

Form 3160-5
(June 2019)UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021**SUNDRY NOTICES AND REPORTS ON WELLS**
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.5. Lease Serial No.
NMSF078766

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☐ Oil Well ☒ Gas Well ☐ Other2. Name of Operator
LOGOS OPERATING, LLC3a. Address 2010 AFTON PLACE,
FARMINGTON, NM 874013b. Phone No. (include area code)
(505) 278-87204. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC 23 T31N R06W, NWSW (L) 1814' FSL 448' FWL

7. If Unit of CA/Agreement, Name and/or No.

NMNM78407E

8. Well Name and No.
ROSA UNIT 612H9 API Well No.
30-039-3143210. Field and Pool or Exploratory Area
BASIN MANCOS11. Country or Parish, State
RIO ARriba COUNTY, NM

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

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

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

LOGOS Operating request a change in plans for the following:

Original TD @ 17,217' MD 6,852' TVD to new **TD @ 17,238' MD 6,872' TVD.**

Geology tops have been updated per changes.

Original KOP @ 6,278' MD 6,266' TVD to new **KOP @ 6,300 MD 6,287' TVD**Original Landing point @ 7,252' MD 6,874' TVD to new **Landing point @ 7,273' MD 6,895' TVD**Original 13.375" casing Surface @ 320' to **new Surface casing 20" @ 320'**Original 9.625" casing Intermediate @ 6,125' MD to **new 13.375" Intermediate1 casing @ 3,379' MD & Additional 9.625" Intermediate2 casing @ 6,163' MD**Original 5.5" casing Production @ 17,217' MD to new **Production casing @ 17,238' MD 6,872' TVD**

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

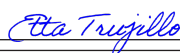
Attached: New C102, Operation and Directional Drill plans.

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

Etta Trujillo

Title Regulatory Specialist

Signature



Date 09/27/2023

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

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

Office

Title 18 U.S.C Section 1001 and Title 43 U.S.C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States

(Instructions on page 2)

Well Name: ROSA UNIT	Well Location: T31N / R6W / SEC 23 / NWSW /	County or Parish/State:
Well Number: 612H	Type of Well: CONVENTIONAL GAS WELL	Allottee or Tribe Name:
Lease Number: NMSF78766	Unit or CA Name: ROSA UNIT	Unit or CA Number: NMNM78407E
US Well Number: 3003931432	Well Status: Location	Operator: LOGOS OPERATING LLC

Notice of Intent

Sundry ID: 2753805

Type of Submission: Notice of Intent

Type of Action: Other

Date Sundry Submitted: 09/27/2023

Time Sundry Submitted: 02:38

Date proposed operation will begin: 09/27/2023

Procedure Description: LOGOS Operating request a change in plans for the following: Original TD @ 17,217' MD 6,852' TVD to new TD @ 17,238' MD 6,872' TVD. Geology tops have been updated per changes. Original KOP @ 6,278' MD 6,266' TVD to new KOP @ 6,300 MD 6,287' TVD Original Landing point @ 7,252' MD 6,874' TVD to new Landing point @ 7,273' MD 6,895' TVD Original 13.375" casing Surface @ 320' to new Surface casing 20" @ 320' Original 9.625" casing Intermediate @ 6,125' MD to new 13.375" Intermediate1 casing @ 3,379' MD & Additional 9.625" Intermediate2 casing @ 6,163' MD Original 5.5" casing Production @ 17,217' MD to new Production casing @ 17,238' MD 6,872' TVD The 13.375", 9.625" Intermediate & 5.5" production cementing bbls and sacks have been update per casing depth changes. Attached: New C102, Operation and Directional Drill plans.

Surface Disturbance

Is any additional surface disturbance proposed?: No

NOI Attachments

Procedure Description

Production_Casing_Assumption_20230928083225.pdf

Intermediate2_Casing_Assumption_20230928083203.pdf

Intermediate1_Casing_Assumption_20230928083154.pdf

3160_5_Rosa_Unit_612H_Plan_1_Change_in_Plans_20230927_20230927143719.pdf

Well Name: ROSA UNIT

Well Location: T31N / R6W / SEC 23 /
NWSW /

County or Parish/State:

Well Number: 612H

Type of Well: CONVENTIONAL GAS
WELL

Allottee or Tribe Name:

Lease Number: NMSF78766

Unit or CA Name: ROSA UNIT

Unit or CA Number:
NMNM78407E

US Well Number: 3003931432

Well Status: Location

Operator: LOGOS OPERATING
LLC**Conditions of Approval****Additional**

APD_Change_KR_09282023_20230928091503.pdf

Operator

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

Operator Electronic Signature: ETTA TRUJILLO

Signed on: SEP 28, 2023 08:32 AM

Name: LOGOS OPERATING LLC

Title: Regulatory Specialist

Street Address: 2010 AFTON PLACE

City: Farmington

State: NM

Phone: (505) 324-4154

Email address: ETRUJILLO@LOGOSRESOURCESLLC.COM

Field

Representative Name:

Street Address:

City:

State:

Zip:

Phone:

Email address:

BLM Point of Contact

BLM POC Name: KENNETH G RENNICK

BLM POC Title: Petroleum Engineer

BLM POC Phone: 5055647742

BLM POC Email Address: krennick@blm.gov

Disposition: Approved

Disposition Date: 09/28/2023

Signature: Kenneth Rennick

**UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
FARMINGTON DISTRICT OFFICE
6251 COLLEGE BLVD.
FARMINGTON, NEW MEXICO 87402**

APD Changes

LOGOS OPERATING LLC

CONDITIONS OF APPROVAL

1. 13 3/8" 1ST Intermediate casing must not fall below 1/3 fluid evacuation.

K. Rennick 09/28/2023

District I
1625 N. French Drive, Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

State of New Mexico
Energy, Minerals & Natural Resources Department

Form C-102
Revised August 1, 2011

District II
811 S. First Street, Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

Submit one copy to
Appropriate District Office

District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

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

☐ AMENDED REPORT

District IV
1220 S. St. Francis Drive, Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

Etta Trujillo

7/29/2022

Signature

Date

Etta Trujillo

Printed Name

etrujillo@logosresourcesllc.com

E-mail Address

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

Date Revised: JULY 29, 2022

Survey Date: JANUARY 4, 2017

Signature and Seal of Professional Surveyor



JASON C. EDWARDS

Certificate Number 15269

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-039-31432	² Pool Code 97232	³ Pool Name BASIN MANCOS
⁴ Property Code 320608	⁵ Property Name ROSA UNIT	⁶ Well Number 612H
⁷ GRID No. 289408	⁸ Operator Name LOGOS OPERATING, LLC	⁹ Elevation 6287'

¹⁰ Surface Location

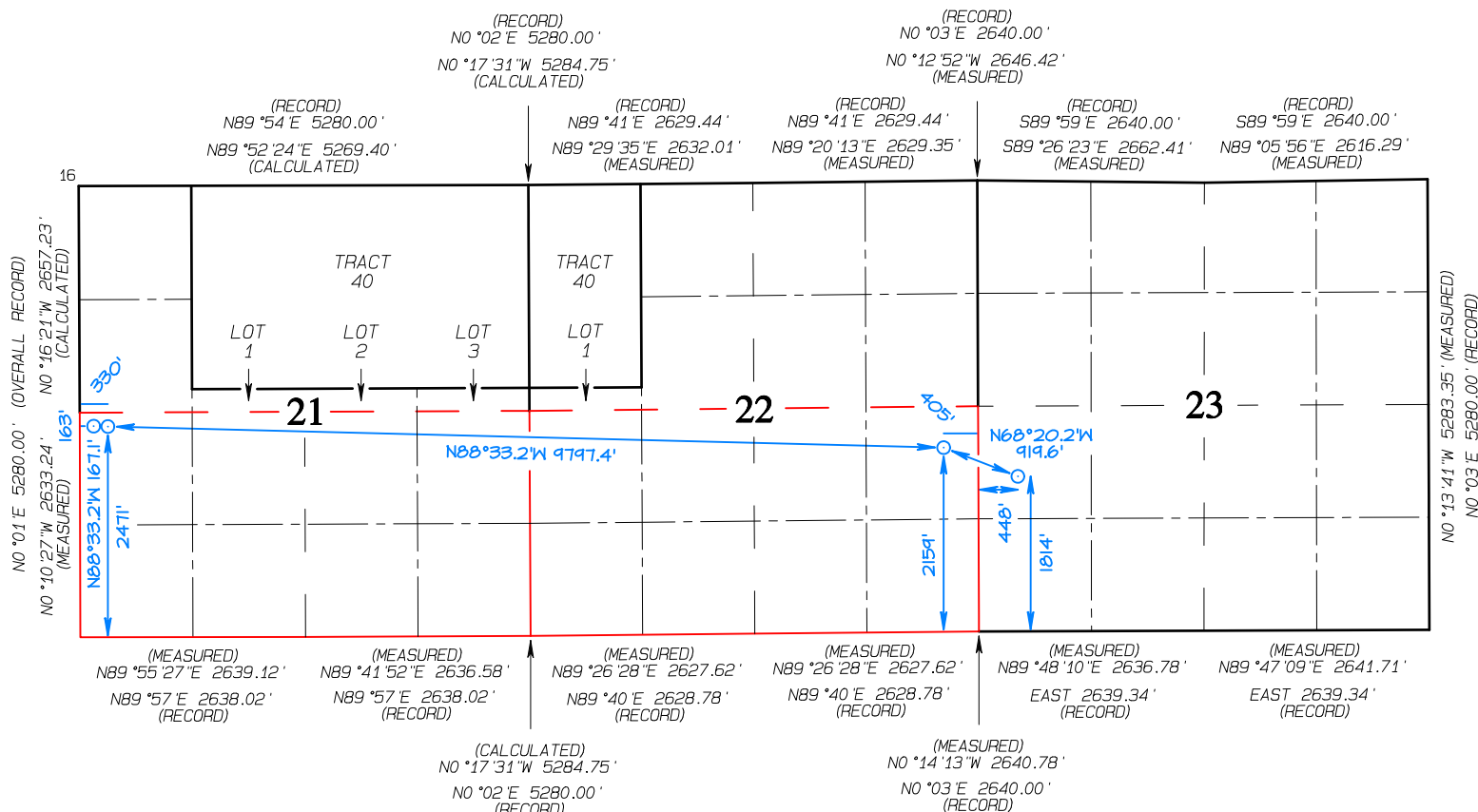
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	23	31N	6W		1814	SOUTH	448	WEST	RIO ARriba

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
L	21	31N	6W		2475	SOUTH	163	WEST	RIO ARriba

¹² Dedicated Acres 640.00	S/2 - Section 21 S/2 - Section 22	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No. R-13457
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION



LAST TAKE POINT
2475' FSL 163' FWL
SEC 21, T31N, R6W
LAT: 36.884586°N
LONG: 107.476020°W
DATUM: NAD1927

LAST PERFORATION
2471' FSL 330' FWL
SEC 21, T31N, R6W
LAT: 36.884573°N
LONG: 107.475449°W
DATUM: NAD1927

FIRST TAKE POINT
2159' FSL 405' FEL
SEC 22, T31N, R6W
LAT: 36.883788°N
LONG: 107.441964°W
DATUM: NAD1927

SURFACE LOCATION
1814' FSL 448' FWL
SEC 23, T31N, R6W
LAT: 36.882846°N
LONG: 107.439046°W
DATUM: NAD1927

LAT: 36.884592°N
LONG: 107.476625°W
DATUM: NAD1983

LAT: 36.884579°N
LONG: 107.476054°W
DATUM: NAD1983

LAT: 36.883794°N
LONG: 107.442568°W
DATUM: NAD1983

LAT: 36.882852°N
LONG: 107.439650°W
DATUM: NAD1983



LOGOS Operating, LLC Operations Plan

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

Date:	September 27, 2022	Pool:	Basin Mancos
Well Name:	Rosa Unit 612H	GL Elevation:	6,287'
Surface Location:	Sec 23, T31N, R6W 1814 FSL, 448 FWL (36.882852° N, 107.439650° W – NAD83)	Measured Depth:	17,238' (KB)
Bottom Hole Location:	Sec 21, T31N, R6W 2475 FSL, 163 FWL (36.884592° N, 107.476625° W – NAD83)	County:	Rio Arriba

Lease Serial #NMSF078766, NMSF078771, CA Serial #NMNM78407E

I. GEOLOGY

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

NAME	MD	TVD	NAME	MD	TVD
OJO ALAMO	2,371'	2,368'	*POINT LOOKOUT	5,611'	5,600'
KIRTLAND	2,498'	2,495'	*MANCOS	6,088'	6,076'
*FRUITLAND	2,858'	2,854'	KICKOFF POINT	6,300'	6,287'
*PICTURED CLIFFS	3,329'	3,324'	LANDING POINT	7,273'	6,895'
LEWIS	3,430'	3,425'			
CHACRA	4,521'	4,513'			
*CLIFF HOUSE	5,323'	5,313'			
MENEFEE	5,371'	5,361'	TD	17,238'	6,872'

* 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 26"/24" surface hole, 17-1/2" intermediate 1 and 12-1/4" intermediate hole 2 vertical 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.

ROSA UNIT 612H



- B. BOP TESTING:** The BOPE will be tested to **250 psi (Low) for 5 minutes** and **1500 psi (High) for 10 minutes**. Pressure test surface casing to **600 psi for 30 minutes** and intermediate casing to **1500 psi for 30 minutes**. Utilize a BOPE Testing Unit with a recording chart and appropriate test plug for testing. The drum brakes will be inspected and tested each tour. BOP equipment will be tested every 30 days, after any repairs are made to the BOP equipment, and after the BOP equipment is subjected to pressure. Annular preventers will be functionally operated at least once per week. Pipe and blind rams shall be activated each trip or but not more than once a day. The New Mexico Oil & Gas Conservation Commission and the BLM will be notified 24 hours in advance of testing of BOPE. **All tests and inspections will be recorded and logged with time and results.** A full BOP test will be conducted when initially installed for the first well on the pad or if seals subject to test pressure are broken, following related repairs and at a minimum of 30 day intervals. A BOPE Shell Test only will be conducted for subsequent wells on the pad when seals subject to pressure have not been broken or repaired and fall within the 30 day interval of first full test.

III. MATERIALS

A. CASING EQUIPMENT:

CASING TYPE	OHSIZE (IN)	DEPTH (MD)	CSG SIZE	WEIGHT	GRADE	CONN
SURFACE	26" or 24"	320' or greater	20"	94 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE 1	17.5"	3,379'	13.375"	54.5 LBS	J-55 or equiv	LTC/BTC
INTERMEDIATE 2	12.25"	6,163'	9.625"	43.5 LBS	N-80 or equiv	LTC/BTC
PRODUCTION	8.5"	17,238'	5.5"	20 LBS	P-110 or equiv	LTC/BTC

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

B. FLOAT EQUIPMENT:

- SURFACE CASING:** 20" notched regular pattern guide shoe. Run (1) standard centralizer on each of the bottom (3) joints of Surface Casing.
- INTERMEDIATE CASING 1:** 13-3/8" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,000ft., 1,500 ft., 1,000 ft., and 500ft.
 - Casing will be kept fluid filled during drilling
- INTERMEDIATE CASING 2:** 9-5/8" cement nose guide shoe with a self-fill insert float. Place float collar one joint above the shoe. Install (1) centralizer on each of the bottom (3) joints and one standard centralizer every (3) joints to 2,500 ft. Run (1) centralizer at 2,500 ft., 2,300ft., 2,000ft., 1,500 ft., and 1,000 ft. Optional use of DV Tools (2) will be strategically placed above loss circulation zones anticipated in the Mesaverde and Fruitland Coal. Optional use of cancellation plugs for DV tools may be used if losses while cementing are not encountered. Optional use of an ICP may be used in conjunction with DV Tools.
- 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

ROSA UNIT 612H



pressure tested during completion operations with frac stack installed.

C. CEMENTING:

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

1. SURFACE: Casing shall be set at ~ 320' and cemented to surface. TOC at Surface.
408 sks of 15.8 ppg Type Neat G, 1.10 cuft/sk yield or equivalent 323 sks of 14.6 ppg Type III with 1.39 cuft/sk yield, 30% excess.
2. INTERMEDIATE 1: Intermediate casing shall be kept fluid-filled while running into the hole to meet BLM minimum collapse requirements. The intermediate casing will be cemented in 1 stage. If cement does not circulate to the surface, a CBL will be run to determine TOC.

Intermediate 1 -13-3/8"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	2,779	600	0.6947	1.3	575	102	1.10	523	15.8
Stage 1 Lead - OH	320	2,459	0.6947	1.3	2,221	396	1.90	1169	12.4
Stage 2 Lead - Cased	-	320	1.019	1	326	58	1.90	172	12.4
					3,122	556		1864	

Set Depth

3379

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

3. INTERMEDIATE 2: Intermediate casing shall be kept fluid filled while running 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 cancellation 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 2 -9-5/8"	Top	Footage	Cement (ft3/ft) Annular Capacity	Excess (30%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Stage 1 Tail	5,663	500	0.3132	1.3	220	39	1.10	200	15.8
Stage 1 Lead	4,596	1,067	0.3132	1.3	434	77	1.90	229	12.4
					654	117		429	
Stage 2 Tail	3,996	600	0.3132	1.3	244	44	1.58	155	13.2
Stage 2 Lead	3,279	717	0.3132	1.3	292	52	1.90	154	12.4
Stage 2 Lead - Cased	3,179	100	0.3627	1	36	6	1.90	19	12.4
Stage 2 Totals					572	102		327	
Int 2 Totals					1,227	219		756	
Contingency									
Stage 3 Tail	3,379	75	0.3132	1.3	31	5	1.58	19	13.2
Stage 3 Tail - Cased	2,879	500	0.3490	1	175	31	1.58	110	13.2
Stage 3 Lead - Cased	-	2,879	0.3490	1	1,005	179	1.90	529	12.4
Contingency Stage 3 Totals					1,210	215		659	

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

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

	Top	ft	Cement (ft3/ft) Annular Capacity	Excess (15%)	Total (ft3)	Total (bbl)	Slurry Yield (ft3/sk)	Sacks Cement	Density (PPG)
Cased Lead	6,063	100	0.2531	1	25	5	1.59	16	13.2
Open Hole Lead	6,163	11,075	0.2291	1.15	2,923	521	1.59	1,838	13.2
					2,948	525		1,854	

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

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

IV. **COMPLETION**

A. **CBL**

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

B. **PRESSURE TEST**

- C. Pressure test 5-1/2" casing to 0.22 psi/ft * 6,895' TVD = 1517 psi for 30 minutes. Increase pressure to Open RSI sleeves.

D. **STIMULATION**

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

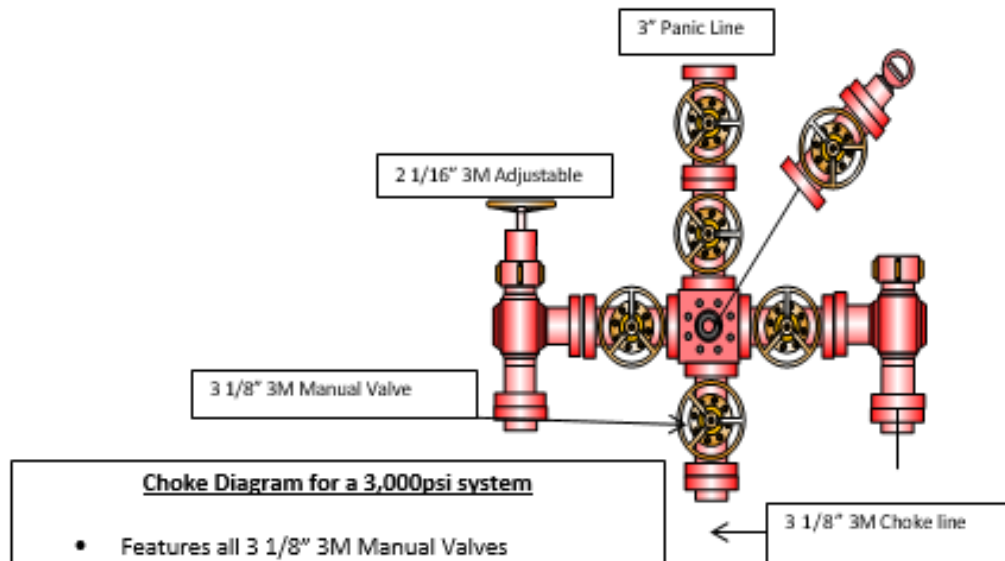
E. **PRODUCTION TUBING**

2-7/8", 6.5#, J-55 or L-80, EUE tubing will be run once volumes and pressures dictate. Due to the extremely high initial flow rates and pressures seen in offset wells, tubing will be installed once it is safe to do so, typically 12-18 months after completion.

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

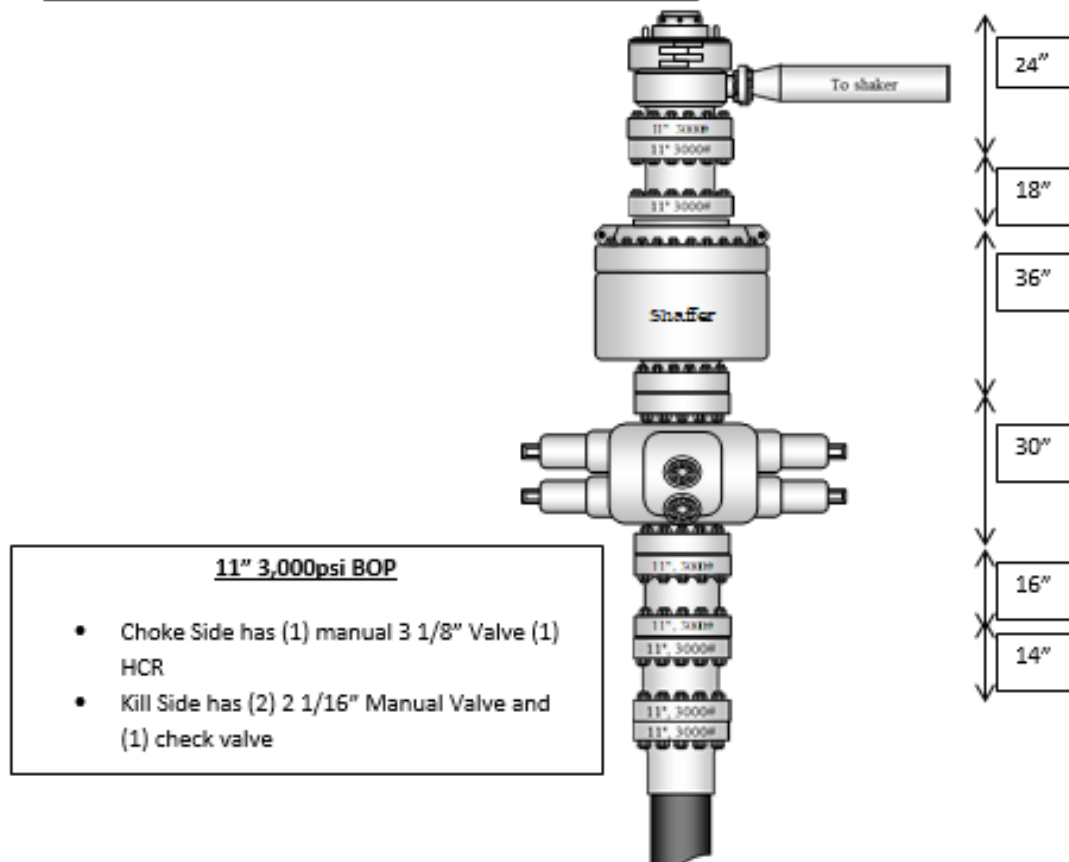


3M 11" B.O.P.E Diagram



Choke Diagram for a 3,000psi system

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



ROSA UNIT 612H

Surface Casing Design - Evacuated/Max SICP (collapse & burst), 100k overpull (tension)

					1.125	1.000		1.400
Surface	Size	Weight	Grade	Conn	Collapse	Burst	70% Burst	Tension (Body)
	20.000	94	J-55	BTC	520	2,110	1,477	1,480,000
Collapse								
	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF		
94 J-55 BTC	320	0.00	15.80	0	263	1.98	full evacuation with 15.8 ppg m	
Burst								
94 J-55 BTC	320	15.80	0.00	1263	0	1.67	1000 psi casing test	
Tension								
94 J-55 BTC		Mud Wt	Air Wt	Bouy Wt	BW +100k	SF		
Tension (Body)	320	15.80	30,080	22,824	122,824	12.05	100k over pull	
Tension (Conn)	320	15.80	30,080	22,824	122,824	11.41	100k over pull	
		BF						BF= 1- (MW)/65.5
		0.7588						

1st Intermediate Casing Design - 1/3 Evacuated/Max SICP (collapse & burst), 100k overpull (tension)

					1.125	1.000		1.400	1.400
	Size	Weight	Grade	Conn	Collapse	Burst	80% Burst	Tension (Body)	Tension (Connection)
Intermediate	13.375	61	J-55	BTC	1,540	3,090	2,472	962,000	1,025,000
	13.375	68	J-55	BTC	1,950	3,450	2,760	1,069,000	1,140,000
	13.375								

Collapse

	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF	
61 J-55 BTC	3,374	9.20	9.20	1065	1614	2.81	1/3 Evac with 9.2 ppg mud outside
68 J-55 BTC	3,374	9.20	9.20	1065	1614	3.55	1/3 evacuation with 9.2 ppg mud outside

Burst

61 J-55 BTC	3,374	9.20	0.00	2644	0	1.17	Casing full with 9.2 ppg mud , annulus evacuated+1030 ps
68 J-55 BTC	3,374	9.20	0.00	2764	0	1.25	Casing full with 9.2 ppg mud , annulus evacuated+1150 ps

Tension

		Mud Wt	Air Wt	Bouy Wt	BW +100k	SF	
61 J-55 BTC							
Tension (Body)	3,374	9.20	205,814	176,906	276,906	3.47	100k over pull
Tension (Conn)	3,374	9.20	205,814	176,906	276,906	3.70	100k over pull
		BF					BF= 1- (MW)/65.5
		0.8595					
68 J-55 BTC							
Tension (Body)	3,374	9.20	229,432	197,206	297,206	3.60	100k over pull
Tension (Conn)	3,374	9.20	229,432	197,206	297,206	3.84	100k over pull
		BF					BF= 1- (MW)/65.5
		0.8595					

Intermediate Casing Design - Evacuated/Max SICP (collapse & burst), 100k overpull (tension)

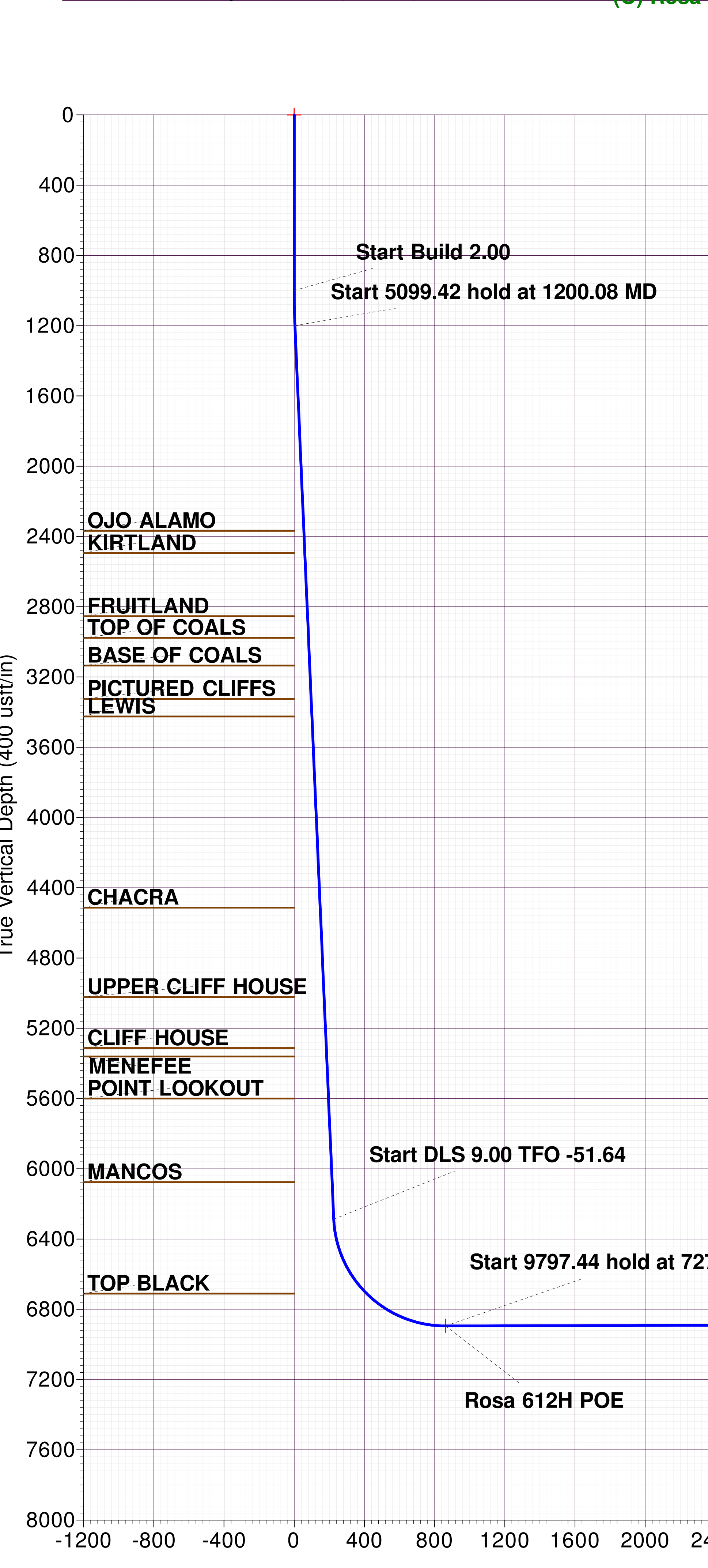
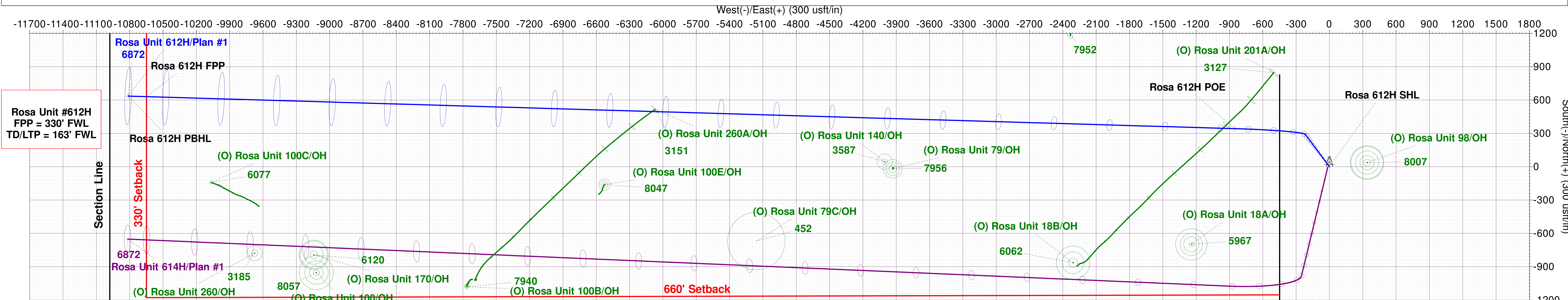
					1.125	1.000	1.400	
	Size	Weight	Grade	Conn	Collapse	Burst	80% Burst	Tension (Body)
Intermediate	9.625	43.5	N-80 or L-80	LTC	3,810	6,330	5,064	1,005,000
	9.625	43.5	N-80 or L-80	BTC	3,810	6,330	5,064	1,005,000
	9.625	43.5	P-110	BTC	4,420	8,700	6,960	1,381,000
Collapse								
	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF		
43.5 N-80 or L-80 L	6,151	0.00	9.40	0	3007	1.27	full evacuation with 9.4 ppg mud	
43.5 N-80 or L-80 B	6,151	0.00	9.40	0	3007	1.27	full evacuation with 9.4 ppg mud	
Burst								
43.5 N-80 or L-80 L	6,151	9.40	0.00	4507	0	1.40	Casing full with 9.4 ppg mud , ar	
43.5 N-80 or L-80 B	6,151	9.40	0.00	4507	0	1.40	Casing full with 9.4 ppg mud , ar	
Tension								
43.5 N-80 or L-80 LTC		Mud Wt	Air Wt	Bouy Wt	BW +100k	SF		
Tension (Body)	6,151	9.40	267,569	229,169	329,169	3.05	100k over pull	
Tension (Conn)	6,151	9.40	267,569	229,169	329,169	2.51	100k over pull	
		BF					BF= 1- (MW)/65.5	
		0.8565						
43.5 N-80 or L-80 BTC								
Tension (Body)	6,151	9.40	267,569	229,169	329,169	3.05	100k over pull	
Tension (Conn)	6,151	9.40	267,569	229,169	329,169	3.26	100k over pull	
		BF					BF= 1- (MW)/65.5	
		0.8565						

Production Casing Design - Evacuated/Max SICP (collapse & burst), 100k overpull (tension)

Production	Size	Weight	Grade	Conn	1.125	1.000	1.400	
					Collapse	Burst	80% Burst	
							Tension (Body)	
	5.5	20	P110	LTC	11,080	12,630	10,104	641,000
	5.5	20	P110	BTC	11,080	12,360	9,888	641,000
Collapse								
	Casing Depth TVD	MW in	MW out	Pres in	Pres out	SF		
20 P110 LTC	6,872	0.00	13.30	0	4753	2.33	full evacuation with 13.3 ppg m	
20 P110 BTC	6,872	0.00	13.30	0	4753	2.33	full evacuation with 13.3 ppg m	
Burst								
20 P110 LTC	6,872	13.30	0.00	6253	0	2.02	1500 psi casing test	
20 P110 BTC	6,872	13.30	0.00	6253	0	1.98	1500 psi casing test	
Tension								
20 P110 LTC		Mud Wt	Air Wt	Bouy Wt	BW +100k	SF		
Tension (Body)	6,872	13.30	137,440	109,532	209,532	3.06	100k over pull	
Tension (Conn)	6,872	13.30	137,440	109,532	209,532	2.62	100k over pull	
		BF					BF= 1- (MW)/65.5	
		0.7969						
20 P110 BTC		Mud Wt	Air Wt	Bouy Wt	BW +100k	SF		
Tension (Body)	6,872	13.30	137,440	109,532	209,532	3.06	100k over pull	
Tension (Conn)	6,872	13.30	137,440	109,532	209,532	3.18	100k over pull	
		BF					BF= 1- (MW)/65.5	

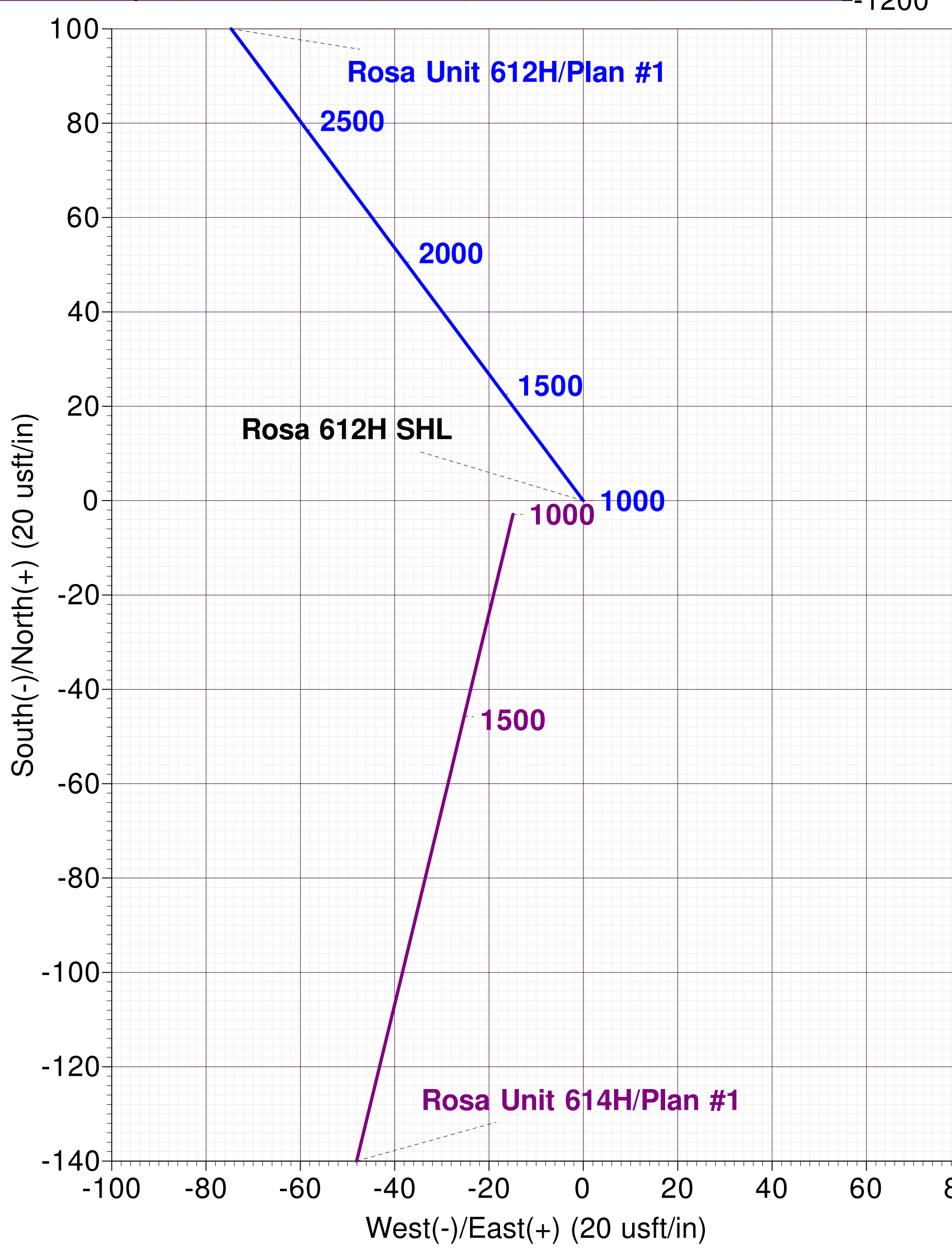
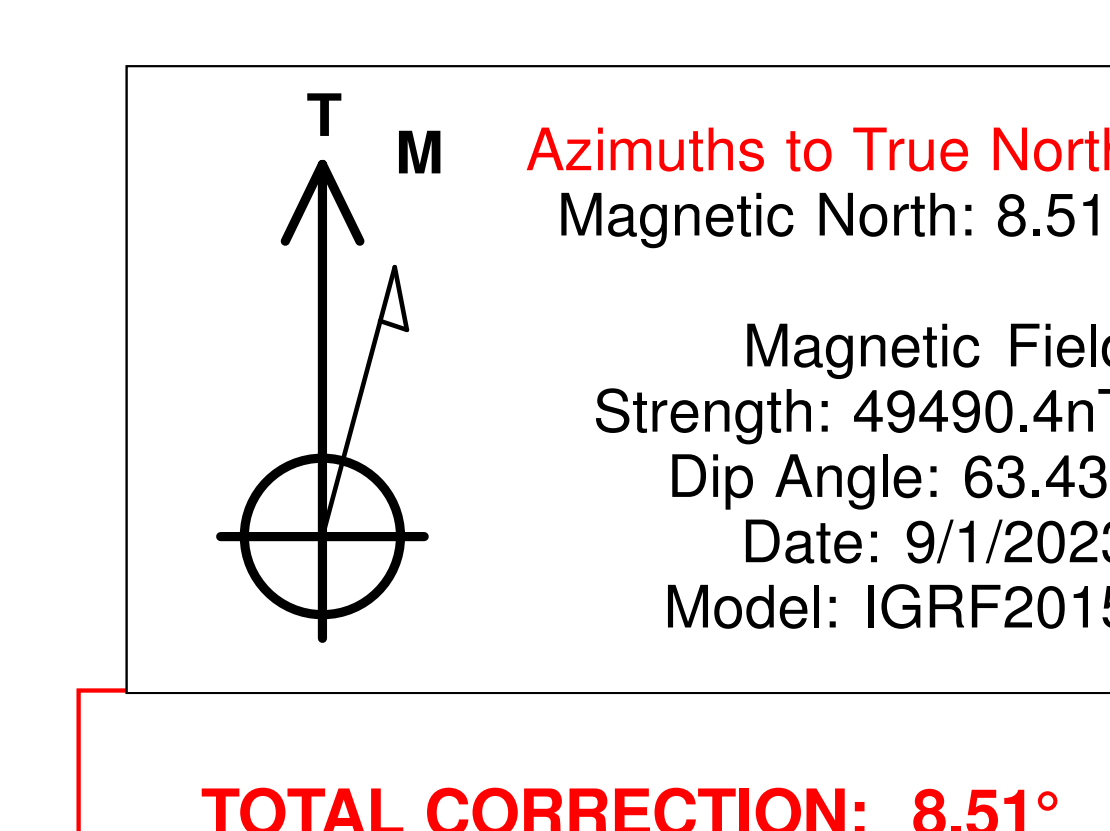


County: Rio Arriba, NM (NAD83)
Site: Rosa Unit 10
Well: Rosa Unit 612H
Depth Reference: 6287+30 @ 6317.00usft (H&P 530)
Rig: H&P 530
Plan: Plan #1
Job #: 17192



SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	1000.00	0.00	0.00	1000.00	0.00	0.00	0.00	0.00	0.00	Start Build 2.00
3	1200.08	4.00	323.26	1199.92	5.60	-4.18	2.00	323.26	4.34	Start 5099.42 hold at 1200.08 MD
4	6299.50	4.00	323.26	6286.91	290.77	-217.04	0.00	0.00	225.47	Start DLS 9.00 TFO -51.64
5	7273.35	90.13	271.68	6895.00	342.89	-853.27	9.00	-51.64	862.96	Start 9797.44 hold at 7273.35 MD
6	17070.79	90.13	271.68	6872.39	630.70	-10646.46	0.00	0.00	10660.37	FPP @ 330' FWL
7	17237.94	90.13	271.68	6872.00	635.61	-10813.53	0.00	0.00	10827.52	TD at 17237.94 @ 163' FEL

DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude		
Rosa 612H SHL	0.00	0.00	0.00	2140920.73	2838226.78	36.882852	-107.439650		
Rosa 612H PBHL	6872.00	635.61	-10813.53	2141511.73	2827410.71	36.884592	-107.476625		
Rosa 612H FPP	6872.39	630.70	-10646.46	2141507.51	2827577.81	36.884579	-107.476054		
Rosa 612H POE	6895.00	342.89	-853.27	2141260.10	2837372.10	36.883794	-107.442568		



FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
2368.00	2371.02	OJO ALAMO
2495.00	2498.33	KIRTLAND
2854.00	2858.20	FRUITLAND
2977.00	2981.51	TOP OF COALS
3135.00	3139.89	BASE OF COALS
3324.00	3329.35	PICTURED CLIFFS
3425.00	3430.60	LEWIS
4513.00	4521.26	CHACRA
5022.00	5031.50	UPPER CLIFF HOUSE
5313.00	5323.21	CLIFF HOUSE
5361.00	5371.33	MENEFE
5600.00	5610.92	POINT LOOKOUT
6076.00	6088.08	MANCOS
6711.00	6774.98	TOP BLACK

Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 10

Rosa Unit 612H

OH

Plan: Plan #1

Standard Planning Report

22 September, 2023

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 612H
Company:	Logos Operating LLC	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site:	Rosa Unit 10	North Reference:	True
Well:	Rosa Unit 612H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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 10			
Site Position:		Northing:	2,140,923.33 usft	Latitude: 36.882859
From:	Lat/Long	Easting:	2,838,241.39 usft	Longitude: -107.439600
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	

Well	Rosa Unit 612H			
Well Position	+N/-S	0.00 usft	Northing:	2,140,920.73 usft
	+E/-W	0.00 usft	Easting:	2,838,226.78 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft	Ground Level: 6,287.00 usft
Grid Convergence:	0.24 °			

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/1/2023	8.51	63.43	49,490.41295077

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	271.68	

Plan Survey Tool Program	Date	9/21/2023			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	17,237.94 Plan #1 (OH)	B001Mb_MWD+HRGM		
			OWSG MWD + HRGM		

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,200.08	4.00	323.26	1,199.92	5.60	-4.18	2.00	2.00	0.00	323.26	
6,299.50	4.00	323.26	6,286.91	290.77	-217.04	0.00	0.00	0.00	0.00	
7,273.35	90.13	271.68	6,895.00	342.89	-853.27	9.00	8.84	-5.30	-51.64	Rosa 612H POE
17,070.79	90.13	271.68	6,872.39	630.70	-10,646.46	0.00	0.00	0.00	0.00	Rosa 612H FPP
17,237.94	90.13	271.68	6,872.00	635.61	-10,813.53	0.00	0.00	0.00	0.00	Rosa 612H PBHL

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 612H
Company:	Logos Operating LLC	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site:	Rosa Unit 10	North Reference:	True
Well:	Rosa Unit 612H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,100.00	2.00	323.26	1,099.98	1.40	-1.04	1.08	2.00	2.00	0.00
1,200.08	4.00	323.26	1,199.92	5.60	-4.18	4.34	2.00	2.00	0.00
Start 5099.42 hold at 1200.08 MD									
1,300.00	4.00	323.26	1,299.59	11.18	-8.35	8.67	0.00	0.00	0.00
1,400.00	4.00	323.26	1,399.35	16.78	-12.52	13.01	0.00	0.00	0.00
1,500.00	4.00	323.26	1,499.11	22.37	-16.70	17.35	0.00	0.00	0.00
1,600.00	4.00	323.26	1,598.86	27.96	-20.87	21.68	0.00	0.00	0.00
1,700.00	4.00	323.26	1,698.62	33.55	-25.05	26.02	0.00	0.00	0.00
1,800.00	4.00	323.26	1,798.37	39.15	-29.22	30.35	0.00	0.00	0.00
1,900.00	4.00	323.26	1,898.13	44.74	-33.39	34.69	0.00	0.00	0.00
2,000.00	4.00	323.26	1,997.89	50.33	-37.57	39.03	0.00	0.00	0.00
2,100.00	4.00	323.26	2,097.64	55.92	-41.74	43.36	0.00	0.00	0.00
2,200.00	4.00	323.26	2,197.40	61.52	-45.92	47.70	0.00	0.00	0.00
2,300.00	4.00	323.26	2,297.16	67.11	-50.09	52.04	0.00	0.00	0.00
2,371.02	4.00	323.26	2,368.00	71.08	-53.06	55.12	0.00	0.00	0.00
OJO ALAMO									
2,400.00	4.00	323.26	2,396.91	72.70	-54.27	56.37	0.00	0.00	0.00
2,498.33	4.00	323.26	2,495.00	78.20	-58.37	60.64	0.00	0.00	0.00
KIRTLAND									
2,500.00	4.00	323.26	2,496.67	78.29	-58.44	60.71	0.00	0.00	0.00
2,600.00	4.00	323.26	2,596.42	83.89	-62.61	65.05	0.00	0.00	0.00
2,700.00	4.00	323.26	2,696.18	89.48	-66.79	69.38	0.00	0.00	0.00
2,800.00	4.00	323.26	2,795.94	95.07	-70.96	73.72	0.00	0.00	0.00
2,858.21	4.00	323.26	2,854.00	98.33	-73.39	76.24	0.00	0.00	0.00
FRUITLAND									
2,900.00	4.00	323.26	2,895.69	100.66	-75.14	78.06	0.00	0.00	0.00
2,981.51	4.00	323.26	2,977.00	105.22	-78.54	81.59	0.00	0.00	0.00
TOP OF COALS									
3,000.00	4.00	323.26	2,995.45	106.25	-79.31	82.39	0.00	0.00	0.00
3,100.00	4.00	323.26	3,095.21	111.85	-83.48	86.73	0.00	0.00	0.00
3,139.89	4.00	323.26	3,135.00	114.08	-85.15	88.46	0.00	0.00	0.00
BASE OF COALS									
3,200.00	4.00	323.26	3,194.96	117.44	-87.66	91.06	0.00	0.00	0.00
3,300.00	4.00	323.26	3,294.72	123.03	-91.83	95.40	0.00	0.00	0.00
3,329.35	4.00	323.26	3,324.00	124.67	-93.06	96.67	0.00	0.00	0.00
PICTURED CLIFFS									
3,400.00	4.00	323.26	3,394.47	128.62	-96.01	99.74	0.00	0.00	0.00
3,430.60	4.00	323.26	3,425.00	130.34	-97.28	101.06	0.00	0.00	0.00
LEWIS									
3,500.00	4.00	323.26	3,494.23	134.22	-100.18	104.07	0.00	0.00	0.00
3,600.00	4.00	323.26	3,593.99	139.81	-104.36	108.41	0.00	0.00	0.00

SDT Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 612H
Company:	Logos Operating LLC	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site:	Rosa Unit 10	North Reference:	True
Well:	Rosa Unit 612H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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)	
3,700.00	4.00	323.26	3,693.74	145.40	-108.53	112.75	0.00	0.00	0.00	
3,800.00	4.00	323.26	3,793.50	150.99	-112.70	117.08	0.00	0.00	0.00	
3,900.00	4.00	323.26	3,893.26	156.59	-116.88	121.42	0.00	0.00	0.00	
4,000.00	4.00	323.26	3,993.01	162.18	-121.05	125.76	0.00	0.00	0.00	
4,100.00	4.00	323.26	4,092.77	167.77	-125.23	130.09	0.00	0.00	0.00	
4,200.00	4.00	323.26	4,192.52	173.36	-129.40	134.43	0.00	0.00	0.00	
4,300.00	4.00	323.26	4,292.28	178.96	-133.58	138.76	0.00	0.00	0.00	
4,400.00	4.00	323.26	4,392.04	184.55	-137.75	143.10	0.00	0.00	0.00	
4,500.00	4.00	323.26	4,491.79	190.14	-141.92	147.44	0.00	0.00	0.00	
4,521.26	4.00	323.26	4,513.00	191.33	-142.81	148.36	0.00	0.00	0.00	
CHACRA										
4,600.00	4.00	323.26	4,591.55	195.73	-146.10	151.77	0.00	0.00	0.00	
4,700.00	4.00	323.26	4,691.31	201.32	-150.27	156.11	0.00	0.00	0.00	
4,800.00	4.00	323.26	4,791.06	206.92	-154.45	160.45	0.00	0.00	0.00	
4,900.00	4.00	323.26	4,890.82	212.51	-158.62	164.78	0.00	0.00	0.00	
5,000.00	4.00	323.26	4,990.57	218.10	-162.80	169.12	0.00	0.00	0.00	
5,031.50	4.00	323.26	5,022.00	219.86	-164.11	170.49	0.00	0.00	0.00	
UPPER CLIFF HOUSE										
5,100.00	4.00	323.26	5,090.33	223.69	-166.97	173.46	0.00	0.00	0.00	
5,200.00	4.00	323.26	5,190.09	229.29	-171.14	177.79	0.00	0.00	0.00	
5,300.00	4.00	323.26	5,289.84	234.88	-175.32	182.13	0.00	0.00	0.00	
5,323.21	4.00	323.26	5,313.00	236.18	-176.29	183.14	0.00	0.00	0.00	
CLIFF HOUSE										
5,371.33	4.00	323.26	5,361.00	238.87	-178.30	185.22	0.00	0.00	0.00	
MENELEE										
5,400.00	4.00	323.26	5,389.60	240.47	-179.49	186.46	0.00	0.00	0.00	
5,500.00	4.00	323.26	5,489.35	246.06	-183.67	190.80	0.00	0.00	0.00	
5,600.00	4.00	323.26	5,589.11	251.66	-187.84	195.14	0.00	0.00	0.00	
5,610.92	4.00	323.26	5,600.00	252.27	-188.30	195.61	0.00	0.00	0.00	
POINT LOOKOUT										
5,700.00	4.00	323.26	5,688.87	257.25	-192.01	199.47	0.00	0.00	0.00	
5,800.00	4.00	323.26	5,788.62	262.84	-196.19	203.81	0.00	0.00	0.00	
5,900.00	4.00	323.26	5,888.38	268.43	-200.36	208.15	0.00	0.00	0.00	
6,000.00	4.00	323.26	5,988.14	274.03	-204.54	212.48	0.00	0.00	0.00	
6,088.08	4.00	323.26	6,076.00	278.95	-208.21	216.30	0.00	0.00	0.00	
MANCOS										
6,100.00	4.00	323.26	6,087.89	279.62	-208.71	216.82	0.00	0.00	0.00	
6,200.00	4.00	323.26	6,187.65	285.21	-212.89	221.16	0.00	0.00	0.00	
6,299.50	4.00	323.26	6,286.91	290.77	-217.04	225.47	0.00	0.00	0.00	
Start DLS 9.00 TFO -51.64										
6,350.00	7.70	295.62	6,337.14	293.65	-221.14	229.66	9.00	7.32	-54.74	
6,400.00	11.94	286.70	6,386.40	296.59	-229.12	237.72	9.00	8.50	-17.82	
6,450.00	16.33	282.47	6,434.88	299.59	-240.95	249.63	9.00	8.77	-8.46	
6,500.00	20.76	280.00	6,482.27	302.65	-256.54	265.31	9.00	8.86	-4.94	
6,550.00	25.21	278.37	6,528.29	305.74	-275.82	284.66	9.00	8.91	-3.26	
6,600.00	29.68	277.21	6,572.65	308.85	-298.65	307.57	9.00	8.94	-2.33	
6,650.00	34.16	276.32	6,615.08	311.95	-324.89	333.90	9.00	8.95	-1.77	
6,700.00	38.64	275.62	6,655.31	315.03	-354.39	363.48	9.00	8.96	-1.40	
6,750.00	43.12	275.05	6,693.11	318.06	-386.97	396.13	9.00	8.97	-1.15	
6,774.98	45.36	274.79	6,711.00	319.55	-404.33	413.52	9.00	8.97	-1.01	
TOP BLACK										
6,800.00	47.61	274.56	6,728.23	321.03	-422.42	431.65	9.00	8.97	-0.94	
6,850.00	52.10	274.14	6,760.46	323.92	-460.52	469.81	9.00	8.98	-0.84	

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 612H
Company:	Logos Operating LLC	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site:	Rosa Unit 10	North Reference:	True
Well:	Rosa Unit 612H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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)
6,900.00	56.59	273.76	6,789.60	326.72	-501.04	510.40	9.00	8.98	-0.75
6,950.00	61.08	273.43	6,815.47	329.39	-543.72	553.15	9.00	8.98	-0.67
7,000.00	65.57	273.12	6,837.91	331.94	-588.32	597.80	9.00	8.98	-0.62
7,050.00	70.06	272.83	6,856.78	334.34	-634.54	644.07	9.00	8.98	-0.57
7,100.00	74.55	272.56	6,871.97	336.58	-682.11	691.69	9.00	8.99	-0.54
7,150.00	79.05	272.30	6,883.39	338.64	-730.74	740.35	9.00	8.99	-0.52
7,200.00	83.54	272.05	6,890.95	340.51	-780.11	789.76	9.00	8.99	-0.50
7,250.00	88.03	271.80	6,894.63	342.18	-829.94	839.61	9.00	8.99	-0.50
7,273.35	90.13	271.68	6,895.00	342.89	-853.27	862.96	9.00	8.99	-0.49
Start 9797.44 hold at 7273.35 MD									
7,300.00	90.13	271.68	6,894.94	343.67	-879.91	889.61	0.00	0.00	0.00
7,400.00	90.13	271.68	6,894.71	346.61	-979.87	989.61	0.00	0.00	0.00
7,500.00	90.13	271.68	6,894.48	349.55	-1,079.82	1,089.61	0.00	0.00	0.00
7,600.00	90.13	271.68	6,894.25	352.49	-1,179.78	1,189.61	0.00	0.00	0.00
7,700.00	90.13	271.68	6,894.01	355.42	-1,279.73	1,289.60	0.00	0.00	0.00
7,800.00	90.13	271.68	6,893.78	358.36	-1,379.69	1,389.60	0.00	0.00	0.00
7,900.00	90.13	271.68	6,893.55	361.30	-1,479.65	1,489.60	0.00	0.00	0.00
8,000.00	90.13	271.68	6,893.32	364.24	-1,579.60	1,589.60	0.00	0.00	0.00
8,100.00	90.13	271.68	6,893.09	367.18	-1,679.56	1,689.60	0.00	0.00	0.00
8,200.00	90.13	271.68	6,892.86	370.11	-1,779.52	1,789.60	0.00	0.00	0.00
8,300.00	90.13	271.68	6,892.63	373.05	-1,879.47	1,889.60	0.00	0.00	0.00
8,400.00	90.13	271.68	6,892.40	375.99	-1,979.43	1,989.60	0.00	0.00	0.00
8,500.00	90.13	271.68	6,892.17	378.93	-2,079.39	2,089.60	0.00	0.00	0.00
8,600.00	90.13	271.68	6,891.94	381.86	-2,179.34	2,189.60	0.00	0.00	0.00
8,700.00	90.13	271.68	6,891.71	384.80	-2,279.30	2,289.60	0.00	0.00	0.00
8,800.00	90.13	271.68	6,891.48	387.74	-2,379.26	2,389.60	0.00	0.00	0.00
8,900.00	90.13	271.68	6,891.25	390.68	-2,479.21	2,489.60	0.00	0.00	0.00
9,000.00	90.13	271.68	6,891.01	393.61	-2,579.17	2,589.60	0.00	0.00	0.00
9,100.00	90.13	271.68	6,890.78	396.55	-2,679.13	2,689.60	0.00	0.00	0.00
9,200.00	90.13	271.68	6,890.55	399.49	-2,779.08	2,789.60	0.00	0.00	0.00
9,300.00	90.13	271.68	6,890.32	402.43	-2,879.04	2,889.60	0.00	0.00	0.00
9,400.00	90.13	271.68	6,890.09	405.36	-2,979.00	2,989.60	0.00	0.00	0.00
9,500.00	90.13	271.68	6,889.86	408.30	-3,078.95	3,089.60	0.00	0.00	0.00
9,600.00	90.13	271.68	6,889.63	411.24	-3,178.91	3,189.60	0.00	0.00	0.00
9,700.00	90.13	271.68	6,889.40	414.18	-3,278.87	3,289.60	0.00	0.00	0.00
9,800.00	90.13	271.68	6,889.17	417.11	-3,378.82	3,389.60	0.00	0.00	0.00
9,900.00	90.13	271.68	6,888.94	420.05	-3,478.78	3,489.60	0.00	0.00	0.00
10,000.00	90.13	271.68	6,888.71	422.99	-3,578.74	3,589.60	0.00	0.00	0.00
10,100.00	90.13	271.68	6,888.48	425.93	-3,678.69	3,689.60	0.00	0.00	0.00
10,200.00	90.13	271.68	6,888.25	428.86	-3,778.65	3,789.60	0.00	0.00	0.00
10,300.00	90.13	271.68	6,888.01	431.80	-3,878.61	3,889.60	0.00	0.00	0.00
10,400.00	90.13	271.68	6,887.78	434.74	-3,978.56	3,989.60	0.00	0.00	0.00
10,500.00	90.13	271.68	6,887.55	437.68	-4,078.52	4,089.60	0.00	0.00	0.00
10,600.00	90.13	271.68	6,887.32	440.61	-4,178.48	4,189.60	0.00	0.00	0.00
10,700.00	90.13	271.68	6,887.09	443.55	-4,278.43	4,289.60	0.00	0.00	0.00
10,800.00	90.13	271.68	6,886.86	446.49	-4,378.39	4,389.60	0.00	0.00	0.00
10,900.00	90.13	271.68	6,886.63	449.43	-4,478.35	4,489.60	0.00	0.00	0.00
11,000.00	90.13	271.68	6,886.40	452.37	-4,578.30	4,589.60	0.00	0.00	0.00
11,100.00	90.13	271.68	6,886.17	455.30	-4,678.26	4,689.60	0.00	0.00	0.00
11,200.00	90.13	271.68	6,885.94	458.24	-4,778.22	4,789.60	0.00	0.00	0.00
11,300.00	90.13	271.68	6,885.71	461.18	-4,878.17	4,889.60	0.00	0.00	0.00
11,400.00	90.13	271.68	6,885.48	464.12	-4,978.13	4,989.60	0.00	0.00	0.00
11,500.00	90.13	271.68	6,885.25	467.05	-5,078.08	5,089.59	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 612H
Company:	Logos Operating LLC	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site:	Rosa Unit 10	North Reference:	True
Well:	Rosa Unit 612H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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)
11,600.00	90.13	271.68	6,885.01	469.99	-5,178.04	5,189.59	0.00	0.00	0.00
11,700.00	90.13	271.68	6,884.78	472.93	-5,278.00	5,289.59	0.00	0.00	0.00
11,800.00	90.13	271.68	6,884.55	475.87	-5,377.95	5,389.59	0.00	0.00	0.00
11,900.00	90.13	271.68	6,884.32	478.80	-5,477.91	5,489.59	0.00	0.00	0.00
12,000.00	90.13	271.68	6,884.09	481.74	-5,577.87	5,589.59	0.00	0.00	0.00
12,100.00	90.13	271.68	6,883.86	484.68	-5,677.82	5,689.59	0.00	0.00	0.00
12,200.00	90.13	271.68	6,883.63	487.62	-5,777.78	5,789.59	0.00	0.00	0.00
12,300.00	90.13	271.68	6,883.40	490.55	-5,877.74	5,889.59	0.00	0.00	0.00
12,400.00	90.13	271.68	6,883.17	493.49	-5,977.69	5,989.59	0.00	0.00	0.00
12,500.00	90.13	271.68	6,882.94	496.43	-6,077.65	6,089.59	0.00	0.00	0.00
12,600.00	90.13	271.68	6,882.71	499.37	-6,177.61	6,189.59	0.00	0.00	0.00
12,700.00	90.13	271.68	6,882.48	502.30	-6,277.56	6,289.59	0.00	0.00	0.00
12,800.00	90.13	271.68	6,882.25	505.24	-6,377.52	6,389.59	0.00	0.00	0.00
12,900.00	90.13	271.68	6,882.01	508.18	-6,477.48	6,489.59	0.00	0.00	0.00
13,000.00	90.13	271.68	6,881.78	511.12	-6,577.43	6,589.59	0.00	0.00	0.00
13,100.00	90.13	271.68	6,881.55	514.05	-6,677.39	6,689.59	0.00	0.00	0.00
13,200.00	90.13	271.68	6,881.32	516.99	-6,777.35	6,789.59	0.00	0.00	0.00
13,300.00	90.13	271.68	6,881.09	519.93	-6,877.30	6,889.59	0.00	0.00	0.00
13,400.00	90.13	271.68	6,880.86	522.87	-6,977.26	6,989.59	0.00	0.00	0.00
13,500.00	90.13	271.68	6,880.63	525.80	-7,077.22	7,089.59	0.00	0.00	0.00
13,600.00	90.13	271.68	6,880.40	528.74	-7,177.17	7,189.59	0.00	0.00	0.00
13,700.00	90.13	271.68	6,880.17	531.68	-7,277.13	7,289.59	0.00	0.00	0.00
13,800.00	90.13	271.68	6,879.94	534.62	-7,377.09	7,389.59	0.00	0.00	0.00
13,900.00	90.13	271.68	6,879.71	537.56	-7,477.04	7,489.59	0.00	0.00	0.00
14,000.00	90.13	271.68	6,879.48	540.49	-7,577.00	7,589.59	0.00	0.00	0.00
14,100.00	90.13	271.68	6,879.25	543.43	-7,676.96	7,689.59	0.00	0.00	0.00
14,200.00	90.13	271.68	6,879.01	546.37	-7,776.91	7,789.59	0.00	0.00	0.00
14,300.00	90.13	271.68	6,878.78	549.31	-7,876.87	7,889.59	0.00	0.00	0.00
14,400.00	90.13	271.68	6,878.55	552.24	-7,976.83	7,989.59	0.00	0.00	0.00
14,500.00	90.13	271.68	6,878.32	555.18	-8,076.78	8,089.59	0.00	0.00	0.00
14,600.00	90.13	271.68	6,878.09	558.12	-8,176.74	8,189.59	0.00	0.00	0.00
14,700.00	90.13	271.68	6,877.86	561.06	-8,276.70	8,289.59	0.00	0.00	0.00
14,800.00	90.13	271.68	6,877.63	563.99	-8,376.65	8,389.59	0.00	0.00	0.00
14,900.00	90.13	271.68	6,877.40	566.93	-8,476.61	8,489.59	0.00	0.00	0.00
15,000.00	90.13	271.68	6,877.17	569.87	-8,576.57	8,589.59	0.00	0.00	0.00
15,100.00	90.13	271.68	6,876.94	572.81	-8,676.52	8,689.59	0.00	0.00	0.00
15,200.00	90.13	271.68	6,876.71	575.74	-8,776.48	8,789.59	0.00	0.00	0.00
15,300.00	90.13	271.68	6,876.48	578.68	-8,876.43	8,889.58	0.00	0.00	0.00
15,400.00	90.13	271.68	6,876.25	581.62	-8,976.39	8,989.58	0.00	0.00	0.00
15,500.00	90.13	271.68	6,876.01	584.56	-9,076.35	9,089.58	0.00	0.00	0.00
15,600.00	90.13	271.68	6,875.78	587.49	-9,176.30	9,189.58	0.00	0.00	0.00
15,700.00	90.13	271.68	6,875.55	590.43	-9,276.26	9,289.58	0.00	0.00	0.00
15,800.00	90.13	271.68	6,875.32	593.37	-9,376.22	9,389.58	0.00	0.00	0.00
15,900.00	90.13	271.68	6,875.09	596.31	-9,476.17	9,489.58	0.00	0.00	0.00
16,000.00	90.13	271.68	6,874.86	599.24	-9,576.13	9,589.58	0.00	0.00	0.00
16,100.00	90.13	271.68	6,874.63	602.18	-9,676.09	9,689.58	0.00	0.00	0.00
16,200.00	90.13	271.68	6,874.40	605.12	-9,776.04	9,789.58	0.00	0.00	0.00
16,300.00	90.13	271.68	6,874.17	608.06	-9,876.00	9,889.58	0.00	0.00	0.00
16,400.00	90.13	271.68	6,873.94	610.99	-9,975.96	9,989.58	0.00	0.00	0.00
16,500.00	90.13	271.68	6,873.71	613.93	-10,075.91	10,089.58	0.00	0.00	0.00
16,600.00	90.13	271.68	6,873.48	616.87	-10,175.87	10,189.58	0.00	0.00	0.00
16,700.00	90.13	271.68	6,873.25	619.81	-10,275.83	10,289.58	0.00	0.00	0.00
16,800.00	90.13	271.68	6,873.02	622.75	-10,375.78	10,389.58	0.00	0.00	0.00
16,900.00	90.13	271.68	6,872.78	625.68	-10,475.74	10,489.58	0.00	0.00	0.00

SDT

Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 612H
Company:	Logos Operating LLC	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site:	Rosa Unit 10	North Reference:	True
Well:	Rosa Unit 612H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

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)
17,000.00	90.13	271.68	6,872.55	628.62	-10,575.70	10,589.58	0.00	0.00	0.00
17,070.79	90.13	271.68	6,872.39	630.70	-10,646.46	10,660.37	0.00	0.00	0.00
FPP @ 330' FWL									
17,100.00	90.13	271.68	6,872.32	631.56	-10,675.65	10,689.58	0.00	0.00	0.00
17,200.00	90.13	271.68	6,872.09	634.50	-10,775.61	10,789.58	0.00	0.00	0.00
17,237.94	90.13	271.68	6,872.00	635.61	-10,813.53	10,827.52	0.00	0.00	0.00
TD at 17237.94 @ 163' FEL									

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Rosa 612H SHL - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	2,140,920.73	2,838,226.78	36.882852	-107.439650
Rosa 612H PBHL - plan misses target center by 0.01usft at 17237.94usft MD (6872.00 TVD, 635.61 N, -10813.53 E) - Point	0.00	0.00	6,872.00	635.61	-10,813.53	2,141,511.73	2,827,410.72	36.884592	-107.476626
Rosa 612H FPP - plan hits target center - Point	0.00	0.00	6,872.39	630.70	-10,646.46	2,141,507.51	2,827,577.81	36.884579	-107.476054
Rosa 612H POE - plan hits target center - Point	0.00	0.00	6,895.00	342.89	-853.27	2,141,260.10	2,837,372.10	36.883794	-107.442568

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,371.02	2,368.00	OJO ALAMO				
2,498.33	2,495.00	KIRTLAND				
2,858.21	2,854.00	FRUITLAND				
2,981.51	2,977.00	TOP OF COALS				
3,139.89	3,135.00	BASE OF COALS				
3,329.35	3,324.00	PICTURED CLIFFS				
3,430.60	3,425.00	LEWIS				
4,521.26	4,513.00	CHACRA				
5,031.50	5,022.00	UPPER CLIFF HOUSE				
5,323.21	5,313.00	CLIFF HOUSE				
5,371.33	5,361.00	MENEFEE				
5,610.92	5,600.00	POINT LOOKOUT				
6,088.08	6,076.00	MANCOS				
6,774.98	6,711.00	TOP BLACK				

SDT
Planning Report

Database:	EDM 5000 Multi User Db	Local Co-ordinate Reference:	Well Rosa Unit 612H
Company:	Logos Operating LLC	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Project:	Rio Arriba, NM (NAD83)	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site:	Rosa Unit 10	North Reference:	True
Well:	Rosa Unit 612H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #1		

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,000.00	1,000.00	0.00	0.00	Start Build 2.00	
1,200.08	1,199.92	5.60	-4.18	Start 5099.42 hold at 1200.08 MD	
6,299.50	6,286.91	290.77	-217.04	Start DLS 9.00 TFO -51.64	
7,273.35	6,895.00	342.89	-853.27	Start 9797.44 hold at 7273.35 MD	
17,070.79	6,872.39	630.70	-10,646.46	FPP @ 330' FWL	
17,237.94	6,872.00	635.61	-10,813.53	TD at 17237.94 @ 163' FEL	

Logos Operating LLC

Rio Arriba, NM (NAD83)

Rosa Unit 10

Rosa Unit 612H

OH

Plan #1

Anticollision Report

22 September, 2023

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCSWA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Max. Cent. Dist. of 100,000.00usft or Max. SF of 10	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	9/21/2023		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	17,237.94	Plan #1 (OH)	B001Mb_MWD+HRGM	OWSG MWD + HRGM	

