,900.00	7,173.00	312.00	311.99	81.11	0.28	-12.57	-25.19	-15.45	8,415.76	8,379.68	36.08	233.260	
12,000.00	7,173.00	312.00	311.99	82.60	0.28	-12.57	-25.19	-15.45	8,471.16	8,434.60	36.56	231.702	
12,100.00	7,173.00	312.00	311.99	84.09	0.28	-12.57	-25.19	-15.45	8,527.37	8,490.33	37.03	230.257	
12,200.00	7,173.00	312.00	311.99	85.59	0.28	-12.57	-25.19	-15.45	8,584.37	8,546.87	37.50	228.918	
12,300.00	7,173.00	312.00	311.99	87.09	0.28	-12.57	-25.19	-15.45	8,642.16	8,604.20	37.96	227.681	
12,400.00	7,173.00	312.00	311.99	88.59	0.28	-12.57	-25.19	-15.45	8,700.71	8,662.30	38.41	226.540	
12,500.00	7,173.00	312.00	311.99	90.10	0.28	-12.57	-25.19	-15.45	8,760.01	8,721.16	38.85	225.490	
12,600.00	7,173.00	312.00	311.99	91.61	0.28	-12.57	-25.19	-15.45	8,820.05	8,780.77	39.28	224.526	
12,700.00	7,173.00	312.00	311.99	93.13	0.28	-12.57	-25.19	-15.45	8,880.81	8,841.10	39.71	223.645	
12,800.00	7,173.00	312.00	311.99	94.64	0.28	-12.57	-25.19	-15.45	8,942.27	8,902.14	40.13	222.842	
12,900.00	7,173.00	312.00	311.99	96.16	0.28	-12.57	-25.19	-15.45	9,004.42	8,963.88	40.54	222.114	
13,000.00	7,173.00	312.00	311.99	97.69	0.28	-12.57	-25.19	-15.45	9,067.25	9,026.31	40.94	221.457	
13,100.00	7,173.00	312.00	311.99	99.21	0.28	-12.57	-25.19	-15.45	9,130.75	9,089.41	41.34	220.867	
13,200.00	7,173.00	312.00	311.99	100.74	0.28	-12.57	-25.19	-15.45	9,194.89	9,153.16	41.73	220.341	
13,300.00	7,173.00	312.00	311.99	102.27	0.28	-12.57	-25.19	-15.45	9,259.67	9,217.56	42.11	219.877	
13,400.00	7,173.00	312.00	311.99	103.80	0.28	-12.57	-25.19	-15.45	9,325.07	9,282.58	42.49	219.472	
13,500.00	7,173.00	312.00	311.99	105.33	0.28	-12.57	-25.19	-15.45	9,391.08	9,348.22	42.86	219.122	
13,600.00	7,173.00	312.00	311.99	106.87	0.28	-12.57	-25.19	-15.45	9,457.69	9,414.47	43.22	218.826	
13,700.00	7,173.00	312.00	311.99	108.41	0.28	-12.57	-25.19	-15.45	9,524.88	9,481.30	43.58	218.582	
13,800.00	7,173.00	312.00	311.99	109.95	0.28	-12.57	-25.19	-15.45	9,592.64	9,548.72	43.93	218.386	
13,900.00	7,173.00	312.00	311.99	111.49	0.28	-12.57	-25.19	-15.45	9,660.97	9,616.70	44.27	218.236	
14,000.00	7,173.00	312.00	311.99	113.03	0.28	-12.57	-25.19	-15.45	9,729.84	9,685.23	44.61	218.132	