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 10						
(O) Rosa Unit 100 - OH - OH	15,497.69	6,946.35	1,537.48	1,190.52	4.431	CC
(O) Rosa Unit 100 - OH - OH	15,500.00	6,946.34	1,537.48	1,190.47	4.431	ES
(O) Rosa Unit 100 - OH - OH	15,600.00	6,946.11	1,540.88	1,192.09	4.418	SF
(O) Rosa Unit 100B - OH - OH	14,141.51	6,934.71	1,620.61	1,419.68	8.066	CC
(O) Rosa Unit 100B - OH - OH	14,200.00	6,934.79	1,621.66	1,419.53	8.023	ES
(O) Rosa Unit 100B - OH - OH	14,300.00	6,934.93	1,628.34	1,424.70	7.996	SF
(O) Rosa Unit 100C - OH - OH	16,471.04	6,130.00	1,097.76	911.58	5.896	CC, ES
(O) Rosa Unit 100C - OH - OH	16,500.00	6,130.00	1,098.14	911.65	5.888	SF
(O) Rosa Unit 100E - OH - OH	12,927.59	6,834.28	669.41	487.20	3.674	CC, ES, SF
(O) Rosa Unit 140 - OH - OH	4,000.00	3,555.00	3,905.25	3,822.05	46.938	SF
(O) Rosa Unit 140 - OH - OH	10,420.97	3,555.00	3,323.96	3,278.15	72.562	CC, ES
(O) Rosa Unit 170 - OH - OH	15,527.18	6,175.00	1,573.03	1,262.67	5.068	CC, ES
(O) Rosa Unit 170 - OH - OH	15,600.00	6,175.00	1,574.72	1,263.09	5.053	SF
(O) Rosa Unit 18A - OH - OH	6,000.00	5,955.00	1,423.46	1,259.61	8.688	ES, SF
(O) Rosa Unit 18A - OH - OH	7,634.95	5,955.00	1,402.94	1,268.97	10.472	CC
(O) Rosa Unit 18B - OH - OH	8,693.58	5,985.00	1,499.55	1,326.24	8.653	CC
(O) Rosa Unit 18B - OH - OH	8,700.00	5,985.00	1,499.57	1,326.15	8.647	ES
(O) Rosa Unit 18B - OH - OH	8,900.00	5,985.00	1,513.69	1,336.80	8.557	SF
(O) Rosa Unit 18C - OH - OH	8,774.38	7,108.03	808.98	729.23	10.144	CC, ES
(O) Rosa Unit 18C - OH - OH	8,800.00	7,108.06	809.39	729.34	10.111	SF
(O) Rosa Unit 201A - OH - OH	3,186.92	4,939.97	785.33	726.73	13.401	CC, ES, SF
(O) Rosa Unit 260 - OH - OH	16,067.45	3,219.00	3,938.72	3,807.25	29.959	CC
(O) Rosa Unit 260 - OH - OH	16,100.00	3,219.00	3,938.85	3,807.04	29.883	ES
(O) Rosa Unit 260 - OH - OH	17,237.94	3,219.00	4,108.96	3,964.25	28.393	SF
(O) Rosa Unit 260A - OH - OH	12,704.47	4,891.00	3,727.54	3,665.26	59.854	CC, ES
(O) Rosa Unit 260A - OH - OH	15,100.00	3,554.00	4,152.35	4,065.36	47.736	SF
(O) Rosa Unit 79 - OH - OH	10,338.26	6,826.78	451.87	302.21	3.019	CC, ES, SF
(O) Rosa Unit 79C - OH - OH	410.00	328.00	5,202.53	4,971.57	22.525	CC
(O) Rosa Unit 79C - OH - OH	500.00	370.00	5,202.75	4,942.08	19.959	ES
(O) Rosa Unit 79C - OH - OH	600.00	370.00	5,204.63	4,943.70	19.946	SF
(O) Rosa Unit 98 - OH - OH	1,000.00	950.16	340.74	317.18	14.462	CC
(O) Rosa Unit 98 - OH - OH	1,200.08	1,150.14	344.34	315.29	11.851	ES
(O) Rosa Unit 98 - OH - OH	6,350.00	6,287.18	615.73	473.76	4.337	SF
Rosa Unit 614H - OH - Plan #1	1,021.70	1,021.65	15.20	8.09	2.139	CC
Rosa Unit 614H - OH - Plan #1	1,100.00	1,099.68	15.49	7.84	2.025	ES, SF

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100 - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 90-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			
0.00	0.00	70.00	70.00	0.00	1.29	-95.96	-952.33	-9,119.20	9,168.79						
100.00	100.00	169.90	169.90	0.25	3.18	-95.96	-952.16	-9,119.20	9,168.78	9,165.34	3.43	2,669.651			
200.00	200.00	270.01	270.00	0.61	5.09	-95.96	-952.33	-9,119.20	9,168.79	9,163.10	5.70	1,609.244			
250.00	250.00	320.01	319.99	0.79	6.04	-95.96	-952.08	-9,119.20	9,168.77	9,161.94	6.83	1,342.707			
300.00	300.00	366.12	366.11	0.97	6.92	-95.96	-952.18	-9,119.20	9,168.78	9,160.89	7.89	1,162.714			
400.00	400.00	470.02	470.00	1.33	8.90	-95.96	-952.33	-9,119.20	9,168.79	9,158.57	10.22	896.938			
500.00	500.00	570.02	570.00	1.68	10.80	-95.96	-952.33	-9,119.20	9,168.79	9,156.31	12.48	734.396			
573.06	573.06	643.08	643.05	1.95	12.19	-95.96	-951.78	-9,119.20	9,168.74	9,154.60	14.14	648.530			
600.00	600.00	669.58	669.55	2.04	12.70	-95.96	-951.79	-9,119.20	9,168.74	9,154.00	14.74	622.080			
700.00	700.00	767.93	767.91	2.40	14.57	-95.96	-951.92	-9,119.20	9,168.75	9,151.78	16.97	540.289			
800.00	800.00	866.29	866.27	2.76	16.44	-95.96	-952.22	-9,119.20	9,168.78	9,149.58	19.20	477.507			
900.00	900.00	970.05	970.00	3.12	18.42	-95.96	-952.33	-9,119.20	9,168.79	9,147.26	21.54	425.755			
1,000.00	1,000.00	1,070.05	1,070.00	3.48	20.32	-95.96	-952.33	-9,119.20	9,168.79	9,145.00	23.80	385.277			
1,100.00	1,099.98	1,169.35	1,169.29	3.83	22.21	-59.24	-951.52	-9,119.20	9,167.82	9,141.77	26.05	351.998			
1,200.08	1,199.92	1,266.84	1,266.78	4.19	24.07	-59.32	-951.71	-9,119.20	9,165.16	9,136.90	28.26	324.351			
1,300.00	1,299.59	1,364.06	1,363.99	4.55	25.92	-59.36	-952.15	-9,119.20	9,161.64	9,131.18	30.46	300.736			
1,400.00	1,399.35	1,469.43	1,469.35	4.91	27.83	-59.40	-952.33	-9,119.20	9,158.10	9,125.36	32.74	279.751			
1,500.00	1,499.11	1,565.62	1,565.54	5.27	29.55	-59.43	-952.26	-9,119.20	9,154.54	9,119.72	34.81	262.961			
1,600.00	1,598.86	1,668.95	1,668.86	5.63	31.50	-59.47	-952.33	-9,119.20	9,150.99	9,113.87	37.12	246.510			
1,700.00	1,698.62	1,768.70	1,768.62	6.00	33.40	-59.51	-952.33	-9,119.20	9,147.44	9,108.06	39.38	232.275			
1,800.00	1,798.37	1,867.92	1,867.83	6.36	35.29	-59.55	-952.09	-9,119.20	9,143.87	9,102.24	41.63	219.634			
1,900.00	1,898.13	1,966.73	1,966.65	6.72	37.17	-59.58	-952.19	-9,119.20	9,140.34	9,096.46	43.88	208.325			
2,000.00	1,997.89	2,068.00	2,067.89	7.09	39.13	-59.62	-952.33	-9,119.20	9,136.82	9,090.62	46.20	197.768			
2,100.00	2,097.64	2,167.76	2,167.64	7.45	41.15	-59.66	-952.33	-9,119.20	9,133.28	9,084.70	48.58	187.996			
2,200.00	2,197.40	2,265.14	2,265.02	7.82	43.12	-59.69	-951.61	-9,119.20	9,129.67	9,078.76	50.92	179.304			
2,300.00	2,297.16	2,360.13	2,360.00	8.19	45.05	-59.73	-952.05	-9,119.20	9,126.20	9,072.99	53.20	171.531			
2,400.00	2,396.91	2,467.07	2,466.91	8.55	47.12	-59.77	-952.33	-9,119.20	9,122.71	9,067.06	55.65	163.940			
2,500.00	2,496.67	2,566.82	2,566.67	8.92	49.02	-59.81	-952.33	-9,119.20	9,119.19	9,061.28	57.91	157.471			
2,600.00	2,596.42	2,666.08	2,665.92	9.29	50.91	-59.84	-951.50	-9,119.20	9,115.58	9,055.42	60.16	151.511			
2,700.00	2,696.18	2,763.22	2,763.05	9.66	52.76	-59.88	-951.67	-9,119.20	9,112.09	9,049.71	62.38	146.077			
2,800.00	2,795.94	2,860.33	2,860.16	10.02	54.61	-59.92	-952.09	-9,119.20	9,108.63	9,044.04	64.59	141.017			
2,900.00	2,895.69	2,965.88	2,965.69	10.39	56.54	-59.96	-952.33	-9,119.20	9,105.16	9,038.27	66.89	136.127			
3,000.00	2,995.45	3,065.07	3,064.88	10.76	58.31	-60.00	-952.01	-9,119.20	9,101.62	9,032.60	69.02	131.868			
3,100.00	3,095.21	3,161.76	3,161.57	11.13	60.03	-60.04	-952.20	-9,119.20	9,098.15	9,027.04	71.11	127.945			
3,200.00	3,194.96	3,265.15	3,264.96	11.49	61.88	-60.08	-952.33	-9,119.20	9,094.68	9,021.36	73.32	124.039			
3,300.00	3,294.72	3,364.91	3,364.72	11.86	63.66	-60.12	-952.33	-9,119.20	9,091.19	9,015.72	75.47	120.462			
3,400.00	3,394.47	3,464.44	3,464.25	12.23	65.44	-60.15	-952.06	-9,119.20	9,087.68	9,010.07	77.61	117.088			
3,500.00	3,494.23	3,563.25	3,563.05	12.60	67.21	-60.19	-952.12	-9,119.20	9,084.21	9,004.46	79.75	113.915			
3,600.00	3,593.99	3,662.05	3,661.85	12.97	68.97	-60.23	-952.27	-9,119.20	9,080.75	8,998.88	81.88	110.908			
3,700.00	3,693.74	3,763.95	3,763.74	13.34	70.88	-60.27	-952.33	-9,119.20	9,077.29	8,993.14	84.15	107.868			
3,800.00	3,793.50	3,863.70	3,863.50	13.71	72.78	-60.31	-952.33	-9,119.20	9,073.83	8,987.41	86.42	105.001			
3,900.00	3,893.26	3,962.87	3,962.66	14.07	74.67	-60.34	-951.80	-9,119.20	9,070.30	8,981.63	88.67	102.292			
4,000.00	3,993.01	4,060.68	4,060.47	14.44	76.53	-60.38	-951.94	-9,119.20	9,066.86	8,975.96	90.90	99.747			
4,100.00	4,092.77	4,158.48	4,158.27	14.81	78.39	-60.42	-952.24	-9,119.20	9,063.45	8,970.32	93.13	97.324			
4,200.00	4,192.52	4,262.76	4,262.52	15.18	80.43	-60.46	-952.33	-9,119.20	9,060.00	8,964.48	95.53	94.842			
4,300.00	4,292.28	4,362.51	4,362.28	15.55	82.38	-60.50	-952.33	-9,119.20	9,056.56	8,958.71	97.85	92.555			
4,400.00	4,392.04	4,461.31	4,461.07	15.92	84.32	-60.53	-951.52	-9,119.20	9,053.02	8,952.86	100.16	90.390			
4,500.00	4,491.79	4,558.18	4,557.94	16.29	86.22	-60.57	-951.72	-9,119.20	9,049.61	8,947.18	102.42	88.356			
4,600.00	4,591.55	4,655.03	4,654.78	16.66	88.12	-60.61	-952.17	-9,119.20	9,046.23	8,941.54	104.69	86.410			
4,700.00	4,691.31	4,761.58	4,761.31	17.03	90.17	-60.65	-952.33	-9,119.20	9,042.82	8,935.72	107.10	84.434			
4,800.00	4,791.06	4,861.34	4,861.06	17.40	92.07	-60.69	-952.33	-9,119.20	9,039.40	8,930.03	109.36	82.654			
4,900.00	4,890.82	4,960.16	4,959.87	17.76	93.95	-60.72	-951.52	-9,119.20	9,035.87	8,924.26	111.61	80.957			

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Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	EDM 5000 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100 - OH - OH													Offset Site Error:	0.00 usft	
Survey Program:		90-A027Ua_INC-ONLY				Offset		Semi Major Axis		Offset Wellbore Centre		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)	Distance Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
5,000.00	4,990.57	5,056.94	5,056.66	18.13	95.79	-60.76	-951.72	-9,119.20	9,032.48	8,918.66	113.82	79.356			
5,100.00	5,090.33	5,153.70	5,153.41	18.50	97.63	-60.80	-952.17	-9,119.20	9,029.13	8,913.10	116.03	77.816			
5,200.00	5,190.09	5,260.39	5,260.09	18.87	99.52	-60.84	-952.33	-9,119.20	9,025.74	8,907.45	118.29	76.304			
5,300.00	5,289.84	5,360.15	5,359.84	19.24	101.25	-60.88	-952.33	-9,119.20	9,022.33	8,901.95	120.38	74.949			
5,400.00	5,389.60	5,459.25	5,458.94	19.61	102.96	-60.92	-951.79	-9,119.20	9,018.86	8,896.40	122.46	73.647			
5,500.00	5,489.35	5,556.95	5,556.64	19.98	104.65	-60.96	-951.93	-9,119.20	9,015.49	8,890.97	124.52	72.403			
5,600.00	5,589.11	5,654.64	5,654.33	20.35	106.34	-61.00	-952.23	-9,119.20	9,012.14	8,885.56	126.57	71.200			
5,700.00	5,688.87	5,759.18	5,758.87	20.72	108.16	-61.04	-952.33	-9,119.20	9,008.76	8,880.00	128.76	69.968			
5,800.00	5,788.62	5,858.94	5,858.62	21.09	109.89	-61.08	-952.33	-9,119.20	9,005.38	8,874.52	130.85	68.820			
5,900.00	5,888.38	5,958.69	5,958.38	21.46	111.62	-61.11	-952.33	-9,119.20	9,002.00	8,869.04	132.95	67.708			
6,000.00	5,988.14	6,058.45	6,058.14	21.83	113.35	-61.15	-952.33	-9,119.20	8,998.62	8,863.57	135.05	66.631			
6,100.00	6,087.89	6,158.21	6,157.89	22.20	115.09	-61.19	-952.33	-9,119.20	8,995.25	8,858.10	137.15	65.586			
6,200.00	6,187.65	6,257.96	6,257.65	22.57	116.87	-61.23	-952.33	-9,119.20	8,991.88	8,852.59	139.30	64.552			
6,299.50	6,286.91	6,357.22	6,356.91	22.93	118.65	-61.27	-952.33	-9,119.20	8,988.54	8,847.09	141.44	63.549			
6,350.00	6,337.14	6,407.46	6,407.14	23.12	119.55	-33.83	-952.33	-9,119.20	8,984.87	8,842.34	142.53	63.038			
6,400.00	6,386.40	6,456.38	6,456.07	23.32	120.43	-25.18	-952.06	-9,119.20	8,977.34	8,833.74	143.59	62.519			
6,450.00	6,434.88	6,504.34	6,504.02	23.52	121.29	-21.28	-952.08	-9,119.20	8,966.05	8,821.41	144.64	61.989			
6,500.00	6,482.27	6,551.21	6,550.90	23.73	122.13	-19.23	-952.12	-9,119.20	8,951.04	8,805.38	145.66	61.450			
6,550.00	6,528.29	6,596.73	6,596.41	23.94	122.94	-18.09	-952.18	-9,119.20	8,932.40	8,785.74	146.66	60.905			
6,600.00	6,572.65	6,640.60	6,640.28	24.16	123.73	-17.53	-952.25	-9,119.20	8,910.25	8,762.63	147.62	60.358			
6,650.00	6,615.08	6,685.40	6,685.08	24.39	124.55	-17.36	-952.33	-9,119.20	8,884.72	8,736.11	148.61	59.786			
6,700.00	6,655.31	6,725.64	6,725.31	24.64	125.34	-17.52	-952.33	-9,119.20	8,855.96	8,706.40	149.56	59.214			
6,750.00	6,693.11	6,763.43	6,763.11	24.90	126.08	-17.98	-952.33	-9,119.20	8,824.16	8,673.71	150.45	58.652			
6,800.00	6,728.23	6,798.55	6,798.23	25.18	126.76	-18.75	-952.33	-9,119.20	8,789.51	8,638.23	151.28	58.101			
6,850.00	6,760.46	6,830.78	6,830.46	25.50	127.39	-19.87	-952.33	-9,119.20	8,752.24	8,600.19	152.04	57.563			
6,900.00	6,789.60	6,859.92	6,859.60	25.84	127.96	-21.44	-952.33	-9,119.20	8,712.56	8,559.82	152.74	57.042			
6,950.00	6,815.47	6,885.79	6,885.47	26.21	128.47	-23.59	-952.33	-9,119.20	8,670.73	8,517.37	153.36	56.539			
7,000.00	6,837.91	6,908.23	6,907.91	26.63	128.91	-26.55	-952.33	-9,119.20	8,627.01	8,473.11	153.90	56.055			
7,050.00	6,856.78	6,927.11	6,926.78	27.08	129.28	-30.71	-952.33	-9,119.20	8,581.66	8,427.30	154.37	55.593			
7,100.00	6,871.97	6,942.30	6,941.97	27.57	129.58	-36.74	-952.33	-9,119.20	8,534.97	8,380.22	154.75	55.154			
7,150.00	6,883.39	6,953.71	6,953.39	28.10	129.80	-45.78	-952.33	-9,119.20	8,487.22	8,332.18	155.05	54.739			
7,200.00	6,890.95	6,961.28	6,960.95	28.66	129.95	-59.61	-952.33	-9,119.20	8,438.71	8,283.45	155.26	54.351			
7,250.00	6,894.63	6,964.95	6,964.63	29.25	130.02	-79.68	-952.33	-9,119.20	8,389.74	8,234.34	155.40	53.989			
7,273.35	6,895.00	6,965.32	6,965.00	29.54	130.03	-90.71	-952.33	-9,119.20	8,366.79	8,211.36	155.43	53.829			
7,300.00	6,894.94	6,965.26	6,964.94	29.87	130.02	-90.70	-952.33	-9,119.20	8,340.60	8,185.14	155.46	53.651			
7,400.00	6,894.71	6,965.03	6,964.71	31.22	130.02	-90.70	-952.33	-9,119.20	8,242.33	8,086.76	155.58	52.980			
7,500.00	6,894.48	6,964.80	6,964.48	32.69	130.02	-90.69	-952.33	-9,119.20	8,144.11	7,988.41	155.70	52.306			
7,600.00	6,894.25	6,964.57	6,964.25	34.27	130.01	-90.68	-952.33	-9,119.20	8,045.93	7,890.09	155.84	51.628			
7,700.00	6,894.01	6,964.34	6,964.01	35.95	130.01	-90.67	-952.33	-9,119.20	7,947.80	7,791.80	156.00	50.948			
7,800.00	6,893.78	6,964.11	6,963.78	37.71	130.00	-90.66	-952.33	-9,119.20	7,849.71	7,693.54	156.17	50.265			
7,900.00	6,893.55	6,963.88	6,963.55	39.54	130.00	-90.65	-952.33	-9,119.20	7,751.67	7,595.32	156.35	49.579			
8,000.00	6,893.32	6,963.65	6,963.32	41.44	129.99	-90.64	-952.33	-9,119.20	7,653.68	7,497.13	156.55	48.889			
8,100.00	6,893.09	6,963.42	6,963.09	43.39	129.99	-90.64	-952.33	-9,119.20	7,555.75	7,398.98	156.77	48.197			
8,200.00	6,892.86	6,963.19	6,962.86	45.39	129.98	-90.63	-952.33	-9,119.20	7,457.87	7,300.87	157.00	47.502			
8,300.00	6,892.63	6,962.96	6,962.63	47.44	129.98	-90.62	-952.33	-9,119.20	7,360.05	7,202.79	157.25	46.804			
8,400.00	6,892.40	6,962.72	6,962.40	49.51	129.97	-90.61	-952.33	-9,119.20	7,262.28	7,104.76	157.52	46.103			
8,500.00	6,892.17	6,962.49	6,962.17	51.62	129.97	-90.60	-952.33	-9,119.20	7,164.58	7,006.77	157.81	45.399			
8,600.00	6,891.94	6,962.26	6,961.94	53.76	129.97	-90.59	-952.33	-9,119.20	7,066.94	6,908.82	158.13	44.692			
8,700.00	6,891.71	6,962.03	6,961.71	55.92	129.96	-90.58	-952.33	-9,119.20	6,969.37	6,810.91	158.46	43.982			
8,800.00	6,891.48	6,961.80	6,961.48	58.11	129.96	-90.58	-952.33	-9,119.20	6,871.87	6,713.06	158.81	43.270			
8,900.00	6,891.25	6,961.57	6,961.25	60.31	129.95	-90.57	-952.33	-9,119.20	6,774.44	6,615.25	159.19	42.555			
9,000.00	6,891.01	6,961.34	6,961.01	62.54	129.95	-90.56	-952.33	-9,119.20	6,677.09	6,517.50	159.59	41.838			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100 - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 90-A027Ua_INC-ONLY												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)			
9,100.00	6,890.78	6,961.11	6,960.78	64.78	129.94	-90.55	-952.33	-9,119.20	6,579.82	6,419.80	160.02	41.118	
9,200.00	6,890.55	6,960.88	6,960.55	67.03	129.94	-90.54	-952.33	-9,119.20	6,482.63	6,322.15	160.48	40.396	
9,300.00	6,890.32	6,960.65	6,960.32	69.29	129.93	-90.53	-952.33	-9,119.20	6,385.53	6,224.57	160.96	39.672	
9,400.00	6,890.09	6,960.42	6,960.09	71.57	129.93	-90.52	-952.33	-9,119.20	6,288.52	6,127.05	161.47	38.946	
9,500.00	6,889.86	6,960.19	6,959.86	73.86	129.93	-90.52	-952.33	-9,119.20	6,191.60	6,029.59	162.01	38.217	
9,600.00	6,889.63	6,959.96	6,959.63	76.16	129.92	-90.51	-952.33	-9,119.20	6,094.78	5,932.20	162.58	37.488	
9,700.00	6,889.40	6,959.72	6,959.40	78.46	129.92	-90.50	-952.33	-9,119.20	5,998.07	5,834.88	163.19	36.756	
9,800.00	6,889.17	6,959.49	6,959.17	80.78	129.91	-90.49	-952.33	-9,119.20	5,901.47	5,737.64	163.82	36.023	
9,900.00	6,888.94	6,959.26	6,958.94	83.10	129.91	-90.48	-952.33	-9,119.20	5,804.98	5,640.48	164.50	35.289	
10,000.00	6,888.71	6,959.03	6,958.71	85.43	129.90	-90.47	-952.33	-9,119.20	5,708.61	5,543.40	165.21	34.554	
10,100.00	6,888.48	6,958.80	6,958.48	87.76	129.90	-90.46	-952.33	-9,119.20	5,612.37	5,446.41	165.96	33.818	
10,200.00	6,888.25	6,958.57	6,958.25	90.10	129.89	-90.46	-952.33	-9,119.20	5,516.27	5,349.52	166.75	33.081	
10,300.00	6,888.01	6,958.34	6,958.01	92.45	129.89	-90.45	-952.33	-9,119.20	5,420.30	5,252.72	167.58	32.345	
10,400.00	6,887.78	6,958.11	6,957.78	94.80	129.88	-90.44	-952.33	-9,119.20	5,324.48	5,156.03	168.46	31.608	
10,500.00	6,887.55	6,957.88	6,957.55	97.15	129.88	-90.43	-952.33	-9,119.20	5,228.82	5,059.44	169.38	30.871	
10,600.00	6,887.32	6,957.65	6,957.32	99.51	129.88	-90.42	-952.33	-9,119.20	5,133.33	4,962.98	170.35	30.134	
10,700.00	6,887.09	6,957.42	6,957.09	101.87	129.87	-90.41	-952.33	-9,119.20	5,038.01	4,866.64	171.37	29.399	
10,800.00	6,886.86	6,957.19	6,956.86	104.24	129.87	-90.40	-952.33	-9,119.20	4,942.87	4,770.43	172.44	28.664	
10,900.00	6,886.63	6,956.96	6,956.63	106.61	129.86	-90.40	-952.33	-9,119.20	4,847.93	4,674.36	173.57	27.930	
11,000.00	6,886.40	6,956.72	6,956.40	108.98	129.86	-90.39	-952.33	-9,119.20	4,753.20	4,578.44	174.76	27.198	
11,100.00	6,886.17	6,956.49	6,956.17	111.36	129.85	-90.38	-952.33	-9,119.20	4,658.69	4,482.68	176.01	26.469	
11,200.00	6,885.94	6,956.26	6,955.94	113.74	129.85	-90.37	-952.33	-9,119.20	4,564.41	4,387.09	177.32	25.741	
11,300.00	6,885.71	6,956.03	6,955.71	116.12	129.84	-90.36	-952.33	-9,119.20	4,470.38	4,291.68	178.70	25.016	
11,400.00	6,885.48	6,955.80	6,955.48	118.51	129.84	-90.35	-952.33	-9,119.20	4,376.62	4,196.46	180.16	24.293	
11,500.00	6,885.25	6,955.57	6,955.25	120.89	129.83	-90.34	-952.33	-9,119.20	4,283.14	4,101.45	181.68	23.575	
11,600.00	6,885.01	6,955.34	6,955.01	123.28	129.83	-90.34	-952.33	-9,119.20	4,189.96	4,006.66	183.29	22.860	
11,700.00	6,884.78	6,955.11	6,954.78	125.67	129.83	-90.33	-952.33	-9,119.20	4,097.10	3,912.11	184.98	22.149	
11,800.00	6,884.55	6,954.88	6,954.55	128.07	129.82	-90.32	-952.33	-9,119.20	4,004.58	3,817.82	186.76	21.442	
11,900.00	6,884.32	6,954.65	6,954.32	130.46	129.82	-90.31	-952.33	-9,119.20	3,912.43	3,723.80	188.63	20.741	
12,000.00	6,884.09	6,954.42	6,954.09	132.86	129.81	-90.30	-952.33	-9,119.20	3,820.68	3,630.07	190.61	20.045	
12,100.00	6,883.86	6,954.19	6,953.86	135.25	129.81	-90.29	-952.33	-9,119.20	3,729.35	3,536.67	192.68	19.355	
12,200.00	6,883.63	6,953.96	6,953.63	137.65	129.80	-90.28	-952.33	-9,119.20	3,638.48	3,443.61	194.87	18.671	
12,300.00	6,883.40	6,953.73	6,953.40	140.05	129.80	-90.27	-952.33	-9,119.20	3,548.10	3,350.92	197.18	17.994	
12,400.00	6,883.17	6,953.49	6,953.17	142.46	129.79	-90.27	-952.33	-9,119.20	3,458.24	3,258.64	199.61	17.325	
12,500.00	6,882.94	6,953.26	6,952.94	144.86	129.79	-90.26	-952.33	-9,119.20	3,368.96	3,166.79	202.17	16.664	
12,600.00	6,882.71	6,953.03	6,952.71	147.27	129.79	-90.25	-952.33	-9,119.20	3,280.30	3,075.43	204.87	16.011	
12,700.00	6,882.48	6,952.80	6,952.48	149.67	129.78	-90.24	-952.33	-9,119.20	3,192.31	2,984.59	207.72	15.368	
12,800.00	6,882.25	6,952.57	6,952.25	152.08	129.78	-90.23	-952.33	-9,119.20	3,105.05	2,894.31	210.73	14.734	
12,900.00	6,882.01	6,952.34	6,952.01	154.49	129.77	-90.22	-952.33	-9,119.20	3,018.57	2,804.66	213.91	14.111	
13,000.00	6,881.78	6,952.11	6,951.78	156.90	129.77	-90.21	-952.33	-9,119.20	2,932.96	2,715.70	217.26	13.500	
13,100.00	6,881.55	6,951.88	6,951.55	159.31	129.76	-90.21	-952.33	-9,119.20	2,848.28	2,627.48	220.80	12.900	
13,200.00	6,881.32	6,951.65	6,951.32	161.72	129.76	-90.20	-952.33	-9,119.20	2,764.63	2,540.09	224.54	12.312	
13,300.00	6,881.09	6,951.42	6,951.09	164.13	129.75	-90.19	-952.33	-9,119.20	2,682.10	2,453.61	228.48	11.739	
13,400.00	6,880.86	6,951.19	6,950.86	166.55	129.75	-90.18	-952.33	-9,119.20	2,600.79	2,368.14	232.65	11.179	
13,500.00	6,880.63	6,950.96	6,950.63	168.96	129.74	-90.17	-952.33	-9,119.20	2,520.83	2,283.79	237.03	10.635	
13,600.00	6,880.40	6,950.73	6,950.40	171.38	129.74	-90.16	-952.33	-9,119.20	2,442.34	2,200.68	241.66	10.107	
13,700.00	6,880.17	6,950.49	6,950.17	173.79	129.74	-90.15	-952.33	-9,119.20	2,365.48	2,118.96	246.52	9.595	
13,800.00	6,879.94	6,950.26	6,949.94	176.21	129.73	-90.15	-952.33	-9,119.20	2,290.41	2,038.77	251.64	9.102	
13,900.00	6,879.71	6,950.03	6,949.71	178.63	129.73	-90.14	-952.33	-9,119.20	2,217.30	1,960.30	257.00	8.628	
14,000.00	6,879.48	6,949.80	6,949.48	181.04	129.72	-90.13	-952.33	-9,119.20	2,146.37	1,883.76	262.61	8.173	
14,100.00	6,879.25	6,949.57	6,949.25	183.46	129.72	-90.12	-952.33	-9,119.20	2,077.83	1,809.37	268.46	7.740	
14,200.00	6,879.01	6,949.34	6,949.01	185.88	129.71	-90.11	-952.33	-9,119.20	2,011.92	1,737.38	274.54	7.328	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100 - OH - OH													Offset Site Error:	0.00 usft		
Survey Program:		90-A027Ua_INC-ONLY					Offset		Semi Major Axis		Rule Assigned:		Warning		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				
14,300.00	6,878.78	6,949.11	6,948.78	188.30	129.71	-90.10	-952.33	-9,119.20	1,948.92	1,668.11	280.81	6.940				
14,400.00	6,878.55	6,948.88	6,948.55	190.72	129.70	-90.09	-952.33	-9,119.20	1,889.11	1,601.85	287.26	6.576				
14,500.00	6,878.32	6,948.65	6,948.32	193.14	129.70	-90.09	-952.33	-9,119.20	1,832.82	1,538.98	293.83	6.238				
14,600.00	6,878.09	6,948.42	6,948.09	195.56	129.70	-90.08	-952.33	-9,119.20	1,780.36	1,479.89	300.47	5.925				
14,700.00	6,877.86	6,948.19	6,947.86	197.99	129.69	-90.07	-952.33	-9,119.20	1,732.09	1,425.00	307.09	5.640				
14,800.00	6,877.63	6,947.96	6,947.63	200.41	129.69	-90.06	-952.33	-9,119.20	1,688.37	1,374.76	313.62	5.384				
14,900.00	6,877.40	6,947.73	6,947.40	202.83	129.68	-90.05	-952.33	-9,119.20	1,649.57	1,329.63	319.94	5.156				
15,000.00	6,877.17	6,947.49	6,947.17	205.25	129.68	-90.04	-952.33	-9,119.20	1,616.02	1,290.08	325.94	4.958				
15,100.00	6,876.94	6,947.26	6,946.94	207.68	129.67	-90.03	-952.33	-9,119.20	1,588.08	1,256.58	331.50	4.791				
15,200.00	6,876.71	6,947.03	6,946.71	210.10	129.67	-90.03	-952.33	-9,119.20	1,566.03	1,229.54	336.49	4.654				
15,300.00	6,876.48	6,946.80	6,946.48	212.53	129.66	-90.02	-952.33	-9,119.20	1,550.13	1,209.33	340.81	4.548				
15,400.00	6,876.25	6,946.57	6,946.25	214.95	129.66	-90.01	-952.33	-9,119.20	1,540.58	1,196.24	344.34	4.474				
15,497.69	6,876.02	6,946.35	6,946.02	217.32	129.65	-90.00	-952.33	-9,119.20	1,537.48	1,190.52	346.96	4.431 CC				
15,500.00	6,876.01	6,946.34	6,946.01	217.38	129.65	-90.00	-952.33	-9,119.20	1,537.48	1,190.47	347.01	4.431 ES				
15,600.00	6,875.78	6,946.11	6,945.78	219.80	129.65	-89.99	-952.33	-9,119.20	1,540.88	1,192.09	348.79	4.418 SF				
15,700.00	6,875.55	6,945.88	6,945.55	222.23	129.65	-89.98	-952.33	-9,119.20	1,550.73	1,201.08	349.65	4.435				
15,800.00	6,875.32	6,945.65	6,945.32	224.66	129.64	-89.97	-952.33	-9,119.20	1,566.92	1,217.29	349.62	4.482				
15,900.00	6,875.09	6,945.42	6,945.09	227.08	129.64	-89.97	-952.33	-9,119.20	1,589.24	1,240.48	348.76	4.557				
16,000.00	6,874.86	6,945.19	6,944.86	229.51	129.63	-89.96	-952.33	-9,119.20	1,617.45	1,270.31	347.15	4.659				
16,100.00	6,874.63	6,944.96	6,944.63	231.94	129.63	-89.95	-952.33	-9,119.20	1,651.25	1,306.38	344.87	4.788				
16,200.00	6,874.40	6,944.73	6,944.40	234.37	129.62	-89.94	-952.33	-9,119.20	1,690.29	1,348.25	342.04	4.942				
16,300.00	6,874.17	6,944.49	6,944.17	236.79	129.62	-89.93	-952.33	-9,119.20	1,734.23	1,395.47	338.75	5.119				
16,400.00	6,873.94	6,944.26	6,943.94	239.22	129.61	-89.92	-952.33	-9,119.20	1,782.69	1,447.58	335.12	5.320				
16,500.00	6,873.71	6,944.03	6,943.71	241.65	129.61	-89.91	-952.33	-9,119.20	1,835.34	1,504.11	331.23	5.541				
16,600.00	6,873.48	6,943.80	6,943.48	244.08	129.60	-89.91	-952.33	-9,119.20	1,891.80	1,564.64	327.17	5.782				
16,700.00	6,873.25	6,943.57	6,943.25	246.51	129.60	-89.90	-952.33	-9,119.20	1,951.76	1,628.76	323.00	6.043				
16,800.00	6,873.02	6,943.34	6,943.02	248.94	129.60	-89.89	-952.33	-9,119.20	2,014.91	1,696.10	318.80	6.320				
16,900.00	6,872.78	6,943.11	6,942.78	251.37	129.59	-89.88	-952.33	-9,119.20	2,080.94	1,766.33	314.61	6.614				
17,000.00	6,872.55	6,942.88	6,942.55	253.80	129.59	-89.87	-952.33	-9,119.20	2,149.60	1,839.14	310.46	6.924				
17,070.79	6,872.39	6,942.72	6,942.39	255.52	129.58	-89.86	-952.33	-9,119.20	2,199.65	1,892.09	307.56	7.152				
17,100.00	6,872.32	6,942.65	6,942.32	256.23	129.58	-89.86	-952.33	-9,119.20	2,220.64	1,914.25	306.38	7.248				
17,200.00	6,872.09	6,942.42	6,942.09	258.66	129.58	-89.85	-952.33	-9,119.20	2,293.84	1,991.43	302.41	7.585				
17,237.94	6,872.00	6,942.33	6,942.00	259.58	129.58	-89.85	-952.33	-9,119.20	2,322.13	2,021.20	300.93	7.716				

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100B - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-NS-GYRO-MS													Offset Well Error: 0.00 usft
Reference													
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 (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	43.24	43.24	0.00	0.06	-97.49	-1,014.58	-7,714.33	7,780.78				
100.00	100.00	116.53	116.53	0.25	0.15	-97.49	-1,014.45	-7,714.63	7,781.15	7,780.75	0.41	N/A	
200.00	200.00	200.00	200.00	0.61	0.27	-97.49	-1,014.16	-7,715.29	7,781.88	7,781.01	0.88	8,891.839	
300.00	300.00	277.36	277.36	0.97	0.46	-97.49	-1,013.94	-7,716.09	7,782.85	7,781.43	1.43	5,450.417	
400.00	400.00	367.21	367.20	1.33	0.69	-97.49	-1,014.02	-7,717.09	7,783.97	7,781.96	2.01	3,868.889	
500.00	500.00	489.81	489.79	1.68	0.99	-97.49	-1,014.51	-7,718.38	7,785.08	7,782.41	2.67	2,914.286	
600.00	600.00	631.24	631.22	2.04	1.33	-97.49	-1,015.03	-7,719.20	7,785.70	7,782.33	3.37	2,307.491	
700.00	700.00	720.93	720.90	2.40	1.56	-97.49	-1,015.17	-7,719.64	7,786.20	7,782.24	3.96	1,967.614	
800.00	800.00	819.86	819.83	2.76	1.80	-97.49	-1,015.10	-7,720.14	7,786.69	7,782.13	4.56	1,706.496	
900.00	900.00	918.32	918.29	3.12	2.05	-97.49	-1,014.95	-7,720.67	7,787.21	7,782.03	5.17	1,505.380	
1,000.00	1,000.00	1,018.63	1,018.60	3.48	2.31	-97.49	-1,014.78	-7,721.23	7,787.74	7,781.95	5.79	1,345.991	
1,100.00	1,099.98	1,127.97	1,127.94	3.83	2.58	-60.77	-1,014.54	-7,721.77	7,787.34	7,780.93	6.41	1,214.600	
1,200.00	1,199.92	1,235.88	1,235.84	4.19	2.84	-60.84	-1,014.23	-7,722.18	7,785.13	7,778.09	7.03	1,106.988	
1,300.00	1,299.59	1,340.78	1,340.75	4.55	3.10	-60.88	-1,014.00	-7,722.49	7,781.99	7,774.34	7.65	1,017.567	
1,400.00	1,399.35	1,443.82	1,443.78	4.91	3.34	-60.93	-1,013.88	-7,722.72	7,778.79	7,770.55	8.24	944.266	
1,500.00	1,499.11	1,544.32	1,544.28	5.27	3.53	-60.97	-1,014.02	-7,722.88	7,775.58	7,766.78	8.80	884.059	
1,600.00	1,598.86	1,635.54	1,635.51	5.63	3.72	-61.02	-1,014.37	-7,723.02	7,772.39	7,763.05	9.34	832.226	
1,700.00	1,698.62	1,715.29	1,715.25	6.00	3.88	-61.06	-1,014.60	-7,723.32	7,769.42	7,759.55	9.87	787.477	
1,800.00	1,798.37	1,800.00	1,799.96	6.36	4.06	-61.09	-1,014.72	-7,723.89	7,766.71	7,756.31	10.40	746.496	
1,900.00	1,898.13	1,906.32	1,906.28	6.72	4.34	-61.14	-1,014.76	-7,724.67	7,764.08	7,753.03	11.05	702.825	
2,000.00	1,997.89	2,000.00	1,999.96	7.09	4.59	-61.18	-1,014.74	-7,725.23	7,761.30	7,749.64	11.66	665.813	
2,100.00	2,097.64	2,096.52	2,096.47	7.45	4.84	-61.23	-1,014.72	-7,725.86	7,758.58	7,746.30	12.28	632.057	
2,200.00	2,197.40	2,178.78	2,178.74	7.82	5.06	-61.26	-1,014.73	-7,726.59	7,756.10	7,743.25	12.86	603.299	
2,300.00	2,297.16	2,270.04	2,269.99	8.19	5.30	-61.30	-1,014.83	-7,727.57	7,753.82	7,740.36	13.46	576.187	
2,400.00	2,396.91	2,364.40	2,364.34	8.55	5.54	-61.35	-1,015.13	-7,728.62	7,751.61	7,737.54	14.07	551.123	
2,500.00	2,496.67	2,469.45	2,469.38	8.92	5.80	-61.40	-1,015.68	-7,729.78	7,749.43	7,734.74	14.69	527.507	
2,600.00	2,596.42	2,580.96	2,580.88	9.29	6.07	-61.45	-1,016.41	-7,730.85	7,747.13	7,731.80	15.33	505.461	
2,700.00	2,696.18	2,678.91	2,678.83	9.66	6.31	-61.50	-1,017.14	-7,731.69	7,744.75	7,728.83	15.93	486.305	
2,800.00	2,795.94	2,774.08	2,773.99	10.02	6.53	-61.55	-1,017.89	-7,732.56	7,742.44	7,725.92	16.52	468.755	
2,900.00	2,895.69	2,871.73	2,871.63	10.39	6.76	-61.60	-1,018.80	-7,733.48	7,740.17	7,723.07	17.10	452.537	
3,000.00	2,995.45	2,970.25	2,970.14	10.76	6.98	-61.65	-1,020.14	-7,734.36	7,737.93	7,720.24	17.69	437.439	
3,100.00	3,095.21	3,076.24	3,076.11	11.13	7.20	-61.71	-1,021.89	-7,735.24	7,735.68	7,717.40	18.28	423.135	
3,200.00	3,194.96	3,185.51	3,185.37	11.49	7.43	-61.77	-1,023.52	-7,736.04	7,733.32	7,714.44	18.88	409.651	
3,300.00	3,294.72	3,271.38	3,271.23	11.86	7.63	-61.82	-1,024.67	-7,736.70	7,730.98	7,711.54	19.44	397.688	
3,400.00	3,394.47	3,353.69	3,353.53	12.23	7.82	-61.86	-1,025.72	-7,737.52	7,728.86	7,708.86	20.00	386.509	
3,500.00	3,494.23	3,433.11	3,432.93	12.60	8.01	-61.91	-1,026.71	-7,738.51	7,726.98	7,706.43	20.55	375.954	
3,600.00	3,593.99	3,508.78	3,508.58	12.97	8.20	-61.95	-1,027.77	-7,739.66	7,725.41	7,704.30	21.11	365.981	
3,700.00	3,693.74	3,600.00	3,599.78	13.34	8.43	-62.00	-1,029.24	-7,741.33	7,724.17	7,702.47	21.70	355.893	
3,800.00	3,793.50	3,666.31	3,666.06	13.71	8.60	-62.04	-1,030.50	-7,742.70	7,723.18	7,700.94	22.24	347.340	
3,900.00	3,893.26	3,749.76	3,749.47	14.07	8.80	-62.09	-1,032.39	-7,744.53	7,722.43	7,699.62	22.81	338.558	
4,000.00	3,993.01	3,885.54	3,885.18	14.44	9.14	-62.17	-1,035.84	-7,747.49	7,721.76	7,698.25	23.51	328.458	
4,100.00	4,092.77	4,050.81	4,050.40	14.81	9.53	-62.27	-1,039.12	-7,749.70	7,720.07	7,695.80	24.27	318.114	
4,200.00	4,192.52	4,159.30	4,158.86	15.18	9.78	-62.33	-1,041.34	-7,750.73	7,718.08	7,693.19	24.88	310.178	
4,300.00	4,292.28	4,263.76	4,263.29	15.55	10.02	-62.40	-1,043.67	-7,751.58	7,716.00	7,690.51	25.49	302.751	
4,400.00	4,392.04	4,365.86	4,365.37	15.92	10.25	-62.46	-1,045.78	-7,752.41	7,713.89	7,687.80	26.08	295.740	
4,500.00	4,491.79	4,467.94	4,467.42	16.29	10.48	-62.52	-1,047.68	-7,753.23	7,711.76	7,685.07	26.69	288.951	
4,600.00	4,591.55	4,570.02	4,569.49	16.66	10.73	-62.58	-1,049.30	-7,754.07	7,709.60	7,682.30	27.30	282.418	
4,700.00	4,691.31	4,681.71	4,681.16	17.03	10.99	-62.64	-1,050.82	-7,754.94	7,707.38	7,679.45	27.93	275.950	
4,800.00	4,791.06	4,797.35	4,796.79	17.40	11.27	-62.70	-1,052.40	-7,755.61	7,704.96	7,676.39	28.57	269.676	
4,900.00	4,890.82	4,890.07	4,889.51	17.76	11.49	-62.75	-1,053.65	-7,756.09	7,702.49	7,673.33	29.16	264.156	
5,000.00	4,990.57	4,982.27	4,981.69	18.13	11.71	-62.80	-1,054.87	-7,756.67	7,700.13	7,670.38	29.75	258.869	
5,100.00	5,090.33	5,090.12	5,089.53	18.50	11.97	-62.86	-1,056.17	-7,757.38	7,697.79	7,667.41	30.38	253.411	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100B - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-NS-GYRO-MS							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)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.00	5,190.09	5,201.72	5,201.12	18.87	12.25	-62.92	-1,057.27	-7,757.98	7,695.30	7,664.28	31.02	248.086	
5,300.00	5,289.84	5,295.59	5,294.99	19.24	12.49	-62.97	-1,058.08	-7,758.48	7,692.79	7,661.16	31.62	243.264	
5,400.00	5,389.60	5,389.74	5,389.13	19.61	12.72	-63.02	-1,058.88	-7,759.04	7,690.35	7,658.12	32.23	238.620	
5,500.00	5,489.35	5,479.04	5,478.42	19.98	12.95	-63.07	-1,059.72	-7,759.66	7,688.02	7,655.19	32.82	234.224	
5,600.00	5,589.11	5,567.72	5,567.10	20.35	13.18	-63.11	-1,060.78	-7,760.36	7,685.84	7,652.42	33.42	229.997	
5,700.00	5,688.87	5,662.06	5,661.42	20.72	13.42	-63.17	-1,062.10	-7,761.19	7,683.78	7,649.76	34.02	225.835	
5,800.00	5,788.62	5,759.63	5,758.98	21.09	13.66	-63.22	-1,063.54	-7,762.06	7,681.77	7,647.13	34.64	221.771	
5,900.00	5,888.38	5,874.45	5,873.79	21.46	13.95	-63.28	-1,065.25	-7,763.04	7,679.73	7,644.44	35.29	217.619	
6,000.00	5,988.14	6,001.45	6,000.77	21.83	14.26	-63.36	-1,066.98	-7,763.74	7,677.37	7,641.40	35.97	213.454	
6,100.00	6,087.89	6,102.53	6,101.84	22.20	14.50	-63.41	-1,068.28	-7,764.12	7,674.84	7,638.26	36.57	209.844	
6,200.00	6,187.65	6,204.45	6,203.75	22.57	14.74	-63.47	-1,069.61	-7,764.48	7,672.29	7,635.10	37.18	206.342	
6,299.50	6,286.91	6,319.39	6,318.69	22.93	15.00	-63.53	-1,071.00	-7,764.77	7,669.64	7,631.83	37.81	202.858	
6,350.00	6,337.14	6,377.57	6,376.86	23.12	15.13	-36.11	-1,071.63	-7,764.83	7,666.26	7,628.14	38.13	201.078	
6,400.00	6,386.40	6,428.20	6,427.49	23.32	15.25	-27.50	-1,072.14	-7,764.86	7,659.05	7,620.62	38.43	199.307	
6,450.00	6,434.88	6,473.94	6,473.23	23.52	15.35	-23.65	-1,072.57	-7,764.89	7,648.07	7,609.35	38.72	197.519	
6,500.00	6,482.27	6,518.68	6,517.96	23.73	15.46	-21.65	-1,072.97	-7,764.95	7,633.42	7,594.41	39.01	195.684	
6,550.00	6,528.29	6,562.15	6,561.43	23.94	15.56	-20.60	-1,073.33	-7,765.03	7,615.17	7,575.88	39.29	193.814	
6,600.00	6,572.65	6,604.36	6,603.64	24.16	15.66	-20.13	-1,073.65	-7,765.12	7,593.44	7,553.88	39.57	191.914	
6,650.00	6,615.08	6,647.33	6,646.61	24.39	15.77	-20.08	-1,073.96	-7,765.23	7,568.36	7,528.51	39.85	189.938	
6,700.00	6,655.31	6,688.10	6,687.38	24.64	15.87	-20.39	-1,074.22	-7,765.33	7,540.07	7,499.95	40.11	187.966	
6,750.00	6,693.11	6,726.41	6,725.69	24.90	15.96	-21.04	-1,074.44	-7,765.42	7,508.75	7,468.38	40.37	186.007	
6,800.00	6,728.23	6,762.03	6,761.31	25.18	16.05	-22.03	-1,074.62	-7,765.51	7,474.60	7,433.99	40.61	184.069	
6,850.00	6,760.46	6,794.74	6,794.02	25.50	16.14	-23.43	-1,074.78	-7,765.60	7,437.83	7,396.99	40.83	182.160	
6,900.00	6,789.60	6,823.13	6,822.40	25.84	16.21	-25.32	-1,074.90	-7,765.68	7,398.66	7,357.63	41.04	180.294	
6,950.00	6,815.47	6,848.14	6,847.41	26.21	16.27	-27.85	-1,074.99	-7,765.75	7,357.36	7,316.13	41.23	178.467	
7,000.00	6,837.91	6,869.87	6,869.14	26.63	16.33	-31.26	-1,075.07	-7,765.82	7,314.16	7,272.77	41.40	176.684	
7,050.00	6,856.78	6,888.18	6,887.46	27.08	16.38	-35.89	-1,075.13	-7,765.88	7,269.34	7,227.79	41.55	174.948	
7,100.00	6,871.97	6,902.97	6,902.24	27.57	16.41	-42.33	-1,075.17	-7,765.93	7,223.18	7,181.49	41.69	173.263	
7,150.00	6,883.39	6,914.13	6,913.40	28.10	16.44	-51.39	-1,075.20	-7,765.97	7,175.95	7,134.14	41.81	171.631	
7,200.00	6,890.95	6,921.59	6,920.87	28.66	16.46	-64.09	-1,075.22	-7,766.00	7,127.95	7,086.04	41.92	170.054	
7,250.00	6,894.63	6,925.30	6,924.58	29.25	16.47	-80.78	-1,075.23	-7,766.01	7,079.48	7,037.47	42.01	168.534	
7,273.35	6,895.00	6,925.75	6,925.02	29.54	16.47	-89.54	-1,075.23	-7,766.01	7,056.76	7,014.72	42.04	167.842	
7,300.00	6,894.94	6,925.78	6,925.05	29.87	16.47	-89.54	-1,075.23	-7,766.01	7,030.83	6,988.74	42.09	167.061	
7,400.00	6,894.71	6,925.90	6,925.18	31.22	16.47	-89.54	-1,075.23	-7,766.01	6,933.56	6,891.31	42.25	164.101	
7,500.00	6,894.48	6,926.03	6,925.30	32.69	16.47	-89.55	-1,075.23	-7,766.01	6,836.37	6,793.93	42.44	161.091	
7,600.00	6,894.25	6,926.15	6,925.42	34.27	16.47	-89.55	-1,075.23	-7,766.01	6,739.26	6,696.62	42.64	158.032	
7,700.00	6,894.01	6,926.27	6,925.55	35.95	16.47	-89.55	-1,075.23	-7,766.01	6,642.24	6,599.37	42.87	154.926	
7,800.00	6,893.78	6,926.40	6,925.67	37.71	16.47	-89.56	-1,075.23	-7,766.01	6,545.31	6,502.18	43.13	151.775	
7,900.00	6,893.55	6,926.52	6,925.80	39.54	16.47	-89.56	-1,075.23	-7,766.01	6,448.47	6,405.07	43.40	148.580	
8,000.00	6,893.32	6,926.65	6,925.92	41.44	16.47	-89.57	-1,075.24	-7,766.01	6,351.73	6,308.03	43.70	145.342	
8,100.00	6,893.09	6,926.77	6,926.05	43.39	16.47	-89.57	-1,075.24	-7,766.01	6,255.09	6,211.06	44.03	142.065	
8,200.00	6,892.86	6,926.90	6,926.17	45.39	16.47	-89.58	-1,075.24	-7,766.01	6,158.56	6,114.17	44.39	138.751	
8,300.00	6,892.63	6,927.02	6,926.30	47.44	16.47	-89.58	-1,075.24	-7,766.02	6,062.14	6,017.37	44.77	135.403	
8,400.00	6,892.40	6,927.15	6,926.42	49.51	16.48	-89.59	-1,075.24	-7,766.02	5,965.84	5,920.65	45.19	132.025	
8,500.00	6,892.17	6,927.27	6,926.55	51.62	16.48	-89.59	-1,075.24	-7,766.02	5,869.66	5,824.03	45.64	128.619	
8,600.00	6,891.94	6,927.40	6,926.67	53.76	16.48	-89.59	-1,075.24	-7,766.02	5,773.62	5,727.50	46.12	125.191	
8,700.00	6,891.71	6,927.52	6,926.80	55.92	16.48	-89.60	-1,075.24	-7,766.02	5,677.71	5,631.07	46.64	121.743	
8,800.00	6,891.48	6,927.65	6,926.93	58.11	16.48	-89.60	-1,075.24	-7,766.02	5,581.94	5,534.75	47.19	118.281	
8,900.00	6,891.25	6,927.78	6,927.05	60.31	16.48	-89.61	-1,075.24	-7,766.02	5,486.32	5,438.54	47.79	114.809	
9,000.00	6,891.01	6,927.90	6,927.18	62.54	16.48	-89.61	-1,075.24	-7,766.02	5,390.87	5,342.44	48.42	111.331	
9,100.00	6,890.78	6,928.03	6,927.31	64.78	16.48	-89.62	-1,075.24	-7,766.02	5,295.58	5,246.48	49.10	107.853	
9,200.00	6,890.55	6,928.16	6,927.43	67.03	16.48	-89.62	-1,075.24	-7,766.02	5,200.47	5,150.64	49.82	104.380	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100B - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		200-NS-GYRO-MS						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)	Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
9,300.00	6,890.32	6,928.29	6,927.56	69.29	16.48	-89.63	-1,075.24	-7,766.02	5,105.54	5,054.95	50.59	100.916		
9,400.00	6,890.09	6,928.41	6,927.69	71.57	16.48	-89.63	-1,075.24	-7,766.02	5,010.81	4,959.40	51.41	97.467		
9,500.00	6,889.86	6,928.54	6,927.82	73.86	16.48	-89.63	-1,075.24	-7,766.02	4,916.29	4,864.01	52.28	94.038		
9,600.00	6,889.63	6,928.67	6,927.94	76.16	16.48	-89.64	-1,075.24	-7,766.02	4,822.00	4,768.79	53.20	90.634		
9,700.00	6,889.40	6,928.80	6,928.07	78.46	16.48	-89.64	-1,075.24	-7,766.02	4,727.93	4,673.75	54.18	87.259		
9,800.00	6,889.17	6,928.93	6,928.20	80.78	16.48	-89.65	-1,075.24	-7,766.02	4,634.12	4,578.90	55.22	83.919		
9,900.00	6,888.94	6,929.05	6,928.33	83.10	16.48	-89.65	-1,075.24	-7,766.02	4,540.57	4,484.24	56.32	80.618		
10,000.00	6,888.71	6,929.18	6,928.46	85.43	16.48	-89.66	-1,075.24	-7,766.02	4,447.30	4,389.81	57.49	77.362		
10,100.00	6,888.48	6,929.31	6,928.59	87.76	16.48	-89.66	-1,075.24	-7,766.02	4,354.32	4,295.60	58.72	74.154		
10,200.00	6,888.25	6,929.44	6,928.72	90.10	16.48	-89.67	-1,075.24	-7,766.02	4,261.67	4,201.65	60.03	70.998		
10,300.00	6,888.01	6,929.57	6,928.85	92.45	16.48	-89.67	-1,075.24	-7,766.02	4,169.36	4,107.95	61.41	67.899		
10,400.00	6,887.78	6,929.70	6,928.97	94.80	16.48	-89.68	-1,075.24	-7,766.02	4,077.41	4,014.54	62.87	64.860		
10,500.00	6,887.55	6,929.83	6,929.10	97.15	16.48	-89.68	-1,075.24	-7,766.03	3,985.84	3,921.43	64.41	61.884		
10,600.00	6,887.32	6,929.96	6,929.23	99.51	16.48	-89.68	-1,075.24	-7,766.03	3,894.69	3,828.65	66.04	58.976		
10,700.00	6,887.09	6,930.09	6,929.37	101.87	16.48	-89.69	-1,075.24	-7,766.03	3,803.99	3,736.23	67.76	56.138		
10,800.00	6,886.86	6,930.22	6,929.50	104.24	16.48	-89.69	-1,075.24	-7,766.03	3,713.76	3,644.18	69.58	53.372		
10,900.00	6,886.63	6,930.35	6,929.63	106.61	16.48	-89.70	-1,075.24	-7,766.03	3,624.05	3,552.54	71.51	50.681		
11,000.00	6,886.40	6,930.48	6,929.76	108.98	16.48	-89.70	-1,075.24	-7,766.03	3,534.89	3,461.35	73.54	48.068		
11,100.00	6,886.17	6,930.61	6,929.89	111.36	16.48	-89.71	-1,075.25	-7,766.03	3,446.32	3,370.64	75.69	45.534		
11,200.00	6,885.94	6,930.75	6,930.02	113.74	16.48	-89.71	-1,075.25	-7,766.03	3,358.40	3,280.44	77.96	43.081		
11,300.00	6,885.71	6,930.88	6,930.15	116.12	16.48	-89.72	-1,075.25	-7,766.03	3,271.17	3,190.81	80.35	40.711		
11,400.00	6,885.48	6,931.01	6,930.28	118.51	16.49	-89.72	-1,075.25	-7,766.03	3,184.69	3,101.80	82.88	38.424		
11,500.00	6,885.25	6,931.14	6,930.42	120.89	16.49	-89.73	-1,075.25	-7,766.03	3,099.02	3,013.46	85.56	36.221		
11,600.00	6,885.01	6,931.27	6,930.55	123.28	16.49	-89.73	-1,075.25	-7,766.03	3,014.24	2,925.86	88.38	34.105		
11,700.00	6,884.78	6,931.41	6,930.68	125.67	16.49	-89.74	-1,075.25	-7,766.03	2,930.41	2,839.05	91.36	32.074		
11,800.00	6,884.55	6,931.54	6,930.81	128.07	16.49	-89.74	-1,075.25	-7,766.03	2,847.64	2,753.12	94.51	30.130		
11,900.00	6,884.32	6,931.67	6,930.95	130.46	16.49	-89.75	-1,075.25	-7,766.03	2,765.99	2,668.16	97.84	28.272		
12,000.00	6,884.09	6,931.80	6,931.08	132.86	16.49	-89.75	-1,075.25	-7,766.03	2,685.60	2,584.26	101.34	26.501		
12,100.00	6,883.86	6,931.94	6,931.21	135.25	16.49	-89.75	-1,075.25	-7,766.03	2,606.55	2,501.52	105.03	24.817		
12,200.00	6,883.63	6,932.07	6,931.35	137.65	16.49	-89.76	-1,075.25	-7,766.03	2,529.00	2,420.08	108.92	23.219		
12,300.00	6,883.40	6,932.21	6,931.48	140.05	16.49	-89.76	-1,075.25	-7,766.03	2,453.06	2,340.05	113.01	21.707		
12,400.00	6,883.17	6,932.34	6,931.61	142.46	16.49	-89.77	-1,075.25	-7,766.03	2,378.91	2,261.61	117.30	20.280		
12,500.00	6,882.94	6,932.47	6,931.75	144.86	16.49	-89.77	-1,075.25	-7,766.04	2,306.71	2,184.91	121.80	18.938		
12,600.00	6,882.71	6,932.61	6,931.88	147.27	16.49	-89.78	-1,075.25	-7,766.04	2,236.65	2,110.15	126.50	17.680		
12,700.00	6,882.48	6,932.74	6,932.02	149.67	16.49	-89.78	-1,075.25	-7,766.04	2,168.94	2,037.54	131.40	16.506		
12,800.00	6,882.25	6,932.88	6,932.15	152.08	16.49	-89.79	-1,075.25	-7,766.04	2,103.81	1,967.32	136.49	15.413		
12,900.00	6,882.01	6,933.01	6,932.29	154.49	16.49	-89.79	-1,075.25	-7,766.04	2,041.50	1,899.75	141.75	14.402		
13,000.00	6,881.78	6,933.15	6,932.42	156.90	16.49	-89.80	-1,075.25	-7,766.04	1,982.28	1,835.12	147.16	13.471		
13,100.00	6,881.55	6,933.29	6,932.56	159.31	16.49	-89.80	-1,075.25	-7,766.04	1,926.42	1,773.75	152.67	12.618		
13,200.00	6,881.32	6,933.42	6,932.70	161.72	16.49	-89.81	-1,075.25	-7,766.04	1,874.25	1,715.99	158.26	11.843		
13,300.00	6,881.09	6,933.56	6,932.83	164.13	16.49	-89.81	-1,075.25	-7,766.04	1,826.06	1,662.21	163.86	11.144		
13,400.00	6,880.86	6,933.69	6,932.97	166.55	16.49	-89.82	-1,075.25	-7,766.04	1,782.19	1,612.78	169.41	10.520		
13,500.00	6,880.63	6,933.83	6,933.11	168.96	16.49	-89.82	-1,075.25	-7,766.04	1,742.96	1,568.12	174.84	9.969		
13,600.00	6,880.40	6,933.97	6,933.24	171.38	16.49	-89.83	-1,075.25	-7,766.04	1,708.69	1,528.63	180.06	9.490		
13,700.00	6,880.17	6,934.10	6,933.38	173.79	16.49	-89.83	-1,075.25	-7,766.04	1,679.67	1,494.69	184.98	9.080		
13,800.00	6,879.94	6,934.24	6,933.52	176.21	16.49	-89.84	-1,075.25	-7,766.04	1,656.20	1,466.69	189.51	8.739		
13,900.00	6,879.71	6,934.38	6,933.65	178.63	16.49	-89.84	-1,075.25	-7,766.04	1,638.51	1,444.94	193.57	8.465		
14,000.00	6,879.48	6,934.52	6,933.79	181.04	16.49	-89.85	-1,075.26	-7,766.04	1,626.78	1,429.71	197.06	8.255		
14,100.00	6,879.25	6,934.66	6,933.93	183.46	16.49	-89.85	-1,075.26	-7,766.04	1,621.14	1,421.21	199.93	8.108		
14,141.51	6,879.15	6,934.71	6,933.99	184.47	16.49	-89.85	-1,075.26	-7,766.04	1,620.61	1,419.68	200.93	8.066 CC		
14,200.00	6,879.01	6,934.79	6,934.07	185.88	16.49	-89.86	-1,075.26	-7,766.04	1,621.66	1,419.53	202.13	8.023 ES		
14,300.00	6,878.78	6,934.93	6,934.21	188.30	16.50	-89.86	-1,075.26	-7,766.04	1,628.34	1,424.70	203.64	7.996 SF		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100B - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 200-NS-GYRO-MS												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)			
14,400.00	6,878.55	6,935.07	6,934.35	190.72	16.50	-89.87	-1,075.26	-7,766.04	1,641.10	1,436.65	204.44	8.027	
14,500.00	6,878.32	6,935.21	6,934.48	193.14	16.50	-89.87	-1,075.26	-7,766.05	1,659.79	1,455.21	204.58	8.113	
14,600.00	6,878.09	6,935.35	6,934.62	195.56	16.50	-89.88	-1,075.26	-7,766.05	1,684.22	1,480.13	204.09	8.252	
14,700.00	6,877.86	6,935.49	6,934.76	197.99	16.50	-89.88	-1,075.26	-7,766.05	1,714.14	1,511.12	203.02	8.443	
14,800.00	6,877.63	6,935.63	6,934.90	200.41	16.50	-89.89	-1,075.26	-7,766.05	1,749.28	1,547.83	201.45	8.683	
14,900.00	6,877.40	6,935.77	6,935.04	202.83	16.50	-89.89	-1,075.26	-7,766.05	1,789.32	1,589.87	199.45	8.971	
15,000.00	6,877.17	6,935.91	6,935.18	205.25	16.50	-89.90	-1,075.26	-7,766.05	1,833.95	1,636.85	197.10	9.304	
15,100.00	6,876.94	6,936.05	6,935.32	207.68	16.50	-89.90	-1,075.26	-7,766.05	1,882.84	1,688.36	194.47	9.682	
15,200.00	6,876.71	6,936.19	6,935.47	210.10	16.50	-89.91	-1,075.26	-7,766.05	1,935.66	1,744.03	191.63	10.101	
15,300.00	6,876.48	6,936.33	6,935.61	212.53	16.50	-89.91	-1,075.26	-7,766.05	1,992.10	1,803.47	188.64	10.560	
15,400.00	6,876.25	6,936.47	6,935.75	214.95	16.50	-89.92	-1,075.26	-7,766.05	2,051.87	1,866.33	185.54	11.059	
15,500.00	6,876.01	6,936.61	6,935.89	217.38	16.50	-89.92	-1,075.26	-7,766.05	2,114.68	1,932.28	182.40	11.594	
15,600.00	6,875.78	6,936.76	6,936.03	219.80	16.50	-89.93	-1,075.26	-7,766.05	2,180.27	2,001.03	179.23	12.164	
15,700.00	6,875.55	6,936.90	6,936.17	222.23	16.50	-89.93	-1,075.26	-7,766.05	2,248.39	2,072.31	176.08	12.769	
15,800.00	6,875.32	6,937.04	6,936.31	224.66	16.50	-89.94	-1,075.26	-7,766.05	2,318.83	2,145.86	172.97	13.406	
15,900.00	6,875.09	6,937.18	6,936.46	227.08	16.50	-89.94	-1,075.26	-7,766.05	2,391.37	2,221.46	169.92	14.074	
16,000.00	6,874.86	6,937.33	6,936.60	229.51	16.50	-89.95	-1,075.26	-7,766.05	2,465.84	2,298.91	166.93	14.772	
16,100.00	6,874.63	6,937.47	6,936.74	231.94	16.50	-89.95	-1,075.26	-7,766.05	2,542.06	2,378.03	164.03	15.498	
16,200.00	6,874.40	6,937.61	6,936.89	234.37	16.50	-89.96	-1,075.26	-7,766.05	2,619.88	2,458.67	161.21	16.251	
16,300.00	6,874.17	6,937.76	6,937.03	236.79	16.50	-89.96	-1,075.26	-7,766.05	2,699.16	2,540.67	158.49	17.031	
16,400.00	6,873.94	6,937.90	6,937.17	239.22	16.50	-89.97	-1,075.26	-7,766.06	2,779.78	2,623.92	155.86	17.835	
16,500.00	6,873.71	6,938.04	6,937.32	241.65	16.50	-89.97	-1,075.26	-7,766.06	2,861.62	2,708.29	153.32	18.664	
16,600.00	6,873.48	6,938.19	6,937.46	244.08	16.50	-89.98	-1,075.26	-7,766.06	2,944.58	2,793.69	150.89	19.515	
16,700.00	6,873.25	6,938.33	6,937.61	246.51	16.50	-89.98	-1,075.26	-7,766.06	3,028.57	2,880.02	148.55	20.388	
16,800.00	6,873.02	6,938.48	6,937.75	248.94	16.50	-89.99	-1,075.26	-7,766.06	3,113.51	2,967.21	146.30	21.282	
16,900.00	6,872.78	6,938.62	6,937.90	251.37	16.50	-89.99	-1,075.27	-7,766.06	3,199.32	3,055.18	144.14	22.196	
17,000.00	6,872.55	6,938.77	6,938.04	253.80	16.50	-90.00	-1,075.27	-7,766.06	3,285.93	3,143.86	142.07	23.129	
17,070.79	6,872.39	6,938.87	6,938.14	255.52	16.51	-90.00	-1,075.27	-7,766.06	3,347.69	3,207.04	140.65	23.801	
17,100.00	6,872.32	6,938.91	6,938.19	256.23	16.51	-90.00	-1,075.27	-7,766.06	3,373.28	3,233.20	140.08	24.081	
17,200.00	6,872.09	6,939.06	6,938.33	258.66	16.51	-90.01	-1,075.27	-7,766.06	3,461.32	3,323.14	138.18	25.050	
17,237.94	6,872.00	6,939.11	6,938.39	259.58	16.51	-90.01	-1,075.27	-7,766.06	3,494.89	3,357.41	137.48	25.422	

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100C - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 335-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	24.00	24.00	0.00	0.05	-92.12	-357.09	-9,635.26	9,641.88				
100.00	100.00	124.00	124.00	0.25	0.28	-92.12	-357.09	-9,635.26	9,641.88	9,641.35	0.53	N/A	
200.00	200.00	224.00	224.00	0.61	0.50	-92.12	-357.09	-9,635.26	9,641.88	9,640.76	1.11	8,663.397	
300.00	300.00	324.00	324.00	0.97	0.73	-92.12	-357.09	-9,635.26	9,641.88	9,640.18	1.70	5,684.660	
400.00	400.00	382.00	382.00	1.33	0.85	-92.12	-357.22	-9,635.42	9,642.13	9,639.95	2.17	4,435.016	
500.00	500.00	409.78	409.78	1.68	0.90	-92.12	-357.20	-9,635.68	9,642.97	9,640.38	2.59	3,724.127	
600.00	600.00	444.00	443.99	2.04	0.98	-92.12	-356.69	-9,636.21	9,644.49	9,641.47	3.02	3,196.359	
700.00	700.00	444.00	443.99	2.40	0.98	-92.12	-356.69	-9,636.21	9,646.87	9,643.50	3.38	2,857.338	
800.00	800.00	506.00	505.92	2.76	1.12	-92.11	-354.66	-9,638.14	9,649.91	9,646.04	3.87	2,492.556	
900.00	900.00	506.00	505.92	3.12	1.12	-92.11	-354.66	-9,638.14	9,653.72	9,649.49	4.23	2,282.552	
1,000.00	1,000.00	530.40	530.27	3.48	1.18	-92.10	-353.53	-9,639.32	9,658.43	9,653.79	4.64	2,080.720	
1,100.00	1,099.98	568.00	567.74	3.83	1.26	-55.28	-351.42	-9,641.58	9,663.02	9,657.93	5.08	1,902.042	
1,200.00	1,199.92	568.00	567.74	4.19	1.26	-55.22	-351.42	-9,641.58	9,666.31	9,660.88	5.43	1,779.417	
1,300.00	1,299.59	597.63	597.23	4.55	1.33	-55.22	-349.56	-9,643.73	9,669.45	9,663.60	5.85	1,651.966	
1,400.00	1,399.35	631.00	630.42	4.91	1.41	-55.22	-347.42	-9,646.50	9,673.41	9,667.12	6.28	1,539.322	
1,500.00	1,499.11	631.00	630.42	5.27	1.41	-55.22	-347.42	-9,646.50	9,678.15	9,671.52	6.64	1,457.757	
1,600.00	1,598.86	693.00	691.97	5.63	1.57	-55.21	-342.88	-9,652.41	9,683.52	9,676.38	7.14	1,355.559	
1,700.00	1,698.62	723.86	722.55	6.00	1.66	-55.21	-340.36	-9,655.62	9,689.58	9,682.00	7.58	1,278.904	
1,800.00	1,798.37	756.00	754.40	6.36	1.75	-55.20	-337.70	-9,659.10	9,696.24	9,688.23	8.01	1,210.104	
1,900.00	1,898.13	818.00	815.79	6.72	1.93	-55.19	-332.73	-9,666.23	9,703.50	9,694.98	8.52	1,138.654	
2,000.00	1,997.89	888.75	885.82	7.09	2.12	-55.18	-327.32	-9,674.69	9,711.20	9,702.15	9.05	1,073.592	
2,100.00	2,097.64	941.00	937.54	7.45	2.27	-55.18	-323.34	-9,680.98	9,719.10	9,709.57	9.53	1,019.788	
2,200.00	2,197.40	1,004.00	999.86	7.82	2.47	-55.17	-318.63	-9,688.86	9,727.43	9,717.38	10.05	967.823	
2,300.00	2,297.16	1,079.02	1,074.08	8.19	2.70	-55.16	-313.56	-9,698.56	9,736.17	9,725.58	10.59	919.013	
2,400.00	2,396.91	1,174.03	1,168.07	8.55	2.99	-55.16	-307.46	-9,711.03	9,745.12	9,733.92	11.19	870.797	
2,500.00	2,496.67	1,325.33	1,317.86	8.92	3.44	-55.15	-298.40	-9,730.37	9,753.71	9,741.79	11.92	817.988	
2,600.00	2,596.42	1,433.70	1,425.16	9.29	3.78	-55.14	-291.79	-9,743.99	9,762.12	9,749.56	12.56	777.340	
2,700.00	2,696.18	1,537.51	1,527.95	9.66	4.10	-55.14	-285.13	-9,756.84	9,770.31	9,757.12	13.18	741.125	
2,800.00	2,795.94	1,624.00	1,613.58	10.02	4.38	-55.13	-279.43	-9,767.66	9,778.62	9,764.85	13.77	710.213	
2,900.00	2,895.69	1,704.22	1,693.01	10.39	4.63	-55.13	-274.59	-9,777.78	9,787.08	9,772.75	14.33	683.120	
3,000.00	2,995.45	1,789.14	1,777.10	10.76	4.89	-55.13	-269.91	-9,788.67	9,795.74	9,780.85	14.90	657.590	
3,100.00	3,095.21	1,854.47	1,841.77	11.13	5.10	-55.13	-266.33	-9,797.17	9,804.62	9,789.20	15.42	635.919	
3,200.00	3,194.96	1,929.57	1,916.11	11.49	5.34	-55.13	-262.71	-9,807.21	9,813.85	9,797.88	15.96	614.758	
3,300.00	3,294.72	2,070.75	2,055.87	11.86	5.78	-55.13	-255.93	-9,826.00	9,823.05	9,806.38	16.67	589.258	
3,400.00	3,394.47	2,163.91	2,148.12	12.23	6.07	-55.13	-251.41	-9,838.15	9,831.97	9,814.71	17.26	569.559	
3,500.00	3,494.23	2,351.55	2,333.93	12.60	6.67	-55.13	-240.50	-9,861.92	9,840.46	9,822.35	18.11	543.324	
3,600.00	3,593.99	2,440.00	2,421.50	12.97	6.96	-55.12	-234.38	-9,872.78	9,848.54	9,829.84	18.71	526.518	
3,700.00	3,693.74	2,536.76	2,517.28	13.34	7.27	-55.11	-227.81	-9,884.81	9,856.78	9,837.47	19.31	510.363	
3,800.00	3,793.50	2,657.68	2,637.02	13.71	7.64	-55.10	-219.78	-9,899.68	9,864.88	9,844.90	19.98	493.651	
3,900.00	3,893.26	2,724.47	2,703.15	14.07	7.86	-55.10	-215.32	-9,907.88	9,872.99	9,852.48	20.52	481.248	
4,000.00	3,993.01	2,782.86	2,760.94	14.44	8.05	-55.09	-211.53	-9,915.33	9,881.57	9,860.54	21.02	470.004	
4,100.00	4,092.77	2,976.84	2,952.97	14.81	8.67	-55.08	-199.17	-9,939.82	9,890.16	9,868.27	21.89	451.823	
4,200.00	4,192.52	3,904.80	3,876.70	15.18	11.01	-55.16	-162.41	-10,010.63	9,892.77	9,868.37	24.39	405.561	
4,300.00	4,292.28	4,013.61	3,985.44	15.55	11.22	-55.19	-161.06	-10,014.36	9,892.17	9,867.19	24.98	395.990	
4,400.00	4,392.04	4,122.42	4,094.18	15.92	11.44	-55.22	-159.74	-10,018.00	9,891.49	9,865.92	25.57	386.854	
4,500.00	4,491.79	4,231.22	4,202.92	16.29	11.65	-55.24	-158.46	-10,021.54	9,890.71	9,864.56	26.16	378.126	
4,600.00	4,591.55	4,340.01	4,311.65	16.66	11.87	-55.27	-157.21	-10,024.98	9,889.85	9,863.11	26.75	369.777	
4,700.00	4,691.31	4,448.81	4,420.39	17.03	12.08	-55.30	-156.00	-10,028.32	9,888.90	9,861.57	27.33	361.784	
4,800.00	4,791.06	4,557.59	4,529.12	17.40	12.30	-55.33	-154.83	-10,031.56	9,887.87	9,859.94	27.92	354.124	
4,900.00	4,890.82	4,666.37	4,637.85	17.76	12.51	-55.36	-153.69	-10,034.70	9,886.74	9,858.23	28.51	346.776	
5,000.00	4,990.57	4,775.15	4,746.57	18.13	12.73	-55.39	-152.58	-10,037.74	9,885.53	9,856.43	29.10	339.723	
5,100.00	5,090.33	4,883.92	4,855.30	18.50	12.95	-55.42	-151.52	-10,040.68	9,884.23	9,854.54	29.69	332.946	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100C - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		335-APC_ISCWSA REV 2 MWD							Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			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	
5,200.00	5,190.09	4,992.68	4,964.02	18.87	13.16	-55.45	-150.48	-10,043.52	9,882.84	9,852.57	30.28	326.429		
5,300.00	5,289.84	5,101.43	5,072.73	19.24	13.38	-55.48	-149.49	-10,046.26	9,881.37	9,850.51	30.86	320.157		
5,400.00	5,389.60	5,210.18	5,181.45	19.61	13.59	-55.51	-148.53	-10,048.91	9,879.81	9,848.36	31.45	314.118		
5,500.00	5,489.35	5,318.92	5,290.15	19.98	13.81	-55.54	-147.60	-10,051.45	9,878.16	9,846.12	32.04	308.297		
5,600.00	5,589.11	5,427.66	5,398.86	20.35	14.03	-55.57	-146.72	-10,053.90	9,876.42	9,843.79	32.63	302.684		
5,700.00	5,688.87	5,536.39	5,507.56	20.72	14.24	-55.60	-145.86	-10,056.24	9,874.60	9,841.38	33.22	297.267		
5,800.00	5,788.62	5,645.11	5,616.25	21.09	14.46	-55.63	-145.05	-10,058.49	9,872.69	9,838.88	33.81	292.035		
5,900.00	5,888.38	5,753.82	5,724.94	21.46	14.68	-55.66	-144.27	-10,060.64	9,870.69	9,836.29	34.39	286.981		
6,000.00	5,988.14	5,862.52	5,833.62	21.83	14.89	-55.69	-143.52	-10,062.69	9,868.60	9,833.62	34.98	282.094		
6,100.00	6,087.89	5,971.22	5,942.30	22.20	15.11	-55.72	-142.81	-10,064.64	9,866.43	9,830.86	35.57	277.366		
6,200.00	6,187.65	6,079.90	6,050.96	22.57	15.33	-55.76	-142.14	-10,066.49	9,864.17	9,828.01	36.16	272.790		
6,299.50	6,286.91	6,188.04	6,159.08	22.93	15.54	-55.79	-141.50	-10,068.23	9,861.84	9,825.09	36.75	268.379		
6,350.00	6,337.14	6,130.00	6,101.05	23.12	15.43	-28.27	-141.84	-10,067.31	9,859.22	9,822.41	36.82	267.783		
6,400.00	6,386.40	6,130.00	6,101.05	23.32	15.43	-19.52	-141.84	-10,067.31	9,852.81	9,815.80	37.00	266.258		
6,450.00	6,434.88	6,130.00	6,101.05	23.52	15.43	-15.48	-141.84	-10,067.31	9,842.78	9,805.59	37.19	264.663		
6,500.00	6,482.27	6,130.00	6,101.05	23.73	15.43	-13.24	-141.84	-10,067.31	9,829.19	9,791.82	37.37	263.011		
6,550.00	6,528.29	6,130.00	6,101.05	23.94	15.43	-11.86	-141.84	-10,067.31	9,812.10	9,774.55	37.55	261.313		
6,600.00	6,572.65	6,130.00	6,101.05	24.16	15.43	-10.99	-141.84	-10,067.31	9,791.61	9,753.88	37.72	259.581		
6,650.00	6,615.08	6,130.00	6,101.05	24.39	15.43	-10.44	-141.84	-10,067.31	9,767.81	9,729.92	37.89	257.826		
6,700.00	6,655.31	6,130.00	6,101.05	24.64	15.43	-10.12	-141.84	-10,067.31	9,740.83	9,702.79	38.04	256.059		
6,750.00	6,693.11	6,130.00	6,101.05	24.90	15.43	-10.00	-141.84	-10,067.31	9,710.82	9,672.63	38.19	254.287		
6,800.00	6,728.23	6,130.00	6,101.05	25.18	15.43	-10.04	-141.84	-10,067.31	9,677.93	9,639.60	38.33	252.520		
6,850.00	6,760.46	6,130.00	6,101.05	25.50	15.43	-10.24	-141.84	-10,067.31	9,642.33	9,603.88	38.45	250.765		
6,900.00	6,789.60	6,130.00	6,101.05	25.84	15.43	-10.63	-141.84	-10,067.31	9,604.21	9,565.64	38.57	249.030		
6,950.00	6,815.47	6,130.00	6,101.05	26.21	15.43	-11.24	-141.84	-10,067.31	9,563.79	9,525.12	38.67	247.320		
7,000.00	6,837.91	6,130.00	6,101.05	26.63	15.43	-12.14	-141.84	-10,067.31	9,521.27	9,482.51	38.76	245.641		
7,050.00	6,856.78	6,130.00	6,101.05	27.08	15.43	-13.44	-141.84	-10,067.31	9,476.91	9,438.07	38.84	243.998		
7,100.00	6,871.97	6,130.00	6,101.05	27.57	15.43	-15.39	-141.84	-10,067.31	9,430.94	9,392.04	38.91	242.395		
7,150.00	6,883.39	6,130.00	6,101.05	28.10	15.43	-18.46	-141.84	-10,067.31	9,383.64	9,344.67	38.96	240.834		
7,200.00	6,890.95	6,130.00	6,101.05	28.66	15.43	-23.73	-141.84	-10,067.31	9,335.26	9,296.26	39.01	239.316		
7,250.00	6,894.63	6,130.00	6,101.05	29.25	15.43	-34.32	-141.84	-10,067.31	9,286.11	9,247.06	39.04	237.841		
7,273.35	6,895.00	6,130.00	6,101.05	29.54	15.43	-43.47	-141.84	-10,067.31	9,262.97	9,223.91	39.06	237.164		
7,300.00	6,894.94	6,130.00	6,101.05	29.87	15.43	-43.47	-141.84	-10,067.31	9,236.50	9,197.43	39.07	236.403		
7,400.00	6,894.71	6,130.00	6,101.05	31.22	15.43	-43.47	-141.84	-10,067.31	9,137.22	9,098.10	39.12	233.551		
7,500.00	6,894.48	6,130.00	6,101.05	32.69	15.43	-43.47	-141.84	-10,067.31	9,037.95	8,998.77	39.18	230.684		
7,600.00	6,894.25	6,130.00	6,101.05	34.27	15.43	-43.47	-141.84	-10,067.31	8,938.70	8,899.46	39.24	227.803		
7,700.00	6,894.01	6,130.00	6,101.05	35.95	15.43	-43.47	-141.84	-10,067.31	8,839.47	8,800.16	39.30	224.907		
7,800.00	6,893.78	6,130.00	6,101.05	37.71	15.43	-43.47	-141.84	-10,067.31	8,740.25	8,700.88	39.37	221.998		
7,900.00	6,893.55	6,130.00	6,101.05	39.54	15.43	-43.47	-141.84	-10,067.31	8,641.05	8,601.61	39.44	219.074		
8,000.00	6,893.32	6,130.00	6,101.05	41.44	15.43	-43.47	-141.84	-10,067.31	8,541.87	8,502.35	39.52	216.137		
8,100.00	6,893.09	6,130.00	6,101.05	43.39	15.43	-43.47	-141.84	-10,067.31	8,442.71	8,403.11	39.60	213.186		
8,200.00	6,892.86	6,130.00	6,101.05	45.39	15.43	-43.47	-141.84	-10,067.31	8,343.57	8,303.88	39.69	210.222		
8,300.00	6,892.63	6,130.00	6,101.05	47.44	15.43	-43.47	-141.84	-10,067.31	8,244.45	8,204.67	39.78	207.244		
8,400.00	6,892.40	6,130.00	6,101.05	49.51	15.43	-43.47	-141.84	-10,067.31	8,145.35	8,105.47	39.88	204.252		
8,500.00	6,892.17	6,130.00	6,101.05	51.62	15.43	-43.47	-141.84	-10,067.31	8,046.27	8,006.29	39.98	201.248		
8,600.00	6,891.94	6,130.00	6,101.05	53.76	15.43	-43.47	-141.84	-10,067.31	7,947.22	7,907.13	40.09	198.231		
8,700.00	6,891.71	6,130.00	6,101.05	55.92	15.43	-43.47	-141.84	-10,067.31	7,848.19	7,807.99	40.21	195.201		
8,800.00	6,891.48	6,130.00	6,101.05	58.11	15.43	-43.47	-141.84	-10,067.31	7,749.19	7,708.86	40.33	192.158		
8,900.00	6,891.25	6,130.00	6,101.05	60.31	15.43	-43.47	-141.84	-10,067.31	7,650.21	7,609.75	40.46	189.104		
9,000.00	6,891.01	6,130.00	6,101.05	62.54	15.43	-43.47	-141.84	-10,067.31	7,551.26	7,510.67	40.59	186.037		
9,100.00	6,890.78	6,130.00	6,101.05	64.78	15.43	-43.47	-141.84	-10,067.31	7,452.33	7,411.60	40.73	182.959		
9,200.00	6,890.55	6,130.00	6,101.05	67.03	15.43	-43.47	-141.84	-10,067.31	7,353.44	7,312.56	40.88	179.869		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100C - OH - OH												Offset Site Error:	0.00 usft
Survey Program:		335-APC_ISCWSA REV 2 MWD <th colspan="2">Rule Assigned:</th> <th colspan="3">Offset Well Error:</th> <td>0.00 usft</td>					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
9,300.00	6,890.32	6,130.00	6,101.05	69.29	15.43	-43.47	-141.84	-10,067.31	7,254.57	7,213.53	41.04	176.769	
9,400.00	6,890.09	6,130.00	6,101.05	71.57	15.43	-43.47	-141.84	-10,067.31	7,155.74	7,114.54	41.21	173.657	
9,500.00	6,889.86	6,130.00	6,101.05	73.86	15.43	-43.47	-141.84	-10,067.31	7,056.94	7,015.56	41.38	170.536	
9,600.00	6,889.63	6,130.00	6,101.05	76.16	15.43	-43.47	-141.84	-10,067.31	6,958.18	6,916.61	41.56	167.405	
9,700.00	6,889.40	6,130.00	6,101.05	78.46	15.43	-43.47	-141.84	-10,067.31	6,859.45	6,817.69	41.76	164.264	
9,800.00	6,889.17	6,130.00	6,101.05	80.78	15.43	-43.47	-141.84	-10,067.31	6,760.76	6,718.79	41.96	161.115	
9,900.00	6,888.94	6,130.00	6,101.05	83.10	15.43	-43.47	-141.84	-10,067.31	6,662.10	6,619.93	42.18	157.958	
10,000.00	6,888.71	6,130.00	6,101.05	85.43	15.43	-43.47	-141.84	-10,067.31	6,563.49	6,521.09	42.40	154.792	
10,100.00	6,888.48	6,130.00	6,101.05	87.76	15.43	-43.47	-141.84	-10,067.31	6,464.92	6,422.28	42.64	151.620	
10,200.00	6,888.25	6,130.00	6,101.05	90.10	15.43	-43.47	-141.84	-10,067.31	6,366.40	6,323.51	42.89	148.441	
10,300.00	6,888.01	6,130.00	6,101.05	92.45	15.43	-43.47	-141.84	-10,067.31	6,267.92	6,224.77	43.15	145.257	
10,400.00	6,887.78	6,130.00	6,101.05	94.80	15.43	-43.47	-141.84	-10,067.31	6,169.49	6,126.06	43.43	142.067	
10,500.00	6,887.55	6,130.00	6,101.05	97.15	15.43	-43.47	-141.84	-10,067.31	6,071.11	6,027.39	43.72	138.874	
10,600.00	6,887.32	6,130.00	6,101.05	99.51	15.43	-43.47	-141.84	-10,067.31	5,972.78	5,928.76	44.02	135.677	
10,700.00	6,887.09	6,130.00	6,101.05	101.87	15.43	-43.47	-141.84	-10,067.31	5,874.52	5,830.17	44.34	132.478	
10,800.00	6,886.86	6,130.00	6,101.05	104.24	15.43	-43.47	-141.84	-10,067.31	5,776.31	5,731.63	44.68	129.278	
10,900.00	6,886.63	6,130.00	6,101.05	106.61	15.43	-43.47	-141.84	-10,067.31	5,678.16	5,633.13	45.04	126.078	
11,000.00	6,886.40	6,130.00	6,101.05	108.98	15.43	-43.47	-141.84	-10,067.31	5,580.08	5,534.67	45.41	122.878	
11,100.00	6,886.17	6,130.00	6,101.05	111.36	15.43	-43.47	-141.84	-10,067.31	5,482.07	5,436.27	45.81	119.681	
11,200.00	6,885.94	6,130.00	6,101.05	113.74	15.43	-43.47	-141.84	-10,067.31	5,384.14	5,337.91	46.22	116.486	
11,300.00	6,885.71	6,130.00	6,101.05	116.12	15.43	-43.47	-141.84	-10,067.31	5,286.28	5,239.62	46.66	113.297	
11,400.00	6,885.48	6,130.00	6,101.05	118.51	15.43	-43.47	-141.84	-10,067.31	5,188.50	5,141.38	47.12	110.113	
11,500.00	6,885.25	6,130.00	6,101.05	120.89	15.43	-43.47	-141.84	-10,067.31	5,090.80	5,043.20	47.61	106.937	
11,600.00	6,885.01	6,130.00	6,101.05	123.28	15.43	-43.47	-141.84	-10,067.31	4,993.20	4,945.09	48.12	103.771	
11,700.00	6,884.78	6,130.00	6,101.05	125.67	15.43	-43.47	-141.84	-10,067.31	4,895.70	4,847.04	48.66	100.614	
11,800.00	6,884.55	6,130.00	6,101.05	128.07	15.43	-43.47	-141.84	-10,067.31	4,798.30	4,749.07	49.23	97.471	
11,900.00	6,884.32	6,130.00	6,101.05	130.46	15.43	-43.47	-141.84	-10,067.31	4,701.01	4,651.18	49.83	94.341	
12,000.00	6,884.09	6,130.00	6,101.05	132.86	15.43	-43.47	-141.84	-10,067.31	4,603.83	4,553.36	50.47	91.227	
12,100.00	6,883.86	6,130.00	6,101.05	135.25	15.43	-43.47	-141.84	-10,067.31	4,506.78	4,455.64	51.14	88.132	
12,200.00	6,883.63	6,130.00	6,101.05	137.65	15.43	-43.47	-141.84	-10,067.31	4,409.86	4,358.01	51.85	85.057	
12,300.00	6,883.40	6,130.00	6,101.05	140.05	15.43	-43.47	-141.84	-10,067.31	4,313.08	4,260.48	52.60	82.003	
12,400.00	6,883.17	6,130.00	6,101.05	142.46	15.43	-43.47	-141.84	-10,067.31	4,216.45	4,163.06	53.39	78.974	
12,500.00	6,882.94	6,130.00	6,101.05	144.86	15.43	-43.47	-141.84	-10,067.31	4,119.98	4,065.75	54.23	75.972	
12,600.00	6,882.71	6,130.00	6,101.05	147.27	15.43	-43.47	-141.84	-10,067.31	4,023.68	3,968.56	55.12	72.998	
12,700.00	6,882.48	6,130.00	6,101.05	149.67	15.43	-43.47	-141.84	-10,067.31	3,927.57	3,871.51	56.06	70.056	
12,800.00	6,882.25	6,130.00	6,101.05	152.08	15.43	-43.47	-141.84	-10,067.31	3,831.66	3,774.59	57.06	67.147	
12,900.00	6,882.01	6,130.00	6,101.05	154.49	15.43	-43.47	-141.84	-10,067.31	3,735.96	3,677.83	58.13	64.274	
13,000.00	6,881.78	6,130.00	6,101.05	156.90	15.43	-43.47	-141.84	-10,067.31	3,640.49	3,581.24	59.25	61.440	
13,100.00	6,881.55	6,130.00	6,101.05	159.31	15.43	-43.47	-141.84	-10,067.31	3,545.27	3,484.82	60.45	58.648	
13,200.00	6,881.32	6,130.00	6,101.05	161.72	15.43	-43.47	-141.84	-10,067.31	3,450.33	3,388.60	61.72	55.899	
13,300.00	6,881.09	6,130.00	6,101.05	164.13	15.43	-43.47	-141.84	-10,067.31	3,355.68	3,292.60	63.08	53.198	
13,400.00	6,880.86	6,130.00	6,101.05	166.55	15.43	-43.47	-141.84	-10,067.31	3,261.34	3,196.82	64.52	50.545	
13,500.00	6,880.63	6,130.00	6,101.05	168.96	15.43	-43.47	-141.84	-10,067.31	3,167.36	3,101.29	66.06	47.945	
13,600.00	6,880.40	6,130.00	6,101.05	171.38	15.43	-43.47	-141.84	-10,067.31	3,073.75	3,006.04	67.70	45.399	
13,700.00	6,880.17	6,130.00	6,101.05	173.79	15.43	-43.47	-141.84	-10,067.31	2,980.56	2,911.10	69.46	42.911	
13,800.00	6,879.94	6,130.00	6,101.05	176.21	15.43	-43.47	-141.84	-10,067.31	2,887.82	2,816.49	71.33	40.484	
13,900.00	6,879.71	6,130.00	6,101.05	178.63	15.43	-43.47	-141.84	-10,067.31	2,795.59	2,722.25	73.34	38.119	
14,000.00	6,879.48	6,130.00	6,101.05	181.04	15.43	-43.47	-141.84	-10,067.31	2,703.91	2,628.42	75.49	35.820	
14,100.00	6,879.25	6,130.00	6,101.05	183.46	15.43	-43.47	-141.84	-10,067.31	2,612.83	2,535.05	77.79	33.590	
14,200.00	6,879.01	6,130.00	6,101.05	185.88	15.43	-43.47	-141.84	-10,067.31	2,522.44	2,442.18	80.26	31.430	
14,300.00	6,878.78	6,130.00	6,101.05	188.30	15.43	-43.47	-141.84	-10,067.31	2,432.79	2,349.89	82.91	29.344	
14,400.00	6,878.55	6,130.00	6,101.05	190.72	15.43	-43.47	-141.84	-10,067.31	2,343.99	2,258.23	85.75	27.334	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100C - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 335-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)			
14,500.00	6,878.32	6,130.00	6,101.05	193.14	15.43	-43.47	-141.84	-10,067.31	2,256.12	2,167.30	88.81	25.403	
14,600.00	6,878.09	6,130.00	6,101.05	195.56	15.43	-43.47	-141.84	-10,067.31	2,169.30	2,077.19	92.11	23.552	
14,700.00	6,877.86	6,130.00	6,101.05	197.99	15.43	-43.47	-141.84	-10,067.31	2,083.66	1,988.01	95.65	21.785	
14,800.00	6,877.63	6,130.00	6,101.05	200.41	15.43	-43.47	-141.84	-10,067.31	1,999.36	1,899.90	99.46	20.102	
14,900.00	6,877.40	6,130.00	6,101.05	202.83	15.43	-43.47	-141.84	-10,067.31	1,916.57	1,813.01	103.56	18.507	
15,000.00	6,877.17	6,130.00	6,101.05	205.25	15.43	-43.47	-141.84	-10,067.31	1,835.49	1,727.53	107.96	17.001	
15,100.00	6,876.94	6,130.00	6,101.05	207.68	15.43	-43.47	-141.84	-10,067.31	1,756.37	1,643.68	112.69	15.586	
15,200.00	6,876.71	6,130.00	6,101.05	210.10	15.43	-43.47	-141.84	-10,067.31	1,679.47	1,561.72	117.75	14.263	
15,300.00	6,876.48	6,130.00	6,101.05	212.53	15.43	-43.47	-141.84	-10,067.31	1,605.12	1,481.97	123.14	13.034	
15,400.00	6,876.25	6,130.00	6,101.05	214.95	15.43	-43.47	-141.84	-10,067.31	1,533.69	1,404.82	128.87	11.901	
15,500.00	6,876.01	6,130.00	6,101.05	217.38	15.43	-43.47	-141.84	-10,067.31	1,465.60	1,330.70	134.90	10.864	
15,600.00	6,875.78	6,130.00	6,101.05	219.80	15.43	-43.47	-141.84	-10,067.31	1,401.35	1,260.15	141.20	9.924	
15,700.00	6,875.55	6,130.00	6,101.05	222.23	15.43	-43.47	-141.84	-10,067.31	1,341.48	1,193.79	147.70	9.083	
15,800.00	6,875.32	6,130.00	6,101.05	224.66	15.43	-43.47	-141.84	-10,067.31	1,286.61	1,132.34	154.28	8.340	
15,900.00	6,875.09	6,130.00	6,101.05	227.08	15.43	-43.47	-141.84	-10,067.31	1,237.40	1,076.61	160.79	7.696	
16,000.00	6,874.86	6,130.00	6,101.05	229.51	15.43	-43.47	-141.84	-10,067.31	1,194.55	1,027.49	167.06	7.150	
16,100.00	6,874.63	6,130.00	6,101.05	231.94	15.43	-43.47	-141.84	-10,067.31	1,158.77	985.92	172.85	6.704	
16,200.00	6,874.40	6,130.00	6,101.05	234.37	15.43	-43.47	-141.84	-10,067.31	1,130.73	952.81	177.91	6.355	
16,300.00	6,874.17	6,130.00	6,101.05	236.79	15.43	-43.47	-141.84	-10,067.31	1,111.01	929.00	182.00	6.104	
16,400.00	6,873.94	6,130.00	6,101.05	239.22	15.43	-43.47	-141.84	-10,067.31	1,100.06	915.14	184.91	5.949	
16,471.04	6,873.77	6,130.00	6,101.05	240.95	15.43	-43.47	-141.84	-10,067.31	1,097.76	911.58	186.18	5.896 CC, ES	
16,500.00	6,873.71	6,130.00	6,101.05	241.65	15.43	-43.47	-141.84	-10,067.31	1,098.14	911.65	186.50	5.888 SF	
16,600.00	6,873.48	6,130.00	6,101.05	244.08	15.43	-43.47	-141.84	-10,067.31	1,105.31	918.60	186.71	5.920	
16,700.00	6,873.25	6,130.00	6,101.05	246.51	15.43	-43.47	-141.84	-10,067.31	1,121.39	935.79	185.60	6.042	
16,800.00	6,873.02	6,130.00	6,101.05	248.94	15.43	-43.47	-141.84	-10,067.31	1,145.99	962.69	183.30	6.252	
16,900.00	6,872.78	6,130.00	6,101.05	251.37	15.43	-43.47	-141.84	-10,067.31	1,178.60	998.57	180.03	6.547	
17,000.00	6,872.55	6,130.00	6,101.05	253.80	15.43	-43.47	-141.84	-10,067.31	1,218.56	1,042.56	175.99	6.924	
17,070.79	6,872.39	6,130.00	6,101.05	255.52	15.43	-43.47	-141.84	-10,067.31	1,250.91	1,078.11	172.81	7.239	
17,100.00	6,872.32	6,130.00	6,101.05	256.23	15.43	-43.47	-141.84	-10,067.31	1,265.18	1,093.75	171.43	7.380	
17,200.00	6,872.09	6,130.00	6,101.05	258.66	15.43	-43.47	-141.84	-10,067.31	1,317.75	1,151.20	166.55	7.912	
17,237.94	6,872.00	6,130.00	6,101.05	259.58	15.43	-43.47	-141.84	-10,067.31	1,339.11	1,174.46	164.65	8.133	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100E - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-Standard Keeper 104, 5800-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference													
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)			
0.00	0.00	0.00	0.00	0.00	0.00	-92.19	-251.05	-6,578.33	6,583.30				
100.00	100.00	58.77	58.77	0.25	0.04	-92.18	-250.96	-6,578.29	6,583.08	6,582.81	0.28	N/A	
200.00	200.00	173.99	173.99	0.61	0.11	-92.18	-250.30	-6,578.05	6,582.85	6,582.17	0.68	9,666.637	
300.00	300.00	300.33	300.32	0.97	0.26	-92.17	-249.07	-6,577.42	6,582.32	6,581.18	1.14	5,755.452	
400.00	400.00	424.69	424.67	1.33	0.42	-92.16	-247.78	-6,576.28	6,581.36	6,579.73	1.62	4,059.002	
500.00	500.00	531.73	531.69	1.68	0.56	-92.15	-246.61	-6,575.07	6,580.18	6,578.09	2.09	3,142.088	
600.00	600.00	636.68	636.63	2.04	0.69	-92.14	-245.37	-6,573.77	6,578.91	6,576.34	2.56	2,564.930	
700.00	700.00	737.98	737.91	2.40	0.82	-92.13	-244.12	-6,572.49	6,577.60	6,574.57	3.03	2,169.315	
800.00	800.00	841.42	841.34	2.76	0.96	-92.12	-242.80	-6,571.16	6,576.26	6,572.76	3.50	1,877.896	
900.00	900.00	948.24	948.13	3.12	1.10	-92.10	-241.41	-6,569.68	6,574.83	6,570.86	3.98	1,653.652	
1,000.00	1,000.00	1,052.83	1,052.70	3.48	1.23	-92.09	-240.03	-6,568.14	6,573.31	6,568.87	4.45	1,477.558	
1,100.00	1,099.98	1,155.31	1,155.16	3.83	1.37	-55.40	-238.68	-6,566.59	6,570.76	6,565.84	4.92	1,335.865	
1,200.08	1,199.92	1,253.63	1,253.47	4.19	1.49	-55.50	-237.38	-6,565.07	6,566.19	6,560.81	5.38	1,220.158	
1,300.00	1,299.59	1,348.54	1,348.36	4.55	1.62	-55.54	-235.98	-6,563.68	6,560.71	6,554.87	5.84	1,123.592	
1,400.00	1,399.35	1,445.58	1,445.37	4.91	1.74	-55.57	-234.38	-6,562.32	6,555.30	6,549.00	6.30	1,040.961	
1,500.00	1,499.11	1,545.03	1,544.80	5.27	1.87	-55.61	-232.68	-6,560.94	6,549.90	6,543.14	6.76	969.465	
1,600.00	1,598.86	1,647.54	1,647.29	5.63	2.01	-55.64	-230.86	-6,559.52	6,544.50	6,537.28	7.22	906.443	
1,700.00	1,698.62	1,753.83	1,753.55	6.00	2.15	-55.68	-229.03	-6,557.96	6,539.01	6,531.32	7.69	850.396	
1,800.00	1,798.37	1,856.18	1,855.87	6.36	2.28	-55.72	-227.31	-6,556.37	6,533.45	6,525.29	8.16	801.037	
1,900.00	1,898.13	1,955.52	1,955.18	6.72	2.41	-55.75	-225.56	-6,554.82	6,527.89	6,519.27	8.62	757.187	
2,000.00	1,997.89	2,053.84	2,053.47	7.09	2.54	-55.79	-223.75	-6,553.30	6,522.34	6,513.25	9.08	717.987	
2,100.00	2,097.64	2,151.34	2,150.94	7.45	2.66	-55.82	-221.92	-6,551.83	6,516.82	6,507.28	9.55	682.706	
2,200.00	2,197.40	2,245.97	2,245.55	7.82	2.79	-55.86	-220.12	-6,550.45	6,511.35	6,501.35	10.00	650.962	
2,300.00	2,297.16	2,337.75	2,337.31	8.19	2.91	-55.89	-218.37	-6,549.21	6,506.00	6,495.54	10.46	622.257	
2,400.00	2,396.91	2,430.04	2,429.57	8.55	3.03	-55.92	-216.61	-6,548.08	6,500.77	6,489.86	10.91	595.992	
2,500.00	2,496.67	2,523.36	2,522.87	8.92	3.15	-55.95	-214.85	-6,547.03	6,495.65	6,484.29	11.36	571.939	
2,600.00	2,596.42	2,616.33	2,615.81	9.29	3.27	-55.98	-213.09	-6,546.08	6,490.63	6,478.82	11.81	549.774	
2,700.00	2,696.18	2,707.61	2,707.07	9.66	3.38	-56.02	-211.41	-6,545.25	6,485.73	6,473.48	12.25	529.488	
2,800.00	2,795.94	2,800.00	2,799.45	10.02	3.50	-56.05	-209.77	-6,544.54	6,480.96	6,468.27	12.69	510.581	
2,900.00	2,895.69	2,882.62	2,882.05	10.39	3.60	-56.08	-208.37	-6,544.05	6,476.39	6,463.27	13.12	493.708	
3,000.00	2,995.45	2,966.26	2,965.69	10.76	3.70	-56.11	-207.05	-6,543.76	6,472.07	6,458.52	13.54	477.878	
3,100.00	3,095.21	3,060.73	3,060.14	11.13	3.82	-56.15	-205.69	-6,543.62	6,467.95	6,453.98	13.97	462.894	
3,200.00	3,194.96	3,162.48	3,161.89	11.49	3.94	-56.19	-204.48	-6,543.44	6,463.83	6,449.42	14.41	448.717	
3,300.00	3,294.72	3,257.68	3,257.08	11.86	4.05	-56.23	-203.53	-6,543.27	6,459.71	6,444.88	14.83	435.567	
3,400.00	3,394.47	3,349.08	3,348.47	12.23	4.16	-56.27	-202.63	-6,543.22	6,455.71	6,440.46	15.25	423.267	
3,500.00	3,494.23	3,438.76	3,438.16	12.60	4.26	-56.31	-201.74	-6,543.28	6,451.86	6,436.19	15.66	411.894	
3,600.00	3,593.99	3,526.31	3,525.69	12.97	4.34	-56.34	-200.87	-6,543.51	6,448.19	6,432.12	16.06	401.424	
3,700.00	3,693.74	3,621.48	3,620.86	13.34	4.44	-56.39	-199.90	-6,543.93	6,444.70	6,428.23	16.47	391.351	
3,800.00	3,793.50	3,757.15	3,756.52	13.71	4.59	-56.44	-198.25	-6,544.14	6,440.93	6,424.03	16.90	381.152	
3,900.00	3,893.26	3,915.23	3,914.58	14.07	4.78	-56.50	-195.63	-6,543.33	6,436.48	6,419.10	17.38	370.386	
4,000.00	3,993.01	4,047.68	4,046.98	14.44	4.95	-56.54	-192.56	-6,541.57	6,431.13	6,413.28	17.85	360.191	
4,100.00	4,092.77	4,143.71	4,142.96	14.81	5.08	-56.57	-189.92	-6,540.21	6,425.71	6,407.40	18.31	350.984	
4,200.00	4,192.52	4,238.71	4,237.91	15.18	5.20	-56.59	-187.02	-6,538.93	6,420.35	6,401.59	18.76	342.282	
4,300.00	4,292.28	4,332.23	4,331.37	15.55	5.32	-56.62	-184.14	-6,537.76	6,415.08	6,395.87	19.20	334.066	
4,400.00	4,392.04	4,424.67	4,423.77	15.92	5.44	-56.64	-181.33	-6,536.70	6,409.91	6,390.26	19.65	326.248	
4,500.00	4,491.79	4,514.26	4,513.32	16.29	5.56	-56.67	-178.82	-6,535.78	6,404.88	6,384.80	20.09	318.838	
4,600.00	4,591.55	4,604.54	4,603.57	16.66	5.67	-56.69	-176.56	-6,534.99	6,400.02	6,379.49	20.53	311.741	
4,700.00	4,691.31	4,710.06	4,709.06	17.03	5.81	-56.73	-174.12	-6,534.08	6,395.18	6,374.20	20.99	304.749	
4,800.00	4,791.06	4,815.01	4,813.97	17.40	5.95	-56.76	-171.79	-6,533.07	6,390.26	6,368.82	21.44	298.038	
4,900.00	4,890.82	4,916.72	4,915.66	17.76	6.08	-56.80	-169.75	-6,532.03	6,385.29	6,363.39	21.90	291.548	
5,000.00	4,990.57	5,018.10	5,017.02	18.13	6.21	-56.84	-168.00	-6,530.95	6,380.29	6,357.93	22.36	285.309	
5,100.00	5,090.33	5,118.04	5,116.94	18.50	6.34	-56.87	-166.45	-6,529.86	6,375.28	6,352.46	22.83	279.267	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100E - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-Standard Keeper 104, 5800-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference													
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)			
5,200.00	5,190.09	5,217.91	5,216.79	18.87	6.47	-56.91	-165.00	-6,528.76	6,370.28	6,346.98	23.30	273.459	
5,300.00	5,289.84	5,317.49	5,316.36	19.24	6.60	-56.96	-163.63	-6,527.66	6,365.28	6,341.51	23.76	267.851	
5,400.00	5,389.60	5,416.12	5,414.97	19.61	6.73	-57.00	-162.34	-6,526.57	6,360.28	6,336.05	24.23	262.466	
5,500.00	5,489.35	5,507.82	5,506.65	19.98	6.84	-57.03	-160.92	-6,525.38	6,355.10	6,330.41	24.70	257.339	
5,600.00	5,589.11	5,600.00	5,598.83	20.35	6.96	-57.07	-160.13	-6,524.72	6,350.51	6,325.36	25.16	252.415	
5,700.00	5,688.87	5,641.04	5,639.87	20.72	7.22	-57.10	-160.13	-6,524.72	6,346.44	6,320.58	25.86	245.398	
5,800.00	5,788.62	5,731.00	5,729.83	21.09	7.80	-57.14	-159.87	-6,524.51	6,342.43	6,315.47	26.96	235.288	
5,900.00	5,888.38	5,840.56	5,839.38	21.46	8.82	-57.20	-160.13	-6,524.72	6,338.86	6,310.31	28.55	222.036	
6,000.00	5,988.14	5,938.84	5,937.66	21.83	10.20	-57.25	-159.76	-6,524.72	6,335.05	6,304.51	30.54	207.434	
6,100.00	6,087.89	6,040.10	6,038.89	22.20	11.77	-57.31	-160.13	-6,524.72	6,331.30	6,298.61	32.69	193.676	
6,200.00	6,187.65	6,138.37	6,137.15	22.57	13.50	-57.36	-159.75	-6,524.72	6,327.50	6,292.55	34.94	181.078	
6,299.50	6,286.91	6,239.14	6,237.91	22.93	15.35	-57.41	-160.13	-6,524.72	6,323.77	6,286.49	37.28	169.621	
6,350.00	6,337.14	6,289.38	6,288.14	23.12	16.31	-29.96	-160.13	-6,524.72	6,319.89	6,281.41	38.48	164.239	
6,400.00	6,386.40	6,337.16	6,335.92	23.32	17.23	-21.27	-159.75	-6,524.72	6,312.11	6,272.48	39.63	159.283	
6,450.00	6,434.88	6,383.76	6,382.52	23.52	18.12	-17.31	-160.00	-6,524.72	6,300.56	6,259.80	40.75	154.606	
6,500.00	6,482.27	6,434.54	6,433.27	23.73	19.13	-15.17	-160.13	-6,524.72	6,285.24	6,243.26	41.97	149.751	
6,550.00	6,528.29	6,480.56	6,479.29	23.94	20.04	-13.92	-160.13	-6,524.72	6,266.24	6,223.15	43.10	145.405	
6,600.00	6,572.65	6,523.94	6,522.67	24.16	20.91	-13.19	-159.72	-6,524.72	6,243.68	6,199.52	44.16	141.390	
6,650.00	6,615.08	6,564.69	6,563.41	24.39	21.72	-12.83	-159.87	-6,524.72	6,217.75	6,172.59	45.16	137.676	
6,700.00	6,655.31	6,607.61	6,606.31	24.64	22.58	-12.75	-160.13	-6,524.72	6,188.59	6,142.39	46.20	133.943	
6,750.00	6,693.11	6,645.41	6,644.11	24.90	23.35	-12.91	-160.13	-6,524.72	6,156.35	6,109.21	47.14	130.609	
6,800.00	6,728.23	6,680.53	6,679.23	25.18	24.07	-13.32	-160.13	-6,524.72	6,121.24	6,073.24	48.00	127.519	
6,850.00	6,760.46	6,712.24	6,710.94	25.50	24.71	-13.98	-159.70	-6,524.72	6,083.46	6,034.67	48.79	124.692	
6,900.00	6,789.60	6,740.19	6,738.89	25.84	25.28	-14.97	-159.76	-6,524.72	6,043.30	5,993.81	49.48	122.126	
6,950.00	6,815.47	6,764.99	6,763.69	26.21	25.79	-16.39	-159.87	-6,524.72	6,000.97	5,950.87	50.10	119.773	
7,000.00	6,837.91	6,786.50	6,785.19	26.63	26.23	-18.42	-160.02	-6,524.72	5,956.75	5,906.11	50.64	117.625	
7,050.00	6,856.78	6,809.11	6,807.78	27.08	26.69	-21.44	-160.13	-6,524.72	5,910.89	5,859.70	51.19	115.465	
7,100.00	6,871.97	6,824.30	6,822.97	27.57	27.00	-26.05	-160.13	-6,524.72	5,863.68	5,812.10	51.58	113.685	
7,150.00	6,883.39	6,835.72	6,834.39	28.10	27.24	-33.69	-160.13	-6,524.72	5,815.41	5,763.54	51.88	112.104	
7,200.00	6,890.95	6,843.28	6,841.95	28.66	27.39	-47.61	-160.13	-6,524.72	5,766.38	5,714.30	52.08	110.717	
7,250.00	6,894.63	6,846.95	6,845.63	29.25	27.47	-74.04	-160.13	-6,524.72	5,716.89	5,664.69	52.20	109.521	
7,273.35	6,895.00	6,847.33	6,846.00	29.54	27.48	-91.12	-160.13	-6,524.72	5,693.71	5,641.49	52.22	109.025	
7,300.00	6,894.94	6,847.27	6,845.94	29.87	27.48	-91.11	-160.13	-6,524.72	5,667.25	5,615.01	52.24	108.484	
7,400.00	6,894.71	6,847.04	6,845.71	31.22	27.47	-91.09	-160.13	-6,524.72	5,567.96	5,515.65	52.31	106.448	
7,500.00	6,894.48	6,846.80	6,845.48	32.69	27.47	-91.07	-160.13	-6,524.72	5,468.70	5,416.32	52.38	104.404	
7,600.00	6,894.25	6,846.57	6,845.25	34.27	27.46	-91.05	-160.13	-6,524.72	5,369.47	5,317.00	52.46	102.350	
7,700.00	6,894.01	6,846.34	6,845.01	35.95	27.46	-91.03	-160.13	-6,524.72	5,270.26	5,217.71	52.55	100.286	
7,800.00	6,893.78	6,846.11	6,844.78	37.71	27.45	-91.01	-160.13	-6,524.72	5,171.09	5,118.43	52.65	98.214	
7,900.00	6,893.55	6,845.88	6,844.55	39.54	27.45	-90.99	-160.13	-6,524.72	5,071.94	5,019.18	52.76	96.132	
8,000.00	6,893.32	6,845.65	6,844.32	41.44	27.44	-90.97	-160.13	-6,524.72	4,972.84	4,919.96	52.88	94.040	
8,100.00	6,893.09	6,845.42	6,844.09	43.39	27.44	-90.95	-160.13	-6,524.72	4,873.77	4,820.75	53.01	91.938	
8,200.00	6,892.86	6,845.19	6,843.86	45.39	27.43	-90.93	-160.13	-6,524.72	4,774.73	4,721.58	53.16	89.826	
8,300.00	6,892.63	6,844.96	6,843.63	47.44	27.43	-90.91	-160.13	-6,524.72	4,675.74	4,622.43	53.31	87.705	
8,400.00	6,892.40	6,844.73	6,843.40	49.51	27.42	-90.89	-160.13	-6,524.72	4,576.80	4,523.31	53.48	85.573	
8,500.00	6,892.17	6,844.50	6,843.17	51.62	27.42	-90.87	-160.13	-6,524.72	4,477.89	4,424.22	53.67	83.432	
8,600.00	6,891.94	6,844.27	6,842.94	53.76	27.41	-90.85	-160.13	-6,524.72	4,379.04	4,325.17	53.88	81.280	
8,700.00	6,891.71	6,844.04	6,842.71	55.92	27.41	-90.83	-160.13	-6,524.72	4,280.25	4,226.15	54.10	79.118	
8,800.00	6,891.48	6,843.80	6,842.48	58.11	27.40	-90.82	-160.13	-6,524.72	4,181.51	4,127.16	54.34	76.946	
8,900.00	6,891.25	6,843.57	6,842.25	60.31	27.40	-90.80	-160.13	-6,524.72	4,082.83	4,028.22	54.61	74.765	
9,000.00	6,891.01	6,843.34	6,842.01	62.54	27.39	-90.78	-160.13	-6,524.72	3,984.22	3,929.32	54.90	72.573	
9,100.00	6,890.78	6,843.11	6,841.78	64.78	27.39	-90.76	-160.13	-6,524.72	3,885.67	3,830.46	55.22	70.373	
9,200.00	6,890.55	6,842.88	6,841.55	67.03	27.38	-90.74	-160.13	-6,524.72	3,787.21	3,731.65	55.56	68.163	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100E - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-Standard Keeper 104, 5800-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference													
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)			
9,300.00	6,890.32	6,842.65	6,841.32	69.29	27.38	-90.72	-160.13	-6,524.72	3,688.83	3,632.89	55.94	65.945	
9,400.00	6,890.09	6,842.42	6,841.09	71.57	27.38	-90.70	-160.13	-6,524.72	3,590.53	3,534.18	56.35	63.718	
9,500.00	6,889.86	6,842.19	6,840.86	73.86	27.37	-90.68	-160.13	-6,524.72	3,492.34	3,435.54	56.80	61.485	
9,600.00	6,889.63	6,841.96	6,840.63	76.16	27.37	-90.66	-160.13	-6,524.72	3,394.24	3,336.95	57.29	59.245	
9,700.00	6,889.40	6,841.73	6,840.40	78.46	27.36	-90.64	-160.13	-6,524.72	3,296.27	3,238.44	57.83	56.999	
9,800.00	6,889.17	6,841.50	6,840.17	80.78	27.36	-90.62	-160.13	-6,524.72	3,198.42	3,140.00	58.42	54.750	
9,900.00	6,888.94	6,841.27	6,839.94	83.10	27.35	-90.60	-160.13	-6,524.72	3,100.70	3,041.64	59.06	52.498	
10,000.00	6,888.71	6,841.04	6,839.71	85.43	27.35	-90.58	-160.13	-6,524.72	3,003.14	2,943.37	59.77	50.244	
10,100.00	6,888.48	6,840.80	6,839.48	87.76	27.34	-90.56	-160.13	-6,524.72	2,905.74	2,845.19	60.55	47.992	
10,200.00	6,888.25	6,840.57	6,839.25	90.10	27.34	-90.54	-160.13	-6,524.72	2,808.52	2,747.12	61.40	45.742	
10,300.00	6,888.01	6,840.34	6,839.01	92.45	27.33	-90.52	-160.13	-6,524.72	2,711.51	2,649.17	62.34	43.498	
10,400.00	6,887.78	6,840.11	6,838.78	94.80	27.33	-90.50	-160.13	-6,524.72	2,614.72	2,551.35	63.37	41.262	
10,500.00	6,887.55	6,839.88	6,838.55	97.15	27.32	-90.48	-160.13	-6,524.72	2,518.19	2,453.68	64.51	39.038	
10,600.00	6,887.32	6,839.65	6,838.32	99.51	27.32	-90.46	-160.13	-6,524.72	2,421.93	2,356.17	65.76	36.829	
10,700.00	6,887.09	6,839.42	6,838.09	101.87	27.31	-90.44	-160.13	-6,524.72	2,325.99	2,258.84	67.15	34.639	
10,800.00	6,886.86	6,839.19	6,837.86	104.24	27.31	-90.42	-160.13	-6,524.72	2,230.41	2,161.72	68.69	32.473	
10,900.00	6,886.63	6,838.96	6,837.63	106.61	27.30	-90.40	-160.13	-6,524.72	2,135.23	2,064.84	70.39	30.334	
11,000.00	6,886.40	6,838.73	6,837.40	108.98	27.30	-90.38	-160.13	-6,524.72	2,040.51	1,968.23	72.28	28.229	
11,100.00	6,886.17	6,838.50	6,837.17	111.36	27.29	-90.36	-160.13	-6,524.72	1,946.32	1,871.93	74.39	26.162	
11,200.00	6,885.94	6,838.27	6,836.94	113.74	27.29	-90.34	-160.13	-6,524.72	1,852.74	1,775.99	76.75	24.141	
11,300.00	6,885.71	6,838.04	6,836.71	116.12	27.29	-90.32	-160.13	-6,524.72	1,759.87	1,680.49	79.38	22.171	
11,400.00	6,885.48	6,837.80	6,836.48	118.51	27.28	-90.30	-160.13	-6,524.72	1,667.82	1,585.49	82.33	20.258	
11,500.00	6,885.25	6,837.57	6,836.25	120.89	27.28	-90.28	-160.13	-6,524.72	1,576.74	1,491.10	85.64	18.411	
11,600.00	6,885.01	6,837.34	6,836.01	123.28	27.27	-90.26	-160.13	-6,524.72	1,486.80	1,397.44	89.37	16.637	
11,700.00	6,884.78	6,837.11	6,835.78	125.67	27.27	-90.24	-160.13	-6,524.72	1,398.24	1,304.67	93.57	14.943	
11,800.00	6,884.55	6,836.88	6,835.55	128.07	27.26	-90.22	-160.13	-6,524.72	1,311.32	1,213.00	98.32	13.337	
11,900.00	6,884.32	6,836.65	6,835.32	130.46	27.26	-90.20	-160.13	-6,524.72	1,226.39	1,122.70	103.69	11.827	
12,000.00	6,884.09	6,836.42	6,835.09	132.86	27.25	-90.18	-160.13	-6,524.72	1,143.91	1,034.15	109.75	10.422	
12,100.00	6,883.86	6,836.19	6,834.86	135.25	27.25	-90.16	-160.13	-6,524.72	1,064.43	947.84	116.58	9.130	
12,200.00	6,883.63	6,835.96	6,834.63	137.65	27.24	-90.14	-160.13	-6,524.72	988.68	864.45	124.23	7.959	
12,300.00	6,883.40	6,835.73	6,834.40	140.05	27.24	-90.12	-160.13	-6,524.72	917.59	784.90	132.69	6.915	
12,400.00	6,883.17	6,835.50	6,834.17	142.46	27.23	-90.10	-160.13	-6,524.72	852.32	710.45	141.87	6.008	
12,500.00	6,882.94	6,835.27	6,833.94	144.86	27.23	-90.08	-160.13	-6,524.72	794.31	642.80	151.52	5.242	
12,600.00	6,882.71	6,835.04	6,833.71	147.27	27.22	-90.06	-160.13	-6,524.72	745.26	584.12	161.14	4.625	
12,700.00	6,882.48	6,834.80	6,833.48	149.67	27.22	-90.04	-160.13	-6,524.72	707.04	537.04	169.99	4.159	
12,800.00	6,882.25	6,834.57	6,833.25	152.08	27.21	-90.03	-160.13	-6,524.72	681.46	504.35	177.11	3.848	
12,900.00	6,882.01	6,834.34	6,833.01	154.49	27.21	-90.01	-160.13	-6,524.72	669.97	488.43	181.55	3.690	
12,927.59	6,881.95	6,834.28	6,832.95	155.15	27.21	-90.00	-160.13	-6,524.72	669.41	487.20	182.21	3.674 CC, ES, SF	
13,000.00	6,881.78	6,834.11	6,832.78	156.90	27.20	-89.99	-160.13	-6,524.72	673.31	490.58	182.73	3.685	
13,100.00	6,881.55	6,833.88	6,832.55	159.31	27.20	-89.97	-160.13	-6,524.72	691.25	510.59	180.67	3.826	
13,200.00	6,881.32	6,833.65	6,832.32	161.72	27.19	-89.95	-160.13	-6,524.72	722.71	546.75	175.96	4.107	
13,300.00	6,881.09	6,833.42	6,832.09	164.13	27.19	-89.93	-160.13	-6,524.72	766.02	596.54	169.49	4.520	
13,400.00	6,880.86	6,833.19	6,831.86	166.55	27.19	-89.91	-160.13	-6,524.72	819.31	657.19	162.12	5.054	
13,500.00	6,880.63	6,832.96	6,831.63	168.96	27.18	-89.89	-160.13	-6,524.72	880.77	726.23	154.54	5.699	
13,600.00	6,880.40	6,832.73	6,831.40	171.38	27.18	-89.87	-160.13	-6,524.72	948.81	801.64	147.17	6.447	
13,700.00	6,880.17	6,832.50	6,831.17	173.79	27.17	-89.85	-160.13	-6,524.72	1,022.12	881.86	140.26	7.287	
13,800.00	6,879.94	6,832.27	6,830.94	176.21	27.17	-89.83	-160.13	-6,524.72	1,099.64	965.72	133.91	8.212	
13,900.00	6,879.71	6,832.04	6,830.71	178.63	27.16	-89.81	-160.13	-6,524.72	1,180.54	1,052.38	128.16	9.211	
14,000.00	6,879.48	6,831.80	6,830.48	181.04	27.16	-89.79	-160.13	-6,524.72	1,264.18	1,141.20	122.98	10.280	
14,100.00	6,879.25	6,831.57	6,830.25	183.46	27.15	-89.77	-160.13	-6,524.72	1,350.05	1,231.72	118.33	11.409	
14,200.00	6,879.01	6,831.34	6,830.01	185.88	27.15	-89.75	-160.13	-6,524.72	1,437.75	1,323.59	114.16	12.594	
14,300.00	6,878.78	6,831.11	6,829.78	188.30	27.14	-89.73	-160.13	-6,524.72	1,526.96	1,416.54	110.42	13.829	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 100E - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		200-Standard Keeper 104, 5800-A027Ua_INC-ONLY						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)				
14,400.00	6,878.55	6,830.88	6,829.55	190.72	27.14	-89.71	-160.13	-6,524.72	1,617.43	1,510.37	107.06	15.108		
14,500.00	6,878.32	6,830.65	6,829.32	193.14	27.13	-89.69	-160.13	-6,524.72	1,708.97	1,604.93	104.03	16.427		
14,600.00	6,878.09	6,830.42	6,829.09	195.56	27.13	-89.67	-160.13	-6,524.72	1,801.40	1,700.10	101.30	17.783		
14,700.00	6,877.86	6,830.19	6,828.86	197.99	27.12	-89.65	-160.13	-6,524.72	1,894.61	1,795.77	98.83	19.170		
14,800.00	6,877.63	6,829.96	6,828.63	200.41	27.12	-89.63	-160.13	-6,524.72	1,988.47	1,891.88	96.59	20.587		
14,900.00	6,877.40	6,829.73	6,828.40	202.83	27.11	-89.61	-160.13	-6,524.72	2,082.90	1,988.35	94.55	22.030		
15,000.00	6,877.17	6,829.50	6,828.17	205.25	27.11	-89.59	-160.13	-6,524.72	2,177.84	2,085.14	92.69	23.495		
15,100.00	6,876.94	6,829.27	6,827.94	207.68	27.10	-89.57	-160.13	-6,524.72	2,273.20	2,182.21	90.99	24.982		
15,200.00	6,876.71	6,829.04	6,827.71	210.10	27.10	-89.55	-160.13	-6,524.72	2,368.95	2,279.51	89.44	26.487		
15,300.00	6,876.48	6,828.80	6,827.48	212.53	27.09	-89.53	-160.13	-6,524.72	2,465.04	2,377.03	88.01	28.009		
15,400.00	6,876.25	6,828.57	6,827.25	214.95	27.09	-89.51	-160.13	-6,524.72	2,561.42	2,474.73	86.69	29.546		
15,500.00	6,876.01	6,828.34	6,827.01	217.38	27.09	-89.49	-160.13	-6,524.72	2,658.08	2,572.59	85.48	31.096		
15,600.00	6,875.78	6,828.11	6,826.78	219.80	27.08	-89.47	-160.13	-6,524.72	2,754.97	2,670.61	84.36	32.657		
15,700.00	6,875.55	6,827.88	6,826.55	222.23	27.08	-89.45	-160.13	-6,524.72	2,852.07	2,768.75	83.33	34.228		
15,800.00	6,875.32	6,827.65	6,826.32	224.66	27.07	-89.43	-160.13	-6,524.72	2,949.37	2,867.01	82.37	35.808		
15,900.00	6,875.09	6,827.42	6,826.09	227.08	27.07	-89.41	-160.13	-6,524.72	3,046.85	2,965.37	81.47	37.397		
16,000.00	6,874.86	6,827.19	6,825.86	229.51	27.06	-89.39	-160.13	-6,524.72	3,144.48	3,063.84	80.64	38.992		
16,100.00	6,874.63	6,826.96	6,825.63	231.94	27.06	-89.37	-160.13	-6,524.72	3,242.26	3,162.39	79.87	40.593		
16,200.00	6,874.40	6,826.73	6,825.40	234.37	27.05	-89.35	-160.13	-6,524.72	3,340.17	3,261.01	79.15	42.198		
16,300.00	6,874.17	6,826.50	6,825.17	236.79	27.05	-89.33	-160.13	-6,524.72	3,438.20	3,359.72	78.48	43.809		
16,400.00	6,873.94	6,826.27	6,824.94	239.22	27.04	-89.31	-160.13	-6,524.72	3,536.34	3,458.48	77.85	45.422		
16,500.00	6,873.71	6,826.04	6,824.71	241.65	27.04	-89.29	-160.13	-6,524.72	3,634.58	3,557.31	77.27	47.039		
16,600.00	6,873.48	6,825.80	6,824.48	244.08	27.03	-89.27	-160.13	-6,524.72	3,732.91	3,656.19	76.72	48.657		
16,700.00	6,873.25	6,825.57	6,824.25	246.51	27.03	-89.25	-160.13	-6,524.72	3,831.33	3,755.13	76.20	50.278		
16,800.00	6,873.02	6,825.34	6,824.02	248.94	27.02	-89.24	-160.13	-6,524.72	3,929.83	3,854.11	75.72	51.899		
16,900.00	6,872.78	6,825.11	6,823.78	251.37	27.02	-89.22	-160.13	-6,524.72	4,028.41	3,953.14	75.27	53.522		
17,000.00	6,872.55	6,824.88	6,823.55	253.80	27.01	-89.20	-160.13	-6,524.72	4,127.05	4,052.21	74.84	55.144		
17,070.79	6,872.39	6,824.72	6,823.39	255.52	27.01	-89.18	-160.13	-6,524.72	4,196.92	4,122.37	74.55	56.293		
17,100.00	6,872.32	6,824.65	6,823.32	256.23	27.01	-89.18	-160.13	-6,524.72	4,225.76	4,151.32	74.44	56.767		
17,200.00	6,872.09	6,824.42	6,823.09	258.66	27.00	-89.16	-160.13	-6,524.72	4,324.52	4,250.46	74.06	58.389		
17,237.94	6,872.00	6,824.33	6,823.00	259.58	27.00	-89.15	-160.13	-6,524.72	4,362.01	4,288.08	73.93	59.004		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 140 - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 120-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference													
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)			
0.00	0.00	0.00	0.00	0.00	0.00	-89.35	45.65	-4,003.36	4,003.75				
100.00	100.00	68.00	68.00	0.25	1.20	-89.35	45.65	-4,003.36	4,003.62	4,002.16	1.46	2,750.171	
200.00	200.00	168.00	168.00	0.61	2.99	-89.35	45.65	-4,003.36	4,003.62	4,000.02	3.60	1,112.169	
300.00	300.00	268.00	268.00	0.97	4.85	-89.35	45.65	-4,003.36	4,003.62	3,997.80	5.82	688.109	
400.00	400.00	368.02	368.02	1.33	6.79	-89.34	45.93	-4,003.36	4,003.62	3,995.51	8.12	493.330	
500.00	500.00	468.18	468.18	1.68	8.73	-89.35	45.72	-4,003.36	4,003.62	3,993.20	10.42	384.395	
551.66	551.66	519.68	519.66	1.87	9.74	-89.35	45.65	-4,003.36	4,003.62	3,992.01	11.61	344.943	
600.00	600.00	568.03	568.00	2.04	10.68	-89.35	45.65	-4,003.36	4,003.62	3,990.89	12.73	314.556	
700.00	700.00	668.25	668.22	2.40	12.65	-89.34	46.02	-4,003.36	4,003.62	3,988.57	15.05	265.995	
800.00	800.00	768.05	768.00	2.76	14.58	-89.35	45.65	-4,003.36	4,003.62	3,986.28	17.34	230.865	
900.00	900.00	868.05	868.00	3.12	16.49	-89.35	45.65	-4,003.36	4,003.62	3,984.01	19.60	204.220	
1,000.00	1,000.00	968.05	968.00	3.48	18.39	-89.35	45.65	-4,003.36	4,003.62	3,981.75	21.87	183.090	
1,100.00	1,099.98	1,068.10	1,068.05	3.83	20.29	-52.64	46.12	-4,003.36	4,002.56	3,978.44	24.13	165.885	
1,200.08	1,199.92	1,168.11	1,168.05	4.19	22.20	-52.75	45.87	-4,003.36	3,999.38	3,973.00	26.39	151.559	
1,300.00	1,299.59	1,267.67	1,267.59	4.55	24.07	-52.83	45.65	-4,003.36	3,995.16	3,966.54	28.61	139.619	
1,400.00	1,399.35	1,367.43	1,367.35	4.91	25.91	-52.91	45.65	-4,003.36	3,990.94	3,960.13	30.81	129.524	
1,500.00	1,499.11	1,467.18	1,467.11	5.27	27.75	-52.99	45.65	-4,003.36	3,986.73	3,953.72	33.01	120.768	
1,600.00	1,598.86	1,566.99	1,566.91	5.63	29.59	-53.06	46.36	-4,003.36	3,982.53	3,947.32	35.21	113.101	
1,700.00	1,698.62	1,666.78	1,666.69	6.00	31.43	-53.15	45.98	-4,003.36	3,978.33	3,940.92	37.41	106.334	
1,800.00	1,798.37	1,766.47	1,766.37	6.36	33.30	-53.24	45.65	-4,003.36	3,974.14	3,934.51	39.64	100.259	
1,900.00	1,898.13	1,866.23	1,866.13	6.72	35.20	-53.32	45.65	-4,003.36	3,969.96	3,928.07	41.90	94.751	
2,000.00	1,997.89	1,965.99	1,965.89	7.09	37.10	-53.40	45.65	-4,003.36	3,965.79	3,921.63	44.16	89.805	
2,100.00	2,097.64	2,065.73	2,065.64	7.45	39.00	-53.47	45.89	-4,003.36	3,961.63	3,915.21	46.42	85.341	
2,200.00	2,197.40	2,165.47	2,165.37	7.82	40.89	-53.56	45.76	-4,003.36	3,957.47	3,908.79	48.68	81.292	
2,300.00	2,297.16	2,265.29	2,265.16	8.19	42.85	-53.64	45.65	-4,003.36	3,953.33	3,902.33	51.00	77.521	
2,400.00	2,396.91	2,365.04	2,364.91	8.55	44.87	-53.72	45.65	-4,003.36	3,949.19	3,895.81	53.38	73.982	
2,500.00	2,496.67	2,464.80	2,464.67	8.92	46.89	-53.80	45.65	-4,003.36	3,945.05	3,889.29	55.76	70.746	
2,600.00	2,596.42	2,564.45	2,564.31	9.29	48.90	-53.87	46.62	-4,003.36	3,940.92	3,882.78	58.15	67.777	
2,700.00	2,696.18	2,664.07	2,663.92	9.66	50.92	-53.96	46.14	-4,003.36	3,936.81	3,876.28	60.53	65.043	
2,800.00	2,795.94	2,764.13	2,763.94	10.02	52.95	-54.05	45.65	-4,003.36	3,932.71	3,869.79	62.92	62.504	
2,900.00	2,895.69	2,863.88	2,863.69	10.39	54.98	-54.13	45.65	-4,003.36	3,928.61	3,863.30	65.31	60.153	
3,000.00	2,995.45	2,963.64	2,963.45	10.76	57.00	-54.21	45.65	-4,003.36	3,924.52	3,856.81	67.70	57.968	
3,100.00	3,095.21	3,063.26	3,063.06	11.13	59.03	-54.28	46.37	-4,003.36	3,920.42	3,850.33	70.09	55.934	
3,200.00	3,194.96	3,162.83	3,162.62	11.49	61.05	-54.37	46.02	-4,003.36	3,916.35	3,843.87	72.48	54.036	
3,300.00	3,294.72	3,262.97	3,262.72	11.86	63.11	-54.46	45.65	-4,003.36	3,912.29	3,837.39	74.90	52.233	
3,400.00	3,394.47	3,362.72	3,362.47	12.23	65.21	-54.54	45.65	-4,003.36	3,908.23	3,830.87	77.36	50.518	
3,500.00	3,494.23	3,462.48	3,462.23	12.60	67.30	-54.63	45.65	-4,003.36	3,904.18	3,824.36	79.82	48.909	
3,600.00	3,593.99	3,555.00	3,554.70	12.97	69.25	-54.70	45.65	-4,003.36	3,900.15	3,818.01	82.14	47.484	
3,700.00	3,693.74	3,555.00	3,554.70	13.34	69.25	-54.70	45.65	-4,003.36	3,897.58	3,815.10	82.48	47.255	
3,750.22	3,743.84	3,555.00	3,554.70	13.52	69.25	-54.70	45.65	-4,003.36	3,897.25	3,814.62	82.63	47.164	
3,800.00	3,793.50	3,555.00	3,554.70	13.71	69.25	-54.70	45.65	-4,003.36	3,897.57	3,814.80	82.77	47.089	
3,900.00	3,893.26	3,555.00	3,554.70	14.07	69.25	-54.70	45.65	-4,003.36	3,900.13	3,817.12	83.01	46.983	
4,000.00	3,993.01	3,555.00	3,554.70	14.44	69.25	-54.70	45.65	-4,003.36	3,905.25	3,822.05	83.20	46.938 SF	
4,100.00	4,092.77	3,555.00	3,554.70	14.81	69.25	-54.70	45.65	-4,003.36	3,912.92	3,829.58	83.34	46.954	
4,200.00	4,192.52	3,555.00	3,554.70	15.18	69.25	-54.70	45.65	-4,003.36	3,923.12	3,839.70	83.42	47.028	
4,300.00	4,292.28	3,555.00	3,554.70	15.55	69.25	-54.70	45.65	-4,003.36	3,935.84	3,852.38	83.46	47.161	
4,400.00	4,392.04	3,555.00	3,554.70	15.92	69.25	-54.70	45.65	-4,003.36	3,951.05	3,867.61	83.44	47.352	
4,500.00	4,491.79	3,555.00	3,554.70	16.29	69.25	-54.70	45.65	-4,003.36	3,968.72	3,885.34	83.38	47.600	
4,600.00	4,591.55	3,555.00	3,554.70	16.66	69.25	-54.70	45.65	-4,003.36	3,988.82	3,905.55	83.27	47.904	
4,700.00	4,691.31	3,555.00	3,554.70	17.03	69.25	-54.70	45.65	-4,003.36	4,011.32	3,928.20	83.11	48.263	
4,800.00	4,791.06	3,555.00	3,554.70	17.40	69.25	-54.70	45.65	-4,003.36	4,036.16	3,953.25	82.92	48.678	
4,900.00	4,890.82	3,555.00	3,554.70	17.76	69.25	-54.70	45.65	-4,003.36	4,063.32	3,980.64	82.68	49.147	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 140 - OH - OH											Offset Site Error: 0.00 usft
Survey Program: 120-A027Ua_INC-ONLY							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)	
5,000.00	4,990.57	3,555.00	3,554.70	18.13	69.25	-54.70	45.65	-4,003.36	4,092.74	4,010.34	82.40 49.668
5,100.00	5,090.33	3,555.00	3,554.70	18.50	69.25	-54.70	45.65	-4,003.36	4,124.38	4,042.29	82.09 50.242
5,200.00	5,190.09	3,555.00	3,554.70	18.87	69.25	-54.70	45.65	-4,003.36	4,158.18	4,076.43	81.74 50.868
5,300.00	5,289.84	3,555.00	3,554.70	19.24	69.25	-54.70	45.65	-4,003.36	4,194.09	4,112.72	81.37 51.545
5,400.00	5,389.60	3,555.00	3,554.70	19.61	69.25	-54.70	45.65	-4,003.36	4,232.06	4,151.10	80.96 52.271
5,500.00	5,489.35	3,555.00	3,554.70	19.98	69.25	-54.70	45.65	-4,003.36	4,272.04	4,191.50	80.53 53.047
5,600.00	5,589.11	3,555.00	3,554.70	20.35	69.25	-54.70	45.65	-4,003.36	4,313.96	4,233.88	80.08 53.870
5,700.00	5,688.87	3,555.00	3,554.70	20.72	69.25	-54.70	45.65	-4,003.36	4,357.78	4,278.17	79.61 54.741
5,800.00	5,788.62	3,555.00	3,554.70	21.09	69.25	-54.70	45.65	-4,003.36	4,403.43	4,324.31	79.11 55.659
5,900.00	5,888.38	3,555.00	3,554.70	21.46	69.25	-54.70	45.65	-4,003.36	4,450.86	4,372.25	78.61 56.621
6,000.00	5,988.14	3,555.00	3,554.70	21.83	69.25	-54.70	45.65	-4,003.36	4,500.01	4,421.92	78.09 57.629
6,100.00	6,087.89	3,555.00	3,554.70	22.20	69.25	-54.70	45.65	-4,003.36	4,550.83	4,473.27	77.55 58.680
6,200.00	6,187.65	3,555.00	3,554.70	22.57	69.25	-54.70	45.65	-4,003.36	4,603.26	4,526.25	77.01 59.773
6,299.50	6,286.91	3,555.00	3,554.70	22.93	69.25	-54.70	45.65	-4,003.36	4,656.97	4,580.51	76.47 60.902
6,350.00	6,337.14	3,555.00	3,554.70	23.12	69.25	-27.04	45.65	-4,003.36	4,683.12	4,606.94	76.17 61.479
6,400.00	6,386.40	3,555.00	3,554.70	23.32	69.25	-18.14	45.65	-4,003.36	4,705.97	4,630.11	75.86 62.031
6,450.00	6,434.88	3,555.00	3,554.70	23.52	69.25	-13.94	45.65	-4,003.36	4,725.71	4,650.17	75.54 62.561
6,500.00	6,482.27	3,555.00	3,554.70	23.73	69.25	-11.52	45.65	-4,003.36	4,742.26	4,667.06	75.20 63.065
6,550.00	6,528.29	3,555.00	3,554.70	23.94	69.25	-9.96	45.65	-4,003.36	4,755.54	4,680.70	74.84 63.542
6,600.00	6,572.65	3,555.00	3,554.70	24.16	69.25	-8.89	45.65	-4,003.36	4,765.51	4,691.04	74.47 63.992
6,650.00	6,615.08	3,555.00	3,554.70	24.39	69.25	-8.11	45.65	-4,003.36	4,772.12	4,698.03	74.09 64.412
6,700.00	6,655.31	3,555.00	3,554.70	24.64	69.25	-7.53	45.65	-4,003.36	4,775.34	4,701.65	73.69 64.801
6,750.00	6,693.11	3,555.00	3,554.70	24.90	69.25	-7.09	45.65	-4,003.36	4,775.17	4,701.88	73.29 65.156
6,800.00	6,728.23	3,555.00	3,554.70	25.18	69.25	-6.77	45.65	-4,003.36	4,771.60	4,698.73	72.87 65.477
6,850.00	6,760.46	3,555.00	3,554.70	25.50	69.25	-6.52	45.65	-4,003.36	4,764.65	4,692.20	72.45 65.761
6,900.00	6,789.60	3,555.00	3,554.70	25.84	69.25	-6.35	45.65	-4,003.36	4,754.35	4,682.32	72.03 66.007
6,950.00	6,815.47	3,555.00	3,554.70	26.21	69.25	-6.23	45.65	-4,003.36	4,740.73	4,669.13	71.60 66.212
7,000.00	6,837.91	3,555.00	3,554.70	26.63	69.25	-6.17	45.65	-4,003.36	4,723.86	4,652.69	71.17 66.374
7,050.00	6,856.78	3,555.00	3,554.70	27.08	69.25	-6.15	45.65	-4,003.36	4,703.80	4,633.05	70.74 66.491
7,100.00	6,871.97	3,555.00	3,554.70	27.57	69.25	-6.19	45.65	-4,003.36	4,680.63	4,610.31	70.32 66.563
7,150.00	6,883.39	3,555.00	3,554.70	28.10	69.25	-6.28	45.65	-4,003.36	4,654.46	4,584.56	69.90 66.586
7,200.00	6,890.95	3,555.00	3,554.70	28.66	69.25	-6.41	45.65	-4,003.36	4,625.40	4,555.91	69.49 66.559
7,250.00	6,894.63	3,555.00	3,554.70	29.25	69.25	-6.62	45.65	-4,003.36	4,593.57	4,524.48	69.10 66.481
7,273.35	6,895.00	3,555.00	3,554.70	29.54	69.25	-6.73	45.65	-4,003.36	4,577.80	4,508.88	68.92 66.423
7,300.00	6,894.94	3,555.00	3,554.70	29.87	69.25	-6.73	45.65	-4,003.36	4,559.52	4,490.81	68.71 66.358
7,400.00	6,894.71	3,555.00	3,554.70	31.22	69.25	-6.73	45.65	-4,003.36	4,491.66	4,423.75	67.91 66.140
7,500.00	6,894.48	3,555.00	3,554.70	32.69	69.25	-6.73	45.65	-4,003.36	4,425.02	4,357.92	67.10 65.951
7,600.00	6,894.25	3,555.00	3,554.70	34.27	69.25	-6.73	45.65	-4,003.36	4,359.66	4,293.39	66.26 65.792
7,700.00	6,894.01	3,555.00	3,554.70	35.95	69.25	-6.73	45.65	-4,003.36	4,295.63	4,230.21	65.42 65.664
7,800.00	6,893.78	3,555.00	3,554.70	37.71	69.25	-6.73	45.65	-4,003.36	4,232.99	4,168.43	64.56 65.569
7,900.00	6,893.55	3,555.00	3,554.70	39.54	69.25	-6.73	45.65	-4,003.36	4,171.81	4,108.13	63.68 65.509
8,000.00	6,893.32	3,555.00	3,554.70	41.44	69.25	-6.73	45.65	-4,003.36	4,112.16	4,049.36	62.80 65.485
8,100.00	6,893.09	3,555.00	3,554.70	43.39	69.25	-6.73	45.65	-4,003.36	4,054.09	3,992.19	61.90 65.499
8,200.00	6,892.86	3,555.00	3,554.70	45.39	69.25	-6.73	45.65	-4,003.36	3,997.68	3,936.70	60.98 65.554
8,300.00	6,892.63	3,555.00	3,554.70	47.44	69.25	-6.73	45.65	-4,003.36	3,943.00	3,882.94	60.06 65.650
8,400.00	6,892.40	3,555.00	3,554.70	49.51	69.25	-6.73	45.65	-4,003.36	3,890.12	3,830.99	59.13 65.791
8,500.00	6,892.17	3,555.00	3,554.70	51.62	69.25	-6.73	45.65	-4,003.36	3,839.12	3,780.93	58.19 65.979
8,600.00	6,891.94	3,555.00	3,554.70	53.76	69.25	-6.73	45.65	-4,003.36	3,790.07	3,732.84	57.24 66.216
8,700.00	6,891.71	3,555.00	3,554.70	55.92	69.25	-6.73	45.65	-4,003.36	3,743.05	3,686.77	56.28 66.504
8,800.00	6,891.48	3,555.00	3,554.70	58.11	69.25	-6.73	45.65	-4,003.36	3,698.14	3,642.82	55.32 66.846
8,900.00	6,891.25	3,555.00	3,554.70	60.31	69.25	-6.73	45.65	-4,003.36	3,655.42	3,601.05	54.36 67.243
9,000.00	6,891.01	3,555.00	3,554.70	62.54	69.25	-6.73	45.65	-4,003.36	3,614.95	3,561.55	53.40 67.695