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104												Offset Well Error:	0.00 usft
Rule Assigned:													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
				Reference	Offset		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
14,100.00	7,173.00	312.00	311.99	114.58	0.28	-12.57	-25.19	-15.45	9,799.24	9,754.31	44.94	218.070	
14,200.00	7,173.00	312.00	311.99	116.13	0.28	-12.57	-25.19	-15.45	9,869.18	9,823.91	45.26	218.050	
14,300.00	7,173.00	312.00	311.99	117.68	0.28	-12.57	-25.19	-15.45	9,939.62	9,894.04	45.58	218.068	
14,400.00	7,173.00	312.00	311.99	119.23	0.28	-12.57	-25.19	-15.45	10,010.57	9,964.68	45.89	218.125	
14,500.00	7,173.00	312.00	311.99	120.78	0.28	-12.57	-25.19	-15.45	10,082.01	10,035.81	46.20	218.217	
14,600.00	7,173.00	312.00	311.99	122.33	0.28	-12.57	-25.19	-15.45	10,153.94	10,107.43	46.50	218.345	
14,700.00	7,173.00	312.00	311.99	123.88	0.28	-12.57	-25.19	-15.45	10,226.33	10,179.53	46.80	218.505	
14,800.00	7,173.00	312.00	311.99	125.44	0.28	-12.57	-25.19	-15.45	10,299.19	10,252.10	47.09	218.697	
14,900.00	7,173.00	312.00	311.99	127.00	0.28	-12.57	-25.19	-15.45	10,372.50	10,325.12	47.38	218.921	
15,000.00	7,173.00	312.00	311.99	128.55	0.28	-12.57	-25.19	-15.45	10,446.26	10,398.60	47.66	219.173	
15,100.00	7,173.00	312.00	311.99	130.11	0.28	-12.57	-25.19	-15.45	10,520.44	10,472.51	47.94	219.454	
15,200.00	7,173.00	312.00	311.99	131.67	0.28	-12.57	-25.19	-15.45	10,595.06	10,546.84	48.21	219.762	
15,300.00	7,173.00	312.00	311.99	133.23	0.28	-12.57	-25.19	-15.45	10,670.08	10,621.60	48.48	220.096	
15,400.00	7,173.00	312.00	311.99	134.80	0.28	-12.57	-25.19	-15.45	10,745.52	10,696.77	48.74	220.455	
15,500.00	7,173.00	312.00	311.99	136.36	0.28	-12.57	-25.19	-15.45	10,821.35	10,772.35	49.00	220.839	
15,600.00	7,173.00	312.00	311.99	137.92	0.28	-12.57	-25.19	-15.45	10,897.57	10,848.32	49.26	221.245	
15,700.00	7,173.00	312.00	311.99	139.49	0.28	-12.57	-25.19	-15.45	10,974.17	10,924.67	49.51	221.674	
15,800.00	7,173.00	312.00	311.99	141.05	0.28	-12.57	-25.19	-15.45	11,051.15	11,001.40	49.75	222.125	
15,900.00	7,173.00	312.00	311.99	142.62	0.28	-12.57	-25.19	-15.45	11,128.50	11,078.50	49.99	222.596	
16,000.00	7,173.00	312.00	311.99	144.19	0.28	-12.57	-25.19	-15.45	11,206.20	11,155.97	50.23	223.087	
16,100.00	7,173.00	312.00	311.99	145.76	0.28	-12.57	-25.19	-15.45	11,284.25	11,233.79	50.47	223.598	
16,200.00	7,173.00	312.00	311.99	147.33	0.28	-12.57	-25.19	-15.45	11,362.65	11,311.95	50.70	224.127	
16,300.00	7,173.00	312.00	311.99	148.90	0.28	-12.57	-25.19	-15.45	11,441.38	11,390.46	50.92	224.673	
16,400.00	7,173.00	312.00	311.99	150.47	0.28	-12.57	-25.19	-15.45	11,520.45	11,469.30	51.15	225.237	
16,500.00	7,173.00	312.00	311.99	152.04	0.28	-12.57	-25.19	-15.45	11,599.84	11,548.47	51.37	225.818	
16,600.00	7,173.00	312.00	311.99	153.61	0.28	-12.57	-25.19	-15.45	11,679.54	11,627.95	51.58	226.414	
16,700.00	7,173.00	312.00	311.99	155.18	0.28	-12.57	-25.19	-15.45	11,759.55	11,707.76	51.80	227.026	