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 140 - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		120-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)	Offset (usft)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Distance Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
9,100.00	6,890.78	3,555.00	3,554.70	64.78	69.25	-6.73	45.65	-4,003.36	3,576.83	3,524.38	52.44	68.205		
9,200.00	6,890.55	3,555.00	3,554.70	67.03	69.25	-6.73	45.65	-4,003.36	3,541.11	3,489.62	51.49	68.769		
9,300.00	6,890.32	3,555.00	3,554.70	69.29	69.25	-6.73	45.65	-4,003.36	3,507.89	3,457.33	50.56	69.385		
9,400.00	6,890.09	3,555.00	3,554.70	71.57	69.25	-6.73	45.65	-4,003.36	3,477.23	3,427.58	49.64	70.046		
9,500.00	6,889.86	3,555.00	3,554.70	73.86	69.25	-6.73	45.65	-4,003.36	3,449.19	3,400.43	48.76	70.742		
9,600.00	6,889.63	3,555.00	3,554.70	76.16	69.25	-6.73	45.65	-4,003.36	3,423.84	3,375.93	47.92	71.456		
9,700.00	6,889.40	3,555.00	3,554.70	78.46	69.25	-6.73	45.65	-4,003.36	3,401.25	3,354.12	47.13	72.164		
9,800.00	6,889.17	3,555.00	3,554.70	80.78	69.25	-6.73	45.65	-4,003.36	3,381.47	3,335.04	46.43	72.832		
9,900.00	6,888.94	3,555.00	3,554.70	83.10	69.25	-6.73	45.65	-4,003.36	3,364.54	3,318.71	45.83	73.414		
10,000.00	6,888.71	3,555.00	3,554.70	85.43	69.25	-6.73	45.65	-4,003.36	3,350.51	3,305.14	45.37	73.851		
10,100.00	6,888.48	3,555.00	3,554.70	87.76	69.25	-6.73	45.65	-4,003.36	3,339.42	3,294.34	45.08	74.073		
10,200.00	6,888.25	3,555.00	3,554.70	90.10	69.25	-6.73	45.65	-4,003.36	3,331.30	3,286.28	45.01	74.006		
10,300.00	6,888.01	3,555.00	3,554.70	92.45	69.25	-6.73	45.65	-4,003.36	3,326.16	3,280.96	45.20	73.587		
10,400.00	6,887.78	3,555.00	3,554.70	94.80	69.25	-6.73	45.65	-4,003.36	3,324.03	3,278.35	45.67	72.780		
10,420.97	6,887.74	3,555.00	3,554.70	95.29	69.25	-6.73	45.65	-4,003.36	3,323.96	3,278.15	45.81	72.562	CC, ES	
10,500.00	6,887.55	3,555.00	3,554.70	97.15	69.25	-6.73	45.65	-4,003.36	3,324.90	3,278.46	46.44	71.596		
10,600.00	6,887.32	3,555.00	3,554.70	99.51	69.25	-6.73	45.65	-4,003.36	3,328.78	3,281.29	47.49	70.090		
10,700.00	6,887.09	3,555.00	3,554.70	101.87	69.25	-6.73	45.65	-4,003.36	3,335.65	3,286.85	48.80	68.353		
10,800.00	6,886.86	3,555.00	3,554.70	104.24	69.25	-6.73	45.65	-4,003.36	3,345.50	3,295.18	50.32	66.487		
10,900.00	6,886.63	3,555.00	3,554.70	106.61	69.25	-6.73	45.65	-4,003.36	3,358.30	3,306.30	52.00	64.581		
11,000.00	6,886.40	3,555.00	3,554.70	108.98	69.25	-6.73	45.65	-4,003.36	3,374.02	3,320.21	53.80	62.709		
11,100.00	6,886.17	3,555.00	3,554.70	111.36	69.25	-6.73	45.65	-4,003.36	3,392.61	3,336.92	55.69	60.921		
11,200.00	6,885.94	3,555.00	3,554.70	113.74	69.25	-6.73	45.65	-4,003.36	3,414.03	3,356.41	57.62	59.249		
11,300.00	6,885.71	3,555.00	3,554.70	116.12	69.25	-6.73	45.65	-4,003.36	3,438.23	3,378.65	59.58	57.710		
11,400.00	6,885.48	3,555.00	3,554.70	118.51	69.25	-6.73	45.65	-4,003.36	3,465.14	3,403.61	61.54	56.311		
11,500.00	6,885.25	3,555.00	3,554.70	120.89	69.25	-6.73	45.65	-4,003.36	3,494.71	3,431.23	63.48	55.053		
11,600.00	6,885.01	3,555.00	3,554.70	123.28	69.25	-6.73	45.65	-4,003.36	3,526.87	3,461.47	65.40	53.931		
11,700.00	6,884.78	3,555.00	3,554.70	125.67	69.25	-6.73	45.65	-4,003.36	3,561.55	3,494.27	67.27	52.940		
11,800.00	6,884.55	3,555.00	3,554.70	128.07	69.25	-6.73	45.65	-4,003.36	3,598.67	3,529.56	69.11	52.073		
11,900.00	6,884.32	3,555.00	3,554.70	130.46	69.25	-6.73	45.65	-4,003.36	3,638.16	3,567.27	70.89	51.320		
12,000.00	6,884.09	3,555.00	3,554.70	132.86	69.25	-6.73	45.65	-4,003.36	3,679.95	3,607.33	72.62	50.674		
12,100.00	6,883.86	3,555.00	3,554.70	135.25	69.25	-6.73	45.65	-4,003.36	3,723.96	3,649.67	74.29	50.128		
12,200.00	6,883.63	3,555.00	3,554.70	137.65	69.25	-6.73	45.65	-4,003.36	3,770.10	3,694.20	75.90	49.672		
12,300.00	6,883.40	3,555.00	3,554.70	140.05	69.25	-6.73	45.65	-4,003.36	3,818.31	3,740.86	77.45	49.302		
12,400.00	6,883.17	3,555.00	3,554.70	142.46	69.25	-6.73	45.65	-4,003.36	3,868.50	3,789.56	78.93	49.009		
12,500.00	6,882.94	3,555.00	3,554.70	144.86	69.25	-6.73	45.65	-4,003.36	3,920.60	3,840.24	80.36	48.788		
12,600.00	6,882.71	3,555.00	3,554.70	147.27	69.25	-6.73	45.65	-4,003.36	3,974.53	3,892.80	81.72	48.634		
12,700.00	6,882.48	3,555.00	3,554.70	149.67	69.25	-6.73	45.65	-4,003.36	4,030.22	3,947.19	83.03	48.540		
12,800.00	6,882.25	3,555.00	3,554.70	152.08	69.25	-6.73	45.65	-4,003.36	4,087.60	4,003.33	84.27	48.504		
12,900.00	6,882.01	3,555.00	3,554.70	154.49	69.25	-6.73	45.65	-4,003.36	4,146.60	4,061.14	85.46	48.519		
13,000.00	6,881.78	3,555.00	3,554.70	156.90	69.25	-6.73	45.65	-4,003.36	4,207.15	4,120.55	86.60	48.583		
13,100.00	6,881.55	3,555.00	3,554.70	159.31	69.25	-6.73	45.65	-4,003.36	4,269.18	4,181.50	87.68	48.692		
13,200.00	6,881.32	3,555.00	3,554.70	161.72	69.25	-6.73	45.65	-4,003.36	4,332.63	4,243.93	88.71	48.842		
13,300.00	6,881.09	3,555.00	3,554.70	164.13	69.25	-6.73	45.65	-4,003.36	4,397.44	4,307.76	89.69	49.031		
13,400.00	6,880.86	3,555.00	3,554.70	166.55	69.25	-6.73	45.65	-4,003.36	4,463.55	4,372.93	90.62	49.256		
13,500.00	6,880.63	3,555.00	3,554.70	168.96	69.25	-6.73	45.65	-4,003.36	4,530.91	4,439.40	91.51	49.514		
13,600.00	6,880.40	3,555.00	3,554.70	171.38	69.25	-6.73	45.65	-4,003.36	4,599.45	4,507.10	92.35	49.803		
13,700.00	6,880.17	3,555.00	3,554.70	173.79	69.25	-6.73	45.65	-4,003.36	4,669.13	4,575.97	93.16	50.121		
13,800.00	6,879.94	3,555.00	3,554.70	176.21	69.25	-6.73	45.65	-4,003.36	4,739.89	4,645.97	93.92	50.466		
13,900.00	6,879.71	3,555.00	3,554.70	178.63	69.25	-6.73	45.65	-4,003.36	4,811.69	4,717.04	94.65	50.837		
14,000.00	6,879.48	3,555.00	3,554.70	181.04	69.25	-6.73	45.65	-4,003.36	4,884.48	4,789.14	95.34	51.231		
14,100.00	6,879.25	3,555.00	3,554.70	183.46	69.25	-6.73	45.65	-4,003.36	4,958.22	4,862.22	96.00	51.647		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 140 - OH - OH													Offset Site Error:	0.00 usft					
Survey Program: 120-A027Ua_INC-ONLY							Offset			Semi Major Axis			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)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning						
14,200.00	6,879.01	3,555.00	3,554.70	185.88	69.25	-6.73	45.65	-4,003.36	5,032.87	4,936.24	96.63	52.085							
14,300.00	6,878.78	3,555.00	3,554.70	188.30	69.25	-6.73	45.65	-4,003.36	5,108.38	5,011.16	97.23	52.541							
14,400.00	6,878.55	3,555.00	3,554.70	190.72	69.25	-6.73	45.65	-4,003.36	5,184.72	5,086.93	97.80	53.016							
14,500.00	6,878.32	3,555.00	3,554.70	193.14	69.25	-6.73	45.65	-4,003.36	5,261.86	5,163.52	98.34	53.508							
14,600.00	6,878.09	3,555.00	3,554.70	195.56	69.25	-6.73	45.65	-4,003.36	5,339.75	5,240.90	98.86	54.016							
14,700.00	6,877.86	3,555.00	3,554.70	197.99	69.25	-6.73	45.65	-4,003.36	5,418.37	5,319.03	99.35	54.539							
14,800.00	6,877.63	3,555.00	3,554.70	200.41	69.25	-6.73	45.65	-4,003.36	5,497.69	5,397.87	99.82	55.076							
14,900.00	6,877.40	3,555.00	3,554.70	202.83	69.25	-6.73	45.65	-4,003.36	5,577.67	5,477.40	100.27	55.627							
15,000.00	6,877.17	3,555.00	3,554.70	205.25	69.25	-6.73	45.65	-4,003.36	5,658.29	5,557.59	100.70	56.190							
15,100.00	6,876.94	3,555.00	3,554.70	207.68	69.25	-6.73	45.65	-4,003.36	5,739.51	5,638.40	101.11	56.766							
15,200.00	6,876.71	3,555.00	3,554.70	210.10	69.25	-6.73	45.65	-4,003.36	5,821.32	5,719.82	101.50	57.352							
15,300.00	6,876.48	3,555.00	3,554.70	212.53	69.25	-6.73	45.65	-4,003.36	5,903.70	5,801.82	101.88	57.949							
15,400.00	6,876.25	3,555.00	3,554.70	214.95	69.25	-6.73	45.65	-4,003.36	5,986.60	5,884.37	102.24	58.557							
15,500.00	6,876.01	3,555.00	3,554.70	217.38	69.25	-6.73	45.65	-4,003.36	6,070.03	5,967.45	102.58	59.173							
15,600.00	6,875.78	3,555.00	3,554.70	219.80	69.25	-6.73	45.65	-4,003.36	6,153.94	6,051.03	102.91	59.799							
15,700.00	6,875.55	3,555.00	3,554.70	222.23	69.25	-6.73	45.65	-4,003.36	6,238.34	6,135.11	103.23	60.433							
15,800.00	6,875.32	3,555.00	3,554.70	224.66	69.25	-6.73	45.65	-4,003.36	6,323.18	6,219.65	103.53	61.075							
15,900.00	6,875.09	3,555.00	3,554.70	227.08	69.25	-6.73	45.65	-4,003.36	6,408.47	6,304.64	103.82	61.725							
16,000.00	6,874.86	3,555.00	3,554.70	229.51	69.25	-6.73	45.65	-4,003.36	6,494.17	6,390.07	104.10	62.381							
16,100.00	6,874.63	3,555.00	3,554.70	231.94	69.25	-6.73	45.65	-4,003.36	6,580.28	6,475.90	104.37	63.045							
16,200.00	6,874.40	3,555.00	3,554.70	234.37	69.25	-6.73	45.65	-4,003.36	6,666.77	6,562.14	104.63	63.715							
16,300.00	6,874.17	3,555.00	3,554.70	236.79	69.25	-6.73	45.65	-4,003.36	6,753.64	6,648.76	104.89	64.391							
16,400.00	6,873.94	3,555.00	3,554.70	239.22	69.25	-6.73	45.65	-4,003.36	6,840.87	6,735.74	105.13	65.073							
16,500.00	6,873.71	3,555.00	3,554.70	241.65	69.25	-6.73	45.65	-4,003.36	6,928.44	6,823.08	105.36	65.760							
16,600.00	6,873.48	3,555.00	3,554.70	244.08	69.25	-6.73	45.65	-4,003.36	7,016.34	6,910.76	105.58	66.452							
16,700.00	6,873.25	3,555.00	3,554.70	246.51	69.25	-6.73	45.65	-4,003.36	7,104.57	6,998.77	105.80	67.149							
16,800.00	6,873.02	3,555.00	3,554.70	248.94	69.25	-6.73	45.65	-4,003.36	7,193.10	7,087.09	106.01	67.851							
16,900.00	6,872.78	3,555.00	3,554.70	251.37	69.25	-6.73	45.65	-4,003.36	7,281.93	7,175.71	106.22	68.557							
17,000.00	6,872.55	3,555.00	3,554.70	253.80	69.25	-6.73	45.65	-4,003.36	7,371.05	7,264.63	106.41	69.268							
17,070.79	6,872.39	3,555.00	3,554.70	255.52	69.25	-6.73	45.65	-4,003.36	7,434.30	7,327.75	106.55	69.773							
17,100.00	6,872.32	3,555.00	3,554.70	256.23	69.25	-6.73	45.65	-4,003.36	7,460.44	7,353.83	106.61	69.982							
17,200.00	6,872.09	3,555.00	3,554.70	258.66	69.25	-6.73	45.65	-4,003.36	7,550.09	7,443.30	106.79	70.700							
17,237.94	6,872.00	3,555.00	3,554.70	259.58	69.25	-6.73	45.65	-4,003.36	7,584.18	7,477.32	106.86	70.973							