16,800.00	7,173.00	312.00	311.99	156.76	0.28	-12.57	-25.19	-15.45	11,839.87	11,787.86	52.01	227.653	
16,900.00	7,173.00	312.00	311.99	158.33	0.28	-12.57	-25.19	-15.45	11,920.49	11,868.27	52.22	228.293	
17,000.00	7,173.00	312.00	311.99	159.90	0.28	-12.57	-25.19	-15.45	12,001.40	11,948.98	52.42	228.948	
17,100.00	7,173.00	312.00	311.99	161.48	0.28	-12.57	-25.19	-15.45	12,082.59	12,029.97	52.62	229.616	
17,200.00	7,173.00	312.00	311.99	163.06	0.28	-12.57	-25.19	-15.45	12,164.06	12,111.24	52.82	230.296	
17,300.00	7,173.00	312.00	311.99	164.63	0.28	-12.57	-25.19	-15.45	12,245.81	12,192.80	53.01	230.989	
17,400.00	7,173.00	312.00	311.99	166.21	0.28	-12.57	-25.19	-15.45	12,327.83	12,274.62	53.21	231.694	
17,500.00	7,173.00	312.00	311.99	167.79	0.28	-12.57	-25.19	-15.45	12,410.11	12,356.71	53.40	232.411	
17,600.00	7,173.00	312.00	311.99	169.36	0.28	-12.57	-25.19	-15.45	12,492.65	12,439.06	53.58	233.138	
17,700.00	7,173.00	312.00	311.99	170.94	0.28	-12.57	-25.19	-15.45	12,575.44	12,521.67	53.77	233.876	
17,800.00	7,173.00	312.00	311.99	172.52	0.28	-12.57	-25.19	-15.45	12,658.48	12,604.53	53.95	234.624	
17,900.00	7,173.00	312.00	311.99	174.10	0.28	-12.57	-25.19	-15.45	12,741.77	12,687.63	54.13	235.382	
18,000.00	7,173.00	312.00	311.99	175.68	0.28	-12.57	-25.19	-15.45	12,825.29	12,770.98	54.31	236.150	
18,100.00	7,173.00	312.00	311.99	177.26	0.28	-12.57	-25.19	-15.45	12,909.05	12,854.56	54.49	236.927	
18,200.00	7,173.00	312.00	311.99	178.84	0.28	-12.57	-25.19	-15.45	12,993.04	12,938.38	54.66	237.712	
18,300.00	7,173.00	312.00	311.99	180.42	0.28	-12.57	-25.19	-15.45	13,077.25	13,022.42	54.83	238.507	
18,400.00	7,173.00	312.00	311.99	182.00	0.28	-12.57	-25.19	-15.45	13,161.68	13,106.69	55.00	239.309	
18,500.00	7,173.00	312.00	311.99	183.59	0.28	-12.57	-25.19	-15.45	13,246.33	13,191.17	55.17	240.120	
18,600.00	7,173.00	312.00	311.99	185.17	0.28	-12.57	-25.19	-15.45	13,331.20	13,275.87	55.33	240.938	
18,700.00	7,173.00	312.00	311.99	186.75	0.28	-12.57	-25.19	-15.45	13,416.27	13,360.78	55.49	241.763	
18,800.00	7,173.00	312.00	311.99	188.33	0.28	-12.57	-25.19	-15.45	13,501.55	13,445.89	55.65	242.595	
18,900.00	7,173.00	312.00	311.99	189.92	0.28	-12.57	-25.19	-15.45	13,587.02	13,531.21	55.81	243.435	
19,000.00	7,173.00	312.00	311.99	191.50	0.28	-12.57	-25.19	-15.45	13,672.70	13,616.73	55.97	244.281	
19,100.00	7,173.00	312.00	311.99	193.09	0.28	-12.57	-25.19	-15.45	13,758.57	13,702.44	56.13	245.133	
19,200.00	7,173.00	312.00	311.99	194.67	0.28	-12.57	-25.19	-15.45	13,844.62	13,788.34	56.28	245.991	

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104							Rule Assigned:						Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
19,249.41	7,173.00	312.00	311.99	195.45	0.28	-12.57	-25.19	-15.45	13,887.22	13,830.86	56.36	246.417		
19,300.00	7,173.00	312.00	311.99	196.25	0.28	-12.57	-25.19	-15.45	13,930.87	13,874.43	56.43	246.855		
19,384.41	7,173.00	312.00	311.99	197.34	0.28	-12.57	-25.19	-15.45	14,003.81	13,946.42	57.39	244.020		