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 170 - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 241-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference													
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)			
0.00	0.00	54.00	54.00	0.00	1.00	-94.96	-793.37	-9,142.28	9,176.64				
100.00	100.00	154.00	154.00	0.25	2.85	-94.96	-793.37	-9,142.28	9,176.64	9,173.55	3.10	2,962.354	
200.00	200.00	254.00	254.00	0.61	4.71	-94.96	-793.37	-9,142.28	9,176.64	9,171.32	5.32	1,725.196	
300.00	300.00	354.00	354.00	0.97	6.67	-94.96	-793.37	-9,142.28	9,176.64	9,169.01	7.64	1,201.567	
322.71	322.71	376.19	376.19	1.05	7.10	-94.96	-793.12	-9,142.28	9,176.62	9,168.47	8.15	1,125.490	
400.00	400.00	451.26	451.26	1.33	8.58	-94.96	-793.27	-9,142.28	9,176.64	9,166.73	9.90	926.781	
500.00	500.00	554.02	554.00	1.68	10.65	-94.96	-793.37	-9,142.28	9,176.64	9,164.31	12.33	744.155	
583.51	583.51	637.53	637.50	1.98	12.35	-94.96	-792.66	-9,142.28	9,176.58	9,162.25	14.33	640.407	
600.00	600.00	653.34	653.31	2.04	12.67	-94.96	-792.67	-9,142.28	9,176.58	9,161.87	14.71	623.832	
700.00	700.00	749.24	749.20	2.40	14.62	-94.96	-793.00	-9,142.28	9,176.61	9,159.59	17.02	539.204	
800.00	800.00	854.06	854.00	2.76	16.64	-94.96	-793.37	-9,142.28	9,176.64	9,157.24	19.40	472.984	
900.00	900.00	954.06	954.00	3.12	18.48	-94.96	-793.37	-9,142.28	9,176.64	9,155.05	21.60	424.873	
1,000.00	1,000.00	1,054.06	1,054.00	3.48	20.32	-94.96	-793.37	-9,142.28	9,176.64	9,152.85	23.80	385.647	
1,100.00	1,099.98	1,152.29	1,152.22	3.83	22.12	-58.24	-792.60	-9,142.28	9,175.66	9,149.70	25.96	353.484	
1,200.08	1,199.92	1,250.28	1,250.20	4.19	23.93	-58.32	-792.94	-9,142.28	9,172.93	9,144.82	28.11	326.267	
1,300.00	1,299.59	1,353.68	1,353.59	4.55	25.83	-58.36	-793.37	-9,142.28	9,169.30	9,138.93	30.37	301.887	
1,400.00	1,399.35	1,453.43	1,453.35	4.91	27.67	-58.40	-793.37	-9,142.28	9,165.64	9,133.07	32.57	281.411	
1,500.00	1,499.11	1,553.19	1,553.11	5.27	29.51	-58.43	-793.37	-9,142.28	9,161.97	9,127.21	34.77	263.514	
1,600.00	1,598.86	1,652.38	1,652.30	5.63	31.34	-58.47	-793.12	-9,142.28	9,158.29	9,121.34	36.96	247.807	
1,700.00	1,698.62	1,751.41	1,751.33	6.00	33.16	-58.51	-793.23	-9,142.28	9,154.65	9,115.51	39.14	233.871	
1,800.00	1,798.37	1,852.48	1,852.37	6.36	35.06	-58.54	-793.37	-9,142.28	9,151.01	9,109.61	41.41	221.009	
1,900.00	1,898.13	1,952.24	1,952.13	6.72	37.02	-58.58	-793.37	-9,142.28	9,147.37	9,103.64	43.73	209.192	
2,000.00	1,997.89	2,051.99	2,051.89	7.09	38.98	-58.62	-793.37	-9,142.28	9,143.72	9,097.67	46.05	198.565	
2,100.00	2,097.64	2,150.37	2,150.26	7.45	40.91	-58.65	-792.56	-9,142.28	9,140.01	9,091.67	48.34	189.061	
2,200.00	2,197.40	2,248.04	2,247.93	7.82	42.83	-58.69	-792.84	-9,142.28	9,136.40	9,085.78	50.63	180.468	
2,300.00	2,297.16	2,351.31	2,351.16	8.19	44.86	-58.73	-793.37	-9,142.28	9,132.82	9,079.80	53.02	172.265	
2,400.00	2,396.91	2,451.06	2,450.91	8.55	46.76	-58.77	-793.37	-9,142.28	9,129.19	9,073.91	55.28	165.146	
2,500.00	2,496.67	2,550.82	2,550.67	8.92	48.66	-58.80	-793.37	-9,142.28	9,125.57	9,068.03	57.54	158.587	
2,600.00	2,596.42	2,649.43	2,649.28	9.29	50.54	-58.84	-792.58	-9,142.28	9,121.87	9,062.09	59.79	152.578	
2,700.00	2,696.18	2,746.95	2,746.79	9.66	52.39	-58.88	-792.83	-9,142.28	9,118.28	9,056.28	62.01	147.054	
2,800.00	2,795.94	2,844.44	2,844.28	10.02	54.25	-58.91	-793.32	-9,142.28	9,114.72	9,050.49	64.23	141.913	
2,900.00	2,895.69	2,949.87	2,949.69	10.39	56.20	-58.95	-793.37	-9,142.28	9,111.12	9,044.58	66.54	136.927	
3,000.00	2,995.45	3,049.63	3,049.45	10.76	58.04	-58.99	-793.37	-9,142.28	9,107.51	9,038.77	68.74	132.485	
3,100.00	3,095.21	3,148.58	3,148.39	11.13	59.86	-59.03	-792.85	-9,142.28	9,103.86	9,032.93	70.93	128.344	
3,200.00	3,194.96	3,246.75	3,246.56	11.49	61.67	-59.06	-793.02	-9,142.28	9,100.28	9,027.18	73.11	124.477	
3,300.00	3,294.72	3,348.92	3,348.72	11.86	63.55	-59.11	-793.37	-9,142.28	9,096.73	9,021.37	75.36	120.715	
3,400.00	3,394.47	3,448.67	3,448.47	12.23	65.39	-59.14	-793.37	-9,142.28	9,093.14	9,015.58	77.56	117.235	
3,500.00	3,494.23	3,548.43	3,548.23	12.60	67.23	-59.18	-793.37	-9,142.28	9,089.56	9,009.79	79.77	113.948	
3,600.00	3,593.99	3,648.07	3,647.87	12.97	69.07	-59.21	-792.72	-9,142.28	9,085.91	9,003.94	81.97	110.840	
3,700.00	3,693.74	3,746.45	3,746.25	13.34	70.89	-59.25	-792.81	-9,142.28	9,082.34	8,998.19	84.15	107.925	
3,800.00	3,793.50	3,844.83	3,844.62	13.71	72.70	-59.29	-793.04	-9,142.28	9,078.79	8,992.46	86.33	105.158	
3,900.00	3,893.26	3,947.48	3,947.26	14.07	74.65	-59.33	-793.37	-9,142.28	9,075.26	8,986.62	88.64	102.379	
4,000.00	3,993.01	4,047.23	4,047.01	14.44	76.85	-59.37	-793.37	-9,142.28	9,071.70	8,980.48	91.22	99.454	
4,100.00	4,092.77	4,146.99	4,146.77	14.81	79.06	-59.41	-793.37	-9,142.28	9,068.14	8,974.35	93.79	96.689	
4,200.00	4,192.52	4,245.60	4,245.37	15.18	81.24	-59.44	-792.87	-9,142.28	9,064.53	8,968.19	96.33	94.095	
4,300.00	4,292.28	4,343.65	4,343.42	15.55	83.41	-59.48	-793.07	-9,142.28	9,061.00	8,962.13	98.87	91.648	
4,400.00	4,392.04	4,446.39	4,446.04	15.92	85.82	-59.52	-793.37	-9,142.28	9,057.48	8,955.83	101.65	89.106	
4,500.00	4,491.79	4,546.14	4,545.79	16.29	88.66	-59.56	-793.37	-9,142.28	9,053.94	8,949.08	104.86	86.344	
4,600.00	4,591.55	4,634.26	4,633.88	16.66	91.18	-59.59	-792.77	-9,142.28	9,050.34	8,942.60	107.74	84.003	
4,700.00	4,691.31	4,737.82	4,737.23	17.03	94.17	-59.63	-792.87	-9,142.28	9,046.81	8,935.71	111.09	81.434	
4,800.00	4,791.06	4,845.71	4,845.06	17.40	97.11	-59.67	-793.37	-9,142.28	9,043.33	8,928.93	114.40	79.051	
4,900.00	4,890.82	4,939.05	4,938.37	17.76	99.58	-59.70	-792.43	-9,142.28	9,039.70	8,922.46	117.24	77.106	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 170 - OH - OH												Offset Site Error:	0.00 usft		
Survey Program:		241-A027Ua_INC-ONLY				Semi Major Axis		Offset Wellbore Centre		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)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
5,000.00	4,990.57	5,045.36	5,044.57	18.13	102.38	-59.75	-793.37	-9,142.28	9,036.28	8,915.87	120.41	75.048			
5,100.00	5,090.33	5,145.11	5,144.33	18.50	104.98	-59.79	-793.37	-9,142.28	9,032.76	8,909.38	123.37	73.216			
5,200.00	5,190.09	5,244.87	5,244.09	18.87	107.58	-59.83	-793.37	-9,142.28	9,029.24	8,902.90	126.34	71.469			
5,300.00	5,289.84	5,340.19	5,339.37	19.24	110.06	-59.85	-791.61	-9,142.28	9,025.53	8,896.34	129.19	69.863			
5,400.00	5,389.60	5,434.08	5,433.24	19.61	112.51	-59.89	-792.28	-9,142.28	9,022.10	8,890.10	132.00	68.349			
5,500.00	5,489.35	5,544.37	5,543.35	19.98	115.41	-59.94	-793.37	-9,142.28	9,018.72	8,883.45	135.27	66.673			
5,600.00	5,589.11	5,644.13	5,643.11	20.35	118.12	-59.98	-793.37	-9,142.28	9,015.22	8,876.87	138.35	65.164			
5,700.00	5,688.87	5,738.67	5,737.63	20.72	120.69	-60.01	-792.24	-9,142.28	9,011.59	8,870.31	141.28	63.784			
5,800.00	5,788.62	5,829.57	5,828.51	21.09	123.16	-60.05	-793.08	-9,142.28	9,008.21	8,864.08	144.12	62.504			
5,900.00	5,888.38	5,943.57	5,942.38	21.46	126.36	-60.09	-793.37	-9,142.28	9,004.74	8,857.05	147.69	60.971			
6,000.00	5,988.14	6,039.22	6,038.00	21.83	129.07	-60.12	-792.08	-9,142.28	9,001.11	8,850.35	150.76	59.704			
6,100.00	6,087.89	6,128.26	6,127.01	22.20	131.59	-60.16	-792.87	-9,142.28	8,997.73	8,844.09	153.65	58.561			
6,200.00	6,187.65	6,175.00	6,173.61	22.57	132.91	-60.18	-793.37	-9,142.28	8,994.56	8,839.22	155.34	57.904			
6,299.50	6,286.91	6,175.00	6,173.61	22.93	132.91	-60.18	-793.37	-9,142.28	8,992.40	8,836.72	155.68	57.760			
6,350.00	6,337.14	6,175.00	6,173.61	23.12	132.91	-32.70	-793.37	-9,142.28	8,989.75	8,833.90	155.86	57.680			
6,400.00	6,386.40	6,175.00	6,173.61	23.32	132.91	-24.00	-793.37	-9,142.28	8,983.52	8,827.50	156.02	57.578			
6,450.00	6,434.88	6,175.00	6,173.61	23.52	132.91	-20.03	-793.37	-9,142.28	8,973.73	8,817.54	156.18	57.456			
6,500.00	6,482.27	6,175.00	6,173.61	23.73	132.91	-17.87	-793.37	-9,142.28	8,960.42	8,804.08	156.34	57.314			
6,550.00	6,528.29	6,175.00	6,173.61	23.94	132.91	-16.63	-793.37	-9,142.28	8,943.68	8,787.19	156.49	57.152			
6,600.00	6,572.65	6,175.00	6,173.61	24.16	132.91	-15.91	-793.37	-9,142.28	8,923.57	8,766.94	156.63	56.972			
6,650.00	6,615.08	6,175.00	6,173.61	24.39	132.91	-15.57	-793.37	-9,142.28	8,900.20	8,743.44	156.76	56.774			
6,700.00	6,655.31	6,175.00	6,173.61	24.64	132.91	-15.50	-793.37	-9,142.28	8,873.70	8,716.81	156.89	56.560			
6,750.00	6,693.11	6,175.00	6,173.61	24.90	132.91	-15.68	-793.37	-9,142.28	8,844.19	8,687.19	157.01	56.330			
6,800.00	6,728.23	6,175.00	6,173.61	25.18	132.91	-16.10	-793.37	-9,142.28	8,811.83	8,654.72	157.11	56.086			
6,850.00	6,760.46	6,175.00	6,173.61	25.50	132.91	-16.77	-793.37	-9,142.28	8,776.79	8,619.58	157.21	55.828			
6,900.00	6,789.60	6,175.00	6,173.61	25.84	132.91	-17.74	-793.37	-9,142.28	8,739.26	8,581.96	157.30	55.557			
6,950.00	6,815.47	6,175.00	6,173.61	26.21	132.91	-19.07	-793.37	-9,142.28	8,699.43	8,542.04	157.38	55.275			
7,000.00	6,837.91	6,175.00	6,173.61	26.63	132.91	-20.90	-793.37	-9,142.28	8,657.52	8,500.06	157.46	54.983			
7,050.00	6,856.78	6,175.00	6,173.61	27.08	132.91	-23.41	-793.37	-9,142.28	8,613.76	8,456.23	157.52	54.682			
7,100.00	6,871.97	6,175.00	6,173.61	27.57	132.91	-26.95	-793.37	-9,142.28	8,568.39	8,410.81	157.59	54.373			
7,150.00	6,883.39	6,175.00	6,173.61	28.10	132.91	-32.13	-793.37	-9,142.28	8,521.67	8,364.03	157.64	54.058			
7,200.00	6,890.95	6,175.00	6,173.61	28.66	132.91	-40.07	-793.37	-9,142.28	8,473.88	8,316.19	157.69	53.737			
7,250.00	6,894.63	6,175.00	6,173.61	29.25	132.91	-52.83	-793.37	-9,142.28	8,425.28	8,267.54	157.74	53.413			
7,273.35	6,895.00	6,175.00	6,173.61	29.54	132.91	-61.26	-793.37	-9,142.28	8,402.38	8,244.62	157.76	53.260			
7,300.00	6,894.94	6,175.00	6,173.61	29.87	132.91	-61.26	-793.37	-9,142.28	8,376.21	8,218.42	157.78	53.086			
7,400.00	6,894.71	6,175.00	6,173.61	31.22	132.91	-61.26	-793.37	-9,142.28	8,278.01	8,120.13	157.88	52.433			
7,500.00	6,894.48	6,175.00	6,173.61	32.69	132.91	-61.26	-793.37	-9,142.28	8,179.85	8,021.87	157.98	51.776			
7,600.00	6,894.25	6,175.00	6,173.61	34.27	132.91	-61.26	-793.37	-9,142.28	8,081.74	7,923.64	158.10	51.118			
7,700.00	6,894.01	6,175.00	6,173.61	35.95	132.91	-61.26	-793.37	-9,142.28	7,983.68	7,825.45	158.23	50.457			
7,800.00	6,893.78	6,175.00	6,173.61	37.71	132.91	-61.26	-793.37	-9,142.28	7,885.66	7,727.30	158.36	49.794			
7,900.00	6,893.55	6,175.00	6,173.61	39.54	132.91	-61.26	-793.37	-9,142.28	7,787.70	7,629.18	158.51	49.129			
8,000.00	6,893.32	6,175.00	6,173.61	41.44	132.91	-61.26	-793.37	-9,142.28	7,689.79	7,531.11	158.68	48.462			
8,100.00	6,893.09	6,175.00	6,173.61	43.39	132.91	-61.26	-793.37	-9,142.28	7,591.93	7,433.07	158.85	47.792			
8,200.00	6,892.86	6,175.00	6,173.61	45.39	132.91	-61.26	-793.37	-9,142.28	7,494.13	7,335.08	159.04	47.120			
8,300.00	6,892.63	6,175.00	6,173.61	47.44	132.91	-61.26	-793.37	-9,142.28	7,396.38	7,237.13	159.25	46.445			
8,400.00	6,892.40	6,175.00	6,173.61	49.51	132.91	-61.26	-793.37	-9,142.28	7,298.70	7,139.23	159.47	45.769			
8,500.00	6,892.17	6,175.00	6,173.61	51.62	132.91	-61.26	-793.37	-9,142.28	7,201.09	7,041.38	159.71	45.090			
8,600.00	6,891.94	6,175.00	6,173.61	53.76	132.91	-61.26	-793.37	-9,142.28	7,103.53	6,943.57	159.96	44.408			
8,700.00	6,891.71	6,175.00	6,173.61	55.92	132.91	-61.26	-793.37	-9,142.28	7,006.05	6,845.82	160.23	43.725			
8,800.00	6,891.48	6,175.00	6,173.61	58.11	132.91	-61.26	-793.37	-9,142.28	6,908.64	6,748.12	160.52	43.040			
8,900.00	6,891.25	6,175.00	6,173.61	60.31	132.91	-61.26	-793.37	-9,142.28	6,811.31	6,650.48	160.82	42.352			
9,000.00	6,891.01	6,175.00	6,173.61	62.54	132.91	-61.26	-793.37	-9,142.28	6,714.05	6,552.90	161.15	41.663			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 170 - OH - OH												Offset Site Error:	0.00 usft
Survey Program:		241-A027Ua_INC-ONLY						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)
9,100.00	6,890.78	6,175.00	6,173.61	64.78	132.91	-61.26	-793.37	-9,142.28	6,616.87	6,455.37	161.50	40.972	
9,200.00	6,890.55	6,175.00	6,173.61	67.03	132.91	-61.26	-793.37	-9,142.28	6,519.78	6,357.92	161.87	40.278	
9,300.00	6,890.32	6,175.00	6,173.61	69.29	132.91	-61.26	-793.37	-9,142.28	6,422.78	6,260.52	162.26	39.583	
9,400.00	6,890.09	6,175.00	6,173.61	71.57	132.91	-61.26	-793.37	-9,142.28	6,325.88	6,163.20	162.68	38.886	
9,500.00	6,889.86	6,175.00	6,173.61	73.86	132.91	-61.26	-793.37	-9,142.28	6,229.07	6,065.95	163.12	38.188	
9,600.00	6,889.63	6,175.00	6,173.61	76.16	132.91	-61.26	-793.37	-9,142.28	6,132.36	5,968.78	163.58	37.488	
9,700.00	6,889.40	6,175.00	6,173.61	78.46	132.91	-61.26	-793.37	-9,142.28	6,035.76	5,871.69	164.07	36.787	
9,800.00	6,889.17	6,175.00	6,173.61	80.78	132.91	-61.26	-793.37	-9,142.28	5,939.27	5,774.68	164.59	36.085	
9,900.00	6,888.94	6,175.00	6,173.61	83.10	132.91	-61.26	-793.37	-9,142.28	5,842.90	5,677.76	165.14	35.381	
10,000.00	6,888.71	6,175.00	6,173.61	85.43	132.91	-61.26	-793.37	-9,142.28	5,746.66	5,580.94	165.72	34.677	
10,100.00	6,888.48	6,175.00	6,173.61	87.76	132.91	-61.26	-793.37	-9,142.28	5,650.55	5,484.21	166.33	33.971	
10,200.00	6,888.25	6,175.00	6,173.61	90.10	132.91	-61.26	-793.37	-9,142.28	5,554.57	5,387.59	166.98	33.266	
10,300.00	6,888.01	6,175.00	6,173.61	92.45	132.91	-61.26	-793.37	-9,142.28	5,458.74	5,291.08	167.66	32.559	
10,400.00	6,887.78	6,175.00	6,173.61	94.80	132.91	-61.26	-793.37	-9,142.28	5,363.06	5,194.68	168.37	31.853	
10,500.00	6,887.55	6,175.00	6,173.61	97.15	132.91	-61.26	-793.37	-9,142.28	5,267.53	5,098.41	169.12	31.146	
10,600.00	6,887.32	6,175.00	6,173.61	99.51	132.91	-61.26	-793.37	-9,142.28	5,172.18	5,002.27	169.92	30.440	
10,700.00	6,887.09	6,175.00	6,173.61	101.87	132.91	-61.26	-793.37	-9,142.28	5,077.01	4,906.26	170.75	29.733	
10,800.00	6,886.86	6,175.00	6,173.61	104.24	132.91	-61.26	-793.37	-9,142.28	4,982.03	4,810.40	171.63	29.028	
10,900.00	6,886.63	6,175.00	6,173.61	106.61	132.91	-61.26	-793.37	-9,142.28	4,887.25	4,714.69	172.55	28.323	
11,000.00	6,886.40	6,175.00	6,173.61	108.98	132.91	-61.26	-793.37	-9,142.28	4,792.68	4,619.15	173.52	27.620	
11,100.00	6,886.17	6,175.00	6,173.61	111.36	132.91	-61.26	-793.37	-9,142.28	4,698.33	4,523.79	174.55	26.918	
11,200.00	6,885.94	6,175.00	6,173.61	113.74	132.91	-61.26	-793.37	-9,142.28	4,604.22	4,428.60	175.62	26.217	
11,300.00	6,885.71	6,175.00	6,173.61	116.12	132.91	-61.26	-793.37	-9,142.28	4,510.37	4,333.62	176.75	25.518	
11,400.00	6,885.48	6,175.00	6,173.61	118.51	132.91	-61.26	-793.37	-9,142.28	4,416.79	4,238.85	177.94	24.822	
11,500.00	6,885.25	6,175.00	6,173.61	120.89	132.91	-61.26	-793.37	-9,142.28	4,323.49	4,144.31	179.19	24.129	
11,600.00	6,885.01	6,175.00	6,173.61	123.28	132.91	-61.26	-793.37	-9,142.28	4,230.50	4,050.00	180.50	23.438	
11,700.00	6,884.78	6,175.00	6,173.61	125.67	132.91	-61.26	-793.37	-9,142.28	4,137.84	3,955.96	181.88	22.750	
11,800.00	6,884.55	6,175.00	6,173.61	128.07	132.91	-61.26	-793.37	-9,142.28	4,045.52	3,862.19	183.33	22.067	
11,900.00	6,884.32	6,175.00	6,173.61	130.46	132.91	-61.26	-793.37	-9,142.28	3,953.58	3,768.72	184.86	21.387	
12,000.00	6,884.09	6,175.00	6,173.61	132.86	132.91	-61.26	-793.37	-9,142.28	3,862.05	3,675.58	186.47	20.712	
12,100.00	6,883.86	6,175.00	6,173.61	135.25	132.91	-61.26	-793.37	-9,142.28	3,770.94	3,582.78	188.16	20.041	
12,200.00	6,883.63	6,175.00	6,173.61	137.65	132.91	-61.26	-793.37	-9,142.28	3,680.29	3,490.35	189.94	19.376	
12,300.00	6,883.40	6,175.00	6,173.61	140.05	132.91	-61.26	-793.37	-9,142.28	3,590.14	3,398.33	191.81	18.717	
12,400.00	6,883.17	6,175.00	6,173.61	142.46	132.91	-61.26	-793.37	-9,142.28	3,500.52	3,306.74	193.78	18.064	
12,500.00	6,882.94	6,175.00	6,173.61	144.86	132.91	-61.26	-793.37	-9,142.28	3,411.48	3,215.63	195.86	17.418	
12,600.00	6,882.71	6,175.00	6,173.61	147.27	132.91	-61.26	-793.37	-9,142.28	3,323.07	3,125.02	198.04	16.779	
12,700.00	6,882.48	6,175.00	6,173.61	149.67	132.91	-61.26	-793.37	-9,142.28	3,235.33	3,034.98	200.35	16.149	
12,800.00	6,882.25	6,175.00	6,173.61	152.08	132.91	-61.26	-793.37	-9,142.28	3,148.32	2,945.55	202.77	15.527	
12,900.00	6,882.01	6,175.00	6,173.61	154.49	132.91	-61.26	-793.37	-9,142.28	3,062.10	2,856.78	205.32	14.914	
13,000.00	6,881.78	6,175.00	6,173.61	156.90	132.91	-61.26	-793.37	-9,142.28	2,976.75	2,768.74	208.01	14.310	
13,100.00	6,881.55	6,175.00	6,173.61	159.31	132.91	-61.26	-793.37	-9,142.28	2,892.34	2,681.49	210.84	13.718	
13,200.00	6,881.32	6,175.00	6,173.61	161.72	132.91	-61.26	-793.37	-9,142.28	2,808.95	2,595.12	213.82	13.137	
13,300.00	6,881.09	6,175.00	6,173.61	164.13	132.91	-61.26	-793.37	-9,142.28	2,726.67	2,509.71	216.96	12.568	
13,400.00	6,880.86	6,175.00	6,173.61	166.55	132.91	-61.26	-793.37	-9,142.28	2,645.62	2,425.36	220.26	12.011	
13,500.00	6,880.63	6,175.00	6,173.61	168.96	132.91	-61.26	-793.37	-9,142.28	2,565.91	2,342.17	223.73	11.469	
13,600.00	6,880.40	6,175.00	6,173.61	171.38	132.91	-61.26	-793.37	-9,142.28	2,487.66	2,260.28	227.37	10.941	
13,700.00	6,880.17	6,175.00	6,173.61	173.79	132.91	-61.26	-793.37	-9,142.28	2,411.02	2,179.82	231.19	10.429	
13,800.00	6,879.94	6,175.00	6,173.61	176.21	132.91	-61.26	-793.37	-9,142.28	2,336.14	2,100.95	235.19	9.933	
13,900.00	6,879.71	6,175.00	6,173.61	178.63	132.91	-61.26	-793.37	-9,142.28	2,263.21	2,023.84	239.38	9.455	
14,000.00	6,879.48	6,175.00	6,173.61	181.04	132.91	-61.26	-793.37	-9,142.28	2,192.42	1,948.69	243.73	8.995	
14,100.00	6,879.25	6,175.00	6,173.61	183.46	132.91	-61.26	-793.37	-9,142.28	2,123.97	1,875.71	248.26	8.555	
14,200.00	6,879.01	6,175.00	6,173.61	185.88	132.91	-61.26	-793.37	-9,142.28	2,058.11	1,805.17	252.95	8.137	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 170 - OH - OH													Offset Site Error:	0.00 usft	
Survey Program:		241-A027Ua_INC-ONLY					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)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
14,300.00	6,878.78	6,175.00	6,173.61	188.30	132.91	-61.26	-793.37	-9,142.28	1,995.09	1,737.32	257.78	7.740			
14,400.00	6,878.55	6,175.00	6,173.61	190.72	132.91	-61.26	-793.37	-9,142.28	1,935.19	1,672.47	262.72	7.366			
14,500.00	6,878.32	6,175.00	6,173.61	193.14	132.91	-61.26	-793.37	-9,142.28	1,878.70	1,610.95	267.75	7.017			
14,600.00	6,878.09	6,175.00	6,173.61	195.56	132.91	-61.26	-793.37	-9,142.28	1,825.95	1,553.12	272.83	6.693			
14,700.00	6,877.86	6,175.00	6,173.61	197.99	132.91	-61.26	-793.37	-9,142.28	1,777.26	1,499.36	277.90	6.395			
14,800.00	6,877.63	6,175.00	6,173.61	200.41	132.91	-61.26	-793.37	-9,142.28	1,732.98	1,450.08	282.90	6.126			
14,900.00	6,877.40	6,175.00	6,173.61	202.83	132.91	-61.26	-793.37	-9,142.28	1,693.45	1,405.69	287.77	5.885			
15,000.00	6,877.17	6,175.00	6,173.61	205.25	132.91	-61.26	-793.37	-9,142.28	1,659.02	1,366.59	292.43	5.673			
15,100.00	6,876.94	6,175.00	6,173.61	207.68	132.91	-61.26	-793.37	-9,142.28	1,630.00	1,333.21	296.79	5.492			
15,200.00	6,876.71	6,175.00	6,173.61	210.10	132.91	-61.26	-793.37	-9,142.28	1,606.70	1,305.91	300.79	5.342			
15,300.00	6,876.48	6,175.00	6,173.61	212.53	132.91	-61.26	-793.37	-9,142.28	1,589.35	1,285.02	304.33	5.222			
15,400.00	6,876.25	6,175.00	6,173.61	214.95	132.91	-61.26	-793.37	-9,142.28	1,578.17	1,270.81	307.36	5.135			
15,500.00	6,876.01	6,175.00	6,173.61	217.38	132.91	-61.26	-793.37	-9,142.28	1,573.27	1,263.47	309.80	5.078			
15,527.18	6,875.95	6,175.00	6,173.61	218.04	132.91	-61.26	-793.37	-9,142.28	1,573.03	1,262.67	310.36	5.068	CC, ES		
15,600.00	6,875.78	6,175.00	6,173.61	219.80	132.91	-61.26	-793.37	-9,142.28	1,574.72	1,263.09	311.63	5.053	SF		
15,700.00	6,875.55	6,175.00	6,173.61	222.23	132.91	-61.26	-793.37	-9,142.28	1,582.50	1,269.68	312.82	5.059			
15,800.00	6,875.32	6,175.00	6,173.61	224.66	132.91	-61.26	-793.37	-9,142.28	1,596.52	1,283.14	313.38	5.095			
15,900.00	6,875.09	6,175.00	6,173.61	227.08	132.91	-61.26	-793.37	-9,142.28	1,616.61	1,303.29	313.32	5.160			
16,000.00	6,874.86	6,175.00	6,173.61	229.51	132.91	-61.26	-793.37	-9,142.28	1,642.56	1,329.87	312.69	5.253			
16,100.00	6,874.63	6,175.00	6,173.61	231.94	132.91	-61.26	-793.37	-9,142.28	1,674.09	1,362.54	311.54	5.374			
16,200.00	6,874.40	6,175.00	6,173.61	234.37	132.91	-61.26	-793.37	-9,142.28	1,710.88	1,400.95	309.93	5.520			
16,300.00	6,874.17	6,175.00	6,173.61	236.79	132.91	-61.26	-793.37	-9,142.28	1,752.62	1,444.69	307.94	5.691			
16,400.00	6,873.94	6,175.00	6,173.61	239.22	132.91	-61.26	-793.37	-9,142.28	1,798.96	1,493.34	305.62	5.886			
16,500.00	6,873.71	6,175.00	6,173.61	241.65	132.91	-61.26	-793.37	-9,142.28	1,849.55	1,546.50	303.05	6.103			
16,600.00	6,873.48	6,175.00	6,173.61	244.08	132.91	-61.26	-793.37	-9,142.28	1,904.04	1,603.76	300.29	6.341			
16,700.00	6,873.25	6,175.00	6,173.61	246.51	132.91	-61.26	-793.37	-9,142.28	1,962.13	1,664.74	297.39	6.598			
16,800.00	6,873.02	6,175.00	6,173.61	248.94	132.91	-61.26	-793.37	-9,142.28	2,023.49	1,729.09	294.40	6.873			
16,900.00	6,872.78	6,175.00	6,173.61	251.37	132.91	-61.26	-793.37	-9,142.28	2,087.84	1,796.48	291.36	7.166			
17,000.00	6,872.55	6,175.00	6,173.61	253.80	132.91	-61.26	-793.37	-9,142.28	2,154.91	1,866.60	288.32	7.474			
17,070.79	6,872.39	6,175.00	6,173.61	255.52	132.91	-61.26	-793.37	-9,142.28	2,203.90	1,917.74	286.17	7.701			
17,100.00	6,872.32	6,175.00	6,173.61	256.23	132.91	-61.26	-793.37	-9,142.28	2,224.46	1,939.17	285.28	7.797			
17,200.00	6,872.09	6,175.00	6,173.61	258.66	132.91	-61.26	-793.37	-9,142.28	2,296.25	2,013.96	282.29	8.134			
17,237.94	6,872.00	6,175.00	6,173.61	259.58	132.91	-61.26	-793.37	-9,142.28	2,324.04	2,042.87	281.17	8.266			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18A - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 152-A027Ua_INC-ONLY													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	-119.34	-698.98	-1,243.31	1,426.39				
100.00	100.00	86.00	86.00	0.25	1.69	-119.34	-698.98	-1,243.31	1,426.32	1,424.37	1.95	733.258	
200.00	200.00	186.00	186.00	0.61	3.74	-119.34	-698.98	-1,243.31	1,426.32	1,421.97	4.35	327.723	
240.09	240.09	226.09	226.09	0.75	4.63	-119.34	-698.74	-1,243.31	1,426.20	1,420.82	5.38	265.177	
300.00	300.00	282.52	282.51	0.97	5.87	-119.34	-698.88	-1,243.31	1,426.27	1,419.44	6.84	208.671	
400.00	400.00	386.03	386.00	1.33	8.56	-119.34	-698.98	-1,243.31	1,426.32	1,416.43	9.89	144.274	
500.00	500.00	486.12	486.00	1.68	11.25	-119.34	-698.98	-1,243.31	1,426.32	1,413.38	12.94	110.228	
556.85	556.85	542.97	542.84	1.89	12.86	-119.32	-698.42	-1,243.31	1,426.05	1,411.29	14.75	96.669	
600.00	600.00	579.24	579.10	2.04	13.89	-119.33	-698.60	-1,243.31	1,426.15	1,410.22	15.93	89.514	
700.00	700.00	686.19	686.00	2.40	16.76	-119.34	-698.98	-1,243.31	1,426.32	1,407.16	19.16	74.440	
743.88	743.88	729.90	729.70	2.56	17.91	-119.31	-698.06	-1,243.31	1,425.87	1,405.40	20.47	69.661	
800.00	800.00	781.50	781.29	2.76	19.27	-119.32	-698.24	-1,243.31	1,425.96	1,403.94	22.03	64.735	
900.00	900.00	886.28	886.00	3.12	21.99	-119.34	-698.98	-1,243.31	1,426.32	1,401.21	25.11	56.814	
1,000.00	1,000.00	986.28	986.00	3.48	24.51	-119.34	-698.98	-1,243.31	1,426.32	1,398.33	27.99	50.958	
1,100.00	1,099.98	1,080.28	1,079.97	3.83	26.89	-82.65	-698.46	-1,243.31	1,425.85	1,395.13	30.72	46.413	
1,200.08	1,199.92	1,186.30	1,185.92	4.19	29.44	-82.90	-698.98	-1,243.31	1,425.44	1,391.81	33.63	42.386	
1,300.00	1,299.59	1,285.97	1,285.59	4.55	31.74	-83.18	-698.98	-1,243.31	1,424.59	1,388.30	36.29	39.255	
1,400.00	1,399.35	1,385.73	1,385.35	4.91	34.05	-83.46	-698.98	-1,243.31	1,423.78	1,384.82	38.96	36.549	
1,500.00	1,499.11	1,482.43	1,482.02	5.27	36.28	-83.67	-697.42	-1,243.31	1,422.21	1,380.66	41.55	34.228	
1,600.00	1,598.86	1,578.78	1,578.36	5.63	38.51	-83.96	-698.06	-1,243.31	1,421.80	1,377.66	44.14	32.211	
1,700.00	1,698.62	1,685.13	1,684.62	6.00	40.90	-84.29	-698.98	-1,243.31	1,421.54	1,374.65	46.89	30.316	
1,800.00	1,798.37	1,784.88	1,784.37	6.36	42.90	-84.57	-698.98	-1,243.31	1,420.86	1,371.61	49.25	28.848	
1,900.00	1,898.13	1,884.64	1,884.13	6.72	44.90	-84.85	-698.98	-1,243.31	1,420.21	1,368.60	51.62	27.514	
2,000.00	1,997.89	1,982.58	1,982.06	7.09	46.86	-85.09	-697.97	-1,243.31	1,419.07	1,365.13	53.95	26.306	
2,100.00	2,097.64	2,079.79	2,079.26	7.45	48.81	-85.38	-698.38	-1,243.31	1,418.71	1,362.45	56.26	25.217	
2,200.00	2,197.40	2,183.97	2,183.40	7.82	50.88	-85.69	-698.98	-1,243.31	1,418.49	1,359.79	58.70	24.166	
2,300.00	2,297.16	2,283.72	2,283.16	8.19	52.80	-85.97	-698.98	-1,243.31	1,417.98	1,357.00	60.98	23.253	
2,400.00	2,296.91	2,283.48	2,282.91	8.55	54.71	-86.25	-698.98	-1,243.31	1,417.50	1,354.24	63.26	22.407	
2,500.00	2,496.67	2,481.87	2,481.29	8.92	56.60	-86.51	-698.22	-1,243.31	1,416.65	1,351.13	65.52	21.622	
2,600.00	2,596.42	2,579.63	2,579.05	9.29	58.48	-86.79	-698.52	-1,243.31	1,416.41	1,348.64	67.76	20.902	
2,700.00	2,696.18	2,682.79	2,682.18	9.66	60.45	-87.10	-698.98	-1,243.31	1,416.29	1,346.19	70.10	20.204	
2,800.00	2,795.94	2,782.55	2,781.94	10.02	62.29	-87.38	-698.98	-1,243.31	1,415.95	1,343.64	72.30	19.583	
2,900.00	2,895.69	2,882.30	2,881.69	10.39	64.12	-87.66	-698.98	-1,243.31	1,415.65	1,341.14	74.51	19.000	
3,000.00	2,995.45	2,980.12	2,979.50	10.76	65.93	-87.91	-698.33	-1,243.31	1,415.01	1,338.33	76.68	18.454	
3,059.81	3,055.11	3,038.44	3,037.82	10.98	67.00	-88.09	-698.52	-1,243.31	1,414.97	1,337.00	77.97	18.147	
3,100.00	3,095.21	3,077.63	3,077.01	11.13	67.72	-88.20	-698.70	-1,243.31	1,414.99	1,336.15	78.84	17.947	
3,200.00	3,194.96	3,181.60	3,180.96	11.49	69.64	-88.51	-698.98	-1,243.31	1,414.94	1,333.81	81.13	17.440	
3,300.00	3,294.72	3,281.36	3,280.72	11.86	71.49	-88.79	-698.98	-1,243.31	1,414.78	1,331.43	83.35	16.974	
3,400.00	3,394.47	3,380.22	3,379.58	12.23	73.33	-89.05	-698.56	-1,243.31	1,414.40	1,328.85	85.55	16.532	
3,433.11	3,427.50	3,412.67	3,412.03	12.35	73.93	-89.15	-698.61	-1,243.31	1,414.39	1,328.12	86.28	16.393	
3,500.00	3,494.23	3,478.23	3,477.59	12.60	75.15	-89.34	-698.77	-1,243.31	1,414.43	1,326.69	87.74	16.121	
3,600.00	3,593.99	3,580.65	3,579.99	12.97	77.05	-89.63	-698.98	-1,243.31	1,414.49	1,324.48	90.01	15.714	
3,700.00	3,693.74	3,680.41	3,679.74	13.34	78.91	-89.91	-698.98	-1,243.31	1,414.46	1,322.22	92.24	15.334	
3,736.43	3,730.08	3,716.51	3,715.84	13.47	79.58	-90.00	-698.41	-1,243.31	1,414.12	1,321.07	93.05	15.198	
3,800.00	3,793.50	3,777.98	3,777.31	13.71	80.73	-90.17	-698.50	-1,243.31	1,414.18	1,319.75	94.43	14.976	
3,900.00	3,893.26	3,874.64	3,873.97	14.07	82.53	-90.46	-698.92	-1,243.31	1,414.48	1,317.89	96.60	14.643	
4,000.00	3,993.01	3,979.70	3,979.01	14.44	84.49	-90.76	-698.98	-1,243.31	1,414.58	1,315.66	98.93	14.299	
4,030.38	4,023.32	4,010.00	4,009.31	14.56	85.06	-90.84	-698.71	-1,243.31	1,414.45	1,314.84	99.61	14.200	
4,100.00	4,092.77	4,077.43	4,076.74	14.81	86.32	-91.03	-698.78	-1,243.31	1,414.58	1,313.45	101.13	13.988	
4,200.00	4,192.52	4,179.22	4,178.52	15.18	88.44	-91.32	-698.98	-1,243.31	1,414.84	1,311.22	103.62	13.654	
4,300.00	4,292.28	4,278.98	4,278.28	15.55	90.83	-91.61	-698.98	-1,243.31	1,415.02	1,308.65	106.37	13.302	
4,316.03	4,308.27	4,294.70	4,293.99	15.61	91.20	-91.63	-698.49	-1,243.31	1,414.74	1,307.94	106.81	13.246	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18A - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		152-A027Ua_INC-ONLY					Offset		Semi Major Axis		Rule Assigned:		Offset Well Error:	0.00 usft
Reference	Offset	Reference	Offset	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Distance		Separation	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)	Factor		
4,400.00	4,392.04	4,375.39	4,374.68	15.92	93.13	-91.87	-698.65	-1,243.31	1,415.03	1,305.99	109.04	12.977		
4,500.00	4,491.79	4,478.58	4,477.79	16.29	95.77	-92.17	-698.98	-1,243.31	1,415.48	1,303.42	112.06	12.632		
4,555.28	4,546.94	4,533.69	4,532.88	16.49	97.33	-92.30	-698.16	-1,243.31	1,415.11	1,301.29	113.82	12.433		
4,600.00	4,591.55	4,572.00	4,571.19	16.66	98.42	-92.41	-698.29	-1,243.31	1,415.34	1,300.27	115.07	12.299		
4,700.00	4,691.31	4,678.21	4,677.31	17.03	101.44	-92.73	-698.98	-1,243.31	1,416.08	1,297.61	118.47	11.953		
4,758.37	4,749.53	4,736.44	4,735.52	17.24	103.10	-92.87	-698.03	-1,243.31	1,415.67	1,295.33	120.34	11.764		
4,800.00	4,791.06	4,772.71	4,771.78	17.40	104.14	-92.97	-698.14	-1,243.31	1,415.90	1,294.37	121.53	11.650		
4,900.00	4,890.82	4,877.86	4,876.82	17.76	107.21	-93.29	-698.98	-1,243.31	1,416.81	1,291.84	124.98	11.337		
5,000.00	4,990.57	4,977.61	4,976.57	18.13	110.28	-93.58	-698.98	-1,243.31	1,417.23	1,288.82	128.41	11.037		
5,100.00	5,090.33	5,077.37	5,076.33	18.50	113.35	-93.86	-698.98	-1,243.31	1,417.69	1,285.84	131.85	10.752		
5,134.88	5,125.13	5,111.56	5,110.48	18.63	114.40	-93.88	-696.74	-1,243.31	1,416.39	1,283.37	133.03	10.647		
5,200.00	5,190.09	5,172.71	5,171.62	18.87	116.28	-94.06	-696.91	-1,243.31	1,416.83	1,281.68	135.15	10.484		
5,300.00	5,289.84	5,266.58	5,265.46	19.24	119.16	-94.35	-697.66	-1,243.31	1,417.87	1,279.47	138.40	10.245		
5,400.00	5,389.60	5,377.04	5,375.60	19.61	122.62	-94.70	-698.98	-1,243.31	1,419.25	1,277.02	142.23	9.979		
5,500.00	5,489.35	5,476.79	5,475.35	19.98	126.02	-94.98	-698.98	-1,243.31	1,419.84	1,273.85	146.00	9.725		
5,508.01	5,497.34	5,484.14	5,482.68	20.01	126.27	-94.96	-697.66	-1,243.31	1,419.01	1,272.73	146.28	9.701		
5,600.00	5,589.11	5,562.62	5,561.13	20.35	128.94	-95.20	-698.26	-1,243.31	1,420.05	1,270.77	149.28	9.513		
5,700.00	5,688.87	5,676.56	5,674.87	20.72	132.77	-95.54	-698.98	-1,243.31	1,421.12	1,267.63	153.49	9.259		
5,790.39	5,779.04	5,766.73	5,765.04	21.05	135.78	-95.79	-698.98	-1,243.31	1,421.75	1,264.92	156.83	9.065		
5,800.00	5,788.62	5,775.91	5,774.16	21.09	136.08	-95.75	-696.93	-1,243.31	1,420.43	1,263.26	157.17	9.037		
5,900.00	5,888.38	5,863.86	5,862.09	21.46	139.02	-96.02	-697.51	-1,243.31	1,421.60	1,261.13	160.47	8.859		
6,000.00	5,988.14	5,955.00	5,952.97	21.83	142.04	-96.31	-698.98	-1,243.31	1,423.46	1,259.61	163.85	8.688 ES, SF		
6,100.00	6,087.89	5,955.00	5,952.97	22.20	142.04	-96.31	-698.98	-1,243.31	1,429.22	1,265.56	163.66	8.733		
6,200.00	6,187.65	5,955.00	5,952.97	22.57	142.04	-96.31	-698.98	-1,243.31	1,441.91	1,279.19	162.72	8.861		
6,299.50	6,286.91	5,955.00	5,952.97	22.93	142.04	-96.31	-698.98	-1,243.31	1,461.23	1,300.13	161.10	9.070		
6,350.00	6,337.14	5,955.00	5,952.97	23.12	142.04	-68.09	-698.98	-1,243.31	1,472.13	1,312.09	160.03	9.199		
6,400.00	6,386.40	5,955.00	5,952.97	23.32	142.04	-58.69	-698.98	-1,243.31	1,481.77	1,322.94	158.83	9.329		
6,450.00	6,434.88	5,955.00	5,952.97	23.52	142.04	-54.06	-698.98	-1,243.31	1,490.24	1,332.76	157.48	9.463		
6,500.00	6,482.27	5,955.00	5,952.97	23.73	142.04	-51.27	-698.98	-1,243.31	1,497.50	1,341.49	156.01	9.599		
6,550.00	6,528.29	5,955.00	5,952.97	23.94	142.04	-49.40	-698.98	-1,243.31	1,503.52	1,349.10	154.42	9.736		
6,600.00	6,572.65	5,955.00	5,952.97	24.16	142.04	-48.08	-698.98	-1,243.31	1,508.29	1,355.56	152.74	9.875		
6,650.00	6,615.08	5,955.00	5,952.97	24.39	142.04	-47.12	-698.98	-1,243.31	1,511.79	1,360.81	150.98	10.013		
6,700.00	6,655.31	5,955.00	5,952.97	24.64	142.04	-46.42	-698.98	-1,243.31	1,514.00	1,364.84	149.16	10.150		
6,750.00	6,693.11	5,955.00	5,952.97	24.90	142.04	-45.93	-698.98	-1,243.31	1,514.91	1,367.60	147.31	10.284		
6,800.00	6,728.23	5,955.00	5,952.97	25.18	142.04	-45.61	-698.98	-1,243.31	1,514.53	1,369.07	145.45	10.412		
6,850.00	6,760.46	5,955.00	5,952.97	25.50	142.04	-45.44	-698.98	-1,243.31	1,512.85	1,369.23	143.62	10.534		
6,900.00	6,789.60	5,955.00	5,952.97	25.84	142.04	-45.40	-698.98	-1,243.31	1,509.88	1,368.05	141.83	10.646		
6,950.00	6,815.47	5,955.00	5,952.97	26.21	142.04	-45.48	-698.98	-1,243.31	1,505.63	1,365.51	140.12	10.745		
7,000.00	6,837.91	5,955.00	5,952.97	26.63	142.04	-45.67	-698.98	-1,243.31	1,500.11	1,361.59	138.53	10.829		
7,050.00	6,856.78	5,955.00	5,952.97	27.08	142.04	-45.98	-698.98	-1,243.31	1,493.36	1,356.28	137.08	10.894		
7,100.00	6,871.97	5,955.00	5,952.97	27.57	142.04	-46.39	-698.98	-1,243.31	1,485.38	1,349.57	135.80	10.938		
7,150.00	6,883.39	5,955.00	5,952.97	28.10	142.04	-46.91	-698.98	-1,243.31	1,476.21	1,341.47	134.74	10.956		
7,200.00	6,890.95	5,955.00	5,952.97	28.66	142.04	-47.53	-698.98	-1,243.31	1,465.89	1,331.98	133.91	10.947		
7,250.00	6,894.63	5,955.00	5,952.97	29.25	142.04	-48.26	-698.98	-1,243.31	1,454.45	1,321.12	133.34	10.908		
7,273.35	6,895.00	5,955.00	5,952.97	29.54	142.04	-48.63	-698.98	-1,243.31	1,448.74	1,315.58	133.17	10.879		
7,300.00	6,894.94	5,955.00	5,952.97	29.87	142.04	-48.63	-698.98	-1,243.31	1,442.33	1,309.30	133.02	10.843		
7,400.00	6,894.71	5,955.00	5,952.97	31.22	142.04	-48.63	-698.98	-1,243.31	1,422.45	1,289.69	132.76	10.715		
7,500.00	6,894.48	5,955.00	5,952.97	32.69	142.04	-48.63	-698.98	-1,243.31	1,409.40	1,276.45	132.95	10.601		
7,600.00	6,894.25	5,955.00	5,952.97	34.27	142.04	-48.63	-698.98	-1,243.31	1,403.37	1,269.76	133.62	10.503		
7,634.95	6,894.16	5,955.00	5,952.97	34.85	142.04	-48.63	-698.98	-1,243.31	1,402.94	1,268.97	133.97	10.472 CC		
7,700.00	6,894.01	5,955.00	5,952.97	35.95	142.04	-48.63	-698.98	-1,243.31	1,404.46	1,269.71	134.75	10.423		
7,800.00	6,893.78	5,955.00	5,952.97	37.71	142.04	-48.63	-698.98	-1,243.31	1,412.64	1,276.34	136.31	10.364		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18A - OH - OH												Offset Site Error:	0.00 usft		
Survey Program:		152-A027Ua_INC-ONLY				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)				
7,900.00	6,893.55	5,955.00	5,952.97	39.54	142.04	-48.63	-698.98	-1,243.31	1,427.80	1,289.58	138.22	10.330			
8,000.00	6,893.32	5,955.00	5,952.97	41.44	142.04	-48.63	-698.98	-1,243.31	1,449.71	1,309.30	140.40	10.325			
8,100.00	6,893.09	5,955.00	5,952.97	43.39	142.04	-48.63	-698.98	-1,243.31	1,478.07	1,335.30	142.77	10.353			
8,200.00	6,892.86	5,955.00	5,952.97	45.39	142.04	-48.63	-698.98	-1,243.31	1,512.53	1,367.30	145.23	10.414			
8,300.00	6,892.63	5,955.00	5,952.97	47.44	142.04	-48.63	-698.98	-1,243.31	1,552.68	1,404.96	147.71	10.511			
8,400.00	6,892.40	5,955.00	5,952.97	49.51	142.04	-48.63	-698.98	-1,243.31	1,598.08	1,447.93	150.14	10.644			
8,500.00	6,892.17	5,955.00	5,952.97	51.62	142.04	-48.63	-698.98	-1,243.31	1,648.30	1,495.82	152.48	10.810			
8,600.00	6,891.94	5,955.00	5,952.97	53.76	142.04	-48.63	-698.98	-1,243.31	1,702.92	1,548.23	154.69	11.009			
8,700.00	6,891.71	5,955.00	5,952.97	55.92	142.04	-48.63	-698.98	-1,243.31	1,761.53	1,604.78	156.75	11.238			
8,800.00	6,891.48	5,955.00	5,952.97	58.11	142.04	-48.63	-698.98	-1,243.31	1,823.75	1,665.09	158.66	11.495			
8,900.00	6,891.25	5,955.00	5,952.97	60.31	142.04	-48.63	-698.98	-1,243.31	1,889.21	1,728.80	160.40	11.778			
9,000.00	6,891.01	5,955.00	5,952.97	62.54	142.04	-48.63	-698.98	-1,243.31	1,957.59	1,795.59	161.99	12.084			
9,100.00	6,890.78	5,955.00	5,952.97	64.78	142.04	-48.63	-698.98	-1,243.31	2,028.59	1,865.15	163.44	12.412			
9,200.00	6,890.55	5,955.00	5,952.97	67.03	142.04	-48.63	-698.98	-1,243.31	2,101.96	1,937.21	164.75	12.759			
9,300.00	6,890.32	5,955.00	5,952.97	69.29	142.04	-48.63	-698.98	-1,243.31	2,177.45	2,011.52	165.93	13.122			
9,400.00	6,890.09	5,955.00	5,952.97	71.57	142.04	-48.63	-698.98	-1,243.31	2,254.85	2,087.85	167.00	13.502			
9,500.00	6,889.86	5,955.00	5,952.97	73.86	142.04	-48.63	-698.98	-1,243.31	2,333.96	2,166.00	167.96	13.896			
9,600.00	6,889.63	5,955.00	5,952.97	76.16	142.04	-48.63	-698.98	-1,243.31	2,414.63	2,245.80	168.83	14.302			
9,700.00	6,889.40	5,955.00	5,952.97	78.46	142.04	-48.63	-698.98	-1,243.31	2,496.70	2,327.08	169.62	14.719			
9,800.00	6,889.17	5,955.00	5,952.97	80.78	142.04	-48.63	-698.98	-1,243.31	2,580.03	2,409.70	170.33	15.147			
9,900.00	6,888.94	5,955.00	5,952.97	83.10	142.04	-48.63	-698.98	-1,243.31	2,664.51	2,493.54	170.97	15.585			
10,000.00	6,888.71	5,955.00	5,952.97	85.43	142.04	-48.63	-698.98	-1,243.31	2,750.03	2,578.47	171.55	16.030			
10,100.00	6,888.48	5,955.00	5,952.97	87.76	142.04	-48.63	-698.98	-1,243.31	2,836.49	2,664.41	172.08	16.484			
10,200.00	6,888.25	5,955.00	5,952.97	90.10	142.04	-48.63	-698.98	-1,243.31	2,923.82	2,751.26	172.56	16.944			
10,300.00	6,888.01	5,955.00	5,952.97	92.45	142.04	-48.63	-698.98	-1,243.31	3,011.94	2,838.94	173.00	17.410			
10,400.00	6,887.78	5,955.00	5,952.97	94.80	142.04	-48.63	-698.98	-1,243.31	3,100.78	2,927.38	173.40	17.882			
10,500.00	6,887.55	5,955.00	5,952.97	97.15	142.04	-48.63	-698.98	-1,243.31	3,190.28	3,016.52	173.76	18.360			
10,600.00	6,887.32	5,955.00	5,952.97	99.51	142.04	-48.63	-698.98	-1,243.31	3,280.39	3,106.29	174.10	18.842			
10,700.00	6,887.09	5,955.00	5,952.97	101.87	142.04	-48.63	-698.98	-1,243.31	3,371.05	3,196.65	174.41	19.329			
10,800.00	6,886.86	5,955.00	5,952.97	104.24	142.04	-48.63	-698.98	-1,243.31	3,462.23	3,287.54	174.69	19.819			
10,900.00	6,886.63	5,955.00	5,952.97	106.61	142.04	-48.63	-698.98	-1,243.31	3,553.88	3,378.93	174.95	20.314			
11,000.00	6,886.40	5,955.00	5,952.97	108.98	142.04	-48.63	-698.98	-1,243.31	3,645.97	3,470.78	175.19	20.811			
11,100.00	6,886.17	5,955.00	5,952.97	111.36	142.04	-48.63	-698.98	-1,243.31	3,738.47	3,563.06	175.42	21.312			
11,200.00	6,885.94	5,955.00	5,952.97	113.74	142.04	-48.63	-698.98	-1,243.31	3,831.35	3,655.72	175.62	21.816			
11,300.00	6,885.71	5,955.00	5,952.97	116.12	142.04	-48.63	-698.98	-1,243.31	3,924.57	3,748.75	175.82	22.322			
11,400.00	6,885.48	5,955.00	5,952.97	118.51	142.04	-48.63	-698.98	-1,243.31	4,018.12	3,842.12	176.00	22.830			
11,500.00	6,885.25	5,955.00	5,952.97	120.89	142.04	-48.63	-698.98	-1,243.31	4,111.98	3,935.81	176.17	23.341			
11,600.00	6,885.01	5,955.00	5,952.97	123.28	142.04	-48.63	-698.98	-1,243.31	4,206.12	4,029.79	176.33	23.854			
11,700.00	6,884.78	5,955.00	5,952.97	125.67	142.04	-48.63	-698.98	-1,243.31	4,300.52	4,124.04	176.48	24.369			
11,800.00	6,884.55	5,955.00	5,952.97	128.07	142.04	-48.63	-698.98	-1,243.31	4,395.17	4,218.55	176.62	24.885			
11,900.00	6,884.32	5,955.00	5,952.97	130.46	142.04	-48.63	-698.98	-1,243.31	4,490.05	4,313.30	176.75	25.403			
12,000.00	6,884.09	5,955.00	5,952.97	132.86	142.04	-48.63	-698.98	-1,243.31	4,585.15	4,408.27	176.88	25.922			
12,100.00	6,883.86	5,955.00	5,952.97	135.25	142.04	-48.63	-698.98	-1,243.31	4,680.46	4,503.46	177.00	26.443			
12,200.00	6,883.63	5,955.00	5,952.97	137.65	142.04	-48.63	-698.98	-1,243.31	4,775.95	4,598.84	177.11	26.965			
12,300.00	6,883.40	5,955.00	5,952.97	140.05	142.04	-48.63	-698.98	-1,243.31	4,871.63	4,694.41	177.22	27.489			
12,400.00	6,883.17	5,955.00	5,952.97	142.46	142.04	-48.63	-698.98	-1,243.31	4,967.48	4,790.15	177.33	28.013			
12,500.00	6,882.94	5,955.00	5,952.97	144.86	142.04	-48.63	-698.98	-1,243.31	5,063.48	4,886.06	177.43	28.538			
12,600.00	6,882.71	5,955.00	5,952.97	147.27	142.04	-48.63	-698.98	-1,243.31	5,159.64	4,982.12	177.52	29.065			
12,700.00	6,882.48	5,955.00	5,952.97	149.67	142.04	-48.63	-698.98	-1,243.31	5,255.95	5,078.33	177.62	29.592			
12,800.00	6,882.25	5,955.00	5,952.97	152.08	142.04	-48.63	-698.98	-1,243.31	5,352.38	5,174.68	177.71	30.119			
12,900.00	6,882.01	5,955.00	5,952.97	154.49	142.04	-48.63	-698.98	-1,243.31	5,448.95	5,271.16	177.79	30.648			
13,000.00	6,881.78	5,955.00	5,952.97	156.90	142.04	-48.63	-698.98	-1,243.31	5,545.64	5,367.76	177.88	31.177			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18A - OH - OH													Offset Site Error:	0.00 usft	
Survey Program: 152-A027Ua_INC-ONLY				Offset		Semi Major Axis		Offset Wellbore Centre		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		
13,100.00	6,881.55	5,955.00	5,952.97	159.31	142.04	-48.63	-698.98	-1,243.31	5,642.44	5,464.49	177.96	31.707			
13,200.00	6,881.32	5,955.00	5,952.97	161.72	142.04	-48.63	-698.98	-1,243.31	5,739.36	5,561.32	178.04	32.237			
13,300.00	6,881.09	5,955.00	5,952.97	164.13	142.04	-48.63	-698.98	-1,243.31	5,836.37	5,658.26	178.11	32.768			
13,400.00	6,880.86	5,955.00	5,952.97	166.55	142.04	-48.63	-698.98	-1,243.31	5,933.49	5,755.30	178.19	33.299			
13,500.00	6,880.63	5,955.00	5,952.97	168.96	142.04	-48.63	-698.98	-1,243.31	6,030.70	5,852.44	178.26	33.830			
13,600.00	6,880.40	5,955.00	5,952.97	171.38	142.04	-48.63	-698.98	-1,243.31	6,128.00	5,949.67	178.34	34.362			
13,700.00	6,880.17	5,955.00	5,952.97	173.79	142.04	-48.63	-698.98	-1,243.31	6,225.39	6,046.98	178.41	34.894			
13,800.00	6,879.94	5,955.00	5,952.97	176.21	142.04	-48.63	-698.98	-1,243.31	6,322.86	6,144.38	178.48	35.427			
13,900.00	6,879.71	5,955.00	5,952.97	178.63	142.04	-48.63	-698.98	-1,243.31	6,420.40	6,241.86	178.55	35.959			
14,000.00	6,879.48	5,955.00	5,952.97	181.04	142.04	-48.63	-698.98	-1,243.31	6,518.02	6,339.41	178.61	36.492			
14,100.00	6,879.25	5,955.00	5,952.97	183.46	142.04	-48.63	-698.98	-1,243.31	6,615.71	6,437.03	178.68	37.025			
14,200.00	6,879.01	5,955.00	5,952.97	185.88	142.04	-48.63	-698.98	-1,243.31	6,713.47	6,534.72	178.75	37.558			
14,300.00	6,878.78	5,955.00	5,952.97	188.30	142.04	-48.63	-698.98	-1,243.31	6,811.30	6,632.48	178.81	38.092			
14,400.00	6,878.55	5,955.00	5,952.97	190.72	142.04	-48.63	-698.98	-1,243.31	6,909.18	6,730.30	178.88	38.625			
14,500.00	6,878.32	5,955.00	5,952.97	193.14	142.04	-48.63	-698.98	-1,243.31	7,007.13	6,828.19	178.94	39.158			
14,600.00	6,878.09	5,955.00	5,952.97	195.56	142.04	-48.63	-698.98	-1,243.31	7,105.13	6,926.12	179.01	39.692			
14,700.00	6,877.86	5,955.00	5,952.97	197.99	142.04	-48.63	-698.98	-1,243.31	7,203.19	7,024.12	179.07	40.225			
14,800.00	6,877.63	5,955.00	5,952.97	200.41	142.04	-48.63	-698.98	-1,243.31	7,301.30	7,122.17	179.14	40.759			
14,900.00	6,877.40	5,955.00	5,952.97	202.83	142.04	-48.63	-698.98	-1,243.31	7,399.46	7,220.26	179.20	41.292			
15,000.00	6,877.17	5,955.00	5,952.97	205.25	142.04	-48.63	-698.98	-1,243.31	7,497.67	7,318.41	179.26	41.825			
15,100.00	6,876.94	5,955.00	5,952.97	207.68	142.04	-48.63	-698.98	-1,243.31	7,595.93	7,416.60	179.33	42.358			
15,200.00	6,876.71	5,955.00	5,952.97	210.10	142.04	-48.63	-698.98	-1,243.31	7,694.23	7,514.84	179.39	42.892			
15,300.00	6,876.48	5,955.00	5,952.97	212.53	142.04	-48.63	-698.98	-1,243.31	7,792.58	7,613.13	179.45	43.425			
15,400.00	6,876.25	5,955.00	5,952.97	214.95	142.04	-48.63	-698.98	-1,243.31	7,890.96	7,711.45	179.51	43.957			
15,500.00	6,876.01	5,955.00	5,952.97	217.38	142.04	-48.63	-698.98	-1,243.31	7,989.39	7,809.81	179.58	44.490			
15,600.00	6,875.78	5,955.00	5,952.97	219.80	142.04	-48.63	-698.98	-1,243.31	8,087.85	7,908.22	179.64	45.023			
15,700.00	6,875.55	5,955.00	5,952.97	222.23	142.04	-48.63	-698.98	-1,243.31	8,186.36	8,006.65	179.70	45.555			
15,800.00	6,875.32	5,955.00	5,952.97	224.66	142.04	-48.63	-698.98	-1,243.31	8,284.90	8,105.13	179.77	46.087			
15,900.00	6,875.09	5,955.00	5,952.97	227.08	142.04	-48.63	-698.98	-1,243.31	8,383.47	8,203.64	179.83	46.619			
16,000.00	6,874.86	5,955.00	5,952.97	229.51	142.04	-48.63	-698.98	-1,243.31	8,482.07	8,302.18	179.89	47.151			
16,100.00	6,874.63	5,955.00	5,952.97	231.94	142.04	-48.63	-698.98	-1,243.31	8,580.71	8,400.76	179.96	47.682			
16,200.00	6,874.40	5,955.00	5,952.97	234.37	142.04	-48.63	-698.98	-1,243.31	8,679.38	8,499.36	180.02	48.214			
16,300.00	6,874.17	5,955.00	5,952.97	236.79	142.04	-48.63	-698.98	-1,243.31	8,778.08	8,598.00	180.08	48.745			
16,400.00	6,873.94	5,955.00	5,952.97	239.22	142.04	-48.63	-698.98	-1,243.31	8,876.81	8,696.67	180.15	49.275			
16,500.00	6,873.71	5,955.00	5,952.97	241.65	142.04	-48.63	-698.98	-1,243.31	8,975.57	8,795.36	180.21	49.806			
16,600.00	6,873.48	5,955.00	5,952.97	244.08	142.04	-48.63	-698.98	-1,243.31	9,074.35	8,894.08	180.28	50.336			
16,700.00	6,873.25	5,955.00	5,952.97	246.51	142.04	-48.63	-698.98	-1,243.31	9,173.16	8,992.82	180.34	50.866			
16,800.00	6,873.02	5,955.00	5,952.97	248.94	142.04	-48.63	-698.98	-1,243.31	9,272.00	9,091.59	180.41	51.395			
16,900.00	6,872.78	5,955.00	5,952.97	251.37	142.04	-48.63	-698.98	-1,243.31	9,370.86	9,190.39	180.47	51.925			
17,000.00	6,872.55	5,955.00	5,952.97	253.80	142.04	-48.63	-698.98	-1,243.31	9,469.75	9,289.21	180.54	52.453			
17,070.79	6,872.39	5,955.00	5,952.97	255.52	142.04	-48.63	-698.98	-1,243.31	9,539.76	9,359.18	180.58	52.828			
17,100.00	6,872.32	5,955.00	5,952.97	256.23	142.04	-48.63	-698.98	-1,243.31	9,568.65	9,388.05	180.60	52.982			
17,200.00	6,872.09	5,955.00	5,952.97	258.66	142.04	-48.63	-698.98	-1,243.31	9,667.58	9,486.92	180.67	53.510			
17,237.94	6,872.00	5,955.00	5,952.97	259.58	142.04	-48.63	-698.98	-1,243.31	9,705.12	9,524.43	180.69	53.710			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18B - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 213-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft
Reference													
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)			
0.00	0.00	0.00	0.00	0.00	0.00	-110.53	-864.20	-2,307.67	2,465.51				
100.00	100.00	19.00	19.00	0.25	0.40	-110.53	-864.20	-2,307.67	2,464.18	2,463.52	0.66	3,759.266	
200.00	200.00	119.00	119.00	0.61	2.53	-110.53	-864.20	-2,307.67	2,464.18	2,461.04	3.14	784.221	
300.00	300.00	219.01	219.00	0.97	4.68	-110.53	-864.20	-2,307.67	2,464.18	2,458.53	5.65	435.990	
400.00	400.00	319.01	319.00	1.33	7.19	-110.53	-864.20	-2,307.67	2,464.18	2,455.66	8.52	289.302	
437.77	437.77	356.76	356.74	1.46	8.14	-110.52	-863.57	-2,307.67	2,463.96	2,454.36	9.60	256.674	
500.00	500.00	415.90	415.88	1.68	9.62	-110.52	-863.68	-2,307.67	2,464.00	2,452.69	11.31	217.949	
600.00	600.00	519.11	519.00	2.04	12.47	-110.53	-864.20	-2,307.67	2,464.18	2,449.66	14.51	169.778	
700.00	700.00	619.11	619.00	2.40	16.35	-110.53	-864.20	-2,307.67	2,464.18	2,445.42	18.75	131.407	
727.02	727.02	643.84	643.71	2.50	17.31	-110.51	-863.13	-2,307.67	2,463.81	2,444.00	19.81	124.380	
800.00	800.00	709.02	708.87	2.76	19.84	-110.52	-863.60	-2,307.67	2,463.99	2,441.39	22.60	109.032	
900.00	900.00	819.47	819.00	3.12	24.55	-110.53	-864.20	-2,307.67	2,464.18	2,436.51	27.67	89.071	
930.43	930.43	849.88	849.35	3.23	25.91	-110.49	-862.46	-2,307.67	2,463.57	2,434.43	29.14	84.545	
1,000.00	1,000.00	903.47	902.90	3.48	28.32	-110.50	-862.96	-2,307.67	2,463.80	2,432.00	31.79	77.495	
1,100.00	1,099.98	1,019.82	1,018.98	3.83	33.21	-73.84	-864.20	-2,307.67	2,463.69	2,426.64	37.05	66.501	
1,200.08	1,199.92	1,115.60	1,114.70	4.19	37.07	-73.94	-862.43	-2,307.67	2,461.62	2,420.36	41.26	59.667	
1,300.00	1,299.59	1,201.41	1,200.46	4.55	40.52	-74.10	-863.53	-2,307.67	2,460.15	2,415.08	45.06	54.593	
1,400.00	1,399.35	1,319.58	1,318.35	4.91	45.28	-74.30	-864.20	-2,307.67	2,458.42	2,408.23	50.19	48.985	
1,500.00	1,499.11	1,410.80	1,409.51	5.27	48.96	-74.41	-862.71	-2,307.67	2,456.01	2,401.78	54.23	45.292	
1,600.00	1,598.86	1,519.45	1,517.86	5.63	53.48	-74.61	-864.20	-2,307.67	2,454.67	2,395.56	59.11	41.529	
1,700.00	1,698.62	1,619.21	1,617.62	6.00	58.04	-74.77	-864.20	-2,307.67	2,452.82	2,388.79	64.03	38.308	
1,800.00	1,798.37	1,703.42	1,701.75	6.36	61.89	-74.88	-863.28	-2,307.67	2,450.70	2,382.46	68.24	35.913	
1,900.00	1,898.13	1,819.19	1,817.13	6.72	67.38	-75.08	-864.20	-2,307.67	2,449.18	2,375.08	74.10	33.053	
2,000.00	1,997.89	1,919.28	1,916.89	7.09	72.15	-75.24	-864.20	-2,307.67	2,447.39	2,368.16	79.23	30.889	
2,100.00	2,097.64	2,019.03	2,016.64	7.45	76.59	-75.40	-864.20	-2,307.67	2,445.62	2,361.58	84.04	29.102	
2,200.00	2,197.40	2,117.78	2,115.29	7.82	80.99	-75.48	-860.96	-2,307.67	2,442.64	2,353.84	88.80	27.508	
2,300.00	2,297.16	2,205.95	2,203.41	8.19	84.92	-75.64	-861.62	-2,307.67	2,441.18	2,348.09	93.09	26.224	
2,400.00	2,296.91	2,294.08	2,291.46	8.55	88.84	-75.81	-863.39	-2,307.67	2,440.22	2,342.85	97.38	25.060	
2,500.00	2,496.67	2,418.79	2,415.67	8.92	93.74	-76.03	-864.20	-2,307.67	2,438.71	2,336.06	102.65	23.758	
2,600.00	2,596.42	2,502.33	2,499.12	9.29	96.90	-76.14	-863.21	-2,307.67	2,436.70	2,330.53	106.17	22.951	
2,700.00	2,696.18	2,618.57	2,615.18	9.66	100.79	-76.35	-864.20	-2,307.67	2,435.37	2,324.94	110.43	22.053	
2,800.00	2,795.94	2,709.67	2,706.25	10.02	103.62	-76.47	-863.33	-2,307.67	2,433.41	2,319.78	113.62	21.417	
2,900.00	2,895.69	2,818.23	2,814.69	10.39	106.53	-76.67	-864.20	-2,307.67	2,432.11	2,315.20	116.90	20.804	
3,000.00	2,995.45	2,917.99	2,914.45	10.76	108.69	-76.83	-864.20	-2,307.67	2,430.51	2,311.07	119.43	20.350	
3,100.00	3,095.21	3,015.36	3,011.78	11.13	110.80	-76.94	-862.36	-2,307.67	2,428.18	2,306.27	121.91	19.918	
3,200.00	3,194.96	3,107.82	3,104.22	11.49	112.80	-77.10	-862.94	-2,307.67	2,426.86	2,302.59	124.28	19.528	
3,300.00	3,294.72	3,217.37	3,213.72	11.86	115.02	-77.31	-864.20	-2,307.67	2,425.81	2,298.94	126.87	19.121	
3,400.00	3,394.47	3,317.13	3,313.47	12.23	116.29	-77.47	-864.20	-2,307.67	2,424.28	2,295.78	128.50	18.866	
3,500.00	3,494.23	3,416.01	3,412.36	12.60	117.55	-77.62	-863.82	-2,307.67	2,422.62	2,292.49	130.13	18.617	
3,600.00	3,593.99	3,513.40	3,509.74	12.97	118.79	-77.78	-864.02	-2,307.67	2,421.21	2,289.47	131.74	18.379	
3,700.00	3,693.74	3,616.41	3,612.74	13.34	120.12	-77.95	-864.20	-2,307.67	2,419.81	2,286.37	133.44	18.134	
3,800.00	3,793.50	3,716.16	3,712.50	13.71	121.43	-78.11	-864.20	-2,307.67	2,418.36	2,283.25	135.12	17.898	
3,900.00	3,893.26	3,815.92	3,812.26	14.07	122.74	-78.27	-864.20	-2,307.67	2,416.93	2,280.14	136.79	17.669	
4,000.00	3,993.01	3,915.67	3,912.01	14.44	124.05	-78.43	-864.20	-2,307.67	2,415.52	2,277.05	138.47	17.444	
4,100.00	4,092.77	4,015.43	4,011.77	14.81	125.36	-78.60	-864.20	-2,307.67	2,414.13	2,273.98	140.15	17.226	
4,200.00	4,192.52	4,115.19	4,111.52	15.18	126.67	-78.76	-864.20	-2,307.67	2,412.75	2,270.93	141.82	17.012	
4,300.00	4,292.28	4,214.94	4,211.28	15.55	127.97	-78.92	-864.20	-2,307.67	2,411.40	2,267.90	143.50	16.804	
4,400.00	4,392.04	4,314.70	4,311.04	15.92	129.28	-79.08	-864.20	-2,307.67	2,410.07	2,264.89	145.18	16.601	
4,500.00	4,491.79	4,414.45	4,410.79	16.29	130.59	-79.25	-864.20	-2,307.67	2,408.75	2,261.90	146.85	16.402	
4,600.00	4,591.55	4,514.21	4,510.55	16.66	131.90	-79.41	-864.20	-2,307.67	2,407.45	2,258.92	148.53	16.208	
4,700.00	4,691.31	4,613.97	4,610.31	17.03	133.21	-79.57	-864.20	-2,307.67	2,406.18	2,255.97	150.21	16.019	
4,800.00	4,791.06	4,713.72	4,710.06	17.40	134.52	-79.73	-864.20	-2,307.67	2,404.92	2,253.04	151.89	15.834	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18B - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 213-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												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
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
4,900.00	4,890.82	4,813.48	4,809.82	17.76	135.83	-79.90	-864.20	-2,307.67	2,403.69	2,250.12	153.56	15.653	
5,000.00	4,990.57	4,913.24	4,909.57	18.13	137.13	-80.06	-864.20	-2,307.67	2,402.47	2,247.23	155.24	15.476	
5,100.00	5,090.33	5,012.99	5,009.33	18.50	138.44	-80.22	-864.20	-2,307.67	2,401.27	2,244.35	156.92	15.303	
5,200.00	5,190.09	5,112.75	5,109.09	18.87	139.75	-80.39	-864.20	-2,307.67	2,400.09	2,241.50	158.60	15.133	
5,300.00	5,289.84	5,212.50	5,208.84	19.24	141.06	-80.55	-864.20	-2,307.67	2,398.93	2,238.66	160.27	14.968	
5,400.00	5,389.60	5,312.26	5,308.60	19.61	142.37	-80.72	-864.20	-2,307.67	2,397.80	2,235.84	161.95	14.806	
5,500.00	5,489.35	5,412.02	5,408.35	19.98	143.68	-80.88	-864.20	-2,307.67	2,396.68	2,233.05	163.63	14.647	
5,600.00	5,589.11	5,511.77	5,508.11	20.35	144.98	-81.05	-864.20	-2,307.67	2,395.58	2,230.27	165.31	14.492	
5,700.00	5,688.87	5,611.53	5,607.87	20.72	146.29	-81.21	-864.20	-2,307.67	2,394.50	2,227.51	166.99	14.340	
5,800.00	5,788.62	5,711.29	5,707.62	21.09	147.60	-81.37	-864.20	-2,307.67	2,393.44	2,224.78	168.66	14.191	
5,900.00	5,888.38	5,811.04	5,807.38	21.46	148.91	-81.54	-864.20	-2,307.67	2,392.40	2,222.06	170.34	14.045	
6,000.00	5,988.14	5,910.80	5,907.14	21.83	150.22	-81.70	-864.20	-2,307.67	2,391.38	2,219.36	172.02	13.902	
6,098.13	6,086.03	5,985.00	5,981.31	22.19	151.19	-81.83	-864.20	-2,307.67	2,390.52	2,217.17	173.35	13.790	
6,100.00	6,087.89	5,985.00	5,981.31	22.20	151.19	-81.83	-864.20	-2,307.67	2,390.52	2,217.17	173.35	13.790	
6,200.00	6,187.65	5,985.00	5,981.31	22.57	151.19	-81.83	-864.20	-2,307.67	2,392.69	2,219.18	173.51	13.790	
6,299.50	6,286.91	5,985.00	5,981.31	22.93	151.19	-81.83	-864.20	-2,307.67	2,398.99	2,225.61	173.38	13.837	
6,350.00	6,337.14	5,985.00	5,981.31	23.12	151.19	-54.17	-864.20	-2,307.67	2,402.03	2,228.82	173.20	13.868	
6,400.00	6,386.40	5,985.00	5,981.31	23.32	151.19	-45.35	-864.20	-2,307.67	2,402.67	2,229.70	172.96	13.891	
6,450.00	6,434.88	5,985.00	5,981.31	23.52	151.19	-41.32	-864.20	-2,307.67	2,400.95	2,228.29	172.66	13.906	
6,500.00	6,482.27	5,985.00	5,981.31	23.73	151.19	-39.16	-864.20	-2,307.67	2,396.88	2,224.58	172.30	13.911	
6,550.00	6,528.29	5,985.00	5,981.31	23.94	151.19	-37.96	-864.20	-2,307.67	2,390.46	2,218.59	171.87	13.908	
6,600.00	6,572.65	5,985.00	5,981.31	24.16	151.19	-37.33	-864.20	-2,307.67	2,381.73	2,210.33	171.40	13.896	
6,650.00	6,615.08	5,985.00	5,981.31	24.39	151.19	-37.11	-864.20	-2,307.67	2,370.71	2,199.83	170.88	13.874	
6,700.00	6,655.31	5,985.00	5,981.31	24.64	151.19	-37.20	-864.20	-2,307.67	2,357.43	2,187.12	170.32	13.841	
6,750.00	6,693.11	5,985.00	5,981.31	24.90	151.19	-37.55	-864.20	-2,307.67	2,341.95	2,172.22	169.73	13.798	
6,800.00	6,728.23	5,985.00	5,981.31	25.18	151.19	-38.14	-864.20	-2,307.67	2,324.30	2,155.19	169.11	13.744	
6,850.00	6,760.46	5,985.00	5,981.31	25.50	151.19	-38.96	-864.20	-2,307.67	2,304.56	2,136.07	168.49	13.678	
6,900.00	6,789.60	5,985.00	5,981.31	25.84	151.19	-40.01	-864.20	-2,307.67	2,282.79	2,114.92	167.87	13.599	
6,950.00	6,815.47	5,985.00	5,981.31	26.21	151.19	-41.30	-864.20	-2,307.67	2,259.07	2,091.81	167.26	13.506	
7,000.00	6,837.91	5,985.00	5,981.31	26.63	151.19	-42.83	-864.20	-2,307.67	2,233.49	2,066.81	166.68	13.400	
7,050.00	6,856.78	5,985.00	5,981.31	27.08	151.19	-44.63	-864.20	-2,307.67	2,206.13	2,040.00	166.14	13.279	
7,100.00	6,871.97	5,985.00	5,981.31	27.57	151.19	-46.70	-864.20	-2,307.67	2,177.12	2,011.47	165.65	13.143	
7,150.00	6,883.39	5,985.00	5,981.31	28.10	151.19	-49.09	-864.20	-2,307.67	2,146.55	1,981.32	165.24	12.991	
7,200.00	6,890.95	5,985.00	5,981.31	28.66	151.19	-51.80	-864.20	-2,307.67	2,114.57	1,949.66	164.91	12.823	
7,250.00	6,894.63	5,985.00	5,981.31	29.25	151.19	-54.86	-864.20	-2,307.67	2,081.30	1,916.61	164.68	12.638	
7,273.35	6,895.00	5,985.00	5,981.31	29.54	151.19	-56.42	-864.20	-2,307.67	2,065.36	1,900.74	164.61	12.547	
7,300.00	6,894.94	5,985.00	5,981.31	29.87	151.19	-56.42	-864.20	-2,307.67	2,047.12	1,882.57	164.55	12.441	
7,400.00	6,894.71	5,985.00	5,981.31	31.22	151.19	-56.42	-864.20	-2,307.67	1,980.40	1,816.04	164.37	12.049	
7,500.00	6,894.48	5,985.00	5,981.31	32.69	151.19	-56.42	-864.20	-2,307.67	1,916.58	1,752.31	164.27	11.667	
7,600.00	6,894.25	5,985.00	5,981.31	34.27	151.19	-56.42	-864.20	-2,307.67	1,855.95	1,691.69	164.27	11.298	
7,700.00	6,894.01	5,985.00	5,981.31	35.95	151.19	-56.42	-864.20	-2,307.67	1,798.85	1,634.47	164.38	10.943	
7,800.00	6,893.78	5,985.00	5,981.31	37.71	151.19	-56.42	-864.20	-2,307.67	1,745.60	1,580.99	164.61	10.604	
7,900.00	6,893.55	5,985.00	5,981.31	39.54	151.19	-56.42	-864.20	-2,307.67	1,696.59	1,531.62	164.97	10.284	
8,000.00	6,893.32	5,985.00	5,981.31	41.44	151.19	-56.42	-864.20	-2,307.67	1,652.18	1,486.71	165.47	9.984	
8,100.00	6,893.09	5,985.00	5,981.31	43.39	151.19	-56.42	-864.20	-2,307.67	1,612.76	1,446.63	166.13	9.708	
8,200.00	6,892.86	5,985.00	5,981.31	45.39	151.19	-56.42	-864.20	-2,307.67	1,578.69	1,411.76	166.94	9.457	
8,300.00	6,892.63	5,985.00	5,981.31	47.44	151.19	-56.42	-864.20	-2,307.67	1,550.34	1,382.43	167.91	9.233	
8,400.00	6,892.40	5,985.00	5,981.31	49.51	151.19	-56.42	-864.20	-2,307.67	1,528.02	1,358.96	169.06	9.039	
8,500.00	6,892.17	5,985.00	5,981.31	51.62	151.19	-56.42	-864.20	-2,307.67	1,511.99	1,341.63	170.36	8.875	
8,600.00	6,891.94	5,985.00	5,981.31	53.76	151.19	-56.42	-864.20	-2,307.67	1,502.47	1,330.65	171.82	8.745	
8,693.58	6,891.72	5,985.00	5,981.31	55.79	151.19	-56.42	-864.20	-2,307.67	1,499.55	1,326.24	173.31	8.653 CC	
8,700.00	6,891.71	5,985.00	5,981.31	55.92	151.19	-56.42	-864.20	-2,307.67	1,499.57	1,326.15	173.41	8.647 ES	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18B - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 213-A027Ua_INC-ONLY												Offset Well Error:	0.00 usft
Reference												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)			
8,800.00	6,891.48	5,985.00	5,981.31	58.11	151.19	-56.42	-864.20	-2,307.67	1,503.32	1,328.21	175.11	8.585	
8,900.00	6,891.25	5,985.00	5,981.31	60.31	151.19	-56.42	-864.20	-2,307.67	1,513.69	1,336.80	176.89	8.557 SF	
9,000.00	6,891.01	5,985.00	5,981.31	62.54	151.19	-56.42	-864.20	-2,307.67	1,530.54	1,351.83	178.70	8.565	
9,100.00	6,890.78	5,985.00	5,981.31	64.78	151.19	-56.42	-864.20	-2,307.67	1,553.65	1,373.14	180.52	8.607	
9,200.00	6,890.55	5,985.00	5,981.31	67.03	151.19	-56.42	-864.20	-2,307.67	1,582.76	1,400.47	182.29	8.683	
9,300.00	6,890.32	5,985.00	5,981.31	69.29	151.19	-56.42	-864.20	-2,307.67	1,617.53	1,433.54	183.99	8.792	
9,400.00	6,890.09	5,985.00	5,981.31	71.57	151.19	-56.42	-864.20	-2,307.67	1,657.61	1,472.03	185.59	8.932	
9,500.00	6,889.86	5,985.00	5,981.31	73.86	151.19	-56.42	-864.20	-2,307.67	1,702.64	1,515.56	187.07	9.101	
9,600.00	6,889.63	5,985.00	5,981.31	76.16	151.19	-56.42	-864.20	-2,307.67	1,752.21	1,563.78	188.43	9.299	
9,700.00	6,889.40	5,985.00	5,981.31	78.46	151.19	-56.42	-864.20	-2,307.67	1,805.97	1,616.32	189.66	9.522	
9,800.00	6,889.17	5,985.00	5,981.31	80.78	151.19	-56.42	-864.20	-2,307.67	1,863.55	1,672.80	190.75	9.769	
9,900.00	6,888.94	5,985.00	5,981.31	83.10	151.19	-56.42	-864.20	-2,307.67	1,924.61	1,732.88	191.72	10.039	
10,000.00	6,888.71	5,985.00	5,981.31	85.43	151.19	-56.42	-864.20	-2,307.67	1,988.82	1,796.25	192.57	10.328	
10,100.00	6,888.48	5,985.00	5,981.31	87.76	151.19	-56.42	-864.20	-2,307.67	2,055.89	1,862.58	193.31	10.635	
10,200.00	6,888.25	5,985.00	5,981.31	90.10	151.19	-56.42	-864.20	-2,307.67	2,125.55	1,931.60	193.95	10.959	
10,300.00	6,888.01	5,985.00	5,981.31	92.45	151.19	-56.42	-864.20	-2,307.67	2,197.55	2,003.06	194.49	11.299	
10,400.00	6,887.78	5,985.00	5,981.31	94.80	151.19	-56.42	-864.20	-2,307.67	2,271.68	2,076.72	194.96	11.652	
10,500.00	6,887.55	5,985.00	5,981.31	97.15	151.19	-56.42	-864.20	-2,307.67	2,347.73	2,152.37	195.36	12.018	
10,600.00	6,887.32	5,985.00	5,981.31	99.51	151.19	-56.42	-864.20	-2,307.67	2,425.51	2,229.82	195.69	12.395	
10,700.00	6,887.09	5,985.00	5,981.31	101.87	151.19	-56.42	-864.20	-2,307.67	2,504.87	2,308.90	195.97	12.782	
10,800.00	6,886.86	5,985.00	5,981.31	104.24	151.19	-56.42	-864.20	-2,307.67	2,585.67	2,389.46	196.20	13.179	
10,900.00	6,886.63	5,985.00	5,981.31	106.61	151.19	-56.42	-864.20	-2,307.67	2,667.76	2,471.37	196.39	13.584	
11,000.00	6,886.40	5,985.00	5,981.31	108.98	151.19	-56.42	-864.20	-2,307.67	2,751.04	2,554.50	196.55	13.997	
11,100.00	6,886.17	5,985.00	5,981.31	111.36	151.19	-56.42	-864.20	-2,307.67	2,835.40	2,638.73	196.67	14.417	
11,200.00	6,885.94	5,985.00	5,981.31	113.74	151.19	-56.42	-864.20	-2,307.67	2,920.75	2,723.99	196.77	14.844	
11,300.00	6,885.71	5,985.00	5,981.31	116.12	151.19	-56.42	-864.20	-2,307.67	3,007.01	2,810.16	196.84	15.276	
11,400.00	6,885.48	5,985.00	5,981.31	118.51	151.19	-56.42	-864.20	-2,307.67	3,094.09	2,897.19	196.90	15.714	
11,500.00	6,885.25	5,985.00	5,981.31	120.89	151.19	-56.42	-864.20	-2,307.67	3,181.93	2,984.99	196.94	16.157	
11,600.00	6,885.01	5,985.00	5,981.31	123.28	151.19	-56.42	-864.20	-2,307.67	3,270.47	3,073.50	196.97	16.604	
11,700.00	6,884.78	5,985.00	5,981.31	125.67	151.19	-56.42	-864.20	-2,307.67	3,359.65	3,162.67	196.98	17.056	
11,800.00	6,884.55	5,985.00	5,981.31	128.07	151.19	-56.42	-864.20	-2,307.67	3,449.42	3,252.44	196.98	17.511	
11,900.00	6,884.32	5,985.00	5,981.31	130.46	151.19	-56.42	-864.20	-2,307.67	3,539.75	3,342.77	196.98	17.970	
12,000.00	6,884.09	5,985.00	5,981.31	132.86	151.19	-56.42	-864.20	-2,307.67	3,630.58	3,433.61	196.97	18.432	
12,100.00	6,883.86	5,985.00	5,981.31	135.25	151.19	-56.42	-864.20	-2,307.67	3,721.88	3,524.93	196.95	18.898	
12,200.00	6,883.63	5,985.00	5,981.31	137.65	151.19	-56.42	-864.20	-2,307.67	3,813.61	3,616.69	196.93	19.366	
12,300.00	6,883.40	5,985.00	5,981.31	140.05	151.19	-56.42	-864.20	-2,307.67	3,905.76	3,708.85	196.90	19.836	
12,400.00	6,883.17	5,985.00	5,981.31	142.46	151.19	-56.42	-864.20	-2,307.67	3,998.28	3,801.40	196.87	20.309	
12,500.00	6,882.94	5,985.00	5,981.31	144.86	151.19	-56.42	-864.20	-2,307.67	4,091.15	3,894.31	196.84	20.784	
12,600.00	6,882.71	5,985.00	5,981.31	147.27	151.19	-56.42	-864.20	-2,307.67	4,184.35	3,987.54	196.81	21.261	
12,700.00	6,882.48	5,985.00	5,981.31	149.67	151.19	-56.42	-864.20	-2,307.67	4,277.86	4,081.08	196.77	21.740	
12,800.00	6,882.25	5,985.00	5,981.31	152.08	151.19	-56.42	-864.20	-2,307.67	4,371.65	4,174.91	196.74	22.221	
12,900.00	6,882.01	5,985.00	5,981.31	154.49	151.19	-56.42	-864.20	-2,307.67	4,465.72	4,269.02	196.70	22.703	
13,000.00	6,881.78	5,985.00	5,981.31	156.90	151.19	-56.42	-864.20	-2,307.67	4,560.04	4,363.37	196.67	23.187	
13,100.00	6,881.55	5,985.00	5,981.31	159.31	151.19	-56.42	-864.20	-2,307.67	4,654.59	4,457.96	196.63	23.672	
13,200.00	6,881.32	5,985.00	5,981.31	161.72	151.19	-56.42	-864.20	-2,307.67	4,749.37	4,552.77	196.60	24.158	
13,300.00	6,881.09	5,985.00	5,981.31	164.13	151.19	-56.42	-864.20	-2,307.67	4,844.36	4,647.79	196.56	24.646	
13,400.00	6,880.86	5,985.00	5,981.31	166.55	151.19	-56.42	-864.20	-2,307.67	4,939.54	4,743.01	196.53	25.134	
13,500.00	6,880.63	5,985.00	5,981.31	168.96	151.19	-56.42	-864.20	-2,307.67	5,034.91	4,838.42	196.49	25.624	
13,600.00	6,880.40	5,985.00	5,981.31	171.38	151.19	-56.42	-864.20	-2,307.67	5,130.46	4,934.00	196.46	26.114	
13,700.00	6,880.17	5,985.00	5,981.31	173.79	151.19	-56.42	-864.20	-2,307.67	5,226.18	5,029.75	196.43	26.606	
13,800.00	6,879.94	5,985.00	5,981.31	176.21	151.19	-56.42	-864.20	-2,307.67	5,322.05	5,125.65	196.40	27.098	
13,900.00	6,879.71	5,985.00	5,981.31	178.63	151.19	-56.42	-864.20	-2,307.67	5,418.07	5,221.70	196.37	27.591	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18B - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 213-A027Ua_INC-ONLY												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)			
14,000.00	6,879.48	5,985.00	5,981.31	181.04	151.19	-56.42	-864.20	-2,307.67	5,514.23	5,317.89	196.34	28.085	
14,100.00	6,879.25	5,985.00	5,981.31	183.46	151.19	-56.42	-864.20	-2,307.67	5,610.53	5,414.21	196.32	28.579	
14,200.00	6,879.01	5,985.00	5,981.31	185.88	151.19	-56.42	-864.20	-2,307.67	5,706.96	5,510.66	196.29	29.074	
14,300.00	6,878.78	5,985.00	5,981.31	188.30	151.19	-56.42	-864.20	-2,307.67	5,803.50	5,607.23	196.27	29.569	
14,400.00	6,878.55	5,985.00	5,981.31	190.72	151.19	-56.42	-864.20	-2,307.67	5,900.16	5,703.91	196.25	30.065	
14,500.00	6,878.32	5,985.00	5,981.31	193.14	151.19	-56.42	-864.20	-2,307.67	5,996.93	5,800.70	196.23	30.561	
14,600.00	6,878.09	5,985.00	5,981.31	195.56	151.19	-56.42	-864.20	-2,307.67	6,093.81	5,897.60	196.21	31.058	
14,700.00	6,877.86	5,985.00	5,981.31	197.99	151.19	-56.42	-864.20	-2,307.67	6,190.78	5,994.59	196.19	31.555	
14,800.00	6,877.63	5,985.00	5,981.31	200.41	151.19	-56.42	-864.20	-2,307.67	6,287.85	6,091.67	196.18	32.052	
14,900.00	6,877.40	5,985.00	5,981.31	202.83	151.19	-56.42	-864.20	-2,307.67	6,385.01	6,188.85	196.16	32.550	
15,000.00	6,877.17	5,985.00	5,981.31	205.25	151.19	-56.42	-864.20	-2,307.67	6,482.25	6,286.10	196.15	33.047	
15,100.00	6,876.94	5,985.00	5,981.31	207.68	151.19	-56.42	-864.20	-2,307.67	6,579.58	6,383.44	196.14	33.546	
15,200.00	6,876.71	5,985.00	5,981.31	210.10	151.19	-56.42	-864.20	-2,307.67	6,676.99	6,480.86	196.13	34.044	
15,300.00	6,876.48	5,985.00	5,981.31	212.53	151.19	-56.42	-864.20	-2,307.67	6,774.47	6,578.35	196.12	34.542	
15,400.00	6,876.25	5,985.00	5,981.31	214.95	151.19	-56.42	-864.20	-2,307.67	6,872.03	6,675.91	196.11	35.041	
15,500.00	6,876.01	5,985.00	5,981.31	217.38	151.19	-56.42	-864.20	-2,307.67	6,969.65	6,773.54	196.11	35.540	
15,600.00	6,875.78	5,985.00	5,981.31	219.80	151.19	-56.42	-864.20	-2,307.67	7,067.34	6,871.24	196.11	36.038	
15,700.00	6,875.55	5,985.00	5,981.31	222.23	151.19	-56.42	-864.20	-2,307.67	7,165.10	6,968.99	196.10	36.537	
15,800.00	6,875.32	5,985.00	5,981.31	224.66	151.19	-56.42	-864.20	-2,307.67	7,262.91	7,066.81	196.10	37.036	
15,900.00	6,875.09	5,985.00	5,981.31	227.08	151.19	-56.42	-864.20	-2,307.67	7,360.79	7,164.68	196.10	37.535	
16,000.00	6,874.86	5,985.00	5,981.31	229.51	151.19	-56.42	-864.20	-2,307.67	7,458.72	7,262.61	196.11	38.034	
16,100.00	6,874.63	5,985.00	5,981.31	231.94	151.19	-56.42	-864.20	-2,307.67	7,556.70	7,360.59	196.11	38.533	
16,200.00	6,874.40	5,985.00	5,981.31	234.37	151.19	-56.42	-864.20	-2,307.67	7,654.74	7,458.62	196.11	39.032	
16,300.00	6,874.17	5,985.00	5,981.31	236.79	151.19	-56.42	-864.20	-2,307.67	7,752.83	7,556.71	196.12	39.531	
16,400.00	6,873.94	5,985.00	5,981.31	239.22	151.19	-56.42	-864.20	-2,307.67	7,850.96	7,654.83	196.13	40.030	
16,500.00	6,873.71	5,985.00	5,981.31	241.65	151.19	-56.42	-864.20	-2,307.67	7,949.14	7,753.01	196.14	40.529	
16,600.00	6,873.48	5,985.00	5,981.31	244.08	151.19	-56.42	-864.20	-2,307.67	8,047.37	7,851.22	196.15	41.027	
16,700.00	6,873.25	5,985.00	5,981.31	246.51	151.19	-56.42	-864.20	-2,307.67	8,145.64	7,949.48	196.16	41.526	
16,800.00	6,873.02	5,985.00	5,981.31	248.94	151.19	-56.42	-864.20	-2,307.67	8,243.95	8,047.78	196.17	42.024	
16,900.00	6,872.78	5,985.00	5,981.31	251.37	151.19	-56.42	-864.20	-2,307.67	8,342.30	8,146.12	196.19	42.522	
17,000.00	6,872.55	5,985.00	5,981.31	253.80	151.19	-56.42	-864.20	-2,307.67	8,440.69	8,244.49	196.20	43.021	
17,070.79	6,872.39	5,985.00	5,981.31	255.52	151.19	-56.42	-864.20	-2,307.67	8,510.37	8,314.16	196.21	43.373	
17,100.00	6,872.32	5,985.00	5,981.31	256.23	151.19	-56.42	-864.20	-2,307.67	8,539.12	8,342.90	196.22	43.519	
17,200.00	6,872.09	5,985.00	5,981.31	258.66	151.19	-56.42	-864.20	-2,307.67	8,637.58	8,441.35	196.24	44.016	
17,237.94	6,872.00	5,985.00	5,981.31	259.58	151.19	-56.42	-864.20	-2,307.67	8,674.95	8,478.71	196.24	44.205	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18C - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 395-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	0.00	0.00	0.00	0.00	-35.71	1,999.46	-1,437.28	2,463.15						
100.00	100.00	42.61	42.61	0.25	0.05	-35.71	1,999.46	-1,437.25	2,462.42	2,462.13	0.30	8,232.026			
200.00	200.00	146.54	146.54	0.61	0.17	-35.70	1,999.51	-1,436.93	2,462.28	2,461.50	0.77	3,178.537			
300.00	300.00	250.47	250.46	0.97	0.28	-35.69	1,999.60	-1,436.25	2,461.97	2,460.72	1.25	1,969.285			
400.00	400.00	354.39	354.38	1.33	0.40	-35.67	1,999.75	-1,435.22	2,461.51	2,459.79	1.73	1,426.357			
500.00	500.00	480.13	480.11	1.68	0.62	-35.66	1,999.04	-1,434.18	2,460.60	2,458.30	2.30	1,071.645			
600.00	600.00	571.70	571.55	2.04	0.81	-35.76	1,995.45	-1,436.95	2,459.18	2,456.35	2.84	867.251			
700.00	700.00	683.37	681.96	2.40	1.13	-36.14	1,984.67	-1,449.13	2,457.76	2,454.28	3.49	705.188			
800.00	800.00	778.53	773.89	2.76	1.48	-36.70	1,969.19	-1,467.99	2,456.38	2,452.14	4.23	580.271			
900.00	900.00	899.88	887.21	3.12	2.22	-37.71	1,941.75	-1,501.47	2,454.98	2,449.64	5.34	460.129			
1,000.00	1,000.00	1,017.94	995.05	3.48	3.08	-38.83	1,910.61	-1,538.04	2,453.35	2,446.79	6.56	374.249			
1,100.00	1,099.98	1,122.50	1,089.65	3.83	3.92	-3.14	1,880.80	-1,571.16	2,449.44	2,441.69	7.75	316.003			
1,200.08	1,199.92	1,202.00	1,160.53	4.19	4.62	-4.00	1,856.69	-1,597.86	2,442.69	2,433.89	8.81	277.389			
1,300.00	1,299.59	1,261.44	1,212.71	4.55	5.16	-4.68	1,838.11	-1,619.40	2,435.97	2,426.26	9.71	250.852			
1,400.00	1,399.35	1,340.01	1,280.53	4.91	5.96	-5.62	1,812.54	-1,649.76	2,430.82	2,419.97	10.86	223.912			
1,500.00	1,499.11	1,415.31	1,344.77	5.27	6.74	-6.56	1,787.37	-1,679.91	2,427.05	2,415.07	11.99	202.441			
1,600.00	1,598.86	1,500.39	1,416.96	5.63	7.59	-7.63	1,758.56	-1,714.49	2,424.54	2,411.36	13.19	183.874			
1,696.87	1,695.50	1,561.66	1,469.18	5.98	8.14	-8.40	1,738.28	-1,739.31	2,423.60	2,409.54	14.07	172.302			
1,700.00	1,698.62	1,563.53	1,470.79	6.00	8.16	-8.42	1,737.68	-1,740.07	2,423.60	2,409.51	14.09	171.973			
1,800.00	1,798.37	1,633.52	1,531.00	6.36	8.79	-9.27	1,715.75	-1,768.20	2,424.56	2,409.50	15.06	160.995			
1,900.00	1,898.13	1,714.47	1,600.67	6.72	9.57	-10.26	1,690.66	-1,800.90	2,426.93	2,410.76	16.16	150.154			
2,000.00	1,997.89	1,855.55	1,723.41	7.09	10.84	-11.91	1,647.38	-1,855.34	2,429.26	2,411.51	17.75	136.826			
2,100.00	2,097.64	1,936.15	1,793.77	7.45	11.57	-12.85	1,622.31	-1,885.63	2,431.76	2,412.96	18.79	129.390			
2,200.00	2,197.40	2,048.14	1,890.99	7.82	12.63	-14.18	1,586.57	-1,928.20	2,435.16	2,414.99	20.16	120.778			
2,300.00	2,297.16	2,141.96	1,972.07	8.19	13.55	-15.31	1,555.51	-1,963.74	2,438.90	2,417.53	21.37	114.115			
2,400.00	2,396.91	2,226.87	2,045.04	8.55	14.41	-16.34	1,526.75	-1,996.28	2,443.65	2,421.14	22.52	108.531			
2,500.00	2,496.67	2,315.35	2,121.22	8.92	15.26	-17.41	1,496.72	-2,029.78	2,449.13	2,425.50	23.63	103.633			
2,600.00	2,596.42	2,383.46	2,180.30	9.29	15.89	-18.21	1,474.83	-2,055.65	2,456.51	2,431.99	24.53	100.155			
2,700.00	2,696.18	2,610.14	2,382.88	9.66	17.76	-20.62	1,406.18	-2,130.50	2,461.16	2,434.50	26.65	92.338			
2,800.00	2,795.94	2,672.86	2,439.95	10.02	18.23	-21.24	1,388.26	-2,149.33	2,465.80	2,438.41	27.39	90.031			
2,900.00	2,895.69	2,945.97	2,696.68	10.39	19.91	-23.45	1,326.16	-2,216.94	2,471.59	2,442.30	29.29	84.372			
2,945.29	2,940.87	2,974.05	2,723.86	10.56	20.04	-23.62	1,321.01	-2,221.78	2,471.44	2,441.87	29.56	83.597			
3,000.00	2,995.45	3,011.22	2,759.82	10.76	20.22	-23.86	1,314.32	-2,228.35	2,471.64	2,441.73	29.90	82.656			
3,100.00	3,095.21	3,060.02	2,807.11	11.13	20.44	-24.15	1,306.22	-2,237.25	2,473.40	2,442.98	30.42	81.308			
3,200.00	3,194.96	3,195.84	2,939.29	11.49	21.03	-24.90	1,287.09	-2,261.86	2,476.68	2,445.39	31.29	79.161			
3,300.00	3,294.72	3,294.78	3,036.28	11.86	21.41	-25.39	1,274.64	-2,276.90	2,478.00	2,446.05	31.95	77.553			
3,400.00	3,394.47	3,441.95	3,181.86	12.23	21.84	-25.93	1,262.38	-2,294.54	2,478.42	2,445.73	32.68	75.829			
3,404.45	3,398.91	3,444.34	3,184.22	12.25	21.85	-25.94	1,262.17	-2,294.82	2,478.41	2,445.71	32.71	75.780			
3,500.00	3,494.23	3,623.78	3,361.45	12.60	22.41	-26.66	1,243.75	-2,315.55	2,478.78	2,445.26	33.52	73.942			
3,600.00	3,593.99	3,803.92	3,541.46	12.97	22.61	-26.91	1,240.07	-2,319.24	2,473.12	2,439.08	34.04	72.658			
3,700.00	3,693.74	3,903.68	3,641.21	13.34	22.71	-27.01	1,238.93	-2,319.51	2,466.63	2,432.13	34.50	71.489			
3,800.00	3,793.50	4,003.44	3,740.97	13.71	22.83	-27.11	1,237.78	-2,319.78	2,460.15	2,425.17	34.98	70.337			
3,900.00	3,893.26	4,103.21	3,840.73	14.07	22.95	-27.21	1,236.61	-2,320.06	2,453.68	2,418.23	35.45	69.215			
4,000.00	3,993.01	4,202.98	3,940.49	14.44	23.06	-27.31	1,235.44	-2,320.35	2,447.20	2,411.28	35.92	68.123			
4,100.00	4,092.77	4,302.74	4,040.25	14.81	23.18	-27.41	1,234.25	-2,320.63	2,440.74	2,404.34	36.40	67.058			
4,200.00	4,192.52	4,402.50	4,140.00	15.18	23.30	-27.52	1,233.04	-2,320.92	2,434.28	2,397.41	36.87	66.021			
4,300.00	4,292.28	4,502.26	4,239.75	15.55	23.42	-27.62	1,231.83	-2,321.21	2,427.82	2,390.48	37.35	65.010			
4,400.00	4,392.04	4,602.02	4,339.50	15.92	23.53	-27.73	1,230.60	-2,321.51	2,421.37	2,383.55	37.82	64.023			
4,500.00	4,491.79	4,701.78	4,439.25	16.29	23.65	-27.84	1,229.36	-2,321.80	2,414.93	2,376.63	38.29	63.061			
4,600.00	4,591.55	4,801.54	4,539.00	16.66	23.77	-27.94	1,228.10	-2,322.10	2,408.49	2,369.72	38.77	62.123			
4,700.00	4,691.31	4,901.29	4,638.75	17.03	23.89	-28.05	1,226.84	-2,322.41	2,402.06	2,362.81	39.25	61.207			
4,800.00	4,791.06	5,001.05	4,738.49	17.40	24.00	-28.16	1,225.56	-2,322.71	2,395.63	2,355.91	39.72	60.312			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18C - OH - OH												Offset Site Error:	0.00 usft
Survey Program:		395-APC_ISCWSA REV 2 MWD										Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Rule Assigned: Distance			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
4,900.00	4,890.82	5,100.80	4,838.24	17.76	24.12	-28.27	1,224.26	-2,323.02	2,389.21	2,349.01	40.20	59.439	
5,000.00	4,990.57	5,200.55	4,937.98	18.13	24.24	-28.38	1,222.96	-2,323.34	2,382.80	2,342.12	40.67	58.586	
5,100.00	5,090.33	5,300.30	5,037.72	18.50	24.36	-28.49	1,221.64	-2,323.65	2,376.39	2,335.24	41.15	57.752	
5,200.00	5,190.09	5,400.04	5,137.45	18.87	24.48	-28.61	1,220.31	-2,323.97	2,369.99	2,328.36	41.62	56.938	
5,300.00	5,289.84	5,499.79	5,237.19	19.24	24.60	-28.72	1,218.96	-2,324.29	2,363.59	2,321.49	42.10	56.142	
5,400.00	5,389.60	5,599.53	5,336.92	19.61	24.72	-28.84	1,217.61	-2,324.62	2,357.20	2,314.63	42.58	55.363	
5,500.00	5,489.35	5,699.28	5,436.66	19.98	24.84	-28.95	1,216.24	-2,324.95	2,350.82	2,307.77	43.05	54.602	
5,600.00	5,589.11	5,799.02	5,536.39	20.35	24.96	-29.07	1,214.85	-2,325.28	2,344.45	2,300.92	43.53	53.857	
5,700.00	5,688.87	5,898.76	5,636.12	20.72	25.08	-29.19	1,213.46	-2,325.61	2,338.08	2,294.07	44.01	53.129	
5,800.00	5,788.62	5,998.49	5,735.84	21.09	25.20	-29.30	1,212.05	-2,325.95	2,331.72	2,287.24	44.49	52.416	
5,900.00	5,888.38	6,098.23	5,835.57	21.46	25.32	-29.42	1,210.63	-2,326.29	2,325.37	2,280.41	44.96	51.718	
6,000.00	5,988.14	6,197.96	5,935.29	21.83	25.44	-29.54	1,209.20	-2,326.64	2,319.03	2,273.59	45.44	51.035	
6,100.00	6,087.89	6,297.70	6,035.02	22.20	25.56	-29.67	1,207.75	-2,326.98	2,312.69	2,266.77	45.92	50.366	
6,200.00	6,187.65	6,397.43	6,134.74	22.57	25.68	-29.79	1,206.29	-2,327.33	2,306.36	2,259.97	46.40	49.711	
6,299.50	6,286.91	6,496.66	6,233.96	22.93	25.80	-29.91	1,204.83	-2,327.68	2,300.08	2,253.20	46.87	49.072	
6,350.00	6,337.14	6,546.89	6,284.18	23.12	25.86	-2.27	1,204.08	-2,327.86	2,295.03	2,247.92	47.11	48.712	
6,400.00	6,386.40	6,596.15	6,333.44	23.32	25.92	6.81	1,203.34	-2,328.04	2,286.42	2,239.06	47.36	48.280	
6,450.00	6,434.88	6,644.65	6,381.92	23.52	25.98	11.38	1,202.62	-2,328.21	2,274.24	2,226.64	47.60	47.777	
6,500.00	6,482.27	6,692.07	6,429.34	23.73	26.04	14.37	1,201.90	-2,328.39	2,258.59	2,210.75	47.84	47.209	
6,550.00	6,528.29	6,738.13	6,475.40	23.94	26.09	16.73	1,201.21	-2,328.55	2,239.56	2,191.48	48.08	46.580	
6,600.00	6,572.65	6,782.54	6,519.80	24.16	26.15	18.86	1,200.53	-2,328.71	2,217.28	2,168.96	48.31	45.894	
6,650.00	6,615.08	6,825.04	6,562.29	24.39	26.20	20.98	1,199.89	-2,328.87	2,191.89	2,143.35	48.54	45.157	
6,700.00	6,655.31	6,865.35	6,602.60	24.64	26.25	23.24	1,199.27	-2,329.02	2,163.58	2,114.82	48.76	44.374	
6,750.00	6,693.11	6,903.23	6,640.48	24.90	26.30	25.75	1,198.69	-2,329.16	2,132.52	2,083.55	48.97	43.548	
6,800.00	6,728.23	6,938.45	6,675.70	25.18	26.34	28.64	1,198.15	-2,329.29	2,098.94	2,049.76	49.17	42.685	
6,850.00	6,760.46	6,970.79	6,708.03	25.50	26.38	32.01	1,197.65	-2,329.41	2,063.05	2,013.69	49.37	41.789	
6,900.00	6,789.60	7,000.05	6,737.29	25.84	26.41	36.00	1,197.20	-2,329.51	2,025.12	1,975.56	49.56	40.865	
6,950.00	6,815.47	7,026.05	6,763.28	26.21	26.45	40.74	1,196.79	-2,329.61	1,985.40	1,935.66	49.74	39.916	
7,000.00	6,837.91	7,048.63	6,785.86	26.63	26.47	46.38	1,196.44	-2,329.69	1,944.17	1,894.25	49.92	38.946	
7,050.00	6,856.78	7,067.65	6,804.87	27.08	26.50	53.02	1,196.15	-2,329.77	1,901.72	1,851.62	50.10	37.959	
7,100.00	6,871.97	7,082.99	6,820.21	27.57	26.52	60.64	1,195.91	-2,329.82	1,858.35	1,808.07	50.28	36.960	
7,150.00	6,883.39	7,094.55	6,831.78	28.10	26.53	69.08	1,195.73	-2,329.87	1,814.35	1,763.89	50.47	35.952	
7,200.00	6,890.95	7,102.28	6,839.50	28.66	26.54	77.98	1,195.61	-2,329.89	1,770.05	1,719.39	50.66	34.939	
7,250.00	6,894.63	7,106.11	6,843.34	29.25	26.54	86.83	1,195.55	-2,329.91	1,725.75	1,674.88	50.87	33.925	
7,273.35	6,895.00	7,106.57	6,843.79	29.54	26.54	90.80	1,195.54	-2,329.91	1,705.15	1,654.18	50.97	33.453	
7,300.00	6,894.94	7,106.59	6,843.81	29.87	26.54	90.80	1,195.54	-2,329.91	1,681.74	1,630.64	51.10	32.913	
7,400.00	6,894.71	7,106.69	6,843.91	31.22	26.54	90.81	1,195.54	-2,329.91	1,594.79	1,543.14	51.65	30.876	
7,500.00	6,894.48	7,106.79	6,844.01	32.69	26.54	90.81	1,195.54	-2,329.91	1,509.47	1,457.10	52.37	28.822	
7,600.00	6,894.25	7,106.88	6,844.11	34.27	26.54	90.82	1,195.54	-2,329.91	1,426.05	1,372.76	53.29	26.759	
7,700.00	6,894.01	7,106.98	6,844.20	35.95	26.54	90.83	1,195.54	-2,329.91	1,344.89	1,290.45	54.45	24.701	
7,800.00	6,893.78	7,107.08	6,844.30	37.71	26.54	90.83	1,195.53	-2,329.91	1,266.44	1,210.56	55.87	22.666	
7,900.00	6,893.55	7,107.18	6,844.40	39.54	26.54	90.84	1,195.53	-2,329.91	1,191.21	1,133.61	57.61	20.678	
8,000.00	6,893.32	7,107.28	6,844.50	41.44	26.55	90.85	1,195.53	-2,329.91	1,119.87	1,060.20	59.67	18.768	
8,100.00	6,893.09	7,107.37	6,844.59	43.39	26.55	90.85	1,195.53	-2,329.91	1,053.20	991.14	62.06	16.970	
8,200.00	6,892.86	7,107.47	6,844.69	45.39	26.55	90.86	1,195.53	-2,329.91	992.15	927.39	64.76	15.320	
8,300.00	6,892.63	7,107.57	6,844.79	47.44	26.55	90.87	1,195.53	-2,329.91	937.81	870.11	67.70	13.853	
8,400.00	6,892.40	7,107.67	6,844.89	49.51	26.55	90.87	1,195.52	-2,329.91	891.41	820.66	70.75	12.600	
8,500.00	6,892.17	7,107.76	6,844.98	51.62	26.55	90.88	1,195.52	-2,329.92	854.25	780.52	73.73	11.587	
8,600.00	6,891.94	7,107.86	6,845.08	53.76	26.55	90.89	1,195.52	-2,329.92	827.56	751.15	76.41	10.830	
8,700.00	6,891.71	7,107.96	6,845.18	55.92	26.55	90.90	1,195.52	-2,329.92	812.39	733.82	78.58	10.339	
8,774.38	6,891.54	7,108.03	6,845.25	57.55	26.55	90.90	1,195.52	-2,329.92	808.98	729.23	79.75	10.144	CC, ES
8,800.00	6,891.48	7,108.06	6,845.28	58.11	26.55	90.90	1,195.52	-2,329.92	809.39	729.34	80.05	10.111	SF