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - Plan #4													Offset Site Error:	0.00 usft	
Survey Program:		125-Standard Keeper 104, 312-B001Mb_MWD+HRGM										Rule Assigned:		Offset Well Error:	0.00 usft
Measured Depth	Vertical	Measured	Vertical	Reference	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Depth (usft)	Depth (usft)	Depth (usft)	Depth (usft)	(usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	-145.57	-24.76	-16.97	30.01						
125.00	125.00	124.96	124.96	0.06	0.06	169.33	-25.06	-16.67	30.69	30.59	0.10	317.732			
225.00	224.98	225.21	225.21	0.17	0.17	105.15	-25.15	-16.01	31.22	30.95	0.27	117.099			
319.00	318.92	318.93	318.92	0.28	0.28	99.18	-25.22	-15.41	31.54	31.12	0.42	75.313			
400.00	399.86	399.88	399.87	0.37	0.37	104.02	-25.55	-15.03	32.17	31.60	0.58	55.886			
469.00	468.80	468.79	468.78	0.52	0.52	107.98	-25.83	-14.71	32.90	31.95	0.95	34.669			
500.00	499.78	499.53	499.52	0.61	0.61	124.76	-25.92	-14.80	33.54	32.40	1.14	29.311			
600.00	599.71	598.45	598.40	0.92	0.92	-179.06	-25.91	-17.30	38.82	37.01	1.81	21.448			
700.00	699.55	696.79	696.56	1.26	1.25	-152.41	-25.44	-23.14	48.80	46.30	2.50	19.526			
800.00	799.19	795.86	795.34	1.60	1.60	-142.31	-24.72	-30.80	62.07	58.88	3.19	19.440 SF			
900.00	898.49	894.67	893.84	1.97	1.95	-139.19	-24.00	-38.43	77.24	73.34	3.90	19.814			
1,000.00	997.33	993.04	991.92	2.34	2.31	-139.08	-23.29	-46.04	94.54	89.92	4.61	20.487			
1,100.00	1,095.61	1,090.86	1,089.45	2.74	2.67	-140.35	-22.58	-53.60	114.24	108.90	5.34	21.393			
1,196.26	1,189.56	1,184.40	1,182.71	3.13	3.01	-142.13	-21.90	-60.83	135.71	129.67	6.05	22.446			
1,200.00	1,193.19	1,188.02	1,186.31	3.15	3.03	-142.26	-21.87	-61.11	136.60	130.52	6.08	22.475			
1,300.00	1,290.42	1,284.83	1,282.83	3.58	3.39	-145.28	-21.17	-68.59	160.47	153.66	6.81	23.575			
1,400.00	1,387.65	1,381.64	1,379.35	4.01	3.75	-147.51	-20.46	-76.07	184.66	177.12	7.54	24.490			
1,500.00	1,484.87	1,478.45	1,475.87	4.45	4.11	-149.22	-19.76	-83.55	209.05	200.77	8.28	25.259			
1,600.00	1,582.10	1,575.27	1,572.39	4.90	4.47	-150.58	-19.05	-91.04	233.58	224.56	9.01	25.911			
1,700.00	1,679.33	1,672.08	1,668.91	5.34	4.83	-151.68	-18.35	-98.52	258.21	248.45	9.75	26.469			
1,800.00	1,776.55	1,768.89	1,765.43	5.79	5.19	-152.58	-17.64	-106.00	282.91	272.41	10.50	26.952			
1,900.00	1,873.78	1,865.70	1,861.95	6.24	5.56	-153.35	-16.94	-113.48	307.67	296.43	11.24	27.374			
2,000.00	1,971.01	1,962.51	1,958.47	6.69	5.92	-153.99	-16.24	-120.97	332.47	320.49	11.98	27.744			
2,100.00	2,068.23	2,059.32	2,054.99	7.15	6.28	-154.55	-15.53	-128.45	357.31	344.58	12.73	28.073			
2,200.00	2,165.46	2,156.14	2,151.51	7.60	6.64	-155.04	-14.83	-135.93	382.17	368.70	13.47	28.365			
2,300.00	2,262.69	2,252.95	2,248.03	8.06	7.01	-155.46	-14.12	-143.41	407.06	392.84	14.22	28.627			
2,400.00	2,359.91	2,349.76	2,344.55	8.51	7.37	-155.84	-13.42	-150.90	431.97	417.00	14.97	28.863			
2,500.00	2,457.14	2,446.57	2,441.07	8.97	7.73	-156.18	-12.71	-158.38	456.89	441.18	15.71	29.078			
2,600.00	2,554.37	2,543.38	2,537.59	9.42	8.10	-156.48	-12.01	-165.86	481.82	465.36	16.46	29.272			
2,700.00	2,651.59	2,640.20	2,634.11	9.88	8.46	-156.75	-11.31	-173.34	506.77	489.56	17.21	29.450			
2,800.00	2,748.82	2,737.01	2,730.62	10.34	8.82	-157.00	-10.60	-180.83	531.73	513.77	17.96	29.613			
2,900.00	2,846.05	2,833.82	2,827.14	10.80	9.18	-157.22	-9.90	-188.31	556.69	537.99	18.70	29.763			
3,000.00	2,943.27	2,930.63	2,923.66	11.25	9.55	-157.43	-9.19	-195.79	581.66	562.21	19.45	29.902			
3,100.00	3,040.50	3,027.44	3,020.18	11.71	9.91	-157.61	-8.49	-203.27	606.64	586.44	20.20	30.030			
3,200.00	3,137.73	3,124.25	3,116.70	12.17	10.27	-157.79	-7.78	-210.76	631.63	610.68	20.95	30.149			
3,300.00	3,234.95	3,221.07	3,213.22	12.63	10.64	-157.95	-7.08	-218.24	656.62	634.92	21.70	30.260			
3,400.00	3,332.18	3,317.88	3,309.74	13.09	11.00	-158.10	-6.38	-225.72	681.61	659.16	22.45	30.364			
3,500.00	3,429.40	3,414.69	3,406.26	13.55	11.36	-158.23	-5.67	-233.20	706.61	683.41	23.20	30.460			
3,600.00	3,526.63	3,511.50	3,502.78	14.00	11.72	-158.36	-4.97	-240.69	731.61	707.66	23.95	30.551			
3,700.00	3,623.86	3,608.31	3,599.30	14.46	12.09	-158.48	-4.26	-248.17	756.61	731.91	24.70	30.636			
3,800.00	3,721.08	3,705.12	3,695.82	14.92	12.45	-158.59	-3.56	-255.65	781.62	756.17	25.45	30.716			
3,900.00	3,818.31	3,801.94	3,792.34	15.38	12.81	-158.70	-2.85	-263.13	806.63	780.43	26.20	30.791			
4,000.00	3,915.54	3,898.75	3,888.86	15.84	13.18	-158.80	-2.15	-270.62	831.64	804.69	26.95	30.862			
4,100.00	4,012.76	3,995.56	3,985.38	16.30	13.54	-158.89	-1.45	-278.10	856.65	828.96	27.70	30.930			
4,200.00	4,109.99	4,092.37	4,081.90	16.76	13.90	-158.98	-0.74	-285.58	881.67	853.22	28.45	30.993			
4,300.00	4,207.22	4,189.18	4,178.42	17.22	14.27	-159.06	-0.04	-293.06	906.69	877.49	29.20	31.053			
4,400.00	4,304.44	4,286.00	4,274.94	17.68	14.63	-159.14	0.67	-300.55	931.71	901.76	29.95	31.111			
4,500.00	4,401.67	4,382.81	4,371.46	18.14	14.99	-159.22	1.37	-308.03	956.73	926.03	30.70	31.165			
4,600.00	4,498.90	4,479.62	4,467.98	18.60	15.35	-159.29	2.08	-315.51	981.75	950.30	31.45	31.217			
4,700.00	4,596.12	4,576.43	4,564.50	19.06	15.72	-159.35	2.78	-322.99	1,006.78	974.58	32.20	31.266			
4,800.00	4,693.35	4,673.24	4,661.02	19.52	16.08	-159.42	3.48	-330.48	1,031.80	998.85	32.95	31.313			
4,900.00	4,790.58	4,770.05	4,757.54	19.98	16.44	-159.48	4.19	-337.96	1,056.83	1,023.13	33.70	31.358			

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - Plan #4													Offset Site Error: 0.00 usft	
Survey Program:		125-Standard Keeper 104, 312-B001Mb_MWD+HRGM						Rule Assigned:					Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			
5,000.00	4,887.80	4,866.87	4,854.06	20.44	16.81	-159.54	4.89	-345.44	1,081.86	1,047.40	34.45	31.401		
5,100.00	4,985.03	4,963.68	4,950.58	20.90	17.17	-159.59	5.60	-352.92	1,106.89	1,071.68	35.20	31.442		
5,200.00	5,082.26	5,060.49	5,047.09	21.36	17.53	-159.65	6.30	-360.41	1,131.92	1,095.96	35.96	31.481		
5,300.00	5,179.48	5,157.30	5,143.61	21.82	17.90	-159.70	7.01	-367.89	1,156.95	1,120.24	36.71	31.518		
5,400.00	5,276.71	5,254.11	5,240.13	22.27	18.26	-159.74	7.71	-375.37	1,181.98	1,144.52	37.46	31.554		
5,500.00	5,373.94	5,350.92	5,336.65	22.73	18.62	-159.79	8.41	-382.85	1,207.01	1,168.80	38.21	31.589		
5,600.00	5,471.16	5,447.74	5,433.17	23.19	18.99	-159.84	9.12	-390.34	1,232.04	1,193.08	38.96	31.622		
5,700.00	5,568.39	5,544.55	5,529.69	23.65	19.35	-159.88	9.82	-397.82	1,257.08	1,217.36	39.71	31.654		
5,800.00	5,665.62	5,641.36	5,626.21	24.11	19.71	-159.92	10.53	-405.30	1,282.11	1,241.64	40.47	31.684		
5,900.00	5,762.84	5,738.17	5,722.73	24.57	20.08	-159.96	11.23	-412.78	1,307.14	1,265.93	41.22	31.714		
6,000.00	5,860.07	5,834.98	5,819.25	25.03	20.44	-160.00	11.94	-420.27	1,332.18	1,290.21	41.97	31.742		
6,100.00	5,957.30	5,931.79	5,915.77	25.50	20.80	-160.03	12.64	-427.75	1,357.22	1,314.49	42.72	31.769		
6,200.00	6,054.52	6,028.61	6,012.29	25.96	21.16	-160.07	13.34	-435.23	1,382.25	1,338.78	43.47	31.795		
6,300.00	6,151.75	6,125.42	6,108.81	26.42	21.53	-160.10	14.05	-442.71	1,407.29	1,363.06	44.23	31.821		
6,400.00	6,248.98	6,222.23	6,205.33	26.88	21.89	-160.14	14.75	-450.20	1,432.33	1,387.35	44.98	31.845		
6,500.00	6,346.20	6,319.04	6,301.85	27.34	22.25	-160.17	15.46	-457.68	1,457.36	1,411.63	45.73	31.869		
6,600.00	6,443.43	6,415.85	6,398.37	27.80	22.62	-160.20	16.16	-465.16	1,482.40	1,435.92	46.48	31.892		
6,696.38	6,537.14	7,617.78	7,161.02	28.24	28.11	171.62	19.96	239.22	1,462.06	1,411.84	50.22	29.114		
6,700.00	6,540.66	7,617.90	7,161.02	28.26	28.11	172.90	19.96	239.35	1,461.32	1,411.05	50.27	29.071		
6,750.00	6,589.27	7,617.51	7,161.02	28.48	28.11	-169.38	19.96	238.96	1,452.05	1,401.15	50.90	28.528		
6,800.00	6,637.66	7,613.21	7,161.02	28.71	28.06	-153.82	19.97	234.65	1,444.64	1,393.19	51.44	28.082		
6,850.00	6,685.53	7,605.01	7,161.01	28.92	27.96	-141.86	19.99	226.45	1,439.13	1,387.23	51.89	27.733		
6,900.00	6,732.60	7,592.97	7,161.01	29.13	27.84	-133.00	20.02	214.42	1,435.50	1,383.25	52.25	27.473		
6,950.00	6,778.56	7,577.17	7,161.01	29.32	27.68	-126.31	20.05	198.61	1,433.71	1,381.19	52.52	27.299		
6,976.89	6,802.72	7,567.15	7,161.01	29.42	27.57	-123.33	20.08	188.59	1,433.47	1,380.84	52.62	27.240		
7,000.00	6,823.13	7,557.70	7,161.00	29.51	27.48	-121.03	20.10	179.14	1,433.64	1,380.95	52.69	27.208		
7,050.00	6,866.05	7,528.72	7,160.86	29.68	27.20	-116.44	20.16	150.16	1,435.14	1,382.42	52.72	27.223		
7,100.00	6,907.04	7,487.41	7,158.65	29.85	26.82	-112.13	20.24	108.92	1,437.81	1,385.22	52.60	27.337		
7,150.00	6,945.85	7,449.11	7,154.21	30.01	26.48	-108.42	20.30	70.89	1,441.50	1,389.03	52.47	27.471		
7,200.00	6,982.24	7,413.02	7,147.95	30.15	26.19	-105.15	20.34	35.35	1,446.11	1,393.75	52.35	27.621		
7,250.00	7,016.00	7,378.59	7,140.10	30.29	25.93	-102.21	20.36	1.83	1,451.51	1,399.29	52.23	27.793		
7,300.00	7,046.90	7,345.44	7,130.85	30.43	25.70	-99.53	20.37	-30.00	1,457.60	1,405.52	52.08	27.987		
7,350.00	7,074.76	7,313.31	7,120.31	30.56	25.49	-97.06	20.36	-60.35	1,464.25	1,412.32	51.93	28.194		
7,400.00	7,099.42	7,282.01	7,108.58	30.69	25.31	-94.77	20.35	-89.37	1,471.34	1,419.56	51.78	28.416		
7,450.00	7,120.70	7,250.00	7,095.13	30.82	25.13	-92.60	20.32	-118.41	1,478.73	1,427.12	51.61	28.654		
7,500.00	7,138.50	7,221.31	7,081.84	30.95	24.99	-90.66	20.28	-143.84	1,486.31	1,434.85	51.46	28.882		
7,550.00	7,152.68	7,191.72	7,066.96	31.10	24.86	-88.82	20.23	-169.41	1,493.95	1,442.65	51.30	29.121		
7,600.00	7,163.18	7,162.54	7,051.13	31.25	24.74	-87.14	20.18	-193.91	1,501.54	1,450.39	51.15	29.354		
7,650.00	7,169.92	7,133.72	7,034.41	31.41	24.63	-85.59	20.11	-217.39	1,508.96	1,457.95	51.01	29.581		
7,700.00	7,172.86	7,100.00	7,013.53	31.59	24.51	-84.07	20.03	-243.86	1,516.13	1,465.28	50.84	29.820		
7,713.53	7,173.00	7,100.00	7,013.53	31.64	24.51	-83.91	20.03	-243.86	1,517.99	1,467.13	50.86	29.848		
7,800.00	7,173.00	7,050.00	6,980.05	31.99	24.36	-82.65	19.87	-280.98	1,531.28	1,480.64	50.64	30.239		
7,900.00	7,173.00	7,000.00	6,943.76	32.47	24.22	-81.30	19.70	-315.36	1,550.42	1,499.99	50.43	30.744		
8,000.00	7,173.00	6,965.95	6,917.56	33.03	24.14	-80.33	19.56	-337.09	1,573.85	1,523.52	50.32	31.274		
8,100.00	7,173.00	6,931.73	6,890.09	33.66	24.06	-79.32	19.41	-357.50	1,601.77	1,551.56	50.21	31.902		
8,200.00	7,173.00	6,900.00	6,863.68	34.36	23.99	-78.36	19.26	-375.07	1,634.23	1,584.12	50.11	32.615		
8,300.00	7,173.00	6,876.18	6,843.29	35.13	23.93	-77.62	19.15	-387.38	1,671.15	1,621.08	50.06	33.380		
8,400.00	7,173.00	6,850.00	6,820.37	35.95	23.87	-76.80	19.01	-400.03	1,712.42	1,662.42	50.00	34.249		
8,500.00	7,173.00	6,833.49	6,805.65	36.82	23.84	-76.27	18.93	-407.52	1,757.83	1,707.81	50.02	35.145		
8,600.00	7,173.00	6,815.74	6,789.63	37.74	23.80	-75.70	18.83	-415.13	1,807.18	1,757.16	50.02	36.128		
8,700.00	7,173.00	6,800.00	6,775.24	38.71	23.76	-75.19	18.74	-421.51	1,860.23	1,810.18	50.04	37.173		
8,800.00	7,173.00	6,800.00	6,775.24	39.71	23.76	-75.19	18.74	-421.51	1,916.87	1,866.67	50.19	38.190		