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18C - OH - OH												Offset Site Error:	0.00 usft
Survey Program:		395-APC_ISCWSA REV 2 MWD						Rule Assigned:				Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance			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
8,900.00	6,891.25	7,108.15	6,845.38	60.31	26.55	90.91	1,195.52	-2,329.92	818.68	737.91	80.76	10.137	
9,000.00	6,891.01	7,108.25	6,845.47	62.54	26.55	90.92	1,195.52	-2,329.92	839.85	759.09	80.76	10.399	
9,100.00	6,890.78	7,108.35	6,845.57	64.78	26.55	90.92	1,195.51	-2,329.92	872.05	791.86	80.19	10.875	
9,200.00	6,890.55	7,108.45	6,845.67	67.03	26.55	90.93	1,195.51	-2,329.92	914.11	834.88	79.23	11.537	
9,300.00	6,890.32	7,108.55	6,845.77	69.29	26.55	90.94	1,195.51	-2,329.92	964.74	886.68	78.06	12.359	
9,400.00	6,890.09	7,108.64	6,845.86	71.57	26.55	90.94	1,195.51	-2,329.92	1,022.67	945.87	76.80	13.316	
9,500.00	6,889.86	7,108.74	6,845.96	73.86	26.55	90.95	1,195.51	-2,329.92	1,086.73	1,011.18	75.55	14.385	
9,600.00	6,889.63	7,108.84	6,846.06	76.16	26.55	90.96	1,195.51	-2,329.92	1,155.90	1,081.56	74.34	15.549	
9,700.00	6,889.40	7,108.94	6,846.16	78.46	26.55	90.96	1,195.50	-2,329.92	1,229.32	1,156.11	73.21	16.791	
9,800.00	6,889.17	7,109.04	6,846.26	80.78	26.55	90.97	1,195.50	-2,329.92	1,306.27	1,234.10	72.17	18.100	
9,900.00	6,888.94	7,109.13	6,846.35	83.10	26.55	90.98	1,195.50	-2,329.92	1,386.17	1,314.96	71.21	19.465	
10,000.00	6,888.71	7,109.23	6,846.45	85.43	26.55	90.99	1,195.50	-2,329.92	1,468.53	1,398.19	70.34	20.877	
10,100.00	6,888.48	7,109.33	6,846.55	87.76	26.55	90.99	1,195.50	-2,329.92	1,552.97	1,483.42	69.55	22.330	
10,200.00	6,888.25	7,109.43	6,846.65	90.10	26.55	91.00	1,195.50	-2,329.92	1,639.16	1,570.34	68.82	23.817	
10,300.00	6,888.01	7,109.52	6,846.74	92.45	26.55	91.01	1,195.50	-2,329.92	1,726.84	1,658.67	68.16	25.334	
10,400.00	6,887.78	7,109.62	6,846.84	94.80	26.55	91.01	1,195.49	-2,329.92	1,815.79	1,748.23	67.56	26.876	
10,500.00	6,887.55	7,109.72	6,846.94	97.15	26.55	91.02	1,195.49	-2,329.92	1,905.84	1,838.83	67.01	28.441	
10,600.00	6,887.32	7,109.82	6,847.04	99.51	26.55	91.03	1,195.49	-2,329.92	1,996.83	1,930.32	66.51	30.024	
10,700.00	6,887.09	7,109.92	6,847.14	101.87	26.55	91.03	1,195.49	-2,329.92	2,088.65	2,022.60	66.05	31.623	
10,800.00	6,886.86	7,110.01	6,847.23	104.24	26.55	91.04	1,195.49	-2,329.92	2,181.19	2,115.56	65.63	33.237	
10,900.00	6,886.63	7,110.11	6,847.33	106.61	26.55	91.05	1,195.49	-2,329.92	2,274.36	2,209.12	65.24	34.863	
11,000.00	6,886.40	7,110.21	6,847.43	108.98	26.55	91.05	1,195.48	-2,329.92	2,368.09	2,303.21	64.88	36.499	
11,100.00	6,886.17	7,110.31	6,847.53	111.36	26.55	91.06	1,195.48	-2,329.92	2,462.31	2,397.75	64.55	38.145	
11,200.00	6,885.94	7,110.41	6,847.63	113.74	26.55	91.07	1,195.48	-2,329.92	2,556.97	2,492.72	64.25	39.798	
11,300.00	6,885.71	7,110.50	6,847.72	116.12	26.55	91.08	1,195.48	-2,329.93	2,652.02	2,588.05	63.97	41.458	
11,400.00	6,885.48	7,110.60	6,847.82	118.51	26.55	91.08	1,195.48	-2,329.93	2,747.42	2,683.71	63.71	43.123	
11,500.00	6,885.25	7,110.70	6,847.92	120.89	26.55	91.09	1,195.48	-2,329.93	2,843.14	2,779.67	63.47	44.794	
11,600.00	6,885.01	7,110.80	6,848.02	123.28	26.55	91.10	1,195.48	-2,329.93	2,939.14	2,875.89	63.25	46.469	
11,700.00	6,884.78	7,110.89	6,848.12	125.67	26.55	91.10	1,195.47	-2,329.93	3,035.41	2,972.36	63.04	48.147	
11,800.00	6,884.55	7,110.99	6,848.21	128.07	26.55	91.11	1,195.47	-2,329.93	3,131.90	3,069.05	62.85	49.828	
11,900.00	6,884.32	7,111.09	6,848.31	130.46	26.55	91.12	1,195.47	-2,329.93	3,228.61	3,165.94	62.68	51.511	
12,000.00	6,884.09	7,111.19	6,848.41	132.86	26.55	91.12	1,195.47	-2,329.93	3,325.52	3,263.00	62.51	53.196	
12,100.00	6,883.86	7,111.29	6,848.51	135.25	26.55	91.13	1,195.47	-2,329.93	3,422.60	3,360.24	62.36	54.883	
12,200.00	6,883.63	7,111.38	6,848.60	137.65	26.55	91.14	1,195.47	-2,329.93	3,519.85	3,457.62	62.22	56.570	
12,300.00	6,883.40	7,111.48	6,848.70	140.05	26.55	91.15	1,195.46	-2,329.93	3,617.24	3,555.15	62.09	58.258	
12,400.00	6,883.17	7,111.58	6,848.80	142.46	26.55	91.15	1,195.46	-2,329.93	3,714.78	3,652.81	61.97	59.947	
12,500.00	6,882.94	7,111.68	6,848.90	144.86	26.55	91.16	1,195.46	-2,329.93	3,812.44	3,750.58	61.86	61.635	
12,600.00	6,882.71	7,111.78	6,849.00	147.27	26.55	91.17	1,195.46	-2,329.93	3,910.22	3,848.47	61.75	63.323	
12,700.00	6,882.48	7,111.87	6,849.09	149.67	26.55	91.17	1,195.46	-2,329.93	4,008.11	3,946.45	61.65	65.010	
12,800.00	6,882.25	7,111.97	6,849.19	152.08	26.55	91.18	1,195.46	-2,329.93	4,106.10	4,044.54	61.56	66.697	
12,900.00	6,882.01	7,112.07	6,849.29	154.49	26.55	91.19	1,195.46	-2,329.93	4,204.19	4,142.71	61.48	68.383	
13,000.00	6,881.78	7,112.17	6,849.39	156.90	26.55	91.19	1,195.45	-2,329.93	4,302.36	4,240.96	61.40	70.067	
13,100.00	6,881.55	7,112.27	6,849.49	159.31	26.55	91.20	1,195.45	-2,329.93	4,400.62	4,339.28	61.33	71.750	
13,200.00	6,881.32	7,112.36	6,849.58	161.72	26.55	91.21	1,195.45	-2,329.93	4,498.95	4,437.68	61.27	73.431	
13,300.00	6,881.09	7,112.46	6,849.68	164.13	26.55	91.21	1,195.45	-2,329.93	4,597.35	4,536.15	61.21	75.111	
13,400.00	6,880.86	7,112.56	6,849.78	166.55	26.55	91.22	1,195.45	-2,329.93	4,695.83	4,634.67	61.15	76.789	
13,500.00	6,880.63	7,112.66	6,849.88	168.96	26.55	91.23	1,195.45	-2,329.93	4,794.36	4,733.26	61.10	78.464	
13,600.00	6,880.40	7,112.76	6,849.98	171.38	26.55	91.24	1,195.44	-2,329.93	4,892.96	4,831.90	61.06	80.138	
13,700.00	6,880.17	7,112.85	6,850.07	173.79	26.55	91.24	1,195.44	-2,329.93	4,991.61	4,930.59	61.02	81.809	
13,800.00	6,879.94	7,112.95	6,850.17	176.21	26.55	91.25	1,195.44	-2,329.93	5,090.31	5,029.33	60.98	83.477	
13,900.00	6,879.71	7,113.05	6,850.27	178.63	26.55	91.26	1,195.44	-2,329.93	5,189.07	5,128.12	60.94	85.144	
14,000.00	6,879.48	7,113.15	6,850.37	181.04	26.55	91.26	1,195.44	-2,329.94	5,287.87	5,226.95	60.92	86.807	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 18C - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 395-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)			
14,100.00	6,879.25	7,113.25	6,850.47	183.46	26.55	91.27	1,195.44	-2,329.94	5,386.71	5,325.82	60.89	88.468	
14,200.00	6,879.01	7,113.34	6,850.56	185.88	26.55	91.28	1,195.44	-2,329.94	5,485.60	5,424.73	60.87	90.126	
14,300.00	6,878.78	7,113.44	6,850.66	188.30	26.55	91.28	1,195.43	-2,329.94	5,584.52	5,523.68	60.85	91.781	
14,400.00	6,878.55	7,113.54	6,850.76	190.72	26.55	91.29	1,195.43	-2,329.94	5,683.49	5,622.66	60.83	93.433	
14,500.00	6,878.32	7,113.64	6,850.86	193.14	26.55	91.30	1,195.43	-2,329.94	5,782.49	5,721.67	60.82	95.082	
14,600.00	6,878.09	7,113.74	6,850.96	195.56	26.55	91.30	1,195.43	-2,329.94	5,881.52	5,820.71	60.81	96.727	
14,700.00	6,877.86	7,113.84	6,851.06	197.99	26.55	91.31	1,195.43	-2,329.94	5,980.58	5,919.79	60.80	98.370	
14,800.00	6,877.63	7,113.93	6,851.15	200.41	26.55	91.32	1,195.43	-2,329.94	6,079.68	6,018.89	60.79	100.009	
14,900.00	6,877.40	7,114.03	6,851.25	202.83	26.55	91.33	1,195.42	-2,329.94	6,178.81	6,118.02	60.79	101.644	
15,000.00	6,877.17	7,114.13	6,851.35	205.25	26.55	91.33	1,195.42	-2,329.94	6,277.96	6,217.17	60.79	103.276	
15,100.00	6,876.94	7,114.23	6,851.45	207.68	26.55	91.34	1,195.42	-2,329.94	6,377.14	6,316.35	60.79	104.905	
15,200.00	6,876.71	7,114.33	6,851.55	210.10	26.55	91.35	1,195.42	-2,329.94	6,476.34	6,415.55	60.79	106.530	
15,300.00	6,876.48	7,114.42	6,851.64	212.53	26.55	91.35	1,195.42	-2,329.94	6,575.57	6,514.77	60.80	108.151	
15,400.00	6,876.25	7,114.52	6,851.74	214.95	26.55	91.36	1,195.42	-2,329.94	6,674.82	6,614.01	60.81	109.769	
15,500.00	6,876.01	7,114.62	6,851.84	217.38	26.55	91.37	1,195.42	-2,329.94	6,774.10	6,713.28	60.82	111.382	
15,600.00	6,875.78	7,114.72	6,851.94	219.80	26.55	91.37	1,195.41	-2,329.94	6,873.39	6,812.56	60.83	112.992	
15,700.00	6,875.55	7,114.82	6,852.04	222.23	26.55	91.38	1,195.41	-2,329.94	6,972.71	6,911.86	60.84	114.598	
15,800.00	6,875.32	7,114.91	6,852.13	224.66	26.55	91.39	1,195.41	-2,329.94	7,072.04	7,011.18	60.86	116.201	
15,900.00	6,875.09	7,115.01	6,852.23	227.08	26.55	91.40	1,195.41	-2,329.94	7,171.39	7,110.51	60.88	117.799	
16,000.00	6,874.86	7,115.11	6,852.33	229.51	26.55	91.40	1,195.41	-2,329.94	7,270.76	7,209.86	60.90	119.393	
16,100.00	6,874.63	7,115.21	6,852.43	231.94	26.55	91.41	1,195.41	-2,329.94	7,370.15	7,309.23	60.92	120.983	
16,200.00	6,874.40	7,115.31	6,852.53	234.37	26.55	91.42	1,195.40	-2,329.94	7,469.55	7,408.61	60.94	122.569	
16,300.00	6,874.17	7,115.41	6,852.63	236.79	26.56	91.42	1,195.40	-2,329.94	7,568.97	7,508.01	60.97	124.151	
16,400.00	6,873.94	7,115.50	6,852.72	239.22	26.56	91.43	1,195.40	-2,329.94	7,668.41	7,607.42	60.99	125.728	
16,500.00	6,873.71	7,115.60	6,852.82	241.65	26.56	91.44	1,195.40	-2,329.94	7,767.86	7,706.84	61.02	127.302	
16,600.00	6,873.48	7,115.70	6,852.92	244.08	26.56	91.44	1,195.40	-2,329.94	7,867.32	7,806.27	61.05	128.871	
16,700.00	6,873.25	7,115.80	6,853.02	246.51	26.56	91.45	1,195.40	-2,329.95	7,966.80	7,905.72	61.08	130.436	
16,800.00	6,873.02	7,115.90	6,853.12	248.94	26.56	91.46	1,195.40	-2,329.95	8,066.29	8,005.18	61.11	131.997	
16,900.00	6,872.78	7,115.99	6,853.21	251.37	26.56	91.46	1,195.39	-2,329.95	8,165.79	8,104.65	61.14	133.553	
17,000.00	6,872.55	7,116.09	6,853.31	253.80	26.56	91.47	1,195.39	-2,329.95	8,265.30	8,204.12	61.18	135.105	
17,070.79	6,872.39	7,116.16	6,853.38	255.52	26.56	91.48	1,195.39	-2,329.95	8,335.76	8,274.55	61.20	136.200	
17,100.00	6,872.32	7,116.19	6,853.41	256.23	26.56	91.48	1,195.39	-2,329.95	8,364.83	8,303.61	61.21	136.652	
17,200.00	6,872.09	7,116.29	6,853.51	258.66	26.56	91.49	1,195.39	-2,329.95	8,464.36	8,403.11	61.25	138.195	
17,237.94	6,872.00	7,116.33	6,853.55	259.58	26.56	91.49	1,195.39	-2,329.95	8,502.13	8,440.87	61.26	138.779	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 201A - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-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	0.00	0.00	0.00	0.00	-111.56	-897.51	-2,271.96	2,444.19				
100.00	100.00	18.81	18.81	0.25	0.02	-111.56	-897.51	-2,271.96	2,442.81	2,442.54	0.27	8,972.782	
200.00	200.00	123.30	123.30	0.61	0.14	-111.55	-897.36	-2,271.88	2,442.68	2,441.94	0.75	3,265.496	
300.00	300.00	231.54	231.54	0.97	0.30	-111.55	-896.98	-2,271.64	2,442.35	2,441.09	1.26	1,933.349	
400.00	400.00	350.07	350.07	1.33	0.56	-111.54	-896.14	-2,270.78	2,441.42	2,439.53	1.89	1,293.732	
500.00	500.00	462.37	462.34	1.68	0.81	-111.52	-894.92	-2,269.31	2,439.80	2,437.30	2.50	977.065	
600.00	600.00	570.11	570.06	2.04	1.06	-111.50	-893.36	-2,267.64	2,437.83	2,434.73	3.10	787.187	
700.00	700.00	672.28	672.20	2.40	1.28	-111.48	-891.62	-2,265.90	2,435.61	2,431.93	3.68	661.570	
800.00	800.00	772.31	772.21	2.76	1.51	-111.46	-889.88	-2,264.19	2,433.39	2,429.13	4.26	571.160	
900.00	900.00	4,914.04	3,046.48	3.12	47.07	-49.04	606.86	-699.07	2,413.11	2,387.63	25.48	94.721	
1,000.00	1,000.00	4,914.14	3,046.48	3.48	47.07	-49.03	606.94	-699.01	2,321.08	2,294.98	26.10	88.931	
1,100.00	1,099.98	4,914.61	3,046.48	3.83	47.08	-13.31	607.30	-698.69	2,229.04	2,202.26	26.78	83.241	
1,200.08	1,199.92	4,915.82	3,046.48	4.19	47.11	-14.40	608.21	-697.90	2,136.29	2,108.80	27.49	77.713	
1,300.00	1,299.59	4,917.36	3,046.48	4.55	47.14	-14.29	609.36	-696.89	2,043.71	2,015.47	28.23	72.387	
1,400.00	1,399.35	4,918.85	3,046.48	4.91	47.17	-14.18	610.49	-695.91	1,951.77	1,922.73	29.04	67.206	
1,500.00	1,499.11	4,920.31	3,046.48	5.27	47.20	-14.08	611.59	-694.96	1,860.66	1,830.73	29.93	62.159	
1,600.00	1,598.86	4,921.72	3,046.48	5.63	47.23	-13.97	612.66	-694.03	1,770.52	1,739.60	30.92	57.262	
1,700.00	1,698.62	4,923.10	3,046.48	6.00	47.26	-13.87	613.70	-693.13	1,681.49	1,649.48	32.01	52.529	
1,800.00	1,798.37	4,924.44	3,046.48	6.36	47.28	-13.78	614.71	-692.25	1,593.76	1,560.54	33.22	47.977	
1,900.00	1,898.13	4,925.75	3,046.48	6.72	47.31	-13.68	615.70	-691.39	1,507.55	1,472.99	34.56	43.622	
2,000.00	1,997.89	4,927.02	3,046.48	7.09	47.34	-13.59	616.67	-690.56	1,423.15	1,387.11	36.04	39.484	
2,100.00	2,097.64	4,928.26	3,046.47	7.45	47.36	-13.50	617.61	-689.75	1,340.90	1,303.21	37.69	35.579	
2,200.00	2,197.40	4,929.47	3,046.47	7.82	47.39	-13.41	618.52	-688.96	1,261.21	1,221.71	39.50	31.926	
2,300.00	2,297.16	4,930.65	3,046.47	8.19	47.41	-13.32	619.41	-688.19	1,184.61	1,143.11	41.50	28.546	
2,400.00	2,396.91	4,931.81	3,046.47	8.55	47.44	-13.24	620.29	-687.43	1,111.72	1,068.05	43.67	25.458	
2,500.00	2,496.67	4,932.93	3,046.47	8.92	47.46	-13.16	621.14	-686.70	1,043.34	997.34	46.00	22.682	
2,600.00	2,596.42	4,934.03	3,046.46	9.29	47.48	-13.08	621.97	-685.98	980.40	931.96	48.45	20.237	
2,700.00	2,696.18	4,935.10	3,046.46	9.66	47.50	-13.00	622.78	-685.29	924.02	873.08	50.94	18.140	
2,800.00	2,795.94	4,936.14	3,046.46	10.02	47.52	-12.92	623.58	-684.60	875.47	822.12	53.35	16.410	
2,900.00	2,895.69	4,937.17	3,046.45	10.39	47.55	-12.85	624.35	-683.94	836.10	780.59	55.52	15.061	
3,000.00	2,995.45	4,938.17	3,046.45	10.76	47.57	-12.77	625.11	-683.29	807.27	750.04	57.23	14.105	
3,100.00	3,095.21	4,939.14	3,046.45	11.13	47.59	-12.70	625.85	-682.65	790.13	731.82	58.31	13.551	
3,186.92	3,181.92	4,939.97	3,046.45	11.45	47.60	-12.64	626.48	-682.11	785.33	726.73	58.60	13.401 CC, ES, SF	
3,200.00	3,194.96	4,940.10	3,046.45	11.49	47.61	-12.63	626.58	-682.03	785.44	726.85	58.59	13.405	
3,300.00	3,294.72	4,941.03	3,046.44	11.86	47.63	-12.57	627.28	-681.42	793.43	735.38	58.05	13.668	
3,400.00	3,394.47	4,941.95	3,046.44	12.23	47.64	-12.50	627.98	-680.83	813.72	756.96	56.76	14.336	
3,500.00	3,494.23	4,942.84	3,046.44	12.60	47.66	-12.43	628.66	-680.24	845.43	790.54	54.89	15.401	
3,600.00	3,593.99	4,943.71	3,046.43	12.97	47.68	-12.37	629.32	-679.68	887.33	834.67	52.66	16.850	
3,700.00	3,693.74	4,944.57	3,046.43	13.34	47.70	-12.31	629.97	-679.12	938.06	887.81	50.25	18.667	
3,800.00	3,793.50	4,945.41	3,046.43	13.71	47.72	-12.25	630.61	-678.57	996.28	948.44	47.83	20.829	
3,900.00	3,893.26	4,946.23	3,046.42	14.07	47.73	-12.19	631.24	-678.04	1,060.74	1,015.24	45.50	23.311	
4,000.00	3,993.01	4,947.04	3,046.42	14.44	47.75	-12.13	631.85	-677.52	1,130.38	1,087.05	43.33	26.088	
4,100.00	4,092.77	4,947.83	3,046.42	14.81	47.77	-12.07	632.45	-677.01	1,204.31	1,162.96	41.35	29.128	
4,200.00	4,192.52	4,948.60	3,046.41	15.18	47.78	-12.01	633.04	-676.51	1,281.78	1,242.22	39.56	32.401	
4,300.00	4,292.28	4,949.36	3,046.41	15.55	47.80	-11.96	633.61	-676.01	1,362.19	1,324.22	37.97	35.877	
4,400.00	4,392.04	4,950.10	3,046.40	15.92	47.81	-11.90	634.18	-675.53	1,445.04	1,408.48	36.56	39.525	
4,500.00	4,491.79	4,950.83	3,046.40	16.29	47.83	-11.85	634.73	-675.06	1,529.95	1,494.63	35.32	43.316	
4,600.00	4,591.55	4,951.54	3,046.40	16.66	47.84	-11.80	635.28	-674.60	1,616.58	1,582.34	34.23	47.221	
4,700.00	4,691.31	4,952.24	3,046.39	17.03	47.86	-11.75	635.81	-674.14	1,704.67	1,671.39	33.28	51.215	
4,800.00	4,791.06	4,952.93	3,046.39	17.40	47.87	-11.70	636.34	-673.70	1,794.02	1,761.56	32.46	55.272	
4,900.00	4,890.82	4,953.60	3,046.39	17.76	47.88	-11.65	636.85	-673.26	1,884.43	1,852.69	31.74	59.372	
5,000.00	4,990.57	4,954.27	3,046.38	18.13	47.90	-11.60	637.36	-672.83	1,975.77	1,944.65	31.12	63.495	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 201A - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-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)			
5,100.00	5,090.33	4,954.92	3,046.38	18.50	47.91	-11.55	637.85	-672.41	2,067.91	2,037.33	30.58	67.623	
5,200.00	5,190.09	4,955.55	3,046.37	18.87	47.92	-11.51	638.34	-672.00	2,160.75	2,130.63	30.12	71.742	
5,300.00	5,289.84	4,956.18	3,046.37	19.24	47.94	-11.46	638.82	-671.59	2,254.20	2,224.48	29.72	75.838	
5,400.00	5,389.60	4,956.80	3,046.37	19.61	47.95	-11.42	639.28	-671.20	2,348.19	2,318.80	29.39	79.901	
5,500.00	5,489.35	4,957.40	3,046.36	19.98	47.96	-11.37	639.75	-670.81	2,442.66	2,413.55	29.11	83.920	
5,600.00	5,589.11	4,958.00	3,046.36	20.35	47.97	-11.33	640.20	-670.42	2,537.55	2,508.67	28.87	87.889	
5,700.00	5,688.87	4,971.00	3,046.26	20.72	48.24	-10.38	650.14	-662.04	2,632.86	2,604.06	28.81	91.393	
5,800.00	5,788.62	4,971.00	3,046.26	21.09	48.24	-10.38	650.14	-662.04	2,728.47	2,699.82	28.65	95.249	
5,900.00	5,888.38	4,971.00	3,046.26	21.46	48.24	-10.38	650.14	-662.04	2,824.37	2,795.85	28.52	99.040	
6,000.00	5,988.14	4,971.00	3,046.26	21.83	48.24	-10.38	650.14	-662.04	2,920.55	2,892.13	28.42	102.761	
6,100.00	6,087.89	4,971.00	3,046.26	22.20	48.24	-10.38	650.14	-662.04	3,016.98	2,988.63	28.35	106.411	
6,200.00	6,187.65	4,971.00	3,046.26	22.57	48.24	-10.38	650.14	-662.04	3,113.64	3,085.33	28.31	109.988	
6,299.50	6,286.91	4,971.00	3,046.26	22.93	48.24	-10.38	650.14	-662.04	3,210.01	3,181.72	28.29	113.472	
6,350.00	6,337.14	4,971.00	3,046.26	23.12	48.24	7.63	650.14	-662.04	3,258.58	3,230.31	28.27	115.253	
6,400.00	6,386.40	4,971.00	3,046.26	23.32	48.24	10.29	650.14	-662.04	3,305.73	3,277.49	28.24	117.059	
6,450.00	6,434.88	4,956.24	3,046.37	23.52	47.94	9.64	638.86	-671.56	3,351.64	3,323.58	28.06	119.453	
6,500.00	6,482.27	4,951.58	3,046.40	23.73	47.84	8.90	635.31	-674.57	3,396.16	3,368.20	27.96	121.465	
6,550.00	6,528.29	4,945.58	3,046.42	23.94	47.72	8.08	630.74	-678.46	3,439.02	3,411.17	27.84	123.521	
6,600.00	6,572.65	4,938.26	3,046.45	24.16	47.57	7.31	625.18	-683.22	3,480.01	3,452.30	27.71	125.607	
6,650.00	6,615.08	4,929.66	3,046.47	24.39	47.39	6.61	618.66	-688.83	3,518.94	3,491.39	27.56	127.705	
6,700.00	6,655.31	4,919.81	3,046.48	24.64	47.19	5.99	611.22	-695.28	3,555.63	3,528.24	27.39	129.798	
6,750.00	6,693.11	4,906.00	3,046.46	24.90	46.90	5.40	600.81	-704.36	3,589.90	3,562.70	27.20	131.981	
6,800.00	6,728.23	4,889.93	3,046.43	25.18	46.57	4.85	588.73	-714.96	3,621.58	3,594.58	26.99	134.167	
6,850.00	6,760.46	4,867.36	3,046.38	25.50	46.11	4.28	571.78	-729.86	3,650.48	3,623.74	26.74	136.519	
6,900.00	6,789.60	4,843.00	3,046.32	25.84	45.61	3.76	553.49	-745.96	3,676.46	3,649.98	26.48	138.824	
6,950.00	6,815.47	4,843.00	3,046.32	26.21	45.61	3.63	553.49	-745.96	3,699.48	3,673.04	26.44	139.917	
7,000.00	6,837.91	4,815.60	3,046.19	26.63	45.04	3.17	533.25	-764.41	3,719.34	3,693.15	26.19	142.016	
7,050.00	6,856.78	4,747.66	3,046.04	27.08	43.60	2.28	485.67	-812.90	3,736.07	3,710.42	25.65	145.661	
7,100.00	6,871.97	4,677.04	3,047.10	27.57	42.08	1.45	437.30	-864.32	3,748.66	3,723.54	25.12	149.220	
7,150.00	6,883.39	4,618.03	3,048.21	28.10	40.81	0.78	396.33	-906.77	3,757.74	3,733.04	24.71	152.103	
7,200.00	6,890.95	4,559.63	3,049.83	28.66	39.54	0.14	355.84	-948.82	3,762.94	3,738.62	24.32	154.733	
7,250.00	6,894.63	4,541.30	3,050.33	29.25	39.14	-0.05	343.15	-962.05	3,764.62	3,740.37	24.24	155.293	
7,273.35	6,895.00	4,523.00	3,050.75	29.54	38.73	-0.24	330.49	-975.25	3,764.25	3,740.11	24.14	155.913	
7,300.00	6,894.94	4,523.00	3,050.75	29.87	38.73	-0.24	330.49	-975.25	3,763.42	3,739.24	24.19	155.607	
7,400.00	6,894.71	4,486.07	3,051.35	31.22	37.92	-0.64	304.90	-1,001.87	3,761.65	3,737.51	24.14	155.820	
7,432.32	6,894.63	4,474.20	3,051.48	31.69	37.67	-0.77	296.67	-1,010.42	3,761.50	3,737.35	24.15	155.743	
7,500.00	6,894.48	4,443.69	3,051.66	32.69	37.01	-1.11	275.46	-1,032.35	3,761.84	3,737.69	24.15	155.757	
7,600.00	6,894.25	4,267.00	3,055.61	34.27	33.22	-3.01	154.01	-1,160.58	3,761.93	3,738.60	23.33	161.276	
7,700.00	6,894.01	4,239.05	3,056.41	35.95	32.61	-3.31	135.19	-1,181.22	3,763.35	3,739.74	23.61	159.424	
7,800.00	6,893.78	4,204.00	3,056.72	37.71	31.84	-3.68	111.81	-1,207.34	3,767.10	3,743.18	23.91	157.538	
7,900.00	6,893.55	4,165.28	3,056.68	39.54	30.99	-4.08	86.08	-1,236.27	3,772.80	3,748.54	24.26	155.509	
8,000.00	6,893.32	4,098.12	3,056.75	41.44	29.52	-4.78	41.24	-1,286.27	3,779.84	3,755.36	24.48	154.388	
8,100.00	6,893.09	4,032.82	3,056.62	43.39	28.10	-5.47	-2.42	-1,334.82	3,788.34	3,763.56	24.78	152.906	
8,200.00	6,892.86	3,972.95	3,056.41	45.39	26.81	-6.09	-42.49	-1,379.31	3,798.20	3,773.04	25.16	150.991	
8,300.00	6,892.63	3,885.00	3,056.09	47.44	24.92	-7.01	-101.45	-1,444.57	3,809.32	3,783.90	25.42	149.861	
8,400.00	6,892.40	3,859.56	3,055.99	49.51	24.38	-7.27	-118.70	-1,463.26	3,821.88	3,795.79	26.08	146.524	
8,500.00	6,892.17	3,822.00	3,055.12	51.62	23.57	-7.67	-144.17	-1,490.86	3,836.72	3,810.01	26.71	143.668	
8,600.00	6,891.94	3,802.67	3,054.48	53.76	23.17	-7.87	-157.36	-1,504.98	3,853.44	3,825.99	27.45	140.377	
8,700.00	6,891.71	3,729.69	3,052.49	55.92	21.69	-8.65	-208.49	-1,557.01	3,871.74	3,843.79	27.95	138.541	
8,800.00	6,891.48	3,629.00	3,051.08	58.11	19.65	-9.74	-280.40	-1,627.45	3,890.65	3,862.27	28.37	137.119	
8,900.00	6,891.25	3,598.01	3,050.92	60.31	19.04	-10.09	-303.03	-1,648.61	3,911.03	3,881.90	29.13	134.281	
9,000.00	6,891.01	3,476.78	3,047.72	62.54	16.61	-11.37	-388.04	-1,734.94	3,933.32	3,903.76	29.56	133.049	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 201A - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 200-APC_ISCWSA REV 2 MWD												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Offset												Warning	
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	
				(usft)	(usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,100.00	6,890.78	3,440.00	3,046.59	64.78	15.85	-11.74	-413.22	-1,761.71	3,956.19	3,925.89	30.30	130.567	
9,200.00	6,890.55	3,440.00	3,046.59	67.03	15.85	-11.74	-413.22	-1,761.71	3,980.94	3,949.79	31.15	127.788	
9,300.00	6,890.32	3,412.37	3,045.27	69.29	15.28	-12.02	-432.28	-1,781.68	4,007.68	3,975.77	31.91	125.576	
9,400.00	6,890.09	3,375.00	3,042.70	71.57	14.52	-12.40	-458.19	-1,808.48	4,036.58	4,003.94	32.64	123.673	
9,500.00	6,889.86	3,375.00	3,042.70	73.86	14.52	-12.40	-458.19	-1,808.48	4,067.10	4,033.64	33.46	121.558	
9,600.00	6,889.63	3,375.00	3,042.70	76.16	14.52	-12.40	-458.19	-1,808.48	4,099.84	4,065.57	34.26	119.659	
9,700.00	6,889.40	3,343.00	3,039.40	78.46	13.88	-12.73	-480.51	-1,831.17	4,134.51	4,099.54	34.97	118.240	
9,800.00	6,889.17	3,343.00	3,039.40	80.78	13.88	-12.73	-480.51	-1,831.17	4,170.98	4,135.24	35.74	116.716	
9,900.00	6,888.94	3,343.00	3,039.40	83.10	13.88	-12.73	-480.51	-1,831.17	4,209.51	4,173.03	36.49	115.372	
10,000.00	6,888.71	3,343.00	3,039.40	85.43	13.88	-12.73	-480.51	-1,831.17	4,250.05	4,212.83	37.22	114.198	
10,100.00	6,888.48	3,327.57	3,037.14	87.76	13.58	-12.88	-491.32	-1,841.94	4,292.19	4,254.30	37.89	113.280	
10,200.00	6,888.25	3,311.00	3,034.02	90.10	13.26	-13.04	-502.97	-1,853.30	4,336.47	4,297.93	38.54	112.520	
10,300.00	6,888.01	3,311.00	3,034.02	92.45	13.26	-13.04	-502.97	-1,853.30	4,382.19	4,342.98	39.21	111.773	
10,400.00	6,887.78	3,311.00	3,034.02	94.80	13.26	-13.04	-502.97	-1,853.30	4,429.70	4,389.85	39.85	111.155	
10,500.00	6,887.55	3,311.00	3,034.02	97.15	13.26	-13.04	-502.97	-1,853.30	4,478.93	4,438.46	40.47	110.659	
10,600.00	6,887.32	3,294.89	3,030.42	99.51	12.95	-13.20	-514.26	-1,864.21	4,529.62	4,488.58	41.04	110.360	
10,700.00	6,887.09	3,279.00	3,026.41	101.87	12.65	-13.35	-525.28	-1,874.93	4,581.91	4,540.31	41.59	110.162	
10,800.00	6,886.86	3,279.00	3,026.41	104.24	12.65	-13.35	-525.28	-1,874.93	4,635.55	4,593.40	42.15	109.971	
10,900.00	6,886.63	3,261.57	3,021.65	106.61	12.33	-13.51	-537.28	-1,886.65	4,690.57	4,647.91	42.66	109.948	
11,000.00	6,886.40	3,247.00	3,017.47	108.98	12.06	-13.64	-547.26	-1,896.41	4,746.86	4,703.70	43.16	109.991	
11,100.00	6,886.17	3,226.65	3,011.41	111.36	11.69	-13.82	-561.15	-1,909.99	4,804.32	4,760.69	43.63	110.116	
11,200.00	6,885.94	3,215.00	3,007.85	113.74	11.48	-13.93	-569.10	-1,917.73	4,862.93	4,818.83	44.10	110.279	
11,300.00	6,885.71	3,215.00	3,007.85	116.12	11.48	-13.93	-569.10	-1,917.73	4,922.83	4,878.27	44.56	110.477	
11,400.00	6,885.48	3,215.00	3,007.85	118.51	11.48	-13.93	-569.10	-1,917.73	4,984.01	4,939.01	45.00	110.746	
11,500.00	6,885.25	3,197.95	3,002.26	120.89	11.18	-14.07	-580.72	-1,928.88	5,046.07	5,000.65	45.42	111.102	
11,600.00	6,885.01	3,183.00	2,996.83	123.28	10.93	-14.20	-590.89	-1,938.40	5,109.58	5,063.76	45.82	111.518	
11,700.00	6,884.78	3,183.00	2,996.83	125.67	10.93	-14.20	-590.89	-1,938.40	5,173.96	5,127.75	46.21	111.960	
11,800.00	6,884.55	3,183.00	2,996.83	128.07	10.93	-14.20	-590.89	-1,938.40	5,239.47	5,192.88	46.59	112.456	
11,900.00	6,884.32	3,183.00	2,996.83	130.46	10.93	-14.20	-590.89	-1,938.40	5,306.05	5,259.09	46.95	113.005	
12,000.00	6,884.09	3,151.00	2,984.15	132.86	10.40	-14.47	-612.33	-1,958.48	5,373.41	5,326.11	47.30	113.606	
12,100.00	6,883.86	3,136.70	2,978.17	135.25	10.17	-14.58	-621.69	-1,967.48	5,441.63	5,393.99	47.64	114.229	
12,200.00	6,883.63	3,119.00	2,970.53	137.65	9.88	-14.72	-633.07	-1,978.69	5,510.57	5,462.60	47.97	114.886	
12,300.00	6,883.40	3,103.09	2,963.39	140.05	9.64	-14.83	-643.06	-1,988.79	5,580.26	5,531.98	48.29	115.566	
12,400.00	6,883.17	3,087.00	2,955.79	142.46	9.39	-14.95	-652.90	-1,999.01	5,650.75	5,602.16	48.59	116.284	
12,500.00	6,882.94	3,087.00	2,955.79	144.86	9.39	-14.95	-652.90	-1,999.01	5,722.01	5,673.13	48.88	117.057	
12,600.00	6,882.71	3,073.11	2,948.90	147.27	9.18	-15.04	-661.14	-2,007.82	5,793.99	5,744.82	49.17	117.827	
12,700.00	6,882.48	3,055.00	2,939.38	149.67	8.92	-15.15	-671.47	-2,019.24	5,866.78	5,817.32	49.46	118.624	
12,800.00	6,882.25	3,055.00	2,939.38	152.08	8.92	-15.15	-671.47	-2,019.24	5,940.16	5,890.45	49.71	119.488	
12,900.00	6,882.01	3,041.69	2,932.10	154.49	8.73	-15.23	-678.85	-2,027.60	6,014.25	5,964.27	49.98	120.336	
13,000.00	6,881.78	3,024.00	2,922.25	156.90	8.49	-15.33	-688.53	-2,038.64	6,088.93	6,038.69	50.24	121.191	
13,100.00	6,881.55	3,024.00	2,922.25	159.31	8.49	-15.33	-688.53	-2,038.64	6,164.23	6,113.76	50.47	122.131	
13,200.00	6,881.32	3,008.84	2,913.62	161.72	8.29	-15.41	-696.76	-2,048.00	6,240.08	6,189.36	50.72	123.023	
13,300.00	6,881.09	2,992.00	2,903.80	164.13	8.07	-15.50	-705.87	-2,058.21	6,316.61	6,265.64	50.97	123.926	
13,400.00	6,880.86	2,992.00	2,903.80	166.55	8.07	-15.50	-705.87	-2,058.21	6,393.62	6,342.44	51.18	124.933	
13,500.00	6,880.63	2,992.00	2,903.80	168.96	8.07	-15.50	-705.87	-2,058.21	6,471.26	6,419.88	51.37	125.961	
13,600.00	6,880.40	2,992.00	2,903.80	171.38	8.07	-15.50	-705.87	-2,058.21	6,549.50	6,497.93	51.57	127.012	
13,700.00	6,880.17	2,992.00	2,903.80	173.79	8.07	-15.50	-705.87	-2,058.21	6,628.33	6,576.58	51.75	128.083	
13,800.00	6,879.94	2,992.00	2,903.80	176.21	8.07	-15.50	-705.87	-2,058.21	6,707.72	6,655.80	51.93	129.173	
13,900.00	6,879.71	2,975.56	2,893.84	178.63	7.87	-15.59	-714.71	-2,067.85	6,787.32	6,735.17	52.15	130.158	
14,000.00	6,879.48	2,960.00	2,883.97	181.04	7.69	-15.67	-723.03	-2,076.54	6,867.83	6,815.47	52.36	131.172	
14,100.00	6,879.25	2,960.00	2,883.97	183.46	7.69	-15.67	-723.03	-2,076.54	6,948.55	6,896.03	52.52	132.307	
14,200.00	6,879.01	2,960.00	2,883.97	185.88	7.69	-15.67	-723.03	-2,076.54	7,029.76	6,977.09	52.67	133.458	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 201A - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-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)			
14,300.00	6,878.78	2,960.00	2,883.97	188.30	7.69	-15.67	-723.03	-2,076.54	7,111.46	7,058.63	52.82	134.625	
14,400.00	6,878.55	2,960.00	2,883.97	190.72	7.69	-15.67	-723.03	-2,076.54	7,193.61	7,140.64	52.97	135.805	
14,500.00	6,878.32	2,960.00	2,883.97	193.14	7.69	-15.67	-723.03	-2,076.54	7,276.21	7,223.10	53.11	137.000	
14,600.00	6,878.09	2,960.00	2,883.97	195.56	7.69	-15.67	-723.03	-2,076.54	7,359.25	7,306.00	53.25	138.207	
14,700.00	6,877.86	2,960.00	2,883.97	197.99	7.69	-15.67	-723.03	-2,076.54	7,442.70	7,389.32	53.38	139.427	
14,800.00	6,877.63	2,960.00	2,883.97	200.41	7.69	-15.67	-723.03	-2,076.54	7,526.55	7,473.04	53.51	140.659	
14,900.00	6,877.40	2,943.71	2,873.26	202.83	7.52	-15.75	-731.73	-2,085.19	7,610.52	7,556.82	53.70	141.734	
15,000.00	6,877.17	2,928.00	2,862.65	205.25	7.36	-15.83	-740.17	-2,093.13	7,695.19	7,641.31	53.88	142.823	
15,100.00	6,876.94	2,928.00	2,862.65	207.68	7.36	-15.83	-740.17	-2,093.13	7,779.97	7,725.97	54.00	144.079	
15,200.00	6,876.71	2,928.00	2,862.65	210.10	7.36	-15.83	-740.17	-2,093.13	7,865.11	7,810.99	54.11	145.344	
15,300.00	6,876.48	2,928.00	2,862.65	212.53	7.36	-15.83	-740.17	-2,093.13	7,950.59	7,896.37	54.23	146.619	
15,400.00	6,876.25	2,928.00	2,862.65	214.95	7.36	-15.83	-740.17	-2,093.13	8,036.41	7,982.08	54.34	147.903	
15,500.00	6,876.01	2,928.00	2,862.65	217.38	7.36	-15.83	-740.17	-2,093.13	8,122.56	8,068.11	54.44	149.194	
15,600.00	6,875.78	2,910.93	2,850.96	219.80	7.19	-15.91	-749.41	-2,101.46	8,208.93	8,154.31	54.62	150.297	
15,700.00	6,875.55	2,896.00	2,840.72	222.23	7.05	-15.98	-757.55	-2,108.65	8,295.58	8,240.78	54.79	151.398	
15,800.00	6,875.32	2,896.00	2,840.72	224.66	7.05	-15.98	-757.55	-2,108.65	8,382.46	8,327.56	54.89	152.704	
15,900.00	6,875.09	2,896.00	2,840.72	227.08	7.05	-15.98	-757.55	-2,108.65	8,469.63	8,414.64	54.99	154.017	
16,000.00	6,874.86	2,880.07	2,829.67	229.51	6.90	-16.06	-766.19	-2,116.21	8,556.97	8,501.81	55.17	155.106	
16,100.00	6,874.63	2,864.00	2,818.31	231.94	6.76	-16.13	-774.73	-2,123.70	8,644.63	8,589.30	55.34	156.215	
16,200.00	6,874.40	2,864.00	2,818.31	234.37	6.76	-16.13	-774.73	-2,123.70	8,732.46	8,677.03	55.43	157.540	
16,300.00	6,874.17	2,864.00	2,818.31	236.79	6.76	-16.13	-774.73	-2,123.70	8,820.54	8,765.02	55.52	158.869	
16,400.00	6,873.94	2,864.00	2,818.31	239.22	6.76	-16.13	-774.73	-2,123.70	8,908.87	8,853.26	55.61	160.204	
16,500.00	6,873.71	2,864.00	2,818.31	241.65	6.76	-16.13	-774.73	-2,123.70	8,997.44	8,941.75	55.70	161.544	
16,600.00	6,873.48	2,864.00	2,818.31	244.08	6.76	-16.13	-774.73	-2,123.70	9,086.26	9,030.48	55.78	162.888	
16,700.00	6,873.25	2,848.61	2,807.17	246.51	6.63	-16.20	-782.71	-2,130.70	9,175.13	9,119.18	55.95	163.986	
16,800.00	6,873.02	2,832.00	2,794.77	248.94	6.50	-16.26	-791.03	-2,137.99	9,264.45	9,208.33	56.12	165.081	
16,900.00	6,872.78	2,832.00	2,794.77	251.37	6.50	-16.26	-791.03	-2,137.99	9,353.78	9,297.58	56.20	166.431	
17,000.00	6,872.55	2,832.00	2,794.77	253.80	6.50	-16.26	-791.03	-2,137.99	9,443.34	9,387.05	56.28	167.784	
17,070.79	6,872.39	2,832.00	2,794.77	255.52	6.50	-16.26	-791.03	-2,137.99	9,506.86	9,450.52	56.34	168.744	
17,100.00	6,872.32	2,832.00	2,794.77	256.23	6.50	-16.26	-791.03	-2,137.99	9,533.09	9,476.73	56.36	169.140	
17,200.00	6,872.09	2,832.00	2,794.77	258.66	6.50	-16.26	-791.03	-2,137.99	9,623.06	9,566.62	56.44	170.499	
17,237.94	6,872.00	2,832.00	2,794.77	259.58	6.50	-16.26	-791.03	-2,137.99	9,657.24	9,600.77	56.47	171.016	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 260 - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 125-A027Ua_INC-ONLY													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	33.00	33.00	0.00	0.65	-94.60	-777.90	-9,675.56	9,706.78				
100.00	100.00	133.00	133.00	0.25	2.62	-94.60	-777.90	-9,675.56	9,706.78	9,703.91	2.87	3,380.925	
200.00	200.00	233.01	233.00	0.61	4.63	-94.60	-777.90	-9,675.56	9,706.78	9,701.54	5.24	1,851.774	
300.00	300.00	333.01	333.00	0.97	6.84	-94.60	-777.90	-9,675.56	9,706.78	9,698.98	7.80	1,243.673	
336.26	336.26	369.23	369.21	1.10	7.64	-94.59	-777.40	-9,675.56	9,706.74	9,698.01	8.73	1,111.457	
400.00	400.00	430.91	430.90	1.33	9.00	-94.59	-777.48	-9,675.56	9,706.75	9,696.43	10.32	940.416	
500.00	500.00	533.07	533.00	1.68	11.26	-94.60	-777.90	-9,675.56	9,706.78	9,693.84	12.94	749.873	
600.00	600.00	633.07	633.00	2.04	13.57	-94.60	-777.90	-9,675.56	9,706.78	9,691.18	15.61	621.889	
639.44	639.44	672.51	672.42	2.18	14.47	-94.59	-776.90	-9,675.56	9,706.70	9,690.05	16.66	582.667	
700.00	700.00	729.26	729.17	2.40	15.78	-94.59	-777.04	-9,675.56	9,706.72	9,688.53	18.18	533.785	
800.00	800.00	833.15	833.00	2.76	18.17	-94.60	-777.90	-9,675.56	9,706.78	9,685.85	20.93	463.769	
900.00	900.00	933.15	933.00	3.12	20.39	-94.60	-777.90	-9,675.56	9,706.78	9,683.28	23.51	412.926	
1,000.00	1,000.00	1,033.14	1,033.00	3.48	22.61	-94.60	-777.90	-9,675.56	9,706.78	9,680.70	26.08	372.131	
1,100.00	1,099.98	1,131.63	1,131.47	3.83	24.79	-57.88	-776.85	-9,675.56	9,705.77	9,677.15	28.63	339.058	
1,200.08	1,199.92	1,228.93	1,228.76	4.19	26.95	-57.95	-777.20	-9,675.56	9,703.02	9,671.88	31.14	311.595	
1,300.00	1,299.59	1,332.84	1,332.59	4.55	29.26	-57.99	-777.90	-9,675.56	9,699.37	9,665.56	33.81	286.915	
1,400.00	1,399.35	1,432.59	1,432.35	4.91	31.57	-58.03	-777.90	-9,675.56	9,695.66	9,659.19	36.47	265.852	
1,500.00	1,499.11	1,532.35	1,532.11	5.27	33.87	-58.06	-777.90	-9,675.56	9,691.96	9,652.83	39.14	247.649	
1,600.00	1,598.86	1,631.86	1,631.59	5.63	36.18	-58.09	-776.29	-9,675.56	9,688.13	9,646.33	41.80	231.791	
1,700.00	1,698.62	1,728.73	1,728.46	6.00	38.42	-58.12	-776.49	-9,675.56	9,684.46	9,640.06	44.40	218.129	
1,800.00	1,798.37	1,825.57	1,825.29	6.36	40.66	-58.16	-777.04	-9,675.56	9,680.81	9,633.81	47.00	205.981	
1,900.00	1,898.13	1,931.51	1,931.13	6.72	43.09	-58.20	-777.90	-9,675.56	9,677.20	9,627.40	49.80	194.325	
2,000.00	1,997.89	2,031.27	2,030.89	7.09	45.31	-58.24	-777.90	-9,675.56	9,673.52	9,621.14	52.37	184.698	
2,100.00	2,097.64	2,131.03	2,130.64	7.45	47.52	-58.27	-777.90	-9,675.56	9,669.84	9,614.89	54.95	175.972	
2,200.00	2,197.40	2,228.54	2,228.14	7.82	49.69	-58.30	-776.62	-9,675.56	9,666.05	9,608.58	57.48	168.169	
2,300.00	2,297.16	2,324.74	2,324.33	8.19	51.82	-58.33	-777.08	-9,675.56	9,662.42	9,602.45	59.98	161.105	
2,400.00	2,396.91	2,430.39	2,429.91	8.55	54.12	-58.38	-777.90	-9,675.56	9,658.83	9,596.18	62.64	154.186	
2,500.00	2,496.67	2,530.15	2,529.67	8.92	56.06	-58.41	-777.90	-9,675.56	9,655.16	9,590.22	64.94	148.669	
2,600.00	2,596.42	2,629.90	2,629.42	9.29	58.00	-58.45	-777.90	-9,675.56	9,651.50	9,584.26	67.24	143.530	
2,700.00	2,696.18	2,728.31	2,727.82	9.66	59.91	-58.48	-776.78	-9,675.56	9,647.74	9,578.23	69.52	138.780	
2,800.00	2,795.94	2,825.28	2,824.79	10.02	61.79	-58.51	-777.08	-9,675.56	9,644.12	9,572.36	71.76	134.386	
2,900.00	2,895.69	2,922.23	2,921.72	10.39	63.67	-58.55	-777.90	-9,675.56	9,640.53	9,566.52	74.01	130.259	
3,000.00	2,995.45	3,028.98	3,028.45	10.76	65.60	-58.59	-777.90	-9,675.56	9,636.90	9,560.59	76.30	126.295	
3,100.00	3,095.21	3,128.73	3,128.21	11.13	67.36	-58.62	-777.90	-9,675.56	9,633.26	9,554.82	78.43	122.818	
3,200.00	3,194.96	3,219.00	3,218.46	11.49	68.96	-58.66	-777.90	-9,675.56	9,629.62	9,549.23	80.40	119.775	
3,300.00	3,294.72	3,219.00	3,218.46	11.86	68.96	-58.66	-777.90	-9,675.56	9,626.60	9,545.84	80.76	119.200	
3,400.00	3,394.47	3,219.00	3,218.46	12.23	68.96	-58.66	-777.90	-9,675.56	9,624.62	9,543.51	81.11	118.654	
3,500.00	3,494.23	3,219.00	3,218.46	12.60	68.96	-58.66	-777.90	-9,675.56	9,623.68	9,542.22	81.46	118.138	
3,540.67	3,534.80	3,219.00	3,218.46	12.75	68.96	-58.66	-777.90	-9,675.56	9,623.60	9,542.00	81.60	117.936	
3,600.00	3,593.99	3,219.00	3,218.46	12.97	68.96	-58.66	-777.90	-9,675.56	9,623.78	9,541.98	81.80	117.651	
3,700.00	3,693.74	3,219.00	3,218.46	13.34	68.96	-58.66	-777.90	-9,675.56	9,624.91	9,542.78	82.13	117.192	
3,800.00	3,793.50	3,219.00	3,218.46	13.71	68.96	-58.66	-777.90	-9,675.56	9,627.09	9,544.64	82.45	116.762	
3,900.00	3,893.26	3,219.00	3,218.46	14.07	68.96	-58.66	-777.90	-9,675.56	9,630.30	9,547.54	82.76	116.360	
4,000.00	3,993.01	3,219.00	3,218.46	14.44	68.96	-58.66	-777.90	-9,675.56	9,634.55	9,551.48	83.07	115.985	
4,100.00	4,092.77	3,219.00	3,218.46	14.81	68.96	-58.66	-777.90	-9,675.56	9,639.84	9,556.47	83.36	115.637	
4,200.00	4,192.52	3,219.00	3,218.46	15.18	68.96	-58.66	-777.90	-9,675.56	9,646.15	9,562.50	83.65	115.317	
4,300.00	4,292.28	3,219.00	3,218.46	15.55	68.96	-58.66	-777.90	-9,675.56	9,653.50	9,569.58	83.93	115.022	
4,400.00	4,392.04	3,219.00	3,218.46	15.92	68.96	-58.66	-777.90	-9,675.56	9,661.88	9,577.69	84.20	114.754	
4,500.00	4,491.79	3,219.00	3,218.46	16.29	68.96	-58.66	-777.90	-9,675.56	9,671.29	9,586.84	84.46	114.512	
4,600.00	4,591.55	3,219.00	3,218.46	16.66	68.96	-58.66	-777.90	-9,675.56	9,681.72	9,597.01	84.71	114.296	
4,700.00	4,691.31	3,219.00	3,218.46	17.03	68.96	-58.66	-777.90	-9,675.56	9,693.17	9,608.22	84.95	114.104	
4,800.00	4,791.06	3,219.00	3,218.46	17.40	68.96	-58.66	-777.90	-9,675.56	9,705.64	9,620.46	85.18	113.937	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 260 - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		125-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		
4,900.00	4,890.82	3,219.00	3,218.46	17.76	68.96	-58.66	-777.90	-9,675.56	9,719.12	9,633.71	85.41	113.795		
5,000.00	4,990.57	3,219.00	3,218.46	18.13	68.96	-58.66	-777.90	-9,675.56	9,733.61	9,647.99	85.63	113.677		
5,100.00	5,090.33	3,219.00	3,218.46	18.50	68.96	-58.66	-777.90	-9,675.56	9,749.11	9,663.27	85.83	113.583		
5,200.00	5,190.09	3,219.00	3,218.46	18.87	68.96	-58.66	-777.90	-9,675.56	9,765.60	9,679.57	86.03	113.512		
5,300.00	5,289.84	3,219.00	3,218.46	19.24	68.96	-58.66	-777.90	-9,675.56	9,783.09	9,696.87	86.22	113.464		
5,400.00	5,389.60	3,219.00	3,218.46	19.61	68.96	-58.66	-777.90	-9,675.56	9,801.56	9,715.16	86.40	113.440		
5,500.00	5,489.35	3,219.00	3,218.46	19.98	68.96	-58.66	-777.90	-9,675.56	9,821.03	9,734.45	86.58	113.437		
5,600.00	5,589.11	3,219.00	3,218.46	20.35	68.96	-58.66	-777.90	-9,675.56	9,841.46	9,754.72	86.74	113.457		
5,700.00	5,688.87	3,219.00	3,218.46	20.72	68.96	-58.66	-777.90	-9,675.56	9,862.87	9,775.98	86.90	113.499		
5,800.00	5,788.62	3,219.00	3,218.46	21.09	68.96	-58.66	-777.90	-9,675.56	9,885.25	9,798.20	87.05	113.563		
5,900.00	5,888.38	3,219.00	3,218.46	21.46	68.96	-58.66	-777.90	-9,675.56	9,908.58	9,821.39	87.19	113.647		
6,000.00	5,988.14	3,219.00	3,218.46	21.83	68.96	-58.66	-777.90	-9,675.56	9,932.87	9,845.55	87.32	113.753		
6,100.00	6,087.89	3,219.00	3,218.46	22.20	68.96	-58.66	-777.90	-9,675.56	9,958.10	9,870.65	87.44	113.879		
6,200.00	6,187.65	3,219.00	3,218.46	22.57	68.96	-58.66	-777.90	-9,675.56	9,984.27	9,896.71	87.56	114.026		
6,299.50	6,286.91	3,219.00	3,218.46	22.93	68.96	-58.66	-777.90	-9,675.56	10,011.23	9,923.56	87.67	114.191		
6,350.00	6,337.14	3,219.00	3,218.46	23.12	68.96	-31.00	-777.90	-9,675.56	10,023.34	9,935.62	87.72	114.263		
6,400.00	6,386.40	3,219.00	3,218.46	23.32	68.96	-22.12	-777.90	-9,675.56	10,031.74	9,943.97	87.77	114.297		
6,450.00	6,434.88	3,219.00	3,218.46	23.52	68.96	-17.96	-777.90	-9,675.56	10,036.52	9,948.70	87.82	114.290		
6,500.00	6,482.27	3,219.00	3,218.46	23.73	68.96	-15.61	-777.90	-9,675.56	10,037.65	9,949.79	87.86	114.244		
6,550.00	6,528.29	3,219.00	3,218.46	23.94	68.96	-14.13	-777.90	-9,675.56	10,035.14	9,947.24	87.90	114.160		
6,600.00	6,572.65	3,219.00	3,218.46	24.16	68.96	-13.16	-777.90	-9,675.56	10,028.99	9,941.05	87.94	114.038		
6,650.00	6,615.08	3,219.00	3,218.46	24.39	68.96	-12.52	-777.90	-9,675.56	10,019.24	9,931.25	87.98	113.879		
6,700.00	6,655.31	3,219.00	3,218.46	24.64	68.96	-12.10	-777.90	-9,675.56	10,005.93	9,917.91	88.01	113.685		
6,750.00	6,693.11	3,219.00	3,218.46	24.90	68.96	-11.87	-777.90	-9,675.56	9,989.13	9,901.09	88.04	113.457		
6,800.00	6,728.23	3,219.00	3,218.46	25.18	68.96	-11.78	-777.90	-9,675.56	9,968.93	9,880.86	88.07	113.195		
6,850.00	6,760.46	3,219.00	3,218.46	25.50	68.96	-11.83	-777.90	-9,675.56	9,945.44	9,857.35	88.09	112.901		
6,900.00	6,789.60	3,219.00	3,218.46	25.84	68.96	-12.01	-777.90	-9,675.56	9,918.77	9,830.66	88.11	112.576		
6,950.00	6,815.47	3,219.00	3,218.46	26.21	68.96	-12.33	-777.90	-9,675.56	9,889.06	9,800.94	88.12	112.222		
7,000.00	6,837.91	3,219.00	3,218.46	26.63	68.96	-12.80	-777.90	-9,675.56	9,856.48	9,768.35	88.13	111.839		
7,050.00	6,856.78	3,219.00	3,218.46	27.08	68.96	-13.45	-777.90	-9,675.56	9,821.19	9,733.05	88.14	111.429		
7,100.00	6,871.97	3,219.00	3,218.46	27.57	68.96	-14.32	-777.90	-9,675.56	9,783.38	9,695.24	88.14	110.993		
7,150.00	6,883.39	3,219.00	3,218.46	28.10	68.96	-15.49	-777.90	-9,675.56	9,743.27	9,655.12	88.15	110.535		
7,200.00	6,890.95	3,219.00	3,218.46	28.66	68.96	-17.06	-777.90	-9,675.56	9,701.06	9,612.91	88.15	110.054		
7,250.00	6,894.63	3,219.00	3,218.46	29.25	68.96	-19.21	-777.90	-9,675.56	9,657.00	9,568.85	88.15	109.552		
7,273.35	6,895.00	3,219.00	3,218.46	29.54	68.96	-20.50	-777.90	-9,675.56	9,635.85	9,547.70	88.15	109.309		
7,300.00	6,894.94	3,219.00	3,218.46	29.87	68.96	-20.50	-777.90	-9,675.56	9,611.54	9,523.39	88.15	109.034		
7,400.00	6,894.71	3,219.00	3,218.46	31.22	68.96	-20.50	-777.90	-9,675.56	9,520.41	9,432.26	88.15	108.004		
7,500.00	6,894.48	3,219.00	3,218.46	32.69	68.96	-20.50	-777.90	-9,675.56	9,429.46	9,341.31	88.15	106.966		
7,600.00	6,894.25	3,219.00	3,218.46	34.27	68.96	-20.50	-777.90	-9,675.56	9,338.69	9,250.53	88.17	105.919		
7,700.00	6,894.01	3,219.00	3,218.46	35.95	68.96	-20.50	-777.90	-9,675.56	9,248.12	9,159.93	88.19	104.864		
7,800.00	6,893.78	3,219.00	3,218.46	37.71	68.96	-20.50	-777.90	-9,675.56	9,157.74	9,069.52	88.22	103.800		
7,900.00	6,893.55	3,219.00	3,218.46	39.54	68.96	-20.50	-777.90	-9,675.56	9,067.57	8,979.30	88.27	102.728		
8,000.00	6,893.32	3,219.00	3,218.46	41.44	68.96	-20.50	-777.90	-9,675.56	8,977.60	8,889.28	88.32	101.648		
8,100.00	6,893.09	3,219.00	3,218.46	43.39	68.96	-20.50	-777.90	-9,675.56	8,887.84	8,799.46	88.38	100.559		
8,200.00	6,892.86	3,219.00	3,218.46	45.39	68.96	-20.50	-777.90	-9,675.56	8,798.31	8,709.85	88.46	99.463		
8,300.00	6,892.63	3,219.00	3,218.46	47.44	68.96	-20.50	-777.90	-9,675.56	8,709.01	8,620.46	88.54	98.359		
8,400.00	6,892.40	3,219.00	3,218.46	49.51	68.96	-20.50	-777.90	-9,675.56	8,619.94	8,531.30	88.64	97.247		
8,500.00	6,892.17	3,219.00	3,218.46	51.62	68.96	-20.50	-777.90	-9,675.56	8,531.11	8,442.36	88.75	96.127		
8,600.00	6,891.94	3,219.00	3,218.46	53.76	68.96	-20.50	-777.90	-9,675.56	8,442.53	8,353.66	88.87	95.001		
8,700.00	6,891.71	3,219.00	3,218.46	55.92	68.96	-20.50	-777.90	-9,675.56	8,354.21	8,265.21	89.00	93.868		
8,800.00	6,891.48	3,219.00	3,218.46	58.11	68.96	-20.50	-777.90	-9,675.56	8,266.16	8,177.01	89.14	92.728		
8,900.00	6,891.25	3,219.00	3,218.46	60.31	68.96	-20.50	-777.90	-9,675.56	8,178.38	8,089.07	89.30	91.582		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 260 - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		125-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	Warning	
9,000.00	6,891.01	3,219.00	3,218.46	62.54	68.96	-20.50	-777.90	-9,675.56	8,090.88	8,001.41	89.47	90.430		
9,100.00	6,890.78	3,219.00	3,218.46	64.78	68.96	-20.50	-777.90	-9,675.56	8,003.68	7,914.02	89.65	89.272		
9,200.00	6,890.55	3,219.00	3,218.46	67.03	68.96	-20.50	-777.90	-9,675.56	7,916.78	7,826.93	89.85	88.110		
9,300.00	6,890.32	3,219.00	3,218.46	69.29	68.96	-20.50	-777.90	-9,675.56	7,830.19	7,740.13	90.06	86.942		
9,400.00	6,890.09	3,219.00	3,218.46	71.57	68.96	-20.50	-777.90	-9,675.56	7,743.93	7,653.64	90.29	85.771		
9,500.00	6,889.86	3,219.00	3,218.46	73.86	68.96	-20.50	-777.90	-9,675.56	7,658.00	7,567.47	90.52	84.596		
9,600.00	6,889.63	3,219.00	3,218.46	76.16	68.96	-20.50	-777.90	-9,675.56	7,572.41	7,481.64	90.78	83.419		
9,700.00	6,889.40	3,219.00	3,218.46	78.46	68.96	-20.50	-777.90	-9,675.56	7,487.18	7,396.14	91.04	82.238		
9,800.00	6,889.17	3,219.00	3,218.46	80.78	68.96	-20.50	-777.90	-9,675.56	7,402.33	7,311.00	91.32	81.056		
9,900.00	6,888.94	3,219.00	3,218.46	83.10	68.96	-20.50	-777.90	-9,675.56	7,317.85	7,226.23	91.62	79.873		
10,000.00	6,888.71	3,219.00	3,218.46	85.43	68.96	-20.50	-777.90	-9,675.56	7,233.77	7,141.84	91.93	78.688		
10,100.00	6,888.48	3,219.00	3,218.46	87.76	68.96	-20.50	-777.90	-9,675.56	7,150.10	7,057.85	92.25	77.504		
10,200.00	6,888.25	3,219.00	3,218.46	90.10	68.96	-20.50	-777.90	-9,675.56	7,066.86	6,974.26	92.60	76.320		
10,300.00	6,888.01	3,219.00	3,218.46	92.45	68.96	-20.50	-777.90	-9,675.56	6,984.05	6,891.10	92.95	75.137		
10,400.00	6,887.78	3,219.00	3,218.46	94.80	68.96	-20.50	-777.90	-9,675.56	6,901.70	6,808.38	93.32	73.957		
10,500.00	6,887.55	3,219.00	3,218.46	97.15	68.96	-20.50	-777.90	-9,675.56	6,819.82	6,726.12	93.71	72.779		
10,600.00	6,887.32	3,219.00	3,218.46	99.51	68.96	-20.50	-777.90	-9,675.56	6,738.44	6,644.33	94.11	71.604		
10,700.00	6,887.09	3,219.00	3,218.46	101.87	68.96	-20.50	-777.90	-9,675.56	6,657.55	6,563.03	94.52	70.433		
10,800.00	6,886.86	3,219.00	3,218.46	104.24	68.96	-20.50	-777.90	-9,675.56	6,577.20	6,482.24	94.95	69.267		
10,900.00	6,886.63	3,219.00	3,218.46	106.61	68.96	-20.50	-777.90	-9,675.56	6,497.39	6,401.99	95.40	68.106		
11,000.00	6,886.40	3,219.00	3,218.46	108.98	68.96	-20.50	-777.90	-9,675.56	6,418.14	6,322.28	95.86	66.951		
11,100.00	6,886.17	3,219.00	3,218.46	111.36	68.96	-20.50	-777.90	-9,675.56	6,339.48	6,243.14	96.34	65.803		
11,200.00	6,885.94	3,219.00	3,218.46	113.74	68.96	-20.50	-777.90	-9,675.56	6,261.44	6,164.60	96.83	64.663		
11,300.00	6,885.71	3,219.00	3,218.46	116.12	68.96	-20.50	-777.90	-9,675.56	6,184.02	6,086.68	97.34	63.531		
11,400.00	6,885.48	3,219.00	3,218.46	118.51	68.96	-20.50	-777.90	-9,675.56	6,107.26	6,009.40	97.86	62.407		
11,500.00	6,885.25	3,219.00	3,218.46	120.89	68.96	-20.50	-777.90	-9,675.56	6,031.18	5,932.78	98.40	61.294		
11,600.00	6,885.01	3,219.00	3,218.46	123.28	68.96	-20.50	-777.90	-9,675.56	5,955.81	5,856.86	98.95	60.191		
11,700.00	6,884.78	3,219.00	3,218.46	125.67	68.96	-20.50	-777.90	-9,675.56	5,881.17	5,781.65	99.51	59.099		
11,800.00	6,884.55	3,219.00	3,218.46	128.07	68.96	-20.50	-777.90	-9,675.56	5,807.29	5,707.20	100.09	58.019		
11,900.00	6,884.32	3,219.00	3,218.46	130.46	68.96	-20.50	-777.90	-9,675.56	5,734.21	5,633.52	100.68	56.952		
12,000.00	6,884.09	3,219.00	3,218.46	132.86	68.96	-20.50	-777.90	-9,675.56	5,661.95	5,560.66	101.29	55.898		
12,100.00	6,883.86	3,219.00	3,218.46	135.25	68.96	-20.50	-777.90	-9,675.56	5,590.54	5,488.63	101.91	54.858		
12,200.00	6,883.63	3,219.00	3,218.46	137.65	68.96	-20.50	-777.90	-9,675.56	5,520.02	5,417.48	102.54	53.833		
12,300.00	6,883.40	3,219.00	3,218.46	140.05	68.96	-20.50	-777.90	-9,675.56	5,450.43	5,347.25	103.18	52.823		
12,400.00	6,883.17	3,219.00	3,218.46	142.46	68.96	-20.50	-777.90	-9,675.56	5,381.79	5,277.95	103.84	51.828		
12,500.00	6,882.94	3,219.00	3,218.46	144.86	68.96	-20.50	-777.90	-9,675.56	5,314.15	5,209.65	104.50	50.851		
12,600.00	6,882.71	3,219.00	3,218.46	147.27	68.96	-20.50	-777.90	-9,675.56	5,247.54	5,142.36	105.18	49.891		
12,700.00	6,882.48	3,219.00	3,218.46	149.67	68.96	-20.50	-777.90	-9,675.56	5,182.01	5,076.14	105.87	48.949		
12,800.00	6,882.25	3,219.00	3,218.46	152.08	68.96	-20.50	-777.90	-9,675.56	5,117.59	5,011.03	106.56	48.026		
12,900.00	6,882.01	3,219.00	3,218.46	154.49	68.96	-20.50	-777.90	-9,675.56	5,054.33	4,947.07	107.26	47.121		
13,000.00	6,881.78	3,219.00	3,218.46	156.90	68.96	-20.50	-777.90	-9,675.56	4,992.27	4,884.30	107.97	46.237		
13,100.00	6,881.55	3,219.00	3,218.46	159.31	68.96	-20.50	-777.90	-9,675.56	4,931.46	4,822.77	108.69	45.373		
13,200.00	6,881.32	3,219.00	3,218.46	161.72	68.96	-20.50	-777.90	-9,675.56	4,871.94	4,762.53	109.41	44.530		
13,300.00	6,881.09	3,219.00	3,218.46	164.13	68.96	-20.50	-777.90	-9,675.56	4,813.76	4,703.63	110.13	43.708		
13,400.00	6,880.86	3,219.00	3,218.46	166.55	68.96	-20.50	-777.90	-9,675.56	4,756.97	4,646.11	110.86	42.908		
13,500.00	6,880.63	3,219.00	3,218.46	168.96	68.96	-20.50	-777.90	-9,675.56	4,701.63	4,590.03	111.60	42.131		
13,600.00	6,880.40	3,219.00	3,218.46	171.38	68.96	-20.50	-777.90	-9,675.56	4,647.78	4,535.45	112.33	41.376		
13,700.00	6,880.17	3,219.00	3,218.46	173.79	68.96	-20.50	-777.90	-9,675.56	4,595.47	4,482.40	113.06	40.645		
13,800.00	6,879.94	3,219.00	3,218.46	176.21	68.96	-20.50	-777.90	-9,675.56	4,544.76	4,430.96	113.80	39.937		
13,900.00	6,879.71	3,219.00	3,218.46	178.63	68.96	-20.50	-777.90	-9,675.56	4,495.70	4,381.17	114.53	39.254		
14,000.00	6,879.48	3,219.00	3,218.46	181.04	68.96	-20.50	-777.90	-9,675.56	4,448.35	4,333.09	115.26	38.594		
14,100.00	6,879.25	3,219.00	3,218.46	183.46	68.96	-20.50	-777.90	-9,675.56	4,402.77	4,286.78	115.99	37.959		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 260 - OH - OH											Offset Site Error: 0.00 usft
Survey Program: 125-A027Ua_INC-ONLY											Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		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	6,879.01	3,219.00	3,218.46	185.88	68.96	-20.50	-777.90	-9,675.56	4,359.00	4,242.29	
14,300.00	6,878.78	3,219.00	3,218.46	188.30	68.96	-20.50	-777.90	-9,675.56	4,317.10	4,199.67	
14,400.00	6,878.55	3,219.00	3,218.46	190.72	68.96	-20.50	-777.90	-9,675.56	4,277.14	4,158.98	
14,500.00	6,878.32	3,219.00	3,218.46	193.14	68.96	-20.50	-777.90	-9,675.56	4,239.15	4,120.28	
14,600.00	6,878.09	3,219.00	3,218.46	195.56	68.96	-20.50	-777.90	-9,675.56	4,203.20	4,083.62	
14,700.00	6,877.86	3,219.00	3,218.46	197.99	68.96	-20.50	-777.90	-9,675.56	4,169.34	4,049.05	
14,800.00	6,877.63	3,219.00	3,218.46	200.41	68.96	-20.50	-777.90	-9,675.56	4,137.62	4,016.61	
14,900.00	6,877.40	3,219.00	3,218.46	202.83	68.96	-20.50	-777.90	-9,675.56	4,108.10	3,986.37	
15,000.00	6,877.17	3,219.00	3,218.46	205.25	68.96	-20.50	-777.90	-9,675.56	4,080.80	3,958.36	
15,100.00	6,876.94	3,219.00	3,218.46	207.68	68.96	-20.50	-777.90	-9,675.56	4,055.79	3,932.62	
15,200.00	6,876.71	3,219.00	3,218.46	210.10	68.96	-20.50	-777.90	-9,675.56	4,033.11	3,909.19	
15,300.00	6,876.48	3,219.00	3,218.46	212.53	68.96	-20.50	-777.90	-9,675.56	4,012.79	3,888.11	
15,400.00	6,876.25	3,219.00	3,218.46	214.95	68.96	-20.50	-777.90	-9,675.56	3,994.87	3,869.42	
15,500.00	6,876.01	3,219.00	3,218.46	217.38	68.96	-20.50	-777.90	-9,675.56	3,979.39	3,853.13	
15,600.00	6,875.78	3,219.00	3,218.46	219.80	68.96	-20.50	-777.90	-9,675.56	3,966.36	3,839.27	
15,700.00	6,875.55	3,219.00	3,218.46	222.23	68.96	-20.50	-777.90	-9,675.56	3,955.82	3,827.86	
15,800.00	6,875.32	3,219.00	3,218.46	224.66	68.96	-20.50	-777.90	-9,675.56	3,947.79	3,818.93	
15,900.00	6,875.09	3,219.00	3,218.46	227.08	68.96	-20.50	-777.90	-9,675.56	3,942.28	3,812.47	
16,000.00	6,874.86	3,219.00	3,218.46	229.51	68.96	-20.50	-777.90	-9,675.56	3,939.30	3,808.51	
16,067.45	6,874.71	3,219.00	3,218.46	231.15	68.96	-20.50	-777.90	-9,675.56	3,938.72	3,807.25	29.959 CC
16,100.00	6,874.63	3,219.00	3,218.46	231.94	68.96	-20.50	-777.90	-9,675.56	3,938.85	3,807.04	29.883 ES
16,200.00	6,874.40	3,219.00	3,218.46	234.37	68.96	-20.50	-777.90	-9,675.56	3,940.95	3,808.08	
16,300.00	6,874.17	3,219.00	3,218.46	236.79	68.96	-20.50	-777.90	-9,675.56	3,945.58	3,811.61	
16,400.00	6,873.94	3,219.00	3,218.46	239.22	68.96	-20.50	-777.90	-9,675.56	3,952.73	3,817.64	
16,500.00	6,873.71	3,219.00	3,218.46	241.65	68.96	-20.50	-777.90	-9,675.56	3,962.40	3,826.16	
16,600.00	6,873.48	3,219.00	3,218.46	244.08	68.96	-20.50	-777.90	-9,675.56	3,974.56	3,837.16	
16,700.00	6,873.25	3,219.00	3,218.46	246.51	68.96	-20.50	-777.90	-9,675.56	3,989.19	3,850.62	
16,800.00	6,873.02	3,219.00	3,218.46	248.94	68.96	-20.50	-777.90	-9,675.56	4,006.26	3,866.51	
16,900.00	6,872.78	3,219.00	3,218.46	251.37	68.96	-20.50	-777.90	-9,675.56	4,025.75	3,884.83	
17,000.00	6,872.55	3,219.00	3,218.46	253.80	68.96	-20.50	-777.90	-9,675.56	4,047.61	3,905.54	
17,070.79	6,872.39	3,219.00	3,218.46	255.52	68.96	-20.50	-777.90	-9,675.56	4,064.51	3,921.63	
17,100.00	6,872.32	3,219.00	3,218.46	256.23	68.96	-20.50	-777.90	-9,675.56	4,071.81	3,928.61	
17,200.00	6,872.09	3,219.00	3,218.46	258.66	68.96	-20.50	-777.90	-9,675.56	4,098.31	3,954.01	
17,237.94	6,872.00	3,219.00	3,218.46	259.58	68.96	-20.50	-777.90	-9,675.56	4,108.96	3,964.25	28.393 SF