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - Plan #4													Offset Site Error: 0.00 usft	
Survey Program: Reference		125-Standard Keeper 104, 312-B001Mb_MWD+HRGM						Rule Assigned:					Offset Well Error: 0.00 usft	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,900.00	7,173.00	6,773.00	6,750.20	40.76	23.70	-74.31	18.59	-431.63	1,976.40	1,926.29	50.11	39.438		
9,000.00	7,173.00	6,750.00	6,728.56	41.84	23.65	-73.55	18.45	-439.39	2,039.14	1,989.07	50.07	40.727		
9,100.00	7,173.00	6,750.00	6,728.56	42.96	23.65	-73.55	18.45	-439.39	2,104.39	2,054.18	50.21	41.912		
9,200.00	7,173.00	6,750.00	6,728.56	44.10	23.65	-73.55	18.45	-439.39	2,172.28	2,121.94	50.34	43.151		
9,300.00	7,173.00	6,750.00	6,728.56	45.27	23.65	-73.55	18.45	-439.39	2,242.58	2,192.12	50.46	44.440		
9,400.00	7,173.00	6,724.65	6,704.39	46.47	23.58	-72.71	18.30	-447.04	2,314.56	2,264.16	50.39	45.929		
9,500.00	7,173.00	6,700.00	6,680.62	47.70	23.52	-71.90	18.14	-453.55	2,388.92	2,338.59	50.33	47.464		
9,600.00	7,173.00	6,700.00	6,680.62	48.94	23.52	-71.90	18.14	-453.55	2,464.64	2,414.20	50.45	48.857		
9,700.00	7,173.00	6,700.00	6,680.62	50.20	23.52	-71.90	18.14	-453.55	2,542.05	2,491.49	50.55	50.285		
9,800.00	7,173.00	6,700.00	6,680.62	51.49	23.52	-71.90	18.14	-453.55	2,620.98	2,570.33	50.65	51.744		
9,900.00	7,173.00	6,700.00	6,680.62	52.79	23.52	-71.90	18.14	-453.55	2,701.31	2,650.56	50.75	53.231		
10,000.00	7,173.00	6,700.00	6,680.62	54.11	23.52	-71.90	18.14	-453.55	2,782.91	2,732.08	50.84	54.744		
10,100.00	7,173.00	6,700.00	6,680.62	55.44	23.52	-71.90	18.14	-453.55	2,865.68	2,814.77	50.92	56.279		
10,200.00	7,173.00	6,678.38	6,659.57	56.78	23.47	-71.18	18.00	-458.50	2,949.14	2,898.26	50.88	57.968		
10,300.00	7,173.00	6,674.17	6,655.46	58.14	23.46	-71.04	17.98	-459.38	3,033.79	2,982.85	50.93	59.566		
10,400.00	7,173.00	6,670.22	6,651.58	59.51	23.44	-70.91	17.95	-460.18	3,119.32	3,068.33	50.99	61.179		
10,500.00	7,173.00	6,650.00	6,631.72	60.90	23.39	-70.24	17.82	-463.91	3,205.89	3,154.94	50.95	62.918		
10,600.00	7,173.00	6,650.00	6,631.72	62.29	23.39	-70.24	17.82	-463.91	3,292.90	3,241.87	51.03	64.531		
10,700.00	7,173.00	6,650.00	6,631.72	63.69	23.39	-70.24	17.82	-463.91	3,380.63	3,329.53	51.10	66.158		
10,800.00	7,173.00	6,650.00	6,631.72	65.11	23.39	-70.24	17.82	-463.91	3,469.03	3,417.86	51.17	67.796		
10,900.00	7,173.00	6,650.00	6,631.72	66.53	23.39	-70.24	17.82	-463.91	3,558.04	3,506.80	51.24	69.445		
11,000.00	7,173.00	6,650.00	6,631.72	67.96	23.39	-70.24	17.82	-463.91	3,647.61	3,596.31	51.30	71.103		
11,100.00	7,173.00	6,650.00	6,631.72	69.39	23.39	-70.24	17.82	-463.91	3,737.72	3,686.36	51.36	72.770		
11,200.00	7,173.00	6,650.00	6,631.72	70.84	23.39	-70.24	17.82	-463.91	3,828.32	3,776.89	51.43	74.445		
11,300.00	7,173.00	6,650.00	6,631.72	72.29	23.39	-70.24	17.82	-463.91	3,919.37	3,867.89	51.49	76.126		
11,400.00	7,173.00	6,650.00	6,631.72	73.74	23.39	-70.24	17.82	-463.91	4,010.86	3,959.31	51.54	77.813		
11,500.00	7,173.00	6,650.00	6,631.72	75.21	23.39	-70.24	17.82	-463.91	4,102.73	4,051.13	51.60	79.506		
11,600.00	7,173.00	6,650.00	6,631.72	76.68	23.39	-70.24	17.82	-463.91	4,194.99	4,143.33	51.66	81.204		
11,700.00	7,173.00	6,650.00	6,631.72	78.15	23.39	-70.24	17.82	-463.91	4,287.58	4,235.87	51.72	82.905		
11,800.00	7,173.00	6,650.00	6,631.72	79.63	23.39	-70.24	17.82	-463.91	4,380.51	4,328.73	51.77	84.610		
11,900.00	7,173.00	6,650.00	6,631.72	81.11	23.39	-70.24	17.82	-463.91	4,473.74	4,421.91	51.83	86.318		
12,000.00	7,173.00	6,650.00	6,631.72	82.60	23.39	-70.24	17.82	-463.91	4,567.25	4,515.37	51.88	88.029		
12,100.00	7,173.00	6,626.87	6,608.85	84.09	23.33	-69.48	17.66	-467.39	4,660.59	4,608.73	51.85	89.880		
12,200.00	7,173.00	6,625.21	6,607.21	85.59	23.32	-69.43	17.65	-467.61	4,754.56	4,702.65	51.90	91.604		
12,300.00	7,173.00	6,623.62	6,605.63	87.09	23.32	-69.37	17.64	-467.82	4,848.77	4,796.81	51.95	93.328		
12,400.00	7,173.00	6,622.08	6,604.10	88.59	23.31	-69.32	17.63	-468.01	4,943.20	4,891.19	52.00	95.053		
12,500.00	7,173.00	6,600.00	6,582.15	90.10	23.25	-68.60	17.48	-470.40	5,038.20	4,986.21	51.98	96.919		
12,600.00	7,173.00	6,600.00	6,582.15	91.61	23.25	-68.60	17.48	-470.40	5,132.99	5,080.95	52.04	98.633		
12,700.00	7,173.00	6,600.00	6,582.15	93.13	23.25	-68.60	17.48	-470.40	5,227.98	5,175.88	52.10	100.348		
12,800.00	7,173.00	6,600.00	6,582.15	94.64	23.25	-68.60	17.48	-470.40	5,323.15	5,271.00	52.16	102.062		
12,900.00	7,173.00	6,600.00	6,582.15	96.16	23.25	-68.60	17.48	-470.40	5,418.50	5,366.28	52.21	103.776		
13,000.00	7,173.00	6,600.00	6,582.15	97.69	23.25	-68.60	17.48	-470.40	5,514.01	5,461.74	52.27	105.488		
13,100.00	7,173.00	6,600.00	6,582.15	99.21	23.25	-68.60	17.48	-470.40	5,609.68	5,557.35	52.33	107.200		
13,200.00	7,173.00	6,600.00	6,582.15	100.74	23.25	-68.60	17.48	-470.40	5,705.49	5,653.11	52.39	108.910		
13,300.00	7,173.00	6,600.00	6,582.15	102.27	23.25	-68.60	17.48	-470.40	5,801.45	5,749.00	52.45	110.619		
13,400.00	7,173.00	6,600.00	6,582.15	103.80	23.25	-68.60	17.48	-470.40	5,897.54	5,845.04	52.50	112.326		
13,500.00	7,173.00	6,600.00	6,582.15	105.33	23.25	-68.60	17.48	-470.40	5,993.76	5,941.20	52.56	114.031		
13,600.00	7,173.00	6,600.00	6,582.15	106.87	23.25	-68.60	17.48	-470.40	6,090.10	6,037.48	52.62	115.734		
13,700.00	7,173.00	6,600.00	6,582.15	108.41	23.25	-68.60	17.48	-470.40	6,186.56	6,133.88	52.68	117.435		
13,800.00	7,173.00	6,600.00	6,582.15	109.95	23.25	-68.60	17.48	-470.40	6,283.13	6,230.39	52.74	119.133		
13,900.00	7,173.00	6,600.00	6,582.15	111.49	23.25	-68.60	17.48	-470.40	6,379.80	6,327.00	52.80	120.828		
14,000.00	7,173.00	6,600.00	6,582.15	113.03	23.25	-68.60	17.48	-470.40	6,476.58	6,423.72	52.86	122.520		

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

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - Plan #4											Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 312-B001Mb_MWD+HRGM											Offset Well Error:	0.00 usft
Rule Assigned:												
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance Between Centres (usft)		Minimum Separation (usft)	Separation Factor
							+N/-S (usft)	+E/-W (usft)	Between Ellipses (usft)			Warning
14,100.00	7,173.00	6,600.00	6,582.15	114.58	23.25	-68.60	17.48	-470.40	6,573.45	6,520.53	52.92	124.210
14,200.00	7,173.00	6,600.00	6,582.15	116.13	23.25	-68.60	17.48	-470.40	6,670.41	6,617.43	52.98	125.896
14,300.00	7,173.00	6,600.00	6,582.15	117.68	23.25	-68.60	17.48	-470.40	6,767.47	6,714.42	53.05	127.579
14,400.00	7,173.00	6,600.00	6,582.15	119.23	23.25	-68.60	17.48	-470.40	6,864.60	6,811.49	53.11	129.259
14,500.00	7,173.00	6,600.00	6,582.15	120.78	23.25	-68.60	17.48	-470.40	6,961.82	6,908.65	53.17	130.935
14,600.00	7,173.00	6,600.00	6,582.15	122.33	23.25	-68.60	17.48	-470.40	7,059.12	7,005.88	53.23	132.607
14,700.00	7,173.00	6,600.00	6,582.15	123.88	23.25	-68.60	17.48	-470.40	7,156.49	7,103.19	53.30	134.276
14,800.00	7,173.00	6,600.00	6,582.15	125.44	23.25	-68.60	17.48	-470.40	7,253.93	7,200.57	53.36	135.941
14,900.00	7,173.00	6,600.00	6,582.15	127.00	23.25	-68.60	17.48	-470.40	7,351.44	7,298.01	53.43	137.602
15,000.00	7,173.00	6,600.00	6,582.15	128.55	23.25	-68.60	17.48	-470.40	7,449.01	7,395.52	53.49	139.259
15,100.00	7,173.00	6,600.00	6,582.15	130.11	23.25	-68.60	17.48	-470.40	7,546.65	7,493.10	53.56	140.911
15,200.00	7,173.00	6,600.00	6,582.15	131.67	23.25	-68.60	17.48	-470.40	7,644.36	7,590.73	53.62	142.560
15,300.00	7,173.00	6,600.00	6,582.15	133.23	23.25	-68.60	17.48	-470.40	7,742.12	7,688.43	53.69	144.204
15,400.00	7,173.00	6,600.00	6,582.15	134.80	23.25	-68.60	17.48	-470.40	7,839.93	7,786.18	53.76	145.843
15,500.00	7,173.00	6,600.00	6,582.15	136.36	23.25	-68.60	17.48	-470.40	7,937.80	7,883.98	53.82	147.478
15,600.00	7,173.00	6,600.00	6,582.15	137.92	23.25	-68.60	17.48	-470.40	8,035.72	7,981.83	53.89	149.109
15,700.00	7,173.00	6,600.00	6,582.15	139.49	23.25	-68.60	17.48	-470.40	8,133.70	8,079.74	53.96	150.735
15,800.00	7,173.00	6,600.00	6,582.15	141.05	23.25	-68.60	17.48	-470.40	8,231.72	8,177.69	54.03	152.356
15,900.00	7,173.00	6,600.00	6,582.15	142.62	23.25	-68.60	17.48	-470.40	8,329.79	8,275.69	54.10	153.973
16,000.00	7,173.00	6,600.00	6,582.15	144.19	23.25	-68.60	17.48	-470.40	8,427.90	8,373.74	54.17	155.584
16,100.00	7,173.00	6,600.00	6,582.15	145.76	23.25	-68.60	17.48	-470.40	8,526.06	8,471.82	54.24	157.191
16,200.00	7,173.00	6,600.00	6,582.15	147.33	23.25	-68.60	17.48	-470.40	8,624.26	8,569.95	54.31	158.793
16,300.00	7,173.00	6,600.00	6,582.15	148.90	23.25	-68.60	17.48	-470.40	8,722.51	8,668.12	54.38	160.389
16,400.00	7,173.00	6,600.00	6,582.15	150.47	23.25	-68.60	17.48	-470.40	8,820.79	8,766.33	54.46	161.981
16,500.00	7,173.00	6,600.00	6,582.15	152.04	23.25	-68.60	17.48	-470.40	8,919.11	8,864.58	54.53	163.567
16,600.00	7,173.00	6,600.00	6,582.15	153.61	23.25	-68.60	17.48	-470.40	9,017.46	8,962.86	54.60	165.149
16,700.00	7,173.00	6,600.00	6,582.15	155.18	23.25	-68.60	17.48	-470.40	9,115.86	9,061.18	54.68	166.725
16,800.00	7,173.00	6,600.00	6,582.15	156.76	23.25	-68.60	17.48	-470.40	9,214.28	9,159.53	54.75	168.296
16,900.00	7,173.00	6,600.00	6,582.15	158.33	23.25	-68.60	17.48	-470.40	9,312.74	9,257.92	54.83	169.861
17,000.00	7,173.00	6,600.00	6,582.15	159.90	23.25	-68.60	17.48	-470.40	9,411.23	9,356.33	54.90	171.421
17,100.00	7,173.00	6,600.00	6,582.15	161.48	23.25	-68.60	17.48	-470.40	9,509.76	9,454.78	54.98	172.976
17,200.00	7,173.00	6,600.00	6,582.15	163.06	23.25	-68.60	17.48	-470.40	9,608.31	9,553.26	55.05	174.526
17,300.00	7,173.00	6,600.00	6,582.15	164.63	23.25	-68.60	17.48	-470.40	9,706.90	9,651.77	55.13	176.070
17,400.00	7,173.00	6,600.00	6,582.15	166.21	23.25	-68.60	17.48	-470.40	9,805.51	9,750.30	55.21	177.608
17,500.00	7,173.00	6,600.00	6,582.15	167.79	23.25	-68.60	17.48	-470.40	9,904.15	9,848.87	55.29	179.141
17,600.00	7,173.00	6,600.00	6,582.15	169.36	23.25	-68.60	17.48	-470.40	10,002.82	9,947.45	55.37	180.669
17,700.00	7,173.00	6,600.00	6,582.15	170.94	23.25	-68.60	17.48	-470.40	10,101.51	10,046.07	55.44	182.191
17,800.00	7,173.00	6,600.00	6,582.15	172.52	23.25	-68.60	17.48	-470.40	10,200.23	10,144.71	55.52	183.707
17,900.00	7,173.00	6,600.00	6,582.15	174.10	23.25	-68.60	17.48	-470.40	10,298.98	10,243.37	55.60	185.218
18,000.00	7,173.00	6,600.00	6,582.15	175.68	23.25	-68.60	17.48	-470.40	10,397.75	10,342.06	55.69	186.723
18,100.00	7,173.00	6,600.00	6,582.15	177.26	23.25	-68.60	17.48	-470.40	10,496.54	10,440.77	55.77	188.222
18,200.00	7,173.00	6,600.00	6,582.15	178.84	23.25	-68.60	17.48	-470.40	10,595.35	10,539.50	55.85	189.716
18,300.00	7,173.00	6,600.00	6,582.15	180.42	23.25	-68.60	17.48	-470.40	10,694.19	10,638.26	55.93	191.204
18,400.00	7,173.00	6,600.00	6,582.15	182.00	23.25	-68.60	17.48	-470.40	10,793.04	10,737.03	56.01	192.686
18,500.00	7,173.00	6,600.00	6,582.15	183.59	23.25	-68.60	17.48	-470.40	10,891.92	10,835.83	56.10	194.163
18,600.00	7,173.00	6,600.00	6,582.15	185.17	23.25	-68.60	17.48	-470.40	10,990.82	10,934.64	56.18	195.633
18,700.00	7,173.00	6,600.00	6,582.15	186.75	23.25	-68.60	17.48	-470.40	11,089.74	11,033.48	56.26	197.099
18,800.00	7,173.00	6,600.00	6,582.15	188.33	23.25	-68.60	17.48	-470.40	11,188.68	11,132.33	56.35	198.558
18,900.00	7,173.00	6,600.00	6,582.15	189.92	23.25	-68.60	17.48	-470.40	11,287.63	11,231.20	56.43	200.011
19,000.00	7,173.00	6,600.00	6,582.15	191.50	23.25	-68.60	17.48	-470.40	11,386.61	11,330.09	56.52	201.459
19,100.00	7,173.00	6,600.00	6,582.15	193.09	23.25	-68.60	17.48	-470.40	11,485.60	11,428.99	56.61	202.901
19,200.00	7,173.00	6,600.00	6,582.15	194.67	23.25	-68.60	17.48	-470.40	11,584.61	11,527.92	56.69	204.337