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 260A - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 200-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	5,150.00	3,223.84	0.00	48.87	-85.14	516.51	-6,070.34	6,858.84				
100.00	100.00	5,150.00	3,223.84	0.25	48.87	-85.14	516.51	-6,070.34	6,813.48	6,778.65	34.82	195.669	
200.00	200.00	5,150.00	3,223.84	0.61	48.87	-85.14	516.51	-6,070.34	6,769.29	6,734.21	35.08	192.978	
300.00	300.00	5,150.00	3,223.84	0.97	48.87	-85.14	516.51	-6,070.34	6,726.30	6,690.89	35.41	189.941	
400.00	400.00	5,150.00	3,223.84	1.33	48.87	-85.14	516.51	-6,070.34	6,684.53	6,648.73	35.80	186.717	
500.00	500.00	5,150.00	3,223.84	1.68	48.87	-85.14	516.51	-6,070.34	6,644.00	6,607.78	36.22	183.425	
600.00	600.00	5,150.00	3,223.84	2.04	48.87	-85.14	516.51	-6,070.34	6,604.74	6,568.08	36.67	180.137	
700.00	700.00	5,150.00	3,223.84	2.40	48.87	-85.14	516.51	-6,070.34	6,566.77	6,529.65	37.12	176.897	
800.00	800.00	5,150.00	3,223.84	2.76	48.87	-85.14	516.51	-6,070.34	6,530.10	6,492.52	37.59	173.731	
900.00	900.00	5,150.00	3,223.84	3.12	48.87	-85.14	516.51	-6,070.34	6,494.77	6,456.72	38.06	170.651	
1,000.00	1,000.00	5,150.00	3,223.84	3.48	48.87	-85.14	516.51	-6,070.34	6,460.80	6,422.27	38.53	167.667	
1,100.00	1,099.98	5,150.00	3,223.84	3.83	48.87	-48.94	516.51	-6,070.34	6,427.11	6,388.10	39.01	164.776	
1,200.08	1,199.92	5,150.00	3,223.84	4.19	48.87	-49.49	516.51	-6,070.34	6,392.61	6,353.15	39.46	161.987	
1,300.00	1,299.59	5,150.00	3,223.84	4.55	48.87	-49.49	516.51	-6,070.34	6,358.47	6,318.57	39.91	159.329	
1,400.00	1,399.35	5,150.00	3,223.84	4.91	48.87	-49.49	516.51	-6,070.34	6,325.71	6,285.36	40.35	156.778	
1,500.00	1,499.11	5,150.00	3,223.84	5.27	48.87	-49.49	516.51	-6,070.34	6,294.36	6,253.57	40.79	154.319	
1,600.00	1,598.86	5,150.00	3,223.84	5.63	48.87	-49.49	516.51	-6,070.34	6,264.45	6,223.23	41.23	151.952	
1,700.00	1,698.62	5,150.00	3,223.84	6.00	48.87	-49.49	516.51	-6,070.34	6,236.01	6,194.34	41.66	149.679	
1,800.00	1,798.37	5,150.00	3,223.84	6.36	48.87	-49.49	516.51	-6,070.34	6,209.04	6,166.94	42.10	147.498	
1,900.00	1,898.13	5,150.00	3,223.84	6.72	48.87	-49.49	516.51	-6,070.34	6,183.57	6,141.05	42.53	145.409	
2,000.00	1,997.89	5,150.00	3,223.84	7.09	48.87	-49.49	516.51	-6,070.34	6,159.62	6,116.67	42.95	143.412	
2,100.00	2,097.64	5,150.00	3,223.84	7.45	48.87	-49.49	516.51	-6,070.34	6,137.21	6,093.84	43.37	141.506	
2,200.00	2,197.40	5,150.00	3,223.84	7.82	48.87	-49.49	516.51	-6,070.34	6,116.35	6,072.56	43.79	139.689	
2,300.00	2,297.16	5,150.00	3,223.84	8.19	48.87	-49.49	516.51	-6,070.34	6,097.06	6,052.86	44.19	137.961	
2,400.00	2,396.91	5,150.00	3,223.84	8.55	48.87	-49.49	516.51	-6,070.34	6,079.35	6,034.75	44.60	136.320	
2,500.00	2,496.67	5,150.00	3,223.84	8.92	48.87	-49.49	516.51	-6,070.34	6,063.24	6,018.25	44.99	134.765	
2,600.00	2,596.42	5,150.00	3,223.84	9.29	48.87	-49.49	516.51	-6,070.34	6,048.74	6,003.36	45.38	133.295	
2,700.00	2,696.18	5,150.00	3,223.84	9.66	48.87	-49.49	516.51	-6,070.34	6,035.87	5,990.11	45.76	131.909	
2,800.00	2,795.94	5,150.00	3,223.84	10.02	48.87	-49.49	516.51	-6,070.34	6,024.62	5,978.49	46.13	130.604	
2,900.00	2,895.69	5,150.00	3,223.84	10.39	48.87	-49.49	516.51	-6,070.34	6,015.02	5,968.53	46.49	129.381	
3,000.00	2,995.45	5,150.00	3,223.84	10.76	48.87	-49.49	516.51	-6,070.34	6,007.07	5,960.22	46.84	128.238	
3,100.00	3,095.21	5,150.00	3,223.84	11.13	48.87	-49.49	516.51	-6,070.34	6,000.77	5,953.58	47.19	127.172	
3,200.00	3,194.96	5,150.00	3,223.84	11.49	48.87	-49.49	516.51	-6,070.34	5,996.13	5,948.62	47.52	126.184	
3,300.00	3,294.72	5,150.00	3,223.84	11.86	48.87	-49.49	516.51	-6,070.34	5,993.16	5,945.32	47.84	125.271	
3,400.00	3,394.47	5,150.00	3,223.84	12.23	48.87	-49.49	516.51	-6,070.34	5,991.86	5,943.71	48.15	124.432	
3,428.04	3,422.45	5,150.00	3,223.84	12.33	48.87	-49.49	516.51	-6,070.34	5,991.80	5,943.56	48.24	124.210	
3,500.00	3,494.23	5,150.00	3,223.84	12.60	48.87	-49.49	516.51	-6,070.34	5,992.23	5,943.77	48.45	123.666	
3,600.00	3,593.99	5,150.00	3,223.84	12.97	48.87	-49.49	516.51	-6,070.34	5,994.26	5,945.52	48.75	122.972	
3,700.00	3,693.74	5,150.00	3,223.84	13.34	48.87	-49.49	516.51	-6,070.34	5,997.97	5,948.94	49.02	122.347	
3,800.00	3,793.50	5,150.00	3,223.84	13.71	48.87	-49.49	516.51	-6,070.34	6,003.33	5,954.04	49.29	121.792	
3,900.00	3,893.26	5,150.00	3,223.84	14.07	48.87	-49.49	516.51	-6,070.34	6,010.36	5,960.81	49.55	121.304	
4,000.00	3,993.01	5,150.00	3,223.84	14.44	48.87	-49.49	516.51	-6,070.34	6,019.03	5,969.24	49.79	120.882	
4,100.00	4,092.77	5,150.00	3,223.84	14.81	48.87	-49.49	516.51	-6,070.34	6,029.36	5,979.33	50.03	120.525	
4,200.00	4,192.52	5,150.00	3,223.84	15.18	48.87	-49.49	516.51	-6,070.34	6,041.32	5,991.07	50.25	120.231	
4,300.00	4,292.28	5,150.00	3,223.84	15.55	48.87	-49.49	516.51	-6,070.34	6,054.91	6,004.45	50.46	120.000	
4,400.00	4,392.04	5,150.00	3,223.84	15.92	48.87	-49.49	516.51	-6,070.34	6,070.12	6,019.46	50.66	119.829	
4,500.00	4,491.79	5,150.00	3,223.84	16.29	48.87	-49.49	516.51	-6,070.34	6,086.93	6,036.09	50.84	119.718	
4,600.00	4,591.55	5,150.00	3,223.84	16.66	48.87	-49.49	516.51	-6,070.34	6,105.33	6,054.31	51.02	119.666	
4,700.00	4,691.31	5,150.00	3,223.84	17.03	48.87	-49.49	516.51	-6,070.34	6,125.32	6,074.13	51.19	119.670	
4,800.00	4,791.06	5,150.00	3,223.84	17.40	48.87	-49.49	516.51	-6,070.34	6,146.86	6,095.52	51.34	119.730	
4,900.00	4,890.82	5,150.00	3,223.84	17.76	48.87	-49.49	516.51	-6,070.34	6,169.95	6,118.47	51.48	119.845	
5,000.00	4,990.57	5,150.00	3,223.84	18.13	48.87	-49.49	516.51	-6,070.34	6,194.57	6,142.95	51.62	120.012	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 260A - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 200-APC_ISCWSA REV 2 MWD												Offset Well Error:	0.00 usft
Reference												Rule Assigned:	
Offset												Warning	
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	
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
5,100.00	5,090.33	5,150.00	3,223.84	18.50	48.87	-49.49	516.51	-6,070.34	6,220.70	6,168.96	51.74	120.232	
5,200.00	5,190.09	5,150.00	3,223.84	18.87	48.87	-49.49	516.51	-6,070.34	6,248.32	6,196.46	51.85	120.502	
5,300.00	5,289.84	5,150.00	3,223.84	19.24	48.87	-49.49	516.51	-6,070.34	6,277.41	6,225.45	51.96	120.822	
5,400.00	5,389.60	5,150.00	3,223.84	19.61	48.87	-49.49	516.51	-6,070.34	6,307.95	6,255.90	52.05	121.189	
5,500.00	5,489.35	5,150.00	3,223.84	19.98	48.87	-49.49	516.51	-6,070.34	6,339.92	6,287.79	52.14	121.603	
5,600.00	5,589.11	5,150.00	3,223.84	20.35	48.87	-49.49	516.51	-6,070.34	6,373.31	6,321.09	52.21	122.063	
5,700.00	5,688.87	5,150.00	3,223.84	20.72	48.87	-49.49	516.51	-6,070.34	6,408.07	6,355.79	52.28	122.568	
5,800.00	5,788.62	5,150.00	3,223.84	21.09	48.87	-49.49	516.51	-6,070.34	6,444.21	6,391.86	52.34	123.115	
5,900.00	5,888.38	5,150.00	3,223.84	21.46	48.87	-49.49	516.51	-6,070.34	6,481.68	6,429.28	52.40	123.704	
6,000.00	5,988.14	5,150.00	3,223.84	21.83	48.87	-49.49	516.51	-6,070.34	6,520.47	6,468.03	52.44	124.334	
6,100.00	6,087.89	5,150.00	3,223.84	22.20	48.87	-49.49	516.51	-6,070.34	6,560.56	6,508.08	52.48	125.002	
6,200.00	6,187.65	5,150.00	3,223.84	22.57	48.87	-49.49	516.51	-6,070.34	6,601.92	6,549.40	52.52	125.709	
6,299.50	6,286.91	5,150.00	3,223.84	22.93	48.87	-49.49	516.51	-6,070.34	6,644.31	6,591.77	52.55	126.449	
6,350.00	6,337.14	5,150.00	3,223.84	23.12	48.87	-22.04	516.51	-6,070.34	6,664.47	6,611.92	52.55	126.814	
6,400.00	6,386.40	5,150.00	3,223.84	23.32	48.87	-13.31	516.51	-6,070.34	6,681.09	6,628.53	52.56	127.123	
6,450.00	6,434.88	5,150.00	3,223.84	23.52	48.87	-9.25	516.51	-6,070.34	6,694.30	6,641.74	52.56	127.373	
6,500.00	6,482.27	5,150.00	3,223.84	23.73	48.87	-6.94	516.51	-6,070.34	6,704.05	6,651.50	52.55	127.564	
6,550.00	6,528.29	5,150.00	3,223.84	23.94	48.87	-5.46	516.51	-6,070.34	6,710.29	6,657.74	52.55	127.696	
6,600.00	6,572.65	5,150.00	3,223.84	24.16	48.87	-4.43	516.51	-6,070.34	6,712.99	6,660.45	52.54	127.769	
6,650.00	6,615.08	5,150.00	3,223.84	24.39	48.87	-3.67	516.51	-6,070.34	6,712.14	6,659.62	52.53	127.786	
6,700.00	6,655.31	5,150.00	3,223.84	24.64	48.87	-3.09	516.51	-6,070.34	6,707.75	6,655.24	52.51	127.745	
6,750.00	6,693.11	5,150.00	3,223.84	24.90	48.87	-2.63	516.51	-6,070.34	6,699.82	6,647.34	52.49	127.649	
6,800.00	6,728.23	5,150.00	3,223.84	25.18	48.87	-2.26	516.51	-6,070.34	6,688.41	6,635.95	52.46	127.497	
6,850.00	6,760.46	5,150.00	3,223.84	25.50	48.87	-1.93	516.51	-6,070.34	6,673.56	6,621.13	52.43	127.291	
6,900.00	6,789.60	5,150.00	3,223.84	25.84	48.87	-1.65	516.51	-6,070.34	6,655.34	6,602.95	52.39	127.031	
6,950.00	6,815.47	5,150.00	3,223.84	26.21	48.87	-1.40	516.51	-6,070.34	6,633.84	6,581.49	52.35	126.717	
7,000.00	6,837.91	5,150.00	3,223.84	26.63	48.87	-1.16	516.51	-6,070.34	6,609.16	6,556.85	52.31	126.353	
7,050.00	6,856.78	5,150.00	3,223.84	27.08	48.87	-0.93	516.51	-6,070.34	6,581.41	6,529.15	52.26	125.937	
7,100.00	6,871.97	5,150.00	3,223.84	27.57	48.87	-0.69	516.51	-6,070.34	6,550.73	6,498.52	52.21	125.473	
7,150.00	6,883.39	5,150.00	3,223.84	28.10	48.87	-0.45	516.51	-6,070.34	6,517.27	6,465.12	52.15	124.962	
7,200.00	6,890.95	5,150.00	3,223.84	28.66	48.87	-0.17	516.51	-6,070.34	6,481.19	6,429.09	52.10	124.404	
7,250.00	6,894.63	5,150.00	3,223.84	29.25	48.87	0.14	516.51	-6,070.34	6,442.67	6,390.63	52.04	123.802	
7,273.35	6,895.00	5,150.00	3,223.84	29.54	48.87	0.31	516.51	-6,070.34	6,423.91	6,371.89	52.02	123.500	
7,300.00	6,894.94	5,150.00	3,223.84	29.87	48.87	0.31	516.51	-6,070.34	6,402.23	6,350.25	51.98	123.163	
7,400.00	6,894.71	5,150.00	3,223.84	31.22	48.87	0.31	516.51	-6,070.34	6,321.25	6,269.40	51.85	121.912	
7,500.00	6,894.48	5,150.00	3,223.84	32.69	48.87	0.31	516.51	-6,070.34	6,240.82	6,189.10	51.73	120.654	
7,600.00	6,894.25	5,150.00	3,223.84	34.27	48.87	0.31	516.51	-6,070.34	6,160.96	6,109.36	51.61	119.387	
7,700.00	6,894.01	5,150.00	3,223.84	35.95	48.87	0.31	516.51	-6,070.34	6,081.70	6,030.21	51.49	118.111	
7,800.00	6,893.78	5,150.00	3,223.84	37.71	48.87	0.31	516.51	-6,070.34	6,003.06	5,951.67	51.38	116.827	
7,900.00	6,893.55	5,150.00	3,223.84	39.54	48.87	0.31	516.51	-6,070.34	5,925.06	5,873.77	51.28	115.532	
8,000.00	6,893.32	5,150.00	3,223.84	41.44	48.87	0.31	516.51	-6,070.34	5,847.73	5,796.54	51.19	114.229	
8,100.00	6,893.09	5,150.00	3,223.84	43.39	48.87	0.31	516.51	-6,070.34	5,771.10	5,719.99	51.11	112.915	
8,200.00	6,892.86	5,150.00	3,223.84	45.39	48.87	0.31	516.51	-6,070.34	5,695.19	5,644.15	51.04	111.592	
8,300.00	6,892.63	5,150.00	3,223.84	47.44	48.87	0.31	516.51	-6,070.34	5,620.04	5,569.07	50.97	110.258	
8,400.00	6,892.40	5,150.00	3,223.84	49.51	48.87	0.31	516.51	-6,070.34	5,545.67	5,494.75	50.92	108.914	
8,500.00	6,892.17	5,150.00	3,223.84	51.62	48.87	0.31	516.51	-6,070.34	5,472.12	5,421.24	50.87	107.561	
8,600.00	6,891.94	5,150.00	3,223.84	53.76	48.87	0.31	516.51	-6,070.34	5,399.41	5,348.57	50.84	106.198	
8,700.00	6,891.71	5,150.00	3,223.84	55.92	48.87	0.31	516.51	-6,070.34	5,327.60	5,276.78	50.82	104.826	
8,800.00	6,891.48	5,150.00	3,223.84	58.11	48.87	0.31	516.51	-6,070.34	5,256.70	5,205.89	50.82	103.446	
8,900.00	6,891.25	5,150.00	3,223.84	60.31	48.87	0.31	516.51	-6,070.34	5,186.77	5,135.94	50.82	102.057	
9,000.00	6,891.01	5,150.00	3,223.84	62.54	48.87	0.31	516.51	-6,070.34	5,117.83	5,066.99	50.84	100.662	
9,100.00	6,890.78	5,150.00	3,223.84	64.78	48.87	0.31	516.51	-6,070.34	5,049.93	4,999.05	50.88	99.261	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 260A - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		200-APC_ISCWSA REV 2 MWD					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		
9,200.00	6,890.55	5,150.00	3,223.84	67.03	48.87	0.31	516.51	-6,070.34	4,983.11	4,932.19	50.92	97.854		
9,300.00	6,890.32	5,150.00	3,223.84	69.29	48.87	0.31	516.51	-6,070.34	4,917.42	4,866.43	50.99	96.444		
9,400.00	6,890.09	5,150.00	3,223.84	71.57	48.87	0.31	516.51	-6,070.34	4,852.90	4,801.84	51.07	95.032		
9,500.00	6,889.86	5,150.00	3,223.84	73.86	48.87	0.31	516.51	-6,070.34	4,789.60	4,738.44	51.16	93.620		
9,600.00	6,889.63	5,150.00	3,223.84	76.16	48.87	0.31	516.51	-6,070.34	4,727.57	4,676.30	51.27	92.209		
9,700.00	6,889.40	5,150.00	3,223.84	78.46	48.87	0.31	516.51	-6,070.34	4,666.85	4,615.46	51.40	90.800		
9,800.00	6,889.17	5,150.00	3,223.84	80.78	48.87	0.31	516.51	-6,070.34	4,607.51	4,555.97	51.54	89.397		
9,900.00	6,888.94	5,150.00	3,223.84	83.10	48.87	0.31	516.51	-6,070.34	4,549.59	4,497.89	51.70	88.001		
10,000.00	6,888.71	5,150.00	3,223.84	85.43	48.87	0.31	516.51	-6,070.34	4,493.15	4,441.27	51.88	86.614		
10,100.00	6,888.48	5,150.00	3,223.84	87.76	48.87	0.31	516.51	-6,070.34	4,438.24	4,386.18	52.07	85.238		
10,200.00	6,888.25	5,150.00	3,223.84	90.10	48.87	0.31	516.51	-6,070.34	4,384.93	4,332.65	52.28	83.876		
10,300.00	6,888.01	5,150.00	3,223.84	92.45	48.87	0.31	516.51	-6,070.34	4,333.27	4,280.77	52.51	82.529		
10,400.00	6,887.78	5,150.00	3,223.84	94.80	48.87	0.31	516.51	-6,070.34	4,283.33	4,230.58	52.75	81.201		
10,500.00	6,887.55	5,150.00	3,223.84	97.15	48.87	0.31	516.51	-6,070.34	4,235.15	4,182.14	53.01	79.891		
10,600.00	6,887.32	5,150.00	3,223.84	99.51	48.87	0.31	516.51	-6,070.34	4,188.81	4,135.52	53.29	78.604		
10,700.00	6,887.09	5,150.00	3,223.84	101.87	48.87	0.31	516.51	-6,070.34	4,144.36	4,090.78	53.59	77.341		
10,800.00	6,886.86	5,150.00	3,223.84	104.24	48.87	0.31	516.51	-6,070.34	4,101.87	4,047.97	53.90	76.102		
10,900.00	6,886.63	5,150.00	3,223.84	106.61	48.87	0.31	516.51	-6,070.34	4,061.40	4,007.17	54.23	74.891		
11,000.00	6,886.40	5,150.00	3,223.84	108.98	48.87	0.31	516.51	-6,070.34	4,023.01	3,968.43	54.58	73.707		
11,100.00	6,886.17	5,150.00	3,223.84	111.36	48.87	0.31	516.51	-6,070.34	3,986.76	3,931.81	54.95	72.553		
11,200.00	6,885.94	5,150.00	3,223.84	113.74	48.87	0.31	516.51	-6,070.34	3,952.70	3,897.36	55.34	71.430		
11,300.00	6,885.71	5,150.00	3,223.84	116.12	48.87	0.31	516.51	-6,070.34	3,920.90	3,865.16	55.74	70.337		
11,400.00	6,885.48	5,150.00	3,223.84	118.51	48.87	0.31	516.51	-6,070.34	3,891.41	3,835.24	56.17	69.276		
11,500.00	6,885.25	5,150.00	3,223.84	120.89	48.87	0.31	516.51	-6,070.34	3,864.29	3,807.67	56.62	68.247		
11,600.00	6,885.01	5,150.00	3,223.84	123.28	48.87	0.31	516.51	-6,070.34	3,839.57	3,782.48	57.09	67.251		
11,700.00	6,884.78	5,150.00	3,223.84	125.67	48.87	0.31	516.51	-6,070.34	3,817.32	3,759.73	57.59	66.286		
11,800.00	6,884.55	5,150.00	3,223.84	128.07	48.87	0.31	516.51	-6,070.34	3,797.58	3,739.47	58.11	65.354		
11,900.00	6,884.32	5,150.00	3,223.84	130.46	48.87	0.31	516.51	-6,070.34	3,780.37	3,721.72	58.65	64.455		
12,000.00	6,884.09	5,150.00	3,223.84	132.86	48.87	0.31	516.51	-6,070.34	3,765.74	3,706.52	59.22	63.588		
12,100.00	6,883.86	5,150.00	3,223.84	135.25	48.87	0.31	516.51	-6,070.34	3,753.72	3,693.91	59.82	62.753		
12,200.00	6,883.63	5,150.00	3,223.84	137.65	48.87	0.31	516.51	-6,070.34	3,744.34	3,683.90	60.44	61.952		
12,300.00	6,883.40	5,150.00	3,223.84	140.05	48.87	0.31	516.51	-6,070.34	3,737.60	3,676.52	61.09	61.185		
12,400.00	6,883.17	5,082.33	3,226.18	142.46	47.31	-0.32	476.69	-6,125.00	3,732.93	3,671.69	61.23	60.962		
12,500.00	6,882.94	5,048.70	3,227.14	144.86	46.54	-0.64	456.85	-6,152.13	3,729.74	3,668.05	61.70	60.453		
12,600.00	6,882.71	4,954.23	3,228.89	147.27	44.38	-1.55	400.26	-6,227.75	3,728.46	3,666.64	61.82	60.310		
12,700.00	6,882.48	4,891.00	3,230.59	149.67	42.95	-2.17	361.36	-6,277.57	3,727.54	3,665.30	62.24	59.888		
12,704.47	6,882.47	4,891.00	3,230.59	149.78	42.95	-2.17	361.36	-6,277.57	3,727.54	3,665.26	62.28	59.854	CC, ES	
12,800.00	6,882.25	4,856.72	3,231.25	152.08	42.17	-2.50	340.16	-6,304.50	3,728.35	3,665.49	62.87	59.304		
12,900.00	6,882.01	4,828.00	3,231.41	154.49	41.52	-2.79	322.52	-6,327.17	3,731.24	3,667.69	63.55	58.712		
13,000.00	6,881.78	4,828.00	3,231.41	156.90	41.52	-2.79	322.52	-6,327.17	3,736.52	3,672.15	64.37	58.048		
13,100.00	6,881.55	4,794.63	3,230.86	159.31	40.76	-3.11	301.88	-6,353.39	3,743.77	3,678.69	65.07	57.532		
13,200.00	6,881.32	4,765.00	3,229.48	161.72	40.09	-3.41	283.26	-6,376.39	3,753.63	3,687.82	65.81	57.036		
13,300.00	6,881.09	4,545.65	3,224.01	164.13	35.24	-5.62	142.58	-6,544.47	3,763.85	3,697.49	66.36	56.716		
13,400.00	6,880.86	4,510.00	3,223.78	166.55	34.44	-6.00	118.81	-6,571.03	3,773.82	3,706.57	67.25	56.119		
13,500.00	6,880.63	4,477.43	3,223.28	168.96	33.74	-6.34	96.80	-6,595.04	3,785.75	3,717.61	68.14	55.554		
13,600.00	6,880.40	4,319.00	3,222.79	171.38	30.34	-8.03	-11.94	-6,710.23	3,798.39	3,728.92	69.47	54.675		
13,700.00	6,880.17	4,271.38	3,223.31	173.79	29.33	-8.55	-45.22	-6,744.28	3,811.63	3,741.08	70.55	54.028		
13,800.00	6,879.94	4,214.34	3,223.41	176.21	28.12	-9.16	-84.86	-6,785.30	3,826.65	3,754.96	71.70	53.373		
13,900.00	6,879.71	4,191.00	3,223.37	178.63	27.62	-9.41	-100.87	-6,802.28	3,843.27	3,770.62	72.65	52.901		
14,000.00	6,879.48	4,150.95	3,222.90	181.04	26.75	-9.83	-128.35	-6,831.42	3,861.72	3,788.03	73.70	52.401		
14,100.00	6,879.25	4,127.00	3,222.24	183.46	26.23	-10.08	-144.87	-6,848.75	3,882.33	3,807.71	74.62	52.026		
14,200.00	6,879.01	4,102.27	3,221.30	185.88	25.72	-10.34	-162.00	-6,866.55	3,904.96	3,829.42	75.54	51.695		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 260A - OH - OH											Offset Site Error: 0.00 usft
Survey Program: 200-APC_ISCWSA REV 2 MWD											Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		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)	
14,300.00	6,878.78	3,853.02	3,216.06	188.30	20.63	-12.95	-334.62	-7,046.20	3,927.70	3,849.15	
14,400.00	6,878.55	3,785.99	3,216.50	190.72	19.26	-13.64	-380.96	-7,094.63	3,949.64	3,869.64	
14,500.00	6,878.32	3,745.00	3,216.36	193.14	18.40	-14.06	-409.50	-7,124.05	3,973.43	3,892.28	
14,600.00	6,878.09	3,745.00	3,216.36	195.56	18.40	-14.06	-409.50	-7,124.05	3,999.07	3,917.28	
14,700.00	6,877.86	3,708.61	3,215.63	197.99	17.68	-14.44	-434.92	-7,150.08	4,026.54	3,943.71	
14,800.00	6,877.63	3,679.21	3,214.52	200.41	17.10	-14.74	-455.40	-7,171.14	4,055.96	3,972.19	
14,900.00	6,877.40	3,617.00	3,212.29	202.83	15.90	-15.37	-498.86	-7,215.59	4,086.49	4,001.36	
15,000.00	6,877.17	3,580.12	3,211.10	205.25	15.17	-15.75	-525.05	-7,241.54	4,118.45	4,032.30	
15,100.00	6,876.94	3,554.00	3,210.02	207.68	14.65	-16.02	-543.96	-7,259.51	4,152.35	4,065.36	
15,200.00	6,876.71	3,554.00	3,210.02	210.10	14.65	-16.02	-543.96	-7,259.51	4,188.09	4,100.70	
15,300.00	6,876.48	3,554.00	3,210.02	212.53	14.65	-16.02	-543.96	-7,259.51	4,225.90	4,138.14	
15,400.00	6,876.25	3,554.00	3,210.02	214.95	14.65	-16.02	-543.96	-7,259.51	4,265.71	4,177.63	
15,500.00	6,876.01	3,554.00	3,210.02	217.38	14.65	-16.02	-543.96	-7,259.51	4,307.49	4,219.12	
15,600.00	6,875.78	3,554.00	3,210.02	219.80	14.65	-16.02	-543.96	-7,259.51	4,351.15	4,262.54	
15,700.00	6,875.55	3,524.11	3,207.18	222.23	14.08	-16.32	-565.57	-7,279.95	4,395.38	4,306.08	
15,800.00	6,875.32	3,492.00	3,200.84	224.66	13.47	-16.62	-588.12	-7,301.89	4,443.23	4,353.28	
15,900.00	6,875.09	3,492.00	3,200.84	227.08	13.47	-16.62	-588.12	-7,301.89	4,491.35	4,401.24	
16,000.00	6,874.86	3,492.00	3,200.84	229.51	13.47	-16.62	-588.12	-7,301.89	4,541.16	4,450.93	
16,100.00	6,874.63	3,492.00	3,200.84	231.94	13.47	-16.62	-588.12	-7,301.89	4,592.60	4,502.28	
16,200.00	6,874.40	3,492.00	3,200.84	234.37	13.47	-16.62	-588.12	-7,301.89	4,645.63	4,555.25	
16,300.00	6,874.17	3,492.00	3,200.84	236.79	13.47	-16.62	-588.12	-7,301.89	4,700.19	4,609.76	
16,400.00	6,873.94	3,492.00	3,200.84	239.22	13.47	-16.62	-588.12	-7,301.89	4,756.23	4,665.78	
16,500.00	6,873.71	3,492.00	3,200.84	241.65	13.47	-16.62	-588.12	-7,301.89	4,813.69	4,723.25	
16,600.00	6,873.48	3,460.00	3,191.46	244.08	12.88	-16.89	-609.67	-7,323.59	4,872.37	4,781.50	
16,700.00	6,873.25	3,460.00	3,191.46	246.51	12.88	-16.89	-609.67	-7,323.59	4,932.10	4,841.28	
16,800.00	6,873.02	3,460.00	3,191.46	248.94	12.88	-16.89	-609.67	-7,323.59	4,993.13	4,902.37	
16,900.00	6,872.78	3,460.00	3,191.46	251.37	12.88	-16.89	-609.67	-7,323.59	5,055.39	4,964.71	
17,000.00	6,872.55	3,460.00	3,191.46	253.80	12.88	-16.89	-609.67	-7,323.59	5,118.86	5,028.27	
17,070.79	6,872.39	3,442.33	3,185.20	255.52	12.56	-17.03	-621.18	-7,335.45	5,164.19	5,073.43	
17,100.00	6,872.32	3,428.00	3,179.69	256.23	12.31	-17.14	-630.39	-7,344.93	5,183.26	5,092.33	
17,200.00	6,872.09	3,428.00	3,179.69	258.66	12.31	-17.14	-630.39	-7,344.93	5,248.59	5,157.78	
17,237.94	6,872.00	3,428.00	3,179.69	259.58	12.31	-17.14	-630.39	-7,344.93	5,273.66	5,182.90	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 79 - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 200-Standard Keeper 104, 4800-A027Ua_INC-ONLY													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	-90.23	-15.45	-3,929.76	3,930.27				
100.00	100.00	41.62	41.62	0.25	0.02	-90.23	-15.45	-3,929.74	3,929.77	3,929.49	0.28	N/A	
200.00	200.00	151.14	151.14	0.61	0.10	-90.22	-15.39	-3,929.50	3,929.55	3,928.85	0.71	5,556.961	
300.00	300.00	257.06	257.05	0.97	0.21	-90.22	-15.30	-3,929.05	3,929.12	3,927.95	1.17	3,354.129	
400.00	400.00	360.07	360.07	1.33	0.34	-90.22	-15.28	-3,928.51	3,928.60	3,926.94	1.66	2,360.902	
500.00	500.00	460.55	460.54	1.68	0.47	-90.22	-15.32	-3,927.93	3,928.02	3,925.87	2.15	1,823.952	
600.00	600.00	559.41	559.41	2.04	0.60	-90.22	-15.39	-3,927.37	3,927.46	3,924.82	2.64	1,486.982	
700.00	700.00	658.59	658.59	2.40	0.73	-90.23	-15.46	-3,926.84	3,926.93	3,923.80	3.13	1,255.289	
800.00	800.00	758.00	757.99	2.76	0.86	-90.22	-15.42	-3,926.33	3,926.41	3,922.80	3.61	1,086.152	
900.00	900.00	858.63	858.62	3.12	0.98	-90.22	-15.25	-3,925.82	3,925.90	3,921.80	4.10	957.919	
1,000.00	1,000.00	960.16	960.15	3.48	1.11	-90.22	-14.95	-3,925.27	3,925.36	3,920.78	4.58	857.181	
1,100.00	1,099.98	1,058.33	1,058.32	3.83	1.22	-53.52	-14.53	-3,924.72	3,923.76	3,918.72	5.04	778.198	
1,200.00	1,199.92	1,154.32	1,154.30	4.19	1.33	-53.63	-14.02	-3,924.27	3,920.18	3,914.68	5.49	713.597	
1,300.00	1,299.59	1,251.59	1,251.57	4.55	1.43	-53.70	-13.42	-3,923.91	3,915.66	3,909.72	5.94	659.108	
1,400.00	1,399.35	1,350.31	1,350.29	4.91	1.54	-53.77	-12.87	-3,923.57	3,911.18	3,904.80	6.39	612.494	
1,500.00	1,499.11	1,446.41	1,446.39	5.27	1.64	-53.85	-12.39	-3,923.29	3,906.75	3,899.94	6.82	572.946	
1,600.00	1,598.86	1,539.86	1,539.84	5.63	1.73	-53.92	-11.87	-3,923.14	3,902.48	3,895.24	7.24	539.048	
1,700.00	1,698.62	1,634.91	1,634.89	6.00	1.81	-53.99	-11.27	-3,923.15	3,898.36	3,890.71	7.65	509.417	
1,800.00	1,798.37	1,732.81	1,732.78	6.36	1.89	-54.06	-10.60	-3,923.22	3,894.32	3,886.27	8.05	483.740	
1,900.00	1,898.13	1,830.81	1,830.77	6.72	1.97	-54.13	-9.91	-3,923.35	3,890.34	3,881.89	8.45	460.614	
2,000.00	1,997.89	1,928.99	1,928.96	7.09	2.04	-54.20	-9.31	-3,923.51	3,886.41	3,877.57	8.84	439.867	
2,100.00	2,097.64	2,027.20	2,027.16	7.45	2.12	-54.28	-8.83	-3,923.71	3,882.52	3,873.30	9.22	420.964	
2,200.00	2,197.40	2,125.50	2,125.46	7.82	2.18	-54.35	-8.41	-3,923.95	3,878.68	3,869.08	9.60	403.846	
2,300.00	2,297.16	2,224.27	2,224.23	8.19	2.24	-54.43	-8.04	-3,924.23	3,874.88	3,864.90	9.98	388.103	
2,400.00	2,396.91	2,324.49	2,324.45	8.55	2.27	-54.51	-7.80	-3,924.51	3,871.10	3,860.74	10.36	373.733	
2,500.00	2,496.67	2,424.04	2,424.01	8.92	2.30	-54.59	-7.76	-3,924.78	3,867.31	3,856.58	10.73	360.295	
2,600.00	2,596.42	2,521.62	2,521.58	9.29	2.30	-54.68	-7.84	-3,925.07	3,863.57	3,852.46	11.12	347.591	
2,700.00	2,696.18	2,619.54	2,619.50	9.66	2.30	-54.76	-8.03	-3,925.42	3,859.89	3,848.39	11.50	335.615	
2,800.00	2,795.94	2,718.94	2,718.90	10.02	2.29	-54.85	-8.32	-3,925.80	3,856.25	3,844.35	11.90	323.971	
2,900.00	2,895.69	2,818.35	2,818.31	10.39	2.29	-54.94	-8.71	-3,926.18	3,852.63	3,840.32	12.31	313.039	
3,000.00	2,995.45	2,917.90	2,917.85	10.76	2.30	-55.03	-9.04	-3,926.57	3,849.02	3,836.30	12.72	302.614	
3,100.00	3,095.21	3,018.62	3,018.58	11.13	2.32	-55.12	-9.25	-3,926.97	3,845.42	3,832.29	13.13	292.778	
3,200.00	3,194.96	3,124.86	3,124.81	11.49	2.40	-55.21	-9.23	-3,927.29	3,841.73	3,828.16	13.56	283.268	
3,300.00	3,294.72	3,228.92	3,228.87	11.86	2.48	-55.29	-8.95	-3,927.44	3,837.88	3,823.89	13.99	274.310	
3,400.00	3,394.47	3,327.70	3,327.65	12.23	2.59	-55.37	-8.59	-3,927.56	3,834.02	3,819.59	14.42	265.844	
3,500.00	3,494.23	3,426.07	3,426.03	12.60	2.69	-55.45	-8.19	-3,927.72	3,830.19	3,815.34	14.85	257.881	
3,600.00	3,593.99	3,523.31	3,523.26	12.97	2.79	-55.53	-7.86	-3,927.92	3,826.42	3,811.14	15.28	250.377	
3,700.00	3,693.74	3,621.05	3,621.00	13.34	2.89	-55.61	-7.63	-3,928.18	3,822.73	3,807.02	15.72	243.245	
3,800.00	3,793.50	3,720.70	3,720.65	13.71	2.98	-55.70	-7.47	-3,928.47	3,819.07	3,802.92	16.15	236.437	
3,900.00	3,893.26	3,819.20	3,819.15	14.07	3.06	-55.78	-7.35	-3,928.76	3,815.42	3,798.84	16.59	230.002	
4,000.00	3,993.01	3,913.19	3,913.14	14.44	3.11	-55.86	-7.50	-3,929.12	3,811.89	3,794.86	17.03	223.877	
4,100.00	4,092.77	4,007.95	4,007.90	14.81	3.17	-55.95	-8.05	-3,929.61	3,808.52	3,791.05	17.47	218.065	
4,200.00	4,192.52	4,112.55	4,112.49	15.18	3.19	-56.06	-9.14	-3,930.13	3,805.15	3,787.24	17.91	212.474	
4,300.00	4,292.28	4,217.73	4,217.65	15.55	3.21	-56.18	-10.79	-3,930.48	3,801.66	3,783.31	18.35	207.150	
4,400.00	4,392.04	4,326.24	4,326.15	15.92	3.23	-56.30	-12.89	-3,930.60	3,797.99	3,779.20	18.79	202.089	
4,500.00	4,491.79	4,432.36	4,432.24	16.29	3.26	-56.43	-15.24	-3,930.48	3,794.12	3,774.89	19.23	197.270	
4,600.00	4,591.55	4,532.71	4,532.56	16.66	3.29	-56.56	-17.84	-3,930.22	3,790.15	3,770.48	19.67	192.707	
4,700.00	4,691.31	4,629.46	4,629.31	17.03	3.71	-56.66	-18.75	-3,930.12	3,786.25	3,765.77	20.49	184.810	
4,800.00	4,791.06	4,728.57	4,728.41	17.40	5.05	-56.75	-19.19	-3,930.07	3,782.39	3,760.17	22.22	170.215	
4,900.00	4,890.82	4,828.99	4,828.82	17.76	6.69	-56.83	-18.75	-3,930.12	3,778.59	3,754.34	24.25	155.844	
5,000.00	4,990.57	4,927.89	4,927.71	18.13	8.96	-56.91	-18.14	-3,930.12	3,774.73	3,747.82	26.91	140.280	
5,100.00	5,090.33	5,028.57	5,028.33	18.50	11.32	-57.01	-18.75	-3,930.12	3,770.96	3,741.31	29.65	127.186	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 79 - OH - OH													Offset Site Error:	0.00 usft	
Survey Program: 200-Standard Keeper 104, 4800-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			
5,200.00	5,190.09	5,127.44	5,127.19	18.87	13.74	-57.09	-18.14	-3,930.12	3,767.12	3,734.68	32.44	116.129			
5,300.00	5,289.84	5,228.15	5,227.84	19.24	16.21	-57.19	-18.75	-3,930.12	3,763.36	3,728.08	35.28	106.658			
5,400.00	5,389.60	5,327.00	5,326.68	19.61	18.66	-57.27	-18.14	-3,930.12	3,759.54	3,721.43	38.11	98.649			
5,500.00	5,489.35	5,427.73	5,427.35	19.98	21.17	-57.37	-18.75	-3,930.12	3,755.81	3,714.82	40.99	91.634			
5,600.00	5,589.11	5,526.56	5,526.17	20.35	23.64	-57.45	-18.14	-3,930.12	3,752.00	3,708.17	43.83	85.608			
5,700.00	5,688.87	5,627.31	5,626.87	20.72	26.16	-57.55	-18.75	-3,930.12	3,748.28	3,701.57	46.72	80.231			
5,800.00	5,788.62	5,726.11	5,725.66	21.09	28.64	-57.63	-18.14	-3,930.12	3,744.49	3,694.93	49.57	75.546			
5,900.00	5,888.38	5,826.89	5,826.38	21.46	31.17	-57.73	-18.75	-3,930.12	3,740.80	3,688.34	52.46	71.302			
6,000.00	5,988.14	5,925.67	5,925.15	21.83	33.66	-57.81	-18.14	-3,930.12	3,737.03	3,681.71	55.32	67.558			
6,100.00	6,087.89	6,026.47	6,025.89	22.20	36.19	-57.91	-18.75	-3,930.12	3,733.35	3,675.14	58.22	64.126			
6,200.00	6,187.65	6,125.23	6,124.64	22.57	38.68	-57.99	-18.14	-3,930.12	3,729.60	3,668.52	61.07	61.068			
6,299.50	6,286.91	6,225.56	6,224.91	22.93	41.20	-58.09	-18.75	-3,930.12	3,725.96	3,662.00	63.96	58.250			
6,350.00	6,337.14	6,275.79	6,275.14	23.12	42.47	-30.66	-18.75	-3,930.12	3,722.11	3,656.70	65.42	56.899			
6,400.00	6,386.40	6,324.07	6,323.40	23.32	43.68	-22.00	-18.13	-3,930.12	3,714.36	3,647.54	66.82	55.589			
6,450.00	6,434.88	6,370.62	6,369.95	23.52	44.86	-18.08	-18.42	-3,930.12	3,702.86	3,634.68	68.18	54.313			
6,500.00	6,482.27	6,420.99	6,420.27	23.73	46.13	-15.99	-18.75	-3,930.12	3,687.61	3,617.99	69.63	52.963			
6,550.00	6,528.29	6,467.01	6,466.29	23.94	47.29	-14.81	-18.75	-3,930.12	3,668.69	3,597.72	70.96	51.698			
6,600.00	6,572.65	6,510.90	6,510.17	24.16	48.39	-14.15	-18.10	-3,930.12	3,646.17	3,573.92	72.24	50.471			
6,650.00	6,615.08	6,551.58	6,550.85	24.39	49.42	-13.87	-18.27	-3,930.12	3,620.32	3,546.89	73.43	49.300			
6,700.00	6,655.31	6,590.14	6,589.40	24.64	50.39	-13.90	-18.63	-3,930.12	3,591.27	3,516.70	74.56	48.164			
6,750.00	6,693.11	6,631.90	6,631.11	24.90	51.44	-14.21	-18.75	-3,930.12	3,559.13	3,483.36	75.76	46.976			
6,800.00	6,728.23	6,667.02	6,666.23	25.18	52.33	-14.79	-18.75	-3,930.12	3,524.13	3,447.34	76.79	45.894			
6,850.00	6,760.46	6,699.24	6,698.46	25.50	53.14	-15.67	-18.75	-3,930.12	3,486.49	3,408.76	77.73	44.854			
6,900.00	6,789.60	6,727.16	6,726.37	25.84	53.85	-16.90	-18.14	-3,930.12	3,446.39	3,367.83	78.55	43.874			
6,950.00	6,815.47	6,751.91	6,751.11	26.21	54.47	-18.66	-18.27	-3,930.12	3,404.20	3,324.92	79.28	42.937			
7,000.00	6,837.91	6,773.36	6,772.56	26.63	55.01	-21.13	-18.45	-3,930.12	3,360.13	3,280.21	79.92	42.043			
7,050.00	6,856.78	6,791.39	6,790.58	27.08	55.46	-24.70	-18.64	-3,930.12	3,314.43	3,233.97	80.46	41.193			
7,100.00	6,871.97	6,810.83	6,809.97	27.57	55.96	-30.17	-18.75	-3,930.12	3,267.39	3,186.36	81.03	40.325			
7,150.00	6,883.39	6,822.24	6,821.39	28.10	56.24	-38.76	-18.75	-3,930.12	3,219.29	3,137.91	81.38	39.559			
7,200.00	6,890.95	6,829.81	6,828.95	28.66	56.43	-53.20	-18.75	-3,930.12	3,170.43	3,088.80	81.63	38.839			
7,250.00	6,894.63	6,833.48	6,832.63	29.25	56.53	-76.98	-18.75	-3,930.12	3,121.13	3,039.35	81.77	38.168			
7,273.35	6,895.00	6,833.86	6,833.00	29.54	56.54	-90.90	-18.75	-3,930.12	3,098.03	3,016.23	81.81	37.871			
7,300.00	6,894.94	6,833.79	6,832.94	29.87	56.53	-90.89	-18.75	-3,930.12	3,071.67	2,989.84	81.83	37.538			
7,400.00	6,894.71	6,833.56	6,832.71	31.22	56.53	-90.86	-18.75	-3,930.12	2,972.80	2,890.87	81.92	36.287			
7,500.00	6,894.48	6,833.33	6,832.48	32.69	56.52	-90.83	-18.75	-3,930.12	2,874.00	2,791.96	82.03	35.034			
7,600.00	6,894.25	6,833.10	6,832.25	34.27	56.52	-90.80	-18.75	-3,930.12	2,775.29	2,693.12	82.16	33.778			
7,700.00	6,894.01	6,832.87	6,832.01	35.95	56.51	-90.77	-18.75	-3,930.12	2,676.67	2,594.36	82.31	32.519			
7,800.00	6,893.78	6,832.64	6,831.78	37.71	56.51	-90.74	-18.75	-3,930.12	2,578.16	2,495.68	82.48	31.256			
7,900.00	6,893.55	6,832.41	6,831.55	39.54	56.50	-90.71	-18.75	-3,930.12	2,479.77	2,397.09	82.68	29.991			
8,000.00	6,893.32	6,832.18	6,831.32	41.44	56.49	-90.68	-18.75	-3,930.12	2,381.52	2,298.60	82.92	28.722			
8,100.00	6,893.09	6,831.95	6,831.09	43.39	56.49	-90.65	-18.75	-3,930.12	2,283.41	2,200.23	83.18	27.450			
8,200.00	6,892.86	6,831.72	6,830.86	45.39	56.48	-90.63	-18.75	-3,930.12	2,185.48	2,101.98	83.50	26.174			
8,300.00	6,892.63	6,831.49	6,830.63	47.44	56.48	-90.60	-18.75	-3,930.12	2,087.74	2,003.88	83.86	24.895			
8,400.00	6,892.40	6,831.26	6,830.40	49.51	56.47	-90.57	-18.75	-3,930.12	1,990.23	1,905.94	84.29	23.612			
8,500.00	6,892.17	6,831.02	6,830.17	51.62	56.46	-90.54	-18.75	-3,930.12	1,892.98	1,808.19	84.79	22.325			
8,600.00	6,891.94	6,830.79	6,829.94	53.76	56.46	-90.51	-18.75	-3,930.12	1,796.03	1,710.65	85.38	21.036			
8,700.00	6,891.71	6,830.56	6,829.71	55.92	56.45	-90.48	-18.75	-3,930.12	1,699.43	1,613.36	86.08	19.743			
8,800.00	6,891.48	6,830.33	6,829.48	58.11	56.45	-90.45	-18.75	-3,930.12	1,603.25	1,516.35	86.90	18.449			
8,900.00	6,891.25	6,830.10	6,829.25	60.31	56.44	-90.42	-18.75	-3,930.12	1,507.57	1,419.69	87.88	17.154			
9,000.00	6,891.01	6,829.87	6,829.01	62.54	56.44	-90.39	-18.75	-3,930.12	1,412.49	1,323.43	89.06	15.861			
9,100.00	6,890.78	6,829.64	6,828.78	64.78	56.43	-90.36	-18.75	-3,930.12	1,318.13	1,227.67	90.46	14.571			
9,200.00	6,890.55	6,829.41	6,828.55	67.03	56.42	-90.33	-18.75	-3,930.12	1,224.67	1,132.51	92.16	13.288			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 79 - OH - OH												Offset Site Error:	0.00 usft
Survey Program: 200-Standard Keeper 104, 4800-A027Ua_INC-ONLY												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)			
9,300.00	6,890.32	6,829.18	6,828.32	69.29	56.42	-90.30	-18.75	-3,930.12	1,132.33	1,038.11	94.22	12.018	
9,400.00	6,890.09	6,828.95	6,828.09	71.57	56.41	-90.27	-18.75	-3,930.12	1,041.40	944.68	96.72	10.767	
9,500.00	6,889.86	6,828.72	6,827.86	73.86	56.41	-90.25	-18.75	-3,930.12	952.29	852.52	99.77	9.544	
9,600.00	6,889.63	6,828.49	6,827.63	76.16	56.40	-90.22	-18.75	-3,930.12	865.57	762.06	103.51	8.362	
9,700.00	6,889.40	6,828.26	6,827.40	78.46	56.39	-90.19	-18.75	-3,930.12	782.02	673.94	108.08	7.235	
9,800.00	6,889.17	6,828.02	6,827.17	80.78	56.39	-90.16	-18.75	-3,930.12	702.79	589.15	113.64	6.185	
9,900.00	6,888.94	6,827.79	6,826.94	83.10	56.38	-90.13	-18.75	-3,930.12	629.49	509.22	120.27	5.234	
10,000.00	6,888.71	6,827.56	6,826.71	85.43	56.38	-90.10	-18.75	-3,930.12	564.45	436.55	127.90	4.413	
10,100.00	6,888.48	6,827.33	6,826.48	87.76	56.37	-90.07	-18.75	-3,930.12	510.84	374.79	136.05	3.755	
10,200.00	6,888.25	6,827.10	6,826.25	90.10	56.37	-90.04	-18.75	-3,930.12	472.55	328.99	143.56	3.292	
10,300.00	6,888.01	6,826.87	6,826.01	92.45	56.36	-90.01	-18.75	-3,930.12	453.49	304.81	148.68	3.050	
10,338.26	6,887.93	6,826.78	6,825.93	93.35	56.36	-90.00	-18.75	-3,930.12	451.87	302.21	149.66	3.019	CC, ES, SF
10,400.00	6,887.78	6,826.64	6,825.78	94.80	56.35	-89.98	-18.75	-3,930.12	456.07	306.12	149.95	3.041	
10,500.00	6,887.55	6,826.41	6,825.55	97.15	56.35	-89.95	-18.75	-3,930.12	479.94	332.63	147.32	3.258	
10,600.00	6,887.32	6,826.18	6,825.32	99.51	56.34	-89.92	-18.75	-3,930.12	522.20	380.12	142.08	3.675	
10,700.00	6,887.09	6,825.95	6,825.09	101.87	56.34	-89.89	-18.75	-3,930.12	578.83	442.98	135.84	4.261	
10,800.00	6,886.86	6,825.72	6,824.86	104.24	56.33	-89.86	-18.75	-3,930.12	646.06	516.37	129.69	4.982	
10,900.00	6,886.63	6,825.49	6,824.63	106.61	56.33	-89.84	-18.75	-3,930.12	720.93	596.80	124.12	5.808	
11,000.00	6,886.40	6,825.26	6,824.40	108.98	56.32	-89.81	-18.75	-3,930.12	801.30	682.00	119.30	6.716	
11,100.00	6,886.17	6,825.02	6,824.17	111.36	56.31	-89.78	-18.75	-3,930.12	885.68	770.47	115.21	7.688	
11,200.00	6,885.94	6,824.79	6,823.94	113.74	56.31	-89.75	-18.75	-3,930.12	973.02	861.28	111.74	8.708	
11,300.00	6,885.71	6,824.56	6,823.71	116.12	56.30	-89.72	-18.75	-3,930.12	1,062.60	953.78	108.82	9.765	
11,400.00	6,885.48	6,824.33	6,823.48	118.51	56.30	-89.69	-18.75	-3,930.12	1,153.89	1,047.56	106.34	10.851	
11,500.00	6,885.25	6,824.10	6,823.25	120.89	56.29	-89.66	-18.75	-3,930.12	1,246.52	1,142.30	104.23	11.960	
11,600.00	6,885.01	6,823.87	6,823.01	123.28	56.28	-89.63	-18.75	-3,930.12	1,340.21	1,237.79	102.42	13.086	
11,700.00	6,884.78	6,823.64	6,822.78	125.67	56.28	-89.60	-18.75	-3,930.12	1,434.75	1,333.89	100.86	14.225	
11,800.00	6,884.55	6,823.41	6,822.55	128.07	56.27	-89.57	-18.75	-3,930.12	1,529.99	1,430.47	99.51	15.375	
11,900.00	6,884.32	6,823.18	6,822.32	130.46	56.27	-89.54	-18.75	-3,930.12	1,625.79	1,527.46	98.34	16.533	
12,000.00	6,884.09	6,822.95	6,822.09	132.86	56.26	-89.51	-18.75	-3,930.12	1,722.08	1,624.77	97.31	17.697	
12,100.00	6,883.86	6,822.72	6,821.86	135.25	56.26	-89.48	-18.75	-3,930.12	1,818.76	1,722.36	96.41	18.866	
12,200.00	6,883.63	6,822.49	6,821.63	137.65	56.25	-89.46	-18.75	-3,930.12	1,915.79	1,820.18	95.61	20.038	
12,300.00	6,883.40	6,822.26	6,821.40	140.05	56.24	-89.43	-18.75	-3,930.12	2,013.10	1,918.20	94.90	21.213	
12,400.00	6,883.17	6,822.02	6,821.17	142.46	56.24	-89.40	-18.75	-3,930.12	2,110.67	2,016.40	94.27	22.389	
12,500.00	6,882.94	6,821.79	6,820.94	144.86	56.23	-89.37	-18.75	-3,930.12	2,208.46	2,114.75	93.71	23.567	
12,600.00	6,882.71	6,821.56	6,820.71	147.27	56.23	-89.34	-18.75	-3,930.12	2,306.43	2,213.22	93.21	24.745	
12,700.00	6,882.48	6,821.33	6,820.48	149.67	56.22	-89.31	-18.75	-3,930.12	2,404.57	2,311.82	92.76	25.924	
12,800.00	6,882.25	6,821.10	6,820.25	152.08	56.21	-89.28	-18.75	-3,930.12	2,502.86	2,410.51	92.35	27.102	
12,900.00	6,882.01	6,820.87	6,820.01	154.49	56.21	-89.25	-18.75	-3,930.12	2,601.28	2,509.30	91.98	28.280	
13,000.00	6,881.78	6,820.64	6,819.78	156.90	56.20	-89.22	-18.75	-3,930.12	2,699.82	2,608.16	91.65	29.458	
13,100.00	6,881.55	6,820.41	6,819.55	159.31	56.20	-89.19	-18.75	-3,930.12	2,798.45	2,707.10	91.35	30.634	
13,200.00	6,881.32	6,820.18	6,819.32	161.72	56.19	-89.16	-18.75	-3,930.12	2,897.19	2,806.11	91.08	31.809	
13,300.00	6,881.09	6,819.95	6,819.09	164.13	56.19	-89.13	-18.75	-3,930.12	2,996.00	2,905.17	90.83	32.984	
13,400.00	6,880.86	6,819.72	6,818.86	166.55	56.18	-89.10	-18.75	-3,930.12	3,094.90	3,004.29	90.61	34.156	
13,500.00	6,880.63	6,819.49	6,818.63	168.96	56.17	-89.07	-18.75	-3,930.12	3,193.86	3,103.45	90.41	35.328	
13,600.00	6,880.40	6,819.26	6,818.40	171.38	56.17	-89.05	-18.75	-3,930.12	3,292.88	3,202.66	90.22	36.498	
13,700.00	6,880.17	6,819.02	6,818.17	173.79	56.16	-89.02	-18.75	-3,930.12	3,391.96	3,301.91	90.05	37.666	
13,800.00	6,879.94	6,818.79	6,817.94	176.21	56.16	-88.99	-18.75	-3,930.12	3,491.10	3,401.20	89.90	38.833	
13,900.00	6,879.71	6,818.56	6,817.71	178.63	56.15	-88.96	-18.75	-3,930.12	3,590.28	3,500.52	89.76	39.998	
14,000.00	6,879.48	6,818.33	6,817.48	181.04	56.14	-88.93	-18.75	-3,930.12	3,689.51	3,599.87	89.64	41.161	
14,100.00	6,879.25	6,818.10	6,817.25	183.46	56.14	-88.90	-18.75	-3,930.12	3,788.77	3,699.25	89.52	42.322	
14,200.00	6,879.01	6,817.87	6,817.01	185.88	56.13	-88.87	-18.75	-3,930.12	3,888.08	3,798.66	89.42	43.481	
14,300.00	6,878.78	6,817.64	6,816.78	188.30	56.13	-88.84	-18.75	-3,930.12	3,987.42	3,898.09	89.33	44.639	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 79 - OH - OH													Offset Site Error: 0.00 usft	
Survey Program: 200-Standard Keeper 104, 4800-A027Ua_INC-ONLY													Offset Well Error: 0.00 usft	
Reference		Offset		Semi Major Axis		Offset Wellbore Centre			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		
14,400.00	6,878.55	6,817.41	6,816.55	190.72	56.12	-88.81	-18.75	-3,930.12	4,086.79	3,997.54	89.24	45.794		
14,500.00	6,878.32	6,817.18	6,816.32	193.14	56.12	-88.78	-18.75	-3,930.12	4,186.19	4,097.02	89.17	46.948		
14,600.00	6,878.09	6,816.95	6,816.09	195.56	56.11	-88.75	-18.75	-3,930.12	4,285.62	4,196.52	89.10	48.099		
14,700.00	6,877.86	6,816.72	6,815.86	197.99	56.10	-88.72	-18.75	-3,930.12	4,385.07	4,296.03	89.04	49.248		
14,800.00	6,877.63	6,816.49	6,815.63	200.41	56.10	-88.69	-18.75	-3,930.12	4,484.55	4,395.56	88.99	50.396		
14,900.00	6,877.40	6,816.26	6,815.40	202.83	56.09	-88.67	-18.75	-3,930.12	4,584.05	4,495.11	88.94	51.541		
15,000.00	6,877.17	6,816.02	6,815.17	205.25	56.09	-88.64	-18.75	-3,930.12	4,683.58	4,594.68	88.90	52.684		
15,100.00	6,876.94	6,815.79	6,814.94	207.68	56.08	-88.61	-18.75	-3,930.12	4,783.12	4,694.25	88.86	53.825		
15,200.00	6,876.71	6,815.56	6,814.71	210.10	56.07	-88.58	-18.75	-3,930.12	4,882.68	4,793.85	88.84	54.963		
15,300.00	6,876.48	6,815.33	6,814.48	212.53	56.07	-88.55	-18.75	-3,930.12	4,982.26	4,893.45	88.81	56.100		
15,400.00	6,876.25	6,815.10	6,814.25	214.95	56.06	-88.52	-18.75	-3,930.12	5,081.86	4,993.06	88.79	57.234		
15,500.00	6,876.01	6,814.87	6,814.01	217.38	56.06	-88.49	-18.75	-3,930.12	5,181.47	5,092.69	88.78	58.366		
15,600.00	6,875.78	6,814.64	6,813.78	219.80	56.05	-88.46	-18.75	-3,930.12	5,281.09	5,192.33	88.76	59.496		
15,700.00	6,875.55	6,814.41	6,813.55	222.23	56.05	-88.43	-18.75	-3,930.12	5,380.73	5,291.98	88.76	60.623		
15,800.00	6,875.32	6,814.18	6,813.32	224.66	56.04	-88.40	-18.75	-3,930.12	5,480.39	5,391.63	88.75	61.748		
15,900.00	6,875.09	6,813.95	6,813.09	227.08	56.03	-88.37	-18.75	-3,930.12	5,580.05	5,491.30	88.75	62.871		
16,000.00	6,874.86	6,813.72	6,812.86	229.51	56.03	-88.34	-18.75	-3,930.12	5,679.73	5,590.97	88.76	63.992		
16,100.00	6,874.63	6,813.49	6,812.63	231.94	56.02	-88.31	-18.75	-3,930.12	5,779.42	5,690.65	88.76	65.110		
16,200.00	6,874.40	6,813.26	6,812.40	234.37	56.02	-88.29	-18.75	-3,930.12	5,879.11	5,790.34	88.77	66.226		
16,300.00	6,874.17	6,813.03	6,812.17	236.79	56.01	-88.26	-18.75	-3,930.12	5,978.82	5,890.04	88.79	67.340		
16,400.00	6,873.94	6,812.79	6,811.94	239.22	56.00	-88.23	-18.75	-3,930.12	6,078.54	5,989.74	88.80	68.451		
16,500.00	6,873.71	6,812.56	6,811.71	241.65	56.00	-88.20	-18.75	-3,930.12	6,178.27	6,089.45	88.82	69.560		
16,600.00	6,873.48	6,812.33	6,811.48	244.08	55.99	-88.17	-18.75	-3,930.12	6,278.01	6,189.17	88.84	70.666		
16,700.00	6,873.25	6,812.10	6,811.25	246.51	55.99	-88.14	-18.75	-3,930.12	6,377.75	6,288.89	88.86	71.770		
16,800.00	6,873.02	6,811.87	6,811.02	248.94	55.98	-88.11	-18.75	-3,930.12	6,477.50	6,388.61	88.89	72.872		
16,900.00	6,872.78	6,811.64	6,810.78	251.37	55.98	-88.08	-18.75	-3,930.12	6,577.26	6,488.35	88.92	73.971		
17,000.00	6,872.55	6,811.41	6,810.55	253.80	55.97	-88.05	-18.75	-3,930.12	6,677.03	6,588.08	88.95	75.068		
17,070.79	6,872.39	6,811.25	6,810.39	255.52	55.97	-88.03	-18.75	-3,930.12	6,747.66	6,658.69	88.97	75.843		
17,100.00	6,872.32	6,811.18	6,810.32	256.23	55.96	-88.02	-18.75	-3,930.12	6,776.80	6,687.82	88.98	76.162		
17,200.00	6,872.09	6,810.95	6,810.09	258.66	55.96	-87.99	-18.75	-3,930.12	6,876.58	6,787.57	89.01	77.254		
17,237.94	6,872.00	6,810.86	6,810.00	259.58	55.96	-87.98	-18.75	-3,930.12	6,914.44	6,825.42	89.03	77.668		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 79C - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 370-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)			
0.00	0.00	0.00	0.00	0.00	0.00	-97.39	-669.37	-5,159.29	5,203.18				
100.00	100.00	18.00	18.00	0.25	12.60	-97.39	-669.37	-5,159.29	5,202.53	5,189.68	12.85	404.831	
200.00	200.00	118.00	118.00	0.61	82.60	-97.39	-669.37	-5,159.29	5,202.53	5,119.32	83.21	62.523	
300.00	300.00	218.00	218.00	0.97	152.60	-97.39	-669.37	-5,159.29	5,202.53	5,048.96	153.57	33.878	
400.00	400.00	318.00	318.00	1.33	222.60	-97.39	-669.37	-5,159.29	5,202.53	4,978.60	223.93	23.233	
410.00	410.00	328.00	328.00	1.36	229.60	-97.39	-669.37	-5,159.29	5,202.53	4,971.57	230.96	22.525 CC	
500.00	500.00	370.00	370.00	1.68	259.00	-97.39	-669.37	-5,159.29	5,202.75	4,942.08	260.67	19.959 ES	
600.00	600.00	370.00	370.00	2.04	259.00	-97.39	-669.37	-5,159.29	5,204.63	4,943.70	260.94	19.946 SF	
700.00	700.00	370.00	370.00	2.40	259.00	-97.39	-669.37	-5,159.29	5,208.44	4,947.33	261.11	19.947	
800.00	800.00	370.00	370.00	2.76	259.00	-97.39	-669.37	-5,159.29	5,214.16	4,952.97	261.18	19.964	
900.00	900.00	370.00	370.00	3.12	259.00	-97.39	-669.37	-5,159.29	5,221.78	4,960.62	261.16	19.995	
1,000.00	1,000.00	370.00	370.00	3.48	259.00	-97.39	-669.37	-5,159.29	5,231.31	4,970.27	261.04	20.040	
1,100.00	1,099.98	370.00	370.00	3.83	259.00	-60.47	-669.37	-5,159.29	5,241.88	4,981.05	260.83	20.097	
1,200.08	1,199.92	370.00	370.00	4.19	259.00	-60.28	-669.37	-5,159.29	5,252.63	4,992.11	260.52	20.162	
1,300.00	1,299.59	370.00	370.00	4.55	259.00	-60.28	-669.37	-5,159.29	5,264.39	5,004.26	260.13	20.238	
1,400.00	1,399.35	370.00	370.00	4.91	259.00	-60.28	-669.37	-5,159.29	5,278.02	5,018.38	259.64	20.328	
1,500.00	1,499.11	370.00	370.00	5.27	259.00	-60.28	-669.37	-5,159.29	5,293.50	5,034.43	259.07	20.432	
1,600.00	1,598.86	370.00	370.00	5.63	259.00	-60.28	-669.37	-5,159.29	5,310.83	5,052.41	258.42	20.551	
1,700.00	1,698.62	370.00	370.00	6.00	259.00	-60.28	-669.37	-5,159.29	5,329.97	5,072.29	257.68	20.684	
1,800.00	1,798.37	370.00	370.00	6.36	259.00	-60.28	-669.37	-5,159.29	5,350.92	5,094.05	256.87	20.831	
1,900.00	1,898.13	370.00	370.00	6.72	259.00	-60.28	-669.37	-5,159.29	5,373.64	5,117.67	255.98	20.993	
2,000.00	1,997.89	370.00	370.00	7.09	259.00	-60.28	-669.37	-5,159.29	5,398.13	5,143.12	255.01	21.168	
2,100.00	2,097.64	370.00	370.00	7.45	259.00	-60.28	-669.37	-5,159.29	5,424.34	5,170.37	253.97	21.358	
2,200.00	2,197.40	370.00	370.00	7.82	259.00	-60.28	-669.37	-5,159.29	5,452.26	5,199.40	252.87	21.562	
2,300.00	2,297.16	370.00	370.00	8.19	259.00	-60.28	-669.37	-5,159.29	5,481.87	5,230.17	251.70	21.780	
2,400.00	2,396.91	370.00	370.00	8.55	259.00	-60.28	-669.37	-5,159.29	5,513.13	5,262.66	250.47	22.011	
2,500.00	2,496.67	370.00	370.00	8.92	259.00	-60.28	-669.37	-5,159.29	5,546.02	5,296.84	249.18	22.257	
2,600.00	2,596.42	370.00	370.00	9.29	259.00	-60.28	-669.37	-5,159.29	5,580.51	5,332.67	247.84	22.517	
2,700.00	2,696.18	370.00	370.00	9.66	259.00	-60.28	-669.37	-5,159.29	5,616.56	5,370.12	246.44	22.790	
2,800.00	2,795.94	370.00	370.00	10.02	259.00	-60.28	-669.37	-5,159.29	5,654.16	5,409.15	245.00	23.078	
2,900.00	2,895.69	370.00	370.00	10.39	259.00	-60.28	-669.37	-5,159.29	5,693.26	5,449.74	243.52	23.379	
3,000.00	2,995.45	370.00	370.00	10.76	259.00	-60.28	-669.37	-5,159.29	5,733.84	5,491.85	241.99	23.694	
3,100.00	3,095.21	370.00	370.00	11.13	259.00	-60.28	-669.37	-5,159.29	5,775.87	5,535.43	240.43	24.023	
3,200.00	3,194.96	370.00	370.00	11.49	259.00	-60.28	-669.37	-5,159.29	5,819.31	5,580.47	238.84	24.365	
3,300.00	3,294.72	370.00	370.00	11.86	259.00	-60.28	-669.37	-5,159.29	5,864.13	5,626.92	237.21	24.721	
3,400.00	3,394.47	370.00	370.00	12.23	259.00	-60.28	-669.37	-5,159.29	5,910.31	5,674.75	235.56	25.091	
3,500.00	3,494.23	370.00	370.00	12.60	259.00	-60.28	-669.37	-5,159.29	5,957.81	5,723.93	233.88	25.474	
3,600.00	3,593.99	370.00	370.00	12.97	259.00	-60.28	-669.37	-5,159.29	6,006.60	5,774.42	232.18	25.871	
3,700.00	3,693.74	370.00	370.00	13.34	259.00	-60.28	-669.37	-5,159.29	6,056.64	5,826.18	230.46	26.280	
3,800.00	3,793.50	370.00	370.00	13.71	259.00	-60.28	-669.37	-5,159.29	6,107.92	5,879.19	228.73	26.704	
3,900.00	3,893.26	370.00	370.00	14.07	259.00	-60.28	-669.37	-5,159.29	6,160.39	5,933.40	226.98	27.140	
4,000.00	3,993.01	370.00	370.00	14.44	259.00	-60.28	-669.37	-5,159.29	6,214.02	5,988.80	225.23	27.590	
4,100.00	4,092.77	370.00	370.00	14.81	259.00	-60.28	-669.37	-5,159.29	6,268.79	6,045.33	223.46	28.053	
4,200.00	4,192.52	370.00	370.00	15.18	259.00	-60.28	-669.37	-5,159.29	6,324.67	6,102.98	221.69	28.529	
4,300.00	4,292.28	370.00	370.00	15.55	259.00	-60.28	-669.37	-5,159.29	6,381.63	6,161.71	219.92	29.018	
4,400.00	4,392.04	370.00	370.00	15.92	259.00	-60.28	-669.37	-5,159.29	6,439.64	6,221.49	218.14	29.520	
4,500.00	4,491.79	370.00	370.00	16.29	259.00	-60.28	-669.37	-5,159.29	6,498.66	6,282.30	216.37	30.035	
4,600.00	4,591.55	370.00	370.00	16.66	259.00	-60.28	-669.37	-5,159.29	6,558.68	6,344.09	214.60	30.563	
4,700.00	4,691.31	370.00	370.00	17.03	259.00	-60.28	-669.37	-5,159.29	6,619.67	6,406.85	212.83	31.104	
4,800.00	4,791.06	370.00	370.00	17.40	259.00	-60.28	-669.37	-5,159.29	6,681.60	6,470.54	211.06	31.657	
4,900.00	4,890.82	370.00	370.00	17.76	259.00	-60.28	-669.37	-5,159.29	6,744.44	6,535.13	209.31	32.223	
5,000.00	4,990.57	370.00	370.00	18.13	259.00	-60.28	-669.37	-5,159.29	6,808.17	6,600.61	207.56	32.801	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 79C - OH - OH													Offset Site Error: 0.00 usft
Survey Program: 370-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)			
5,100.00	5,090.33	370.00	370.00	18.50	259.00	-60.28	-669.37	-5,159.29	6,872.77	6,666.94	205.82	33.392	
5,200.00	5,190.09	370.00	370.00	18.87	259.00	-60.28	-669.37	-5,159.29	6,938.20	6,734.11	204.10	33.995	
5,300.00	5,289.84	370.00	370.00	19.24	259.00	-60.28	-669.37	-5,159.29	7,004.45	6,802.07	202.38	34.610	
5,400.00	5,389.60	370.00	370.00	19.61	259.00	-60.28	-669.37	-5,159.29	7,071.50	6,870.82	200.68	35.238	
5,500.00	5,489.35	370.00	370.00	19.98	259.00	-60.28	-669.37	-5,159.29	7,139.31	6,940.32	198.99	35.877	
5,600.00	5,589.11	370.00	370.00	20.35	259.00	-60.28	-669.37	-5,159.29	7,207.88	7,010.56	197.32	36.529	
5,700.00	5,688.87	370.00	370.00	20.72	259.00	-60.28	-669.37	-5,159.29	7,277.17	7,081.51	195.67	37.192	
5,800.00	5,788.62	370.00	370.00	21.09	259.00	-60.28	-669.37	-5,159.29	7,347.17	7,153.15	194.03	37.867	
5,900.00	5,888.38	370.00	370.00	21.46	259.00	-60.28	-669.37	-5,159.29	7,417.86	7,225.46	192.40	38.554	
6,000.00	5,988.14	370.00	370.00	21.83	259.00	-60.28	-669.37	-5,159.29	7,489.22	7,298.42	190.80	39.252	
6,100.00	6,087.89	370.00	370.00	22.20	259.00	-60.28	-669.37	-5,159.29	7,561.22	7,372.01	189.21	39.962	
6,200.00	6,187.65	370.00	370.00	22.57	259.00	-60.28	-669.37	-5,159.29	7,633.86	7,446.21	187.64	40.683	
6,299.50	6,286.91	370.00	370.00	22.93	259.00	-60.28	-669.37	-5,159.29	7,706.74	7,520.64	186.10	41.411	
6,350.00	6,337.14	370.00	370.00	23.12	259.00	-32.10	-669.37	-5,159.29	7,742.58	7,557.30	185.29	41.787	
6,400.00	6,386.40	370.00	370.00	23.32	259.00	-22.78	-669.37	-5,159.29	7,775.39	7,590.98	184.42	42.162	
6,450.00	6,434.88	370.00	370.00	23.52	259.00	-18.25	-669.37	-5,159.29	7,805.37	7,621.88	183.49	42.538	
6,500.00	6,482.27	370.00	370.00	23.73	259.00	-15.56	-669.37	-5,159.29	7,832.36	7,649.85	182.51	42.914	
6,550.00	6,528.29	370.00	370.00	23.94	259.00	-13.78	-669.37	-5,159.29	7,856.24	7,674.74	181.49	43.287	
6,600.00	6,572.65	370.00	370.00	24.16	259.00	-12.53	-669.37	-5,159.29	7,876.87	7,696.44	180.43	43.656	
6,650.00	6,615.08	370.00	370.00	24.39	259.00	-11.60	-669.37	-5,159.29	7,894.17	7,714.84	179.33	44.020	
6,700.00	6,655.31	370.00	370.00	24.64	259.00	-10.90	-669.37	-5,159.29	7,908.04	7,729.84	178.20	44.377	
6,750.00	6,693.11	370.00	370.00	24.90	259.00	-10.36	-669.37	-5,159.29	7,918.43	7,741.38	177.05	44.725	
6,800.00	6,728.23	370.00	370.00	25.18	259.00	-9.96	-669.37	-5,159.29	7,925.27	7,749.40	175.87	45.063	
6,850.00	6,760.46	370.00	370.00	25.50	259.00	-9.66	-669.37	-5,159.29	7,928.54	7,753.86	174.68	45.388	
6,900.00	6,789.60	370.00	370.00	25.84	259.00	-9.44	-669.37	-5,159.29	7,928.22	7,754.73	173.49	45.700	
6,950.00	6,815.47	370.00	370.00	26.21	259.00	-9.30	-669.37	-5,159.29	7,924.31	7,752.02	172.29	45.995	
7,000.00	6,837.91	370.00	370.00	26.63	259.00	-9.23	-669.37	-5,159.29	7,916.83	7,745.74	171.10	46.271	
7,050.00	6,856.78	370.00	370.00	27.08	259.00	-9.23	-669.37	-5,159.29	7,905.82	7,735.91	169.91	46.528	
7,100.00	6,871.97	370.00	370.00	27.57	259.00	-9.29	-669.37	-5,159.29	7,891.33	7,722.58	168.75	46.763	
7,150.00	6,883.39	370.00	370.00	28.10	259.00	-9.41	-669.37	-5,159.29	7,873.43	7,705.82	167.61	46.975	
7,200.00	6,890.95	370.00	370.00	28.66	259.00	-9.61	-669.37	-5,159.29	7,852.21	7,685.71	166.50	47.161	
7,250.00	6,894.63	370.00	370.00	29.25	259.00	-9.88	-669.37	-5,159.29	7,827.77	7,662.34	165.42	47.319	
7,273.35	6,895.00	370.00	370.00	29.54	259.00	-10.03	-669.37	-5,159.29	7,815.29	7,650.35	164.94	47.383	
7,300.00	6,894.94	370.00	370.00	29.87	259.00	-10.03	-669.37	-5,159.29	7,800.69	7,636.31	164.38	47.454	
7,400.00	6,894.71	370.00	370.00	31.22	259.00	-10.03	-669.37	-5,159.29	7,746.50	7,584.21	162.29	47.733	
7,500.00	6,894.48	370.00	370.00	32.69	259.00	-10.03	-669.37	-5,159.29	7,693.23	7,533.05	160.18	48.029	
7,600.00	6,894.25	370.00	370.00	34.27	259.00	-10.03	-669.37	-5,159.29	7,640.89	7,482.83	158.06	48.342	
7,700.00	6,894.01	370.00	370.00	35.95	259.00	-10.03	-669.37	-5,159.29	7,589.51	7,433.58	155.93	48.673	
7,800.00	6,893.78	370.00	370.00	37.71	259.00	-10.03	-669.37	-5,159.29	7,539.11	7,385.32	153.79	49.023	
7,900.00	6,893.55	370.00	370.00	39.54	259.00	-10.03	-669.37	-5,159.29	7,489.70	7,338.06	151.64	49.392	
8,000.00	6,893.32	370.00	370.00	41.44	259.00	-10.03	-669.37	-5,159.29	7,441.31	7,291.83	149.48	49.781	
8,100.00	6,893.09	370.00	370.00	43.39	259.00	-10.03	-669.37	-5,159.29	7,393.96	7,246.64	147.31	50.193	
8,200.00	6,892.86	370.00	370.00	45.39	259.00	-10.03	-669.37	-5,159.29	7,347.66	7,202.52	145.13	50.627	
8,300.00	6,892.63	370.00	370.00	47.44	259.00	-10.03	-669.37	-5,159.29	7,302.43	7,159.49	142.95	51.085	
8,400.00	6,892.40	370.00	370.00	49.51	259.00	-10.03	-669.37	-5,159.29	7,258.31	7,117.56	140.75	51.568	
8,500.00	6,892.17	370.00	370.00	51.62	259.00	-10.03	-669.37	-5,159.29	7,215.30	7,076.75	138.55	52.079	
8,600.00	6,891.94	370.00	370.00	53.76	259.00	-10.03	-669.37	-5,159.29	7,173.42	7,037.09	136.33	52.617	
8,700.00	6,891.71	370.00	370.00	55.92	259.00	-10.03	-669.37	-5,159.29	7,132.70	6,998.59	134.11	53.185	
8,800.00	6,891.48	370.00	370.00	58.11	259.00	-10.03	-669.37	-5,159.29	7,093.16	6,961.28	131.88	53.784	
8,900.00	6,891.25	370.00	370.00	60.31	259.00	-10.03	-669.37	-5,159.29	7,054.81	6,925.16	129.65	54.415	
9,000.00	6,891.01	370.00	370.00	62.54	259.00	-10.03	-669.37	-5,159.29	7,017.68	6,890.27	127.41	55.080	
9,100.00	6,890.78	370.00	370.00	64.78	259.00	-10.03	-669.37	-5,159.29	6,981.79	6,856.62	125.17	55.780	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 79C - OH - OH												Offset Site Error:	0.00 usft		
Survey Program:		370-A026Ua_BLIND		Offset		Semi Major Axis		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)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
9,200.00	6,890.55	370.00	370.00	67.03	259.00	-10.03	-669.37	-5,159.29	6,947.14	6,824.22	122.92	56.516			
9,300.00	6,890.32	370.00	370.00	69.29	259.00	-10.03	-669.37	-5,159.29	6,913.77	6,793.09	120.68	57.290			
9,400.00	6,890.09	370.00	370.00	71.57	259.00	-10.03	-669.37	-5,159.29	6,881.70	6,763.25	118.44	58.102			
9,500.00	6,889.86	370.00	370.00	73.86	259.00	-10.03	-669.37	-5,159.29	6,850.93	6,734.72	116.21	58.952			
9,600.00	6,889.63	370.00	370.00	76.16	259.00	-10.03	-669.37	-5,159.29	6,821.49	6,707.50	113.99	59.842			
9,700.00	6,889.40	370.00	370.00	78.46	259.00	-10.03	-669.37	-5,159.29	6,793.39	6,681.60	111.79	60.770			
9,800.00	6,889.17	370.00	370.00	80.78	259.00	-10.03	-669.37	-5,159.29	6,766.66	6,657.05	109.61	61.735			
9,900.00	6,888.94	370.00	370.00	83.10	259.00	-10.03	-669.37	-5,159.29	6,741.30	6,633.84	107.46	62.735			
10,000.00	6,888.71	370.00	370.00	85.43	259.00	-10.03	-669.37	-5,159.29	6,717.33	6,611.99	105.34	63.767			
10,100.00	6,888.48	370.00	370.00	87.76	259.00	-10.03	-669.37	-5,159.29	6,694.78	6,591.51	103.27	64.826			
10,200.00	6,888.25	370.00	370.00	90.10	259.00	-10.03	-669.37	-5,159.29	6,673.64	6,572.38	101.26	65.906			
10,300.00	6,888.01	370.00	370.00	92.45	259.00	-10.03	-669.37	-5,159.29	6,653.95	6,554.63	99.32	66.998			
10,400.00	6,887.78	370.00	370.00	94.80	259.00	-10.03	-669.37	-5,159.29	6,635.70	6,538.24	97.45	68.090			
10,500.00	6,887.55	370.00	370.00	97.15	259.00	-10.03	-669.37	-5,159.29	6,618.91	6,523.22	95.69	69.170			
10,600.00	6,887.32	370.00	370.00	99.51	259.00	-10.03	-669.37	-5,159.29	6,603.59	6,509.55	94.04	70.219			
10,700.00	6,887.09	370.00	370.00	101.87	259.00	-10.03	-669.37	-5,159.29	6,589.76	6,497.22	92.53	71.215			
10,800.00	6,886.86	370.00	370.00	104.24	259.00	-10.03	-669.37	-5,159.29	6,577.41	6,486.23	91.18	72.135			
10,900.00	6,886.63	370.00	370.00	106.61	259.00	-10.03	-669.37	-5,159.29	6,566.57	6,476.56	90.02	72.949			
11,000.00	6,886.40	370.00	370.00	108.98	259.00	-10.03	-669.37	-5,159.29	6,557.23	6,468.17	89.06	73.627			
11,100.00	6,886.17	370.00	370.00	111.36	259.00	-10.03	-669.37	-5,159.29	6,549.41	6,461.07	88.34	74.137			
11,200.00	6,885.94	370.00	370.00	113.74	259.00	-10.03	-669.37	-5,159.29	6,543.11	6,455.22	87.89	74.448			
11,300.00	6,885.71	370.00	370.00	116.12	259.00	-10.03	-669.37	-5,159.29	6,538.33	6,450.61	87.72	74.534			
11,400.00	6,885.48	370.00	370.00	118.51	259.00	-10.03	-669.37	-5,159.29	6,535.08	6,447.21	87.87	74.375			
11,500.00	6,885.25	370.00	370.00	120.89	259.00	-10.03	-669.37	-5,159.29	6,533.35	6,445.02	88.33	73.961			
11,562.63	6,885.10	370.00	370.00	122.39	259.00	-10.03	-669.37	-5,159.29	6,533.05	6,444.26	88.80	73.574			
11,600.00	6,885.01	370.00	370.00	123.28	259.00	-10.03	-669.37	-5,159.29	6,533.16	6,444.03	89.13	73.296			
11,700.00	6,884.78	370.00	370.00	125.67	259.00	-10.03	-669.37	-5,159.29	6,534.50	6,444.23	90.26	72.395			
11,800.00	6,884.55	370.00	370.00	128.07	259.00	-10.03	-669.37	-5,159.29	6,537.36	6,445.65	91.71	71.282			
11,900.00	6,884.32	370.00	370.00	130.46	259.00	-10.03	-669.37	-5,159.29	6,541.76	6,448.29	93.47	69.991			
12,000.00	6,884.09	370.00	370.00	132.86	259.00	-10.03	-669.37	-5,159.29	6,547.68	6,452.17	95.50	68.560			
12,100.00	6,883.86	370.00	370.00	135.25	259.00	-10.03	-669.37	-5,159.29	6,555.12	6,457.32	97.79	67.029			
12,200.00	6,883.63	370.00	370.00	137.65	259.00	-10.03	-669.37	-5,159.29	6,564.07	6,463.75	100.32	65.434			
12,300.00	6,883.40	370.00	370.00	140.05	259.00	-10.03	-669.37	-5,159.29	6,574.53	6,471.50	103.04	63.808			
12,400.00	6,883.17	370.00	370.00	142.46	259.00	-10.03	-669.37	-5,159.29	6,586.50	6,480.57	105.93	62.179			
12,500.00	6,882.94	370.00	370.00	144.86	259.00	-10.03	-669.37	-5,159.29	6,599.96	6,490.99	108.97	60.569			
12,600.00	6,882.71	370.00	370.00	147.27	259.00	-10.03	-669.37	-5,159.29	6,614.90	6,502.78	112.12	58.996			
12,700.00	6,882.48	370.00	370.00	149.67	259.00	-10.03	-669.37	-5,159.29	6,631.32	6,515.94	115.38	57.473			
12,800.00	6,882.25	370.00	370.00	152.08	259.00	-10.03	-669.37	-5,159.29	6,649.20	6,530.48	118.72	56.007			
12,900.00	6,882.01	370.00	370.00	154.49	259.00	-10.03	-669.37	-5,159.29	6,668.53	6,546.41	122.12	54.606			
13,000.00	6,881.78	370.00	370.00	156.90	259.00	-10.03	-669.37	-5,159.29	6,689.30	6,563.73	125.57	53.271			
13,100.00	6,881.55	370.00	370.00	159.31	259.00	-10.03	-669.37	-5,159.29	6,711.50	6,582.45	129.05	52.006			
13,200.00	6,881.32	370.00	370.00	161.72	259.00	-10.03	-669.37	-5,159.29	6,735.11	6,602.56	132.56	50.809			
13,300.00	6,881.09	370.00	370.00	164.13	259.00	-10.03	-669.37	-5,159.29	6,760.12	6,624.05	136.07	49.680			
13,400.00	6,880.86	370.00	370.00	166.55	259.00	-10.03	-669.37	-5,159.29	6,786.51	6,646.92	139.59	48.616			
13,500.00	6,880.63	370.00	370.00	168.96	259.00	-10.03	-669.37	-5,159.29	6,814.26	6,671.16	143.11	47.617			
13,600.00	6,880.40	370.00	370.00	171.38	259.00	-10.03	-669.37	-5,159.29	6,843.36	6,696.76	146.61	46.678			
13,700.00	6,880.17	370.00	370.00	173.79	259.00	-10.03	-669.37	-5,159.29	6,873.80	6,723.71	150.09	45.797			
13,800.00	6,879.94	370.00	370.00	176.21	259.00	-10.03	-669.37	-5,159.29	6,905.55	6,752.00	153.55	44.972			
13,900.00	6,879.71	370.00	370.00	178.63	259.00	-10.03	-669.37	-5,159.29	6,938.59	6,781.61	156.98	44.200			
14,000.00	6,879.48	370.00	370.00	181.04	259.00	-10.03	-669.37	-5,159.29	6,972.91	6,812.53	160.38	43.478			
14,100.00	6,879.25	370.00	370.00	183.46	259.00	-10.03	-669.37	-5,159.29	7,008.50	6,844.75	163.74	42.802			
14,200.00	6,879.01	370.00	370.00	185.88	259.00	-10.03	-669.37	-5,159.29	7,045.32	6,878.25	167.06	42.171			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 79C - OH - OH													Offset Site Error:	0.00 usft		
Survey Program: 370-A026Ua_BLIND				Offset		Semi Major Axis		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)	Highside Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning			
14,300.00	6,878.78	370.00	370.00	188.30	259.00	-10.03	-669.37	-5,159.29	7,083.36	6,913.01	170.34	41.582				
14,400.00	6,878.55	370.00	370.00	190.72	259.00	-10.03	-669.37	-5,159.29	7,122.60	6,949.02	173.58	41.033				
14,500.00	6,878.32	370.00	370.00	193.14	259.00	-10.03	-669.37	-5,159.29	7,163.02	6,986.25	176.77	40.522				
14,600.00	6,878.09	370.00	370.00	195.56	259.00	-10.03	-669.37	-5,159.29	7,204.61	7,024.70	179.91	40.045				
14,700.00	6,877.86	370.00	370.00	197.99	259.00	-10.03	-669.37	-5,159.29	7,247.33	7,064.33	183.00	39.602				
14,800.00	6,877.63	370.00	370.00	200.41	259.00	-10.03	-669.37	-5,159.29	7,291.18	7,105.14	186.05	39.190				
14,900.00	6,877.40	370.00	370.00	202.83	259.00	-10.03	-669.37	-5,159.29	7,336.13	7,147.09	189.04	38.808				
15,000.00	6,877.17	370.00	370.00	205.25	259.00	-10.03	-669.37	-5,159.29	7,382.16	7,190.19	191.97	38.454				
15,100.00	6,876.94	370.00	370.00	207.68	259.00	-10.03	-669.37	-5,159.29	7,429.25	7,234.39	194.86	38.126				
15,200.00	6,876.71	370.00	370.00	210.10	259.00	-10.03	-669.37	-5,159.29	7,477.38	7,279.69	197.69	37.824				
15,300.00	6,876.48	370.00	370.00	212.53	259.00	-10.03	-669.37	-5,159.29	7,526.53	7,326.07	200.47	37.545				
15,400.00	6,876.25	370.00	370.00	214.95	259.00	-10.03	-669.37	-5,159.29	7,576.69	7,373.50	203.19	37.289				
15,500.00	6,876.01	370.00	370.00	217.38	259.00	-10.03	-669.37	-5,159.29	7,627.82	7,421.96	205.86	37.054				
15,600.00	6,875.78	370.00	370.00	219.80	259.00	-10.03	-669.37	-5,159.29	7,679.92	7,471.44	208.48	36.838				
15,700.00	6,875.55	370.00	370.00	222.23	259.00	-10.03	-669.37	-5,159.29	7,732.95	7,521.92	211.04	36.642				
15,800.00	6,875.32	370.00	370.00	224.66	259.00	-10.03	-669.37	-5,159.29	7,786.92	7,573.37	213.55	36.465				
15,900.00	6,875.09	370.00	370.00	227.08	259.00	-10.03	-669.37	-5,159.29	7,841.78	7,625.78	216.00	36.304				
16,000.00	6,874.86	370.00	370.00	229.51	259.00	-10.03	-669.37	-5,159.29	7,897.53	7,679.12	218.41	36.160				
16,100.00	6,874.63	370.00	370.00	231.94	259.00	-10.03	-669.37	-5,159.29	7,954.15	7,733.39	220.76	36.031				
16,200.00	6,874.40	370.00	370.00	234.37	259.00	-10.03	-669.37	-5,159.29	8,011.61	7,788.55	223.06	35.917				
16,300.00	6,874.17	370.00	370.00	236.79	259.00	-10.03	-669.37	-5,159.29	8,069.91	7,844.60	225.31	35.817				
16,400.00	6,873.94	370.00	370.00	239.22	259.00	-10.03	-669.37	-5,159.29	8,129.02	7,901.50	227.51	35.730				
16,500.00	6,873.71	370.00	370.00	241.65	259.00	-10.03	-669.37	-5,159.29	8,188.92	7,959.25	229.66	35.656				
16,600.00	6,873.48	370.00	370.00	244.08	259.00	-10.03	-669.37	-5,159.29	8,249.60	8,017.83	231.77	35.594				
16,700.00	6,873.25	370.00	370.00	246.51	259.00	-10.03	-669.37	-5,159.29	8,311.04	8,077.22	233.82	35.544				
16,800.00	6,873.02	370.00	370.00	248.94	259.00	-10.03	-669.37	-5,159.29	8,373.22	8,137.39	235.83	35.505				
16,900.00	6,872.78	370.00	370.00	251.37	259.00	-10.03	-669.37	-5,159.29	8,436.13	8,198.34	237.79	35.477				
17,000.00	6,872.55	370.00	370.00	253.80	259.00	-10.03	-669.37	-5,159.29	8,499.75	8,260.04	239.71	35.459				
17,070.79	6,872.39	370.00	370.00	255.52	259.00	-10.03	-669.37	-5,159.29	8,545.21	8,304.17	241.04	35.452				
17,100.00	6,872.32	370.00	370.00	256.23	259.00	-10.03	-669.37	-5,159.29	8,564.07	8,322.48	241.58	35.450				
17,200.00	6,872.09	370.00	370.00	258.66	259.00	-10.03	-669.37	-5,159.29	8,629.06	8,385.65	243.41	35.451				
17,237.94	6,872.00	370.00	370.00	259.58	259.00	-10.03	-669.37	-5,159.29	8,653.89	8,409.80	244.09	35.453				