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

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

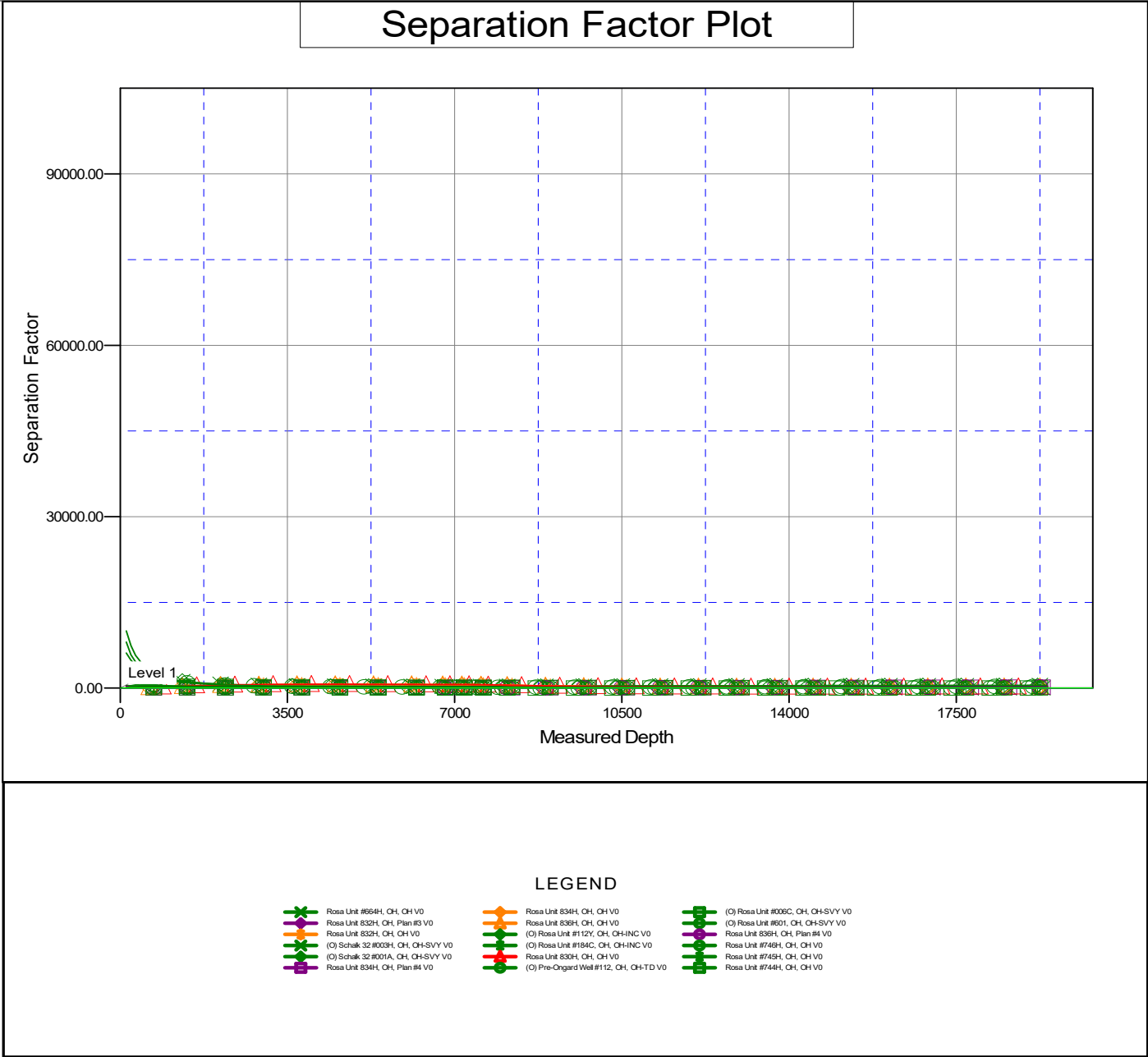
Offset Design: Rosa Unit 42 - Rosa Unit 836H - OH - Plan #4													Offset Site Error:	0.00 usft
Survey Program: 125-Standard Keeper 104, 312-B001Mb_MWD+HRGM													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
19,249.41	7,173.00	6,600.00	6,582.15	195.45	23.25	-68.60	17.48	-470.40	11,633.54	11,576.80	56.74	205.045		
19,300.00	7,173.00	6,600.00	6,582.15	196.25	23.25	-68.60	17.48	-470.40	11,683.64	11,626.86	56.78	205.768		
19,384.41	7,173.00	6,600.00	6,582.15	197.34	23.25	-68.60	17.48	-470.40	11,767.24	11,706.04	61.20	192.261		

SDT
Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 830H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6563+30 @ 6593.00usft (H&P 530)
Reference Site:	Rosa Unit 42	MD Reference:	6563+30 @ 6593.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 830H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #4	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6563+30 @ 6593.00usft (H&P 530)
Offset Depths are relative to Offset Datum
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit 830H
Coordinate System is US State Plane 1983, New Mexico Western Zone
Grid Convergence at Surface is: 0.31°



Sante Fe Main Office
Phone: (505) 476-3441

General Information
Phone: (505) 629-6116

Online Phone Directory
<https://www.emnrd.nm.gov/ocd/contact-us>

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

CONDITIONS

Action 405400

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 405400
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	Any previous COA's not addressed within the updated COA's still apply.	3/28/2025