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 98 - OH - OH													Offset Site Error:	0.00 usft	
Survey Program:		170-A027Ua_INC-ONLY		Offset		Semi Major Axis		Offset Wellbore Centre		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		
0.00	0.00	0.00	0.00	0.00	0.00	83.76	37.03	338.73	344.39						
100.00	100.00	50.00	50.00	0.25	0.89	83.76	37.03	338.73	340.74	339.61	1.14	299.708			
200.00	200.00	150.00	150.00	0.61	2.66	83.76	37.03	338.73	340.74	337.48	3.27	104.300			
300.00	300.00	250.00	250.00	0.97	4.52	83.76	37.03	338.73	340.74	335.26	5.49	62.110			
400.00	400.00	350.04	350.04	1.33	6.40	83.74	37.13	338.73	340.76	333.03	7.73	44.092			
500.00	500.00	450.02	450.00	1.68	8.43	83.76	37.03	338.73	340.74	330.63	10.12	33.686			
600.00	600.00	550.02	550.00	2.04	10.76	83.76	37.03	338.73	340.74	327.95	12.80	26.624			
700.00	700.00	650.02	650.00	2.40	13.08	83.76	37.03	338.73	340.74	325.26	15.48	22.009			
800.00	800.00	750.15	750.12	2.76	15.41	83.60	37.97	338.73	340.85	322.68	18.17	18.761			
900.00	900.00	850.31	850.27	3.12	17.74	83.69	37.48	338.73	340.79	319.94	20.86	16.341			
1,000.00	1,000.00	950.16	950.00	3.48	20.08	83.76	37.03	338.73	340.74	317.18	23.56	14.462 CC			
1,100.00	1,099.98	1,050.32	1,050.14	3.83	22.48	120.61	37.78	338.73	341.71	315.40	26.31	12.987			
1,200.08	1,199.92	1,150.14	1,149.92	4.19	24.87	121.44	37.03	338.73	344.34	315.29	29.06	11.851 ES			
1,300.00	1,299.59	1,249.82	1,249.59	4.55	27.26	122.42	37.03	338.73	348.04	316.23	31.81	10.943			
1,400.00	1,399.35	1,349.67	1,349.43	4.91	29.66	123.29	37.57	338.73	351.86	317.30	34.56	10.181			
1,500.00	1,499.11	1,449.42	1,449.11	5.27	32.07	124.31	37.03	338.73	355.73	318.40	37.33	9.529			
1,600.00	1,598.86	1,549.22	1,548.86	5.63	34.52	125.21	37.14	338.73	359.71	319.57	40.14	8.961			
1,700.00	1,698.62	1,648.98	1,648.62	6.00	36.76	126.12	37.03	338.73	363.79	321.05	42.74	8.512			
1,800.00	1,798.37	1,748.73	1,748.37	6.36	38.97	127.00	37.03	338.73	367.95	322.64	45.31	8.121			
1,900.00	1,898.13	1,848.49	1,848.11	6.72	41.18	127.65	38.41	338.73	372.17	324.29	47.88	7.772			
2,000.00	1,997.89	1,948.22	1,947.83	7.09	43.40	128.53	38.09	338.73	376.49	326.04	50.46	7.461			
2,100.00	2,097.64	2,047.91	2,047.51	7.45	45.61	129.46	37.35	338.73	380.92	327.89	53.03	7.183			
2,200.00	2,197.40	2,147.86	2,147.40	7.82	47.57	130.31	37.03	338.73	385.42	330.06	55.36	6.962			
2,300.00	2,297.16	2,247.61	2,247.16	8.19	49.42	131.09	37.03	338.73	389.98	332.41	57.57	6.774			
2,400.00	2,396.91	2,347.36	2,346.89	8.55	51.27	131.69	38.16	338.73	394.51	334.73	59.78	6.600			
2,500.00	2,496.67	2,447.00	2,446.52	8.92	53.11	132.47	37.96	338.73	399.21	337.23	61.98	6.441			
2,600.00	2,596.42	2,546.60	2,546.12	9.29	54.96	133.27	37.43	338.73	404.02	339.83	64.19	6.294			
2,700.00	2,696.18	2,646.67	2,646.18	9.66	56.70	134.04	37.03	338.73	408.89	342.60	66.29	6.168			
2,800.00	2,795.94	2,746.43	2,745.94	10.02	58.31	134.73	37.03	338.73	413.78	345.52	68.26	6.061			
2,900.00	2,895.69	2,846.19	2,845.69	10.39	59.92	135.41	37.03	338.73	418.73	348.49	70.24	5.961			
3,000.00	2,995.45	2,945.89	2,945.40	10.76	61.54	136.04	37.28	338.73	423.69	351.48	72.21	5.867			
3,100.00	3,095.21	3,045.58	3,045.09	11.13	63.15	136.70	37.16	338.73	428.77	354.58	74.19	5.779			
3,200.00	3,194.96	3,145.46	3,144.96	11.49	64.78	137.35	37.03	338.73	433.90	357.73	76.18	5.696			
3,300.00	3,294.72	3,245.22	3,244.72	11.86	66.43	137.96	37.03	338.73	439.07	360.88	78.19	5.615			
3,400.00	3,394.47	3,344.97	3,344.47	12.23	68.08	138.57	37.03	338.73	444.28	364.08	80.20	5.540			
3,500.00	3,494.23	3,444.67	3,444.18	12.60	69.73	139.12	37.29	338.73	449.48	367.27	82.21	5.467			
3,600.00	3,593.99	3,544.34	3,543.84	12.97	71.38	139.71	37.20	338.73	454.81	370.59	84.22	5.400			
3,700.00	3,693.74	3,644.25	3,643.74	13.34	73.03	140.29	37.03	338.73	460.20	373.96	86.24	5.336			
3,800.00	3,793.50	3,744.00	3,743.50	13.71	74.71	140.84	37.03	338.73	465.59	377.32	88.28	5.274			
3,900.00	3,893.26	3,843.76	3,843.26	14.07	76.38	141.37	37.03	338.73	471.03	380.72	90.31	5.215			
4,000.00	3,993.01	3,943.45	3,942.95	14.44	78.06	141.87	37.28	338.73	476.44	384.09	92.35	5.159			
4,100.00	4,092.77	4,043.09	4,042.59	14.81	79.73	142.39	37.19	338.73	481.98	387.59	94.39	5.106			
4,200.00	4,192.52	4,143.03	4,142.52	15.18	81.41	142.91	37.03	338.73	487.58	391.15	96.43	5.056			
4,300.00	4,292.28	4,242.79	4,242.28	15.55	83.11	143.40	37.03	338.73	493.17	394.68	98.48	5.008			
4,400.00	4,392.04	4,342.54	4,342.04	15.92	84.80	143.87	37.03	338.73	498.79	398.25	100.54	4.961			
4,500.00	4,491.79	4,442.22	4,441.71	16.29	86.49	144.31	37.28	338.73	504.37	401.78	102.59	4.916			
4,600.00	4,591.55	4,541.83	4,541.32	16.66	88.18	144.78	37.18	338.73	510.09	405.45	104.64	4.875			
4,700.00	4,691.31	4,641.82	4,641.31	17.03	89.88	145.24	37.03	338.73	515.86	409.16	106.70	4.835			
4,800.00	4,791.06	4,741.57	4,741.06	17.40	91.59	145.68	37.03	338.73	521.62	412.84	108.77	4.796			
4,900.00	4,890.82	4,841.33	4,840.82	17.76	93.30	146.11	37.03	338.73	527.40	416.56	110.84	4.758			
5,000.00	4,990.57	4,941.05	4,940.54	18.13	95.00	146.49	37.34	338.73	533.10	420.20	112.91	4.722			
5,100.00	5,090.33	5,040.67	5,040.16	18.50	96.71	146.91	37.29	338.73	538.96	423.99	114.97	4.688			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 98 - OH - OH													Offset Site Error:	0.00 usft
Survey Program:		170-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		
5,200.00	5,190.09	5,140.28	5,139.76	18.87	98.41	147.32	37.16	338.73	544.87	427.83	117.04	4.656		
5,300.00	5,289.84	5,240.36	5,239.84	19.24	100.13	147.73	37.03	338.73	550.81	431.69	119.11	4.624		
5,400.00	5,389.60	5,340.12	5,339.60	19.61	101.84	148.11	37.03	338.73	556.72	435.53	121.19	4.594		
5,500.00	5,489.35	5,439.61	5,439.09	19.98	103.56	148.47	37.13	338.73	562.62	439.36	123.26	4.564		
5,600.00	5,589.11	5,539.63	5,539.11	20.35	105.30	148.85	37.03	338.73	568.63	443.26	125.37	4.536		
5,700.00	5,688.87	5,639.39	5,638.87	20.72	107.08	149.21	37.03	338.73	574.62	447.11	127.51	4.506		
5,800.00	5,788.62	5,739.14	5,738.62	21.09	108.86	149.56	37.03	338.73	580.63	450.97	129.65	4.478		
5,900.00	5,888.38	5,838.69	5,838.17	21.46	110.64	149.89	37.24	338.73	586.57	454.78	131.79	4.451		
6,000.00	5,988.14	5,938.23	5,937.71	21.83	112.41	150.24	37.11	338.73	592.68	458.75	133.93	4.425		
6,100.00	6,087.89	6,038.42	6,037.89	22.20	114.31	150.58	37.03	338.73	598.78	462.60	136.18	4.397		
6,200.00	6,187.65	6,138.18	6,137.65	22.57	116.27	150.90	37.03	338.73	604.87	466.37	138.50	4.367		
6,299.50	6,286.91	6,237.21	6,236.67	22.93	118.21	151.18	37.48	338.73	610.77	469.96	140.80	4.338		
6,350.00	6,337.14	6,287.18	6,286.65	23.12	119.19	178.97	37.40	338.73	615.73	473.76	141.97	4.337 SF		
6,400.00	6,386.40	6,336.18	6,335.65	23.32	120.16	-171.99	37.29	338.73	624.25	481.14	143.11	4.362		
6,450.00	6,434.88	6,384.39	6,383.86	23.52	121.10	-167.62	37.12	338.73	636.33	492.10	144.23	4.412		
6,500.00	6,482.27	6,432.84	6,432.27	23.73	122.09	-165.02	37.03	338.73	651.84	506.45	145.39	4.483		
6,550.00	6,528.29	6,478.86	6,478.29	23.94	123.05	-163.24	37.03	338.73	670.72	524.20	146.52	4.578		
6,600.00	6,572.65	6,523.22	6,522.65	24.16	123.97	-161.86	37.03	338.73	692.91	545.31	147.61	4.694		
6,650.00	6,615.08	6,565.65	6,565.08	24.39	124.86	-160.68	37.03	338.73	718.31	569.67	148.64	4.832		
6,700.00	6,655.31	6,605.88	6,605.31	24.64	125.70	-159.56	37.03	338.73	746.79	597.16	149.63	4.991		
6,750.00	6,693.11	6,643.68	6,643.11	24.90	126.49	-158.39	37.03	338.73	778.21	627.66	150.55	5.169		
6,800.00	6,728.23	6,678.51	6,677.93	25.18	127.21	-157.17	38.07	338.73	812.04	660.64	151.40	5.363		
6,850.00	6,760.46	6,710.41	6,709.83	25.50	127.88	-155.61	38.02	338.73	848.84	696.66	152.18	5.578		
6,900.00	6,789.60	6,739.25	6,738.67	25.84	128.48	-153.68	37.94	338.73	888.03	735.15	152.88	5.809		
6,950.00	6,815.47	6,764.85	6,764.27	26.21	129.01	-151.20	37.85	338.73	929.36	775.87	153.50	6.055		
7,000.00	6,837.91	6,787.05	6,786.47	26.63	129.48	-147.91	37.75	338.73	972.61	818.57	154.03	6.314		
7,050.00	6,856.78	6,805.72	6,805.14	27.08	129.87	-143.45	37.65	338.73	1,017.49	863.00	154.48	6.586		
7,100.00	6,871.97	6,820.74	6,820.16	27.57	130.18	-137.20	37.56	338.73	1,063.73	908.89	154.84	6.870		
7,150.00	6,883.39	6,832.03	6,831.44	28.10	130.42	-128.25	37.49	338.73	1,111.05	955.94	155.12	7.163		
7,200.00	6,890.95	6,839.50	6,838.91	28.66	130.57	-115.42	37.44	338.73	1,159.16	1,003.86	155.30	7.464		
7,250.00	6,894.63	6,843.12	6,842.53	29.25	130.65	-98.14	37.42	338.73	1,207.75	1,052.36	155.39	7.772		
7,273.35	6,895.00	6,843.49	6,842.90	29.54	130.65	-88.97	37.42	338.73	1,230.52	1,075.12	155.40	7.918		
7,300.00	6,894.94	6,843.42	6,842.83	29.87	130.65	-88.95	37.42	338.73	1,256.53	1,101.12	155.41	8.085		
7,400.00	6,894.71	6,843.17	6,842.58	31.22	130.65	-88.90	37.42	338.73	1,354.36	1,198.94	155.42	8.714		
7,500.00	6,894.48	6,842.92	6,842.34	32.69	130.64	-88.85	37.42	338.73	1,452.48	1,297.05	155.44	9.345		
7,600.00	6,894.25	6,842.68	6,842.09	34.27	130.64	-88.80	37.42	338.73	1,550.85	1,395.39	155.45	9.976		
7,700.00	6,894.01	6,842.43	6,841.84	35.95	130.63	-88.74	37.42	338.73	1,649.41	1,493.94	155.47	10.609		
7,800.00	6,893.78	6,842.18	6,841.59	37.71	130.63	-88.69	37.42	338.73	1,748.13	1,592.64	155.49	11.243		
7,900.00	6,893.55	6,841.93	6,841.34	39.54	130.62	-88.64	37.43	338.73	1,846.99	1,691.49	155.51	11.877		
8,000.00	6,893.32	6,841.68	6,841.09	41.44	130.62	-88.59	37.43	338.73	1,945.97	1,790.44	155.53	12.512		
8,100.00	6,893.09	6,841.44	6,840.85	43.39	130.61	-88.53	37.43	338.73	2,045.05	1,889.50	155.55	13.147		
8,200.00	6,892.86	6,841.19	6,840.60	45.39	130.61	-88.48	37.43	338.73	2,144.21	1,988.64	155.57	13.783		
8,300.00	6,892.63	6,840.94	6,840.35	47.44	130.60	-88.43	37.43	338.73	2,243.45	2,087.86	155.59	14.419		
8,400.00	6,892.40	6,840.69	6,840.10	49.51	130.60	-88.38	37.43	338.73	2,342.75	2,187.14	155.61	15.055		
8,500.00	6,892.17	6,840.44	6,839.85	51.62	130.59	-88.32	37.44	338.73	2,442.11	2,286.48	155.63	15.691		
8,600.00	6,891.94	6,840.20	6,839.61	53.76	130.59	-88.27	37.44	338.73	2,541.52	2,385.86	155.66	16.328		
8,700.00	6,891.71	6,839.95	6,839.36	55.92	130.58	-88.22	37.44	338.73	2,640.97	2,485.29	155.68	16.964		
8,800.00	6,891.48	6,839.70	6,839.11	58.11	130.58	-88.17	37.44	338.73	2,740.47	2,584.76	155.70	17.600		
8,900.00	6,891.25	6,839.45	6,838.86	60.31	130.57	-88.11	37.44	338.73	2,839.99	2,684.27	155.73	18.237		
9,000.00	6,891.01	6,839.20	6,838.62	62.54	130.57	-88.06	37.44	338.73	2,939.56	2,783.80	155.75	18.873		
9,100.00	6,890.78	6,838.96	6,838.37	64.78	130.56	-88.01	37.45	338.73	3,039.15	2,883.37	155.78	19.509		
9,200.00	6,890.55	6,838.71	6,838.12	67.03	130.55	-87.96	37.45	338.73	3,138.76	2,982.96	155.81	20.145		

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 98 - OH - OH												Offset Site Error:	0.00 usft		
Survey Program: 170-A027Ua_INC-ONLY				Offset		Semi Major Axis		Offset Wellbore Centre		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	6,890.32	6,838.46	6,837.87	69.29	130.55	-87.90	37.45	338.73	3,238.40	3,082.57	155.83	20.781			
9,400.00	6,890.09	6,838.21	6,837.63	71.57	130.54	-87.85	37.45	338.73	3,338.06	3,182.20	155.86	21.417			
9,500.00	6,889.86	6,837.97	6,837.38	73.86	130.54	-87.80	37.45	338.73	3,437.74	3,281.85	155.89	22.053			
9,600.00	6,889.63	6,837.72	6,837.13	76.16	130.53	-87.75	37.45	338.73	3,537.44	3,381.52	155.92	22.688			
9,700.00	6,889.40	6,837.47	6,836.88	78.46	130.53	-87.69	37.46	338.73	3,637.16	3,481.21	155.95	23.323			
9,800.00	6,889.17	6,837.23	6,836.64	80.78	130.52	-87.64	37.46	338.73	3,736.89	3,580.91	155.98	23.958			
9,900.00	6,888.94	6,836.98	6,836.39	83.10	130.52	-87.59	37.46	338.73	3,836.63	3,680.62	156.01	24.592			
10,000.00	6,888.71	6,836.73	6,836.14	85.43	130.51	-87.54	37.46	338.73	3,936.39	3,780.35	156.04	25.227			
10,100.00	6,888.48	6,836.48	6,835.90	87.76	130.51	-87.48	37.46	338.73	4,036.16	3,880.08	156.07	25.861			
10,200.00	6,888.25	6,836.24	6,835.65	90.10	130.50	-87.43	37.46	338.73	4,135.94	3,979.83	156.11	26.494			
10,300.00	6,888.01	6,835.99	6,835.40	92.45	130.50	-87.38	37.47	338.73	4,235.73	4,079.59	156.14	27.128			
10,400.00	6,887.78	6,835.74	6,835.15	94.80	130.49	-87.33	37.47	338.73	4,335.53	4,179.35	156.18	27.761			
10,500.00	6,887.55	6,835.50	6,834.91	97.15	130.49	-87.28	37.47	338.73	4,435.34	4,279.13	156.21	28.393			
10,600.00	6,887.32	6,835.25	6,834.66	99.51	130.48	-87.22	37.47	338.73	4,535.16	4,378.91	156.25	29.025			
10,700.00	6,887.09	6,835.00	6,834.41	101.87	130.48	-87.17	37.47	338.73	4,634.98	4,478.70	156.28	29.657			
10,800.00	6,886.86	6,834.76	6,834.17	104.24	130.47	-87.12	37.47	338.73	4,734.82	4,578.49	156.32	30.289			
10,900.00	6,886.63	6,834.51	6,833.92	106.61	130.47	-87.07	37.48	338.73	4,834.66	4,678.29	156.36	30.920			
11,000.00	6,886.40	6,834.26	6,833.67	108.98	130.46	-87.01	37.48	338.73	4,934.50	4,778.10	156.40	31.550			
11,100.00	6,886.17	6,834.02	6,833.43	111.36	130.46	-86.96	37.48	338.73	5,034.35	4,877.91	156.44	32.181			
11,200.00	6,885.94	6,833.77	6,833.18	113.74	130.45	-86.91	37.48	338.73	5,134.21	4,977.73	156.48	32.810			
11,300.00	6,885.71	6,833.52	6,832.93	116.12	130.45	-86.86	37.48	338.73	5,234.08	5,077.55	156.52	33.440			
11,400.00	6,885.48	6,833.28	6,832.69	118.51	130.44	-86.81	37.48	338.73	5,333.94	5,177.38	156.57	34.069			
11,500.00	6,885.25	6,833.03	6,832.44	120.89	130.44	-86.75	37.49	338.73	5,433.82	5,277.21	156.61	34.697			
11,600.00	6,885.01	6,832.78	6,832.20	123.28	130.43	-86.70	37.49	338.73	5,533.70	5,377.04	156.65	35.325			
11,700.00	6,884.78	6,832.54	6,831.95	125.67	130.43	-86.65	37.49	338.73	5,633.58	5,476.88	156.70	35.952			
11,800.00	6,884.55	6,832.29	6,831.70	128.07	130.42	-86.60	37.49	338.73	5,733.47	5,576.72	156.74	36.579			
11,900.00	6,884.32	6,832.04	6,831.46	130.46	130.42	-86.55	37.49	338.73	5,833.36	5,676.57	156.79	37.205			
12,000.00	6,884.09	6,831.80	6,831.21	132.86	130.41	-86.49	37.49	338.73	5,933.25	5,776.42	156.83	37.831			
12,100.00	6,883.86	6,831.55	6,830.96	135.25	130.41	-86.44	37.50	338.73	6,033.15	5,876.27	156.88	38.457			
12,200.00	6,883.63	6,831.31	6,830.72	137.65	130.40	-86.39	37.50	338.73	6,133.05	5,976.12	156.93	39.081			
12,300.00	6,883.40	6,831.06	6,830.47	140.05	130.40	-86.34	37.50	338.73	6,232.95	6,075.97	156.98	39.706			
12,400.00	6,883.17	6,830.81	6,830.23	142.46	130.39	-86.29	37.50	338.73	6,332.86	6,175.83	157.03	40.329			
12,500.00	6,882.94	6,830.57	6,829.98	144.86	130.38	-86.23	37.50	338.73	6,432.77	6,275.69	157.08	40.952			
12,600.00	6,882.71	6,830.32	6,829.73	147.27	130.38	-86.18	37.50	338.73	6,532.68	6,375.55	157.13	41.575			
12,700.00	6,882.48	6,830.08	6,829.49	149.67	130.37	-86.13	37.51	338.73	6,632.60	6,475.42	157.18	42.197			
12,800.00	6,882.25	6,829.83	6,829.24	152.08	130.37	-86.08	37.51	338.73	6,732.52	6,575.28	157.23	42.818			
12,900.00	6,882.01	6,829.59	6,829.00	154.49	130.36	-86.03	37.51	338.73	6,832.44	6,675.15	157.29	43.439			
13,000.00	6,881.78	6,829.34	6,828.75	156.90	130.36	-85.97	37.51	338.73	6,932.36	6,775.02	157.34	44.059			
13,100.00	6,881.55	6,829.09	6,828.51	159.31	130.35	-85.92	37.51	338.73	7,032.28	6,874.89	157.40	44.679			
13,200.00	6,881.32	6,828.85	6,828.26	161.72	130.35	-85.87	37.51	338.73	7,132.21	6,974.76	157.45	45.298			
13,300.00	6,881.09	6,828.60	6,828.02	164.13	130.34	-85.82	37.51	338.73	7,232.14	7,074.63	157.51	45.916			
13,400.00	6,880.86	6,828.36	6,827.77	166.55	130.34	-85.77	37.52	338.73	7,332.07	7,174.50	157.57	46.534			
13,500.00	6,880.63	6,828.11	6,827.52	168.96	130.33	-85.72	37.52	338.73	7,432.00	7,274.38	157.62	47.151			
13,600.00	6,880.40	6,827.87	6,827.28	171.38	130.33	-85.66	37.52	338.73	7,531.94	7,374.26	157.68	47.767			
13,700.00	6,880.17	6,827.62	6,827.03	173.79	130.32	-85.61	37.52	338.73	7,631.87	7,474.13	157.74	48.383			
13,800.00	6,879.94	6,827.38	6,826.79	176.21	130.32	-85.56	37.52	338.73	7,731.81	7,574.01	157.80	48.998			
13,900.00	6,879.71	6,827.13	6,826.54	178.63	130.31	-85.51	37.52	338.73	7,831.75	7,673.89	157.86	49.612			
14,000.00	6,879.48	6,826.89	6,826.30	181.04	130.31	-85.46	37.53	338.73	7,931.69	7,773.77	157.92	50.226			
14,100.00	6,879.25	6,826.64	6,826.05	183.46	130.30	-85.41	37.53	338.73	8,031.63	7,873.65	157.98	50.839			
14,200.00	6,879.01	6,826.40	6,825.81	185.88	130.30	-85.35	37.53	338.73	8,131.58	7,973.53	158.04	51.451			
14,300.00	6,878.78	6,826.15	6,825.56	188.30	130.29	-85.30	37.53	338.73	8,231.52	8,073.41	158.11	52.063			
14,400.00	6,878.55	6,825.91	6,825.32	190.72	130.29	-85.25	37.53	338.73	8,331.47	8,173.30	158.17	52.674			

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - (O) Rosa Unit 98 - OH - OH													Offset Site Error:	0.00 usft
Survey Program: 170-A027Ua_INC-ONLY				Offset					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	
14,500.00	6,878.32	6,825.66	6,825.07	193.14	130.28	-85.20	37.53	338.73	8,431.42	8,273.18	158.23	53.284		
14,600.00	6,878.09	6,825.42	6,824.83	195.56	130.28	-85.15	37.53	338.73	8,531.36	8,373.06	158.30	53.894		
14,700.00	6,877.86	6,825.17	6,824.58	197.99	130.27	-85.10	37.54	338.73	8,631.31	8,472.95	158.36	54.503		
14,800.00	6,877.63	6,824.93	6,824.34	200.41	130.27	-85.04	37.54	338.73	8,731.27	8,572.83	158.43	55.111		
14,900.00	6,877.40	6,824.68	6,824.10	202.83	130.26	-84.99	37.54	338.73	8,831.22	8,672.72	158.50	55.718		
15,000.00	6,877.17	6,824.44	6,823.85	205.25	130.26	-84.94	37.54	338.73	8,931.17	8,772.61	158.57	56.325		
15,100.00	6,876.94	6,824.19	6,823.61	207.68	130.25	-84.89	37.54	338.73	9,031.13	8,872.49	158.63	56.931		
15,200.00	6,876.71	6,823.95	6,823.36	210.10	130.25	-84.84	37.54	338.73	9,131.08	8,972.38	158.70	57.536		
15,300.00	6,876.48	6,823.71	6,823.12	212.53	130.24	-84.79	37.55	338.73	9,231.04	9,072.27	158.77	58.141		
15,400.00	6,876.25	6,823.46	6,822.87	214.95	130.24	-84.74	37.55	338.73	9,330.99	9,172.15	158.84	58.744		
15,500.00	6,876.01	6,823.22	6,822.63	217.38	130.23	-84.68	37.55	338.73	9,430.95	9,272.04	158.91	59.347		
15,600.00	6,875.78	6,822.97	6,822.38	219.80	130.23	-84.63	37.55	338.73	9,530.91	9,371.93	158.98	59.950		
15,700.00	6,875.55	6,822.73	6,822.14	222.23	130.22	-84.58	37.55	338.73	9,630.87	9,471.82	159.05	60.551		
15,800.00	6,875.32	6,822.48	6,821.90	224.66	130.22	-84.53	37.55	338.73	9,730.83	9,571.71	159.13	61.152		
15,900.00	6,875.09	6,822.24	6,821.65	227.08	130.21	-84.48	37.55	338.73	9,830.79	9,671.59	159.20	61.752		
16,000.00	6,874.86	6,822.00	6,821.41	229.51	130.21	-84.43	37.56	338.73	9,930.76	9,771.48	159.27	62.351		
16,100.00	6,874.63	6,821.75	6,821.16	231.94	130.20	-84.38	37.56	338.73	10,030.72	9,871.37	159.35	62.949		
16,200.00	6,874.40	6,821.51	6,820.92	234.37	130.20	-84.32	37.56	338.73	10,130.68	9,971.26	159.42	63.547		
16,300.00	6,874.17	6,821.26	6,820.68	236.79	130.19	-84.27	37.56	338.73	10,230.65	10,071.15	159.50	64.144		
16,400.00	6,873.94	6,821.02	6,820.43	239.22	130.19	-84.22	37.56	338.73	10,330.61	10,171.04	159.57	64.740		
16,500.00	6,873.71	6,820.78	6,820.19	241.65	130.18	-84.17	37.56	338.73	10,430.58	10,270.93	159.65	65.335		
16,600.00	6,873.48	6,820.53	6,819.94	244.08	130.18	-84.12	37.57	338.73	10,530.54	10,370.82	159.72	65.929		
16,700.00	6,873.25	6,820.29	6,819.70	246.51	130.17	-84.07	37.57	338.73	10,630.51	10,470.71	159.80	66.523		
16,800.00	6,873.02	6,820.04	6,819.46	248.94	130.17	-84.02	37.57	338.73	10,730.48	10,570.60	159.88	67.116		
16,900.00	6,872.78	6,819.80	6,819.21	251.37	130.16	-83.97	37.57	338.73	10,830.45	10,670.49	159.96	67.708		
17,000.00	6,872.55	6,819.56	6,818.97	253.80	130.16	-83.92	37.57	338.73	10,930.42	10,770.38	160.04	68.299		
17,070.79	6,872.39	6,819.38	6,818.80	255.52	130.15	-83.88	37.57	338.73	11,001.19	10,841.09	160.09	68.717		
17,100.00	6,872.32	6,819.31	6,818.73	256.23	130.15	-83.86	37.57	338.73	11,030.39	10,870.27	160.12	68.889		
17,200.00	6,872.09	6,819.07	6,818.48	258.66	130.14	-83.81	37.57	338.73	11,130.36	10,970.16	160.20	69.479		
17,237.94	6,872.00	6,818.98	6,818.39	259.58	130.14	-83.79	37.57	338.73	11,168.28	11,008.06	160.23	69.702		

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - Rosa Unit 614H - OH - Plan #1												Offset Site Error:	0.00 usft
Survey Program: 0-A008Mb_MWD+IFR1+MS												Offset Well Error:	0.00 usft
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
0.00	0.00	0.00	0.00	0.00	0.00	-101.05	-2.91	-14.92	15.20				
100.00	100.00	100.00	100.00	0.25	0.25	-101.05	-2.91	-14.92	15.20	14.70	0.50	30.282	
200.00	200.00	200.00	200.00	0.61	0.61	-101.05	-2.91	-14.92	15.20	13.98	1.22	12.469	
300.00	300.00	300.00	300.00	0.97	0.97	-101.05	-2.91	-14.92	15.20	13.26	1.94	7.851	
400.00	400.00	400.00	400.00	1.33	1.33	-101.05	-2.91	-14.92	15.20	12.54	2.65	5.729	
500.00	500.00	500.00	500.00	1.68	1.68	-101.05	-2.91	-14.92	15.20	11.83	3.37	4.510	
600.00	600.00	600.00	600.00	2.04	2.04	-101.05	-2.91	-14.92	15.20	11.11	4.09	3.719	
700.00	700.00	700.00	700.00	2.40	2.40	-101.05	-2.91	-14.92	15.20	10.39	4.80	3.164	
800.00	800.00	800.00	800.00	2.76	2.76	-101.05	-2.91	-14.92	15.20	9.68	5.52	2.753	
900.00	900.00	900.00	900.00	3.12	3.12	-101.05	-2.91	-14.92	15.20	8.96	6.24	2.436	
1,000.00	1,000.00	1,000.00	1,000.00	3.48	3.48	-101.05	-2.91	-14.92	15.20	8.24	6.95	2.185	
1,021.70	1,021.70	1,021.65	1,021.65	3.55	3.55	-64.87	-2.99	-14.93	15.20	8.09	7.11	2.139 CC	
1,100.00	1,099.98	1,099.68	1,099.66	3.83	3.82	-76.01	-4.60	-15.32	15.49	7.84	7.65	2.025 ES, SF	
1,200.08	1,199.92	1,198.85	1,198.69	4.19	4.14	-103.90	-9.62	-16.54	19.64	11.32	8.32	2.360	
1,300.00	1,299.59	1,296.94	1,296.41	4.55	4.47	-123.54	-17.86	-18.53	30.94	21.95	8.99	3.442	
1,400.00	1,399.35	1,394.12	1,392.88	4.91	4.80	-132.01	-29.22	-21.27	47.27	37.63	9.64	4.902	
1,500.00	1,499.11	1,490.09	1,487.71	5.27	5.13	-135.76	-43.56	-24.74	67.39	57.11	10.29	6.552	
1,600.00	1,598.86	1,585.17	1,581.11	5.63	5.46	-137.49	-60.76	-28.89	90.84	79.91	10.93	8.314	
1,700.00	1,698.62	1,682.08	1,676.12	6.00	5.79	-138.44	-79.36	-33.38	115.44	103.82	11.61	9.939	
1,800.00	1,798.37	1,778.99	1,771.12	6.36	6.13	-139.06	-97.96	-37.88	140.06	127.75	12.31	11.378	
1,900.00	1,898.13	1,875.90	1,866.13	6.72	6.48	-139.49	-116.56	-42.37	164.69	151.68	13.01	12.661	
2,000.00	1,997.89	1,972.82	1,961.13	7.09	6.83	-139.81	-135.16	-46.87	189.33	175.62	13.71	13.811	
2,100.00	2,097.64	2,069.73	2,056.14	7.45	7.18	-140.06	-153.76	-51.36	213.97	199.55	14.41	14.846	
2,200.00	2,197.40	2,166.64	2,151.14	7.82	7.54	-140.25	-172.36	-55.85	238.61	223.49	15.12	15.782	
2,300.00	2,297.16	2,263.55	2,246.15	8.19	7.90	-140.41	-190.96	-60.35	263.26	247.43	15.83	16.633	
2,400.00	2,396.91	2,360.47	2,341.15	8.55	8.26	-140.55	-209.56	-64.84	287.91	271.37	16.54	17.409	
2,500.00	2,496.67	2,457.38	2,436.16	8.92	8.62	-140.66	-228.16	-69.33	312.56	295.31	17.25	18.120	
2,600.00	2,596.42	2,554.29	2,531.16	9.29	8.98	-140.75	-246.76	-73.83	337.21	319.24	17.96	18.772	
2,700.00	2,696.18	2,651.21	2,626.17	9.66	9.35	-140.83	-265.35	-78.32	361.86	343.18	18.68	19.374	
2,800.00	2,795.94	2,748.12	2,721.17	10.02	9.71	-140.90	-283.95	-82.81	386.51	367.12	19.39	19.930	
2,900.00	2,895.69	2,845.03	2,816.18	10.39	10.08	-140.97	-302.55	-87.31	411.16	391.05	20.11	20.446	
3,000.00	2,995.45	2,941.94	2,911.18	10.76	10.44	-141.02	-321.15	-91.80	435.81	414.99	20.83	20.925	
3,100.00	3,095.21	3,038.86	3,006.19	11.13	10.81	-141.07	-339.75	-96.29	460.47	438.92	21.55	21.371	
3,200.00	3,194.96	3,135.77	3,101.19	11.49	11.18	-141.12	-358.35	-100.79	485.12	462.86	22.27	21.788	
3,300.00	3,294.72	3,232.68	3,196.20	11.86	11.55	-141.16	-376.95	-105.28	509.77	486.79	22.98	22.179	
3,400.00	3,394.47	3,329.60	3,291.20	12.23	11.92	-141.20	-395.55	-109.77	534.43	510.72	23.71	22.544	
3,500.00	3,494.23	3,426.51	3,386.21	12.60	12.29	-141.23	-414.15	-114.27	559.08	534.66	24.43	22.888	
3,600.00	3,593.99	3,523.42	3,481.21	12.97	12.66	-141.26	-432.75	-118.76	583.74	558.59	25.15	23.212	
3,700.00	3,693.74	3,620.33	3,576.22	13.34	13.03	-141.29	-451.35	-123.25	608.39	582.52	25.87	23.517	
3,800.00	3,793.50	3,717.25	3,671.22	13.71	13.40	-141.31	-469.95	-127.75	633.04	606.45	26.59	23.805	
3,900.00	3,893.26	3,814.16	3,766.23	14.07	13.77	-141.34	-488.55	-132.24	657.70	630.38	27.32	24.078	
4,000.00	3,993.01	3,911.07	3,861.23	14.44	14.14	-141.36	-507.15	-136.73	682.35	654.31	28.04	24.336	
4,100.00	4,092.77	4,007.98	3,956.24	14.81	14.51	-141.38	-525.75	-141.23	707.01	678.25	28.76	24.581	
4,200.00	4,192.52	4,104.90	4,051.24	15.18	14.89	-141.40	-544.35	-145.72	731.66	702.18	29.49	24.813	
4,300.00	4,292.28	4,201.81	4,146.25	15.55	15.26	-141.42	-562.94	-150.21	756.32	726.11	30.21	25.034	
4,400.00	4,392.04	4,298.72	4,241.25	15.92	15.63	-141.43	-581.54	-154.71	780.97	750.04	30.94	25.245	
4,500.00	4,491.79	4,395.64	4,336.26	16.29	16.00	-141.45	-600.14	-159.20	805.63	773.97	31.66	25.445	
4,600.00	4,591.55	4,492.55	4,431.26	16.66	16.38	-141.47	-618.74	-163.69	830.28	797.90	32.39	25.637	
4,700.00	4,691.31	4,589.46	4,526.27	17.03	16.75	-141.48	-637.34	-168.19	854.94	821.83	33.11	25.820	
4,800.00	4,791.06	4,686.37	4,621.27	17.40	17.12	-141.49	-655.94	-172.68	879.59	845.76	33.84	25.994	
4,900.00	4,890.82	4,783.29	4,716.28	17.76	17.50	-141.51	-674.54	-177.17	904.25	869.69	34.56	26.162	
5,000.00	4,990.57	4,880.20	4,811.28	18.13	17.87	-141.52	-693.14	-181.67	928.90	893.61	35.29	26.322	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - Rosa Unit 614H - OH - Plan #1													Offset Site Error: 0.00 usft
Survey Program: 0-A008Mb_MWD+IFR1+MS													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)			
5,100.00	5,090.33	4,977.11	4,906.29	18.50	18.25	-141.53	-711.74	-186.16	953.56	917.54	36.02	26.476	
5,200.00	5,190.09	5,074.03	5,001.29	18.87	18.62	-141.54	-730.34	-190.65	978.21	941.47	36.74	26.623	
5,300.00	5,289.84	5,170.94	5,096.30	19.24	19.00	-141.55	-748.94	-195.15	1,002.87	965.40	37.47	26.764	
5,400.00	5,389.60	5,267.85	5,191.31	19.61	19.37	-141.56	-767.54	-199.64	1,027.53	989.33	38.20	26.900	
5,500.00	5,489.35	5,364.76	5,286.31	19.98	19.74	-141.57	-786.14	-204.14	1,052.18	1,013.26	38.92	27.031	
5,600.00	5,589.11	5,461.68	5,381.32	20.35	20.12	-141.58	-804.74	-208.63	1,076.84	1,037.18	39.65	27.157	
5,700.00	5,688.87	5,558.59	5,476.32	20.72	20.49	-141.59	-823.34	-213.12	1,101.49	1,061.11	40.38	27.278	
5,800.00	5,788.62	5,655.50	5,571.33	21.09	20.87	-141.59	-841.94	-217.62	1,126.15	1,085.04	41.11	27.395	
5,900.00	5,888.38	5,752.41	5,666.33	21.46	21.24	-141.60	-860.53	-222.11	1,150.80	1,108.97	41.84	27.508	
6,000.00	5,988.14	5,849.33	5,761.34	21.83	21.62	-141.61	-879.13	-226.60	1,175.46	1,132.89	42.56	27.616	
6,100.00	6,087.89	5,946.24	5,856.34	22.20	21.99	-141.62	-897.73	-231.10	1,200.11	1,156.82	43.29	27.721	
6,200.00	6,187.65	6,043.15	5,951.35	22.57	22.37	-141.62	-916.33	-235.59	1,224.77	1,180.75	44.02	27.823	
6,299.50	6,286.91	6,139.58	6,045.88	22.93	22.74	-141.63	-934.84	-240.06	1,249.30	1,204.56	44.75	27.920	
6,350.00	6,337.14	6,188.47	6,093.80	23.12	22.93	-113.05	-944.22	-242.33	1,261.74	1,216.62	45.12	27.967	
6,400.00	6,386.40	6,236.56	6,140.95	23.32	23.12	-103.40	-953.45	-244.56	1,274.00	1,228.51	45.49	28.008	
6,450.00	6,434.88	6,284.06	6,187.51	23.52	23.30	-98.60	-962.57	-246.76	1,286.19	1,240.32	45.86	28.046	
6,500.00	6,482.27	6,330.65	6,233.19	23.73	23.48	-95.73	-971.51	-248.92	1,298.30	1,252.07	46.24	28.080	
6,550.00	6,528.29	6,376.07	6,277.70	23.94	23.66	-93.83	-980.22	-251.02	1,310.39	1,263.78	46.61	28.113	
6,600.00	6,572.65	6,425.04	6,326.67	24.16	23.85	-92.57	-989.58	-254.10	1,322.46	1,275.43	47.03	28.121	
6,650.00	6,615.08	6,478.64	6,377.79	24.39	24.06	-91.70	-999.58	-261.51	1,334.33	1,286.83	47.49	28.095	
6,700.00	6,655.31	6,534.75	6,431.53	24.64	24.27	-91.05	-1,009.68	-274.01	1,345.87	1,297.89	47.99	28.045	
6,750.00	6,693.11	6,593.65	6,486.59	24.90	24.49	-90.59	-1,019.80	-292.25	1,357.01	1,308.50	48.51	27.971	
6,800.00	6,728.23	6,655.65	6,542.54	25.18	24.71	-90.26	-1,029.82	-316.95	1,367.62	1,318.55	49.07	27.871	
6,850.00	6,760.46	6,721.02	6,598.73	25.50	24.94	-90.05	-1,039.58	-348.83	1,377.60	1,327.94	49.65	27.745	
6,900.00	6,789.60	6,789.98	6,654.25	25.84	25.15	-89.94	-1,048.88	-388.62	1,386.80	1,336.54	50.27	27.590	
6,950.00	6,815.47	6,862.70	6,707.91	26.21	25.37	-89.90	-1,057.45	-436.89	1,395.11	1,344.20	50.91	27.405	
7,000.00	6,837.91	6,939.19	6,758.18	26.63	25.58	-89.91	-1,064.99	-493.98	1,402.38	1,350.80	51.58	27.188	
7,050.00	6,856.78	7,019.29	6,803.28	27.08	25.78	-89.95	-1,071.12	-559.82	1,408.46	1,356.17	52.29	26.935	
7,100.00	6,871.97	7,102.58	6,841.23	27.57	25.99	-90.00	-1,075.50	-633.77	1,413.24	1,360.20	53.04	26.644	
7,150.00	6,883.39	7,188.44	6,870.14	28.10	26.23	-90.03	-1,077.81	-714.52	1,416.60	1,362.76	53.84	26.312	
7,200.00	6,890.95	7,275.97	6,888.39	28.66	26.48	-90.04	-1,077.81	-800.05	1,418.46	1,363.78	54.68	25.939	
7,250.00	6,894.63	7,364.12	6,894.98	29.25	26.76	-90.00	-1,075.40	-887.85	1,418.77	1,363.20	55.57	25.531	
7,273.35	6,895.00	7,390.09	6,894.95	29.54	26.85	-90.00	-1,074.30	-913.79	1,418.48	1,362.54	55.94	25.356	
7,300.00	6,894.94	7,416.73	6,894.89	29.87	26.94	-90.00	-1,073.16	-940.41	1,418.13	1,361.76	56.37	25.157	
7,400.00	6,894.71	7,516.72	6,894.66	31.22	27.32	-90.00	-1,068.90	-1,040.31	1,416.80	1,358.71	58.09	24.389	
7,500.00	6,894.48	7,616.72	6,894.43	32.69	27.73	-90.00	-1,064.63	-1,140.21	1,415.47	1,355.48	59.98	23.597	
7,600.00	6,894.25	7,716.71	6,894.20	34.27	28.19	-90.00	-1,060.36	-1,240.11	1,414.14	1,352.11	62.03	22.797	
7,700.00	6,894.01	7,816.70	6,893.97	35.95	28.69	-90.00	-1,056.10	-1,340.01	1,412.81	1,348.59	64.22	22.000	
7,800.00	6,893.78	7,916.69	6,893.73	37.71	29.23	-90.00	-1,051.83	-1,439.91	1,411.48	1,344.95	66.52	21.217	
7,900.00	6,893.55	8,016.68	6,893.50	39.54	29.80	-90.00	-1,047.56	-1,539.81	1,410.15	1,341.21	68.94	20.454	
8,000.00	6,893.32	8,116.67	6,893.27	41.44	30.41	-90.00	-1,043.30	-1,639.71	1,408.82	1,337.36	71.46	19.716	
8,100.00	6,893.09	8,216.66	6,893.04	43.39	31.05	-90.00	-1,039.03	-1,739.61	1,407.49	1,333.43	74.06	19.006	
8,200.00	6,892.86	8,316.65	6,892.81	45.39	31.72	-90.00	-1,034.77	-1,839.51	1,406.16	1,329.42	76.74	18.325	
8,300.00	6,892.63	8,416.64	6,892.58	47.44	32.42	-90.00	-1,030.50	-1,939.41	1,404.83	1,325.34	79.49	17.674	
8,400.00	6,892.40	8,516.64	6,892.35	49.51	33.15	-90.00	-1,026.23	-2,039.31	1,403.50	1,321.20	82.30	17.054	
8,500.00	6,892.17	8,616.63	6,892.11	51.62	33.90	-90.00	-1,021.97	-2,139.21	1,402.17	1,317.00	85.17	16.464	
8,600.00	6,891.94	8,716.62	6,891.88	53.76	34.67	-90.00	-1,017.70	-2,239.11	1,400.84	1,312.75	88.09	15.903	
8,700.00	6,891.71	8,816.61	6,891.65	55.92	35.47	-90.00	-1,013.44	-2,339.01	1,399.51	1,308.45	91.06	15.370	
8,800.00	6,891.48	8,916.60	6,891.42	58.11	36.29	-90.00	-1,009.17	-2,438.91	1,398.18	1,304.11	94.07	14.864	
8,900.00	6,891.25	9,016.59	6,891.19	60.31	37.13	-90.00	-1,004.90	-2,538.81	1,396.85	1,299.73	97.12	14.383	
9,000.00	6,891.01	9,116.58	6,890.96	62.54	37.98	-90.00	-1,000.64	-2,638.71	1,395.52	1,295.32	100.20	13.927	
9,100.00	6,890.78	9,216.57	6,890.73	64.78	38.85	-90.00	-996.37	-2,738.61	1,394.19	1,290.87	103.32	13.494	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - Rosa Unit 614H - OH - Plan #1												Offset Site Error:	0.00 usft
Survey Program: 0-A008Mb_MWD+IFR1+MS												Offset Well Error:	0.00 usft
Reference												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
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
9,200.00	6,890.55	9,316.57	6,890.49	67.03	39.74	-90.00	-992.10	-2,838.51	1,392.86	1,286.40	106.47	13.083	
9,300.00	6,890.32	9,416.56	6,890.26	69.29	40.64	-90.00	-987.84	-2,938.41	1,391.53	1,281.89	109.64	12.692	
9,400.00	6,890.09	9,516.55	6,890.03	71.57	41.56	-90.00	-983.57	-3,038.31	1,390.20	1,277.36	112.84	12.320	
9,500.00	6,889.86	9,616.54	6,889.80	73.86	42.49	-90.00	-979.31	-3,138.21	1,388.87	1,272.81	116.06	11.967	
9,600.00	6,889.63	9,716.53	6,889.57	76.16	43.43	-90.00	-975.04	-3,238.11	1,387.54	1,268.24	119.31	11.630	
9,700.00	6,889.40	9,816.52	6,889.34	78.46	44.38	-90.00	-970.77	-3,338.01	1,386.21	1,263.64	122.57	11.310	
9,800.00	6,889.17	9,916.51	6,889.10	80.78	45.34	-90.00	-966.51	-3,437.91	1,384.88	1,259.03	125.85	11.004	
9,900.00	6,888.94	10,016.50	6,888.87	83.10	46.31	-90.00	-962.24	-3,537.81	1,383.55	1,254.40	129.15	10.713	
10,000.00	6,888.71	10,116.49	6,888.64	85.43	47.29	-90.00	-957.97	-3,637.71	1,382.22	1,249.76	132.47	10.434	
10,100.00	6,888.48	10,216.49	6,888.41	87.76	48.28	-90.00	-953.71	-3,737.61	1,380.89	1,245.10	135.80	10.169	
10,200.00	6,888.25	10,316.48	6,888.18	90.10	49.28	-90.00	-949.44	-3,837.51	1,379.56	1,240.42	139.14	9.915	
10,300.00	6,888.01	10,416.47	6,887.95	92.45	50.29	-90.00	-945.18	-3,937.41	1,378.23	1,235.73	142.50	9.672	
10,400.00	6,887.78	10,516.46	6,887.72	94.80	51.30	-90.00	-940.91	-4,037.31	1,376.90	1,231.04	145.87	9.439	
10,500.00	6,887.55	10,616.45	6,887.48	97.15	52.32	-90.00	-936.64	-4,137.21	1,375.57	1,226.33	149.25	9.217	
10,600.00	6,887.32	10,716.44	6,887.25	99.51	53.35	-90.00	-932.38	-4,237.11	1,374.24	1,221.61	152.64	9.003	
10,700.00	6,887.09	10,816.43	6,887.02	101.87	54.38	-90.00	-928.11	-4,337.01	1,372.91	1,216.88	156.04	8.799	
10,800.00	6,886.86	10,916.42	6,886.79	104.24	55.42	-90.00	-923.85	-4,436.91	1,371.58	1,212.14	159.45	8.602	
10,900.00	6,886.63	11,016.41	6,886.56	106.61	56.46	-90.00	-919.58	-4,536.81	1,370.25	1,207.39	162.87	8.413	
11,000.00	6,886.40	11,116.41	6,886.33	108.98	57.51	-90.00	-915.31	-4,636.71	1,368.92	1,202.63	166.29	8.232	
11,100.00	6,886.17	11,216.40	6,886.10	111.36	58.57	-90.00	-911.05	-4,736.61	1,367.59	1,197.87	169.73	8.058	
11,200.00	6,885.94	11,316.39	6,885.86	113.74	59.63	-90.00	-906.78	-4,836.51	1,366.26	1,193.10	173.17	7.890	
11,300.00	6,885.71	11,416.38	6,885.63	116.12	60.69	-90.00	-902.51	-4,936.41	1,364.93	1,188.32	176.62	7.728	
11,400.00	6,885.48	11,516.37	6,885.40	118.51	61.76	-90.00	-898.25	-5,036.31	1,363.61	1,183.53	180.07	7.573	
11,500.00	6,885.25	11,616.36	6,885.17	120.89	62.83	-90.00	-893.98	-5,136.21	1,362.28	1,178.74	183.53	7.423	
11,600.00	6,885.01	11,716.35	6,884.94	123.28	63.90	-90.00	-889.72	-5,236.11	1,360.95	1,173.95	187.00	7.278	
11,700.00	6,884.78	11,816.34	6,884.71	125.67	64.98	-90.00	-885.45	-5,336.01	1,359.62	1,169.14	190.47	7.138	
11,800.00	6,884.55	11,916.34	6,884.48	128.07	66.06	-90.00	-881.18	-5,435.91	1,358.29	1,164.34	193.95	7.003	
11,900.00	6,884.32	12,016.33	6,884.24	130.46	67.15	-90.00	-876.92	-5,535.81	1,356.96	1,159.52	197.43	6.873	
12,000.00	6,884.09	12,116.32	6,884.01	132.86	68.23	-90.00	-872.65	-5,635.71	1,355.63	1,154.71	200.92	6.747	
12,100.00	6,883.86	12,216.31	6,883.78	135.25	69.33	-90.00	-868.38	-5,735.61	1,354.30	1,149.89	204.41	6.625	
12,200.00	6,883.63	12,316.30	6,883.55	137.65	70.42	-90.00	-864.12	-5,835.51	1,352.97	1,145.06	207.91	6.508	
12,300.00	6,883.40	12,416.29	6,883.32	140.05	71.52	-90.00	-859.85	-5,935.41	1,351.64	1,140.23	211.41	6.394	
12,400.00	6,883.17	12,516.28	6,883.09	142.46	72.61	-90.00	-855.59	-6,035.31	1,350.31	1,135.40	214.91	6.283	
12,500.00	6,882.94	12,616.27	6,882.86	144.86	73.72	-90.00	-851.32	-6,135.21	1,348.98	1,130.56	218.42	6.176	
12,600.00	6,882.71	12,716.26	6,882.62	147.27	74.82	-90.00	-847.05	-6,235.11	1,347.65	1,125.72	221.93	6.072	
12,700.00	6,882.48	12,816.26	6,882.39	149.67	75.93	-90.00	-842.79	-6,335.01	1,346.32	1,120.87	225.44	5.972	
12,800.00	6,882.25	12,916.25	6,882.16	152.08	77.03	-90.00	-838.52	-6,434.91	1,344.99	1,116.03	228.96	5.874	
12,900.00	6,882.01	13,016.24	6,881.93	154.49	78.14	-90.00	-834.25	-6,534.81	1,343.66	1,111.18	232.48	5.780	
13,000.00	6,881.78	13,116.23	6,881.70	156.90	79.26	-90.00	-829.99	-6,634.71	1,342.33	1,106.32	236.01	5.688	
13,100.00	6,881.55	13,216.22	6,881.47	159.31	80.37	-90.00	-825.72	-6,734.60	1,341.00	1,101.47	239.53	5.598	
13,200.00	6,881.32	13,316.21	6,881.24	161.72	81.48	-90.00	-821.46	-6,834.50	1,339.67	1,096.61	243.06	5.512	
13,300.00	6,881.09	13,416.20	6,881.00	164.13	82.60	-90.00	-817.19	-6,934.40	1,338.34	1,091.74	246.59	5.427	
13,400.00	6,880.86	13,516.19	6,880.77	166.55	83.72	-90.00	-812.92	-7,034.30	1,337.01	1,086.88	250.13	5.345	
13,500.00	6,880.63	13,616.19	6,880.54	168.96	84.84	-90.00	-808.66	-7,134.20	1,335.68	1,082.01	253.66	5.266	
13,600.00	6,880.40	13,716.18	6,880.31	171.38	85.96	-90.00	-804.39	-7,234.10	1,334.35	1,077.15	257.20	5.188	
13,700.00	6,880.17	13,816.17	6,880.08	173.79	87.09	-90.00	-800.13	-7,334.00	1,333.02	1,072.27	260.74	5.112	
13,800.00	6,879.94	13,916.16	6,879.85	176.21	88.21	-90.00	-795.86	-7,433.90	1,331.69	1,067.40	264.29	5.039	
13,900.00	6,879.71	14,016.15	6,879.62	178.63	89.34	-90.00	-791.59	-7,533.80	1,330.36	1,062.53	267.83	4.967	
14,000.00	6,879.48	14,116.14	6,879.38	181.04	90.47	-90.00	-787.33	-7,633.70	1,329.03	1,057.65	271.38	4.897	
14,100.00	6,879.25	14,216.13	6,879.15	183.46	91.59	-90.00	-783.06	-7,733.60	1,327.70	1,052.77	274.93	4.829	
14,200.00	6,879.01	14,316.12	6,878.92	185.88	92.72	-90.00	-778.79	-7,833.50	1,326.37	1,047.89	278.48	4.763	
14,300.00	6,878.78	14,416.11	6,878.69	188.30	93.86	-90.00	-774.53	-7,933.40	1,325.04	1,043.01	282.03	4.698	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Offset Design: Rosa Unit 10 - Rosa Unit 614H - OH - Plan #1													Offset Site Error: 0.00 usft
Survey Program: 0-A008Mb_MWD+IFR1+MS							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 +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
14,400.00	6,878.55	14,516.11	6,878.46	190.72	94.99	-90.00	-770.26	-8,033.30	1,323.71	1,038.12	285.59	4.635	
14,500.00	6,878.32	14,616.10	6,878.23	193.14	96.12	-90.00	-766.00	-8,133.20	1,322.38	1,033.24	289.14	4.573	
14,600.00	6,878.09	14,716.09	6,877.99	195.56	97.26	-90.00	-761.73	-8,233.10	1,321.05	1,028.35	292.70	4.513	
14,700.00	6,877.86	14,816.08	6,877.76	197.99	98.39	-90.00	-757.46	-8,333.00	1,319.72	1,023.46	296.26	4.455	
14,800.00	6,877.63	14,916.07	6,877.53	200.41	99.53	-90.00	-753.20	-8,432.90	1,318.39	1,018.57	299.82	4.397	
14,900.00	6,877.40	15,016.06	6,877.30	202.83	100.67	-90.00	-748.93	-8,532.80	1,317.06	1,013.68	303.38	4.341	
15,000.00	6,877.17	15,116.05	6,877.07	205.25	101.80	-90.00	-744.66	-8,632.70	1,315.73	1,008.79	306.94	4.287	
15,100.00	6,876.94	15,216.04	6,876.84	207.68	102.94	-90.00	-740.40	-8,732.60	1,314.40	1,003.89	310.51	4.233	
15,200.00	6,876.71	15,316.03	6,876.61	210.10	104.08	-90.00	-736.13	-8,832.50	1,313.07	999.00	314.07	4.181	
15,300.00	6,876.48	15,416.03	6,876.37	212.53	105.22	-90.00	-731.87	-8,932.40	1,311.74	994.10	317.64	4.130	
15,400.00	6,876.25	15,516.02	6,876.14	214.95	106.37	-90.00	-727.60	-9,032.30	1,310.41	989.21	321.21	4.080	
15,500.00	6,876.01	15,616.01	6,875.91	217.38	107.51	-90.00	-723.33	-9,132.20	1,309.08	984.31	324.78	4.031	
15,600.00	6,875.78	15,716.00	6,875.68	219.80	108.65	-90.00	-719.07	-9,232.10	1,307.75	979.41	328.35	3.983	
15,700.00	6,875.55	15,815.99	6,875.45	222.23	109.79	-90.00	-714.80	-9,332.00	1,306.42	974.51	331.92	3.936	
15,800.00	6,875.32	15,915.98	6,875.22	224.66	110.94	-90.00	-710.54	-9,431.90	1,305.09	969.60	335.49	3.890	
15,900.00	6,875.09	16,015.97	6,874.99	227.08	112.08	-90.00	-706.27	-9,531.80	1,303.76	964.70	339.06	3.845	
16,000.00	6,874.86	16,115.96	6,874.75	229.51	113.23	-90.00	-702.00	-9,631.70	1,302.43	959.80	342.64	3.801	
16,100.00	6,874.63	16,215.96	6,874.52	231.94	114.38	-90.00	-697.74	-9,731.60	1,301.10	954.89	346.21	3.758	
16,200.00	6,874.40	16,315.95	6,874.29	234.37	115.52	-90.00	-693.47	-9,831.50	1,299.77	949.99	349.79	3.716	
16,300.00	6,874.17	16,415.94	6,874.06	236.79	116.67	-90.00	-689.20	-9,931.40	1,298.44	945.08	353.36	3.675	
16,400.00	6,873.94	16,515.93	6,873.83	239.22	117.82	-90.00	-684.94	-10,031.30	1,297.11	940.17	356.94	3.634	
16,500.00	6,873.71	16,615.92	6,873.60	241.65	118.97	-90.00	-680.67	-10,131.20	1,295.78	935.26	360.52	3.594	
16,600.00	6,873.48	16,715.91	6,873.37	244.08	120.12	-90.00	-676.41	-10,231.10	1,294.45	930.35	364.10	3.555	
16,700.00	6,873.25	16,815.90	6,873.13	246.51	121.27	-90.00	-672.14	-10,331.00	1,293.12	925.44	367.68	3.517	
16,800.00	6,873.02	16,915.89	6,872.90	248.94	122.42	-90.00	-667.87	-10,430.90	1,291.79	920.53	371.26	3.479	
16,900.00	6,872.78	17,015.88	6,872.67	251.37	123.57	-90.00	-663.61	-10,530.80	1,290.46	915.62	374.84	3.443	
17,000.00	6,872.55	17,115.88	6,872.44	253.80	124.72	-90.00	-659.34	-10,630.70	1,289.13	910.71	378.43	3.407	
17,070.79	6,872.39	17,186.66	6,872.28	255.52	125.54	-90.00	-656.32	-10,701.42	1,288.19	907.23	380.96	3.381	
17,100.00	6,872.32	17,215.87	6,872.21	256.23	125.87	-90.00	-655.07	-10,730.60	1,287.80	905.80	382.01	3.371	
17,200.00	6,872.09	17,304.21	6,872.00	258.66	126.89	-90.00	-651.31	-10,818.86	1,286.53	901.04	385.49	3.337	
17,205.31	6,872.08	17,304.21	6,872.00	258.79	126.89	-90.00	-651.31	-10,818.86	1,286.52	900.89	385.63	3.336	
17,237.94	6,872.00	17,304.21	6,872.00	259.58	126.89	-90.00	-651.31	-10,818.86	1,286.93	900.62	386.31	3.331	

SDT

Anticollision Report

Company:	Logos Operating LLC	Local Co-ordinate Reference:	Well Rosa Unit 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6287+30 @ 6317.00usft (H&P 530)

Offset Depths are relative to Offset Datum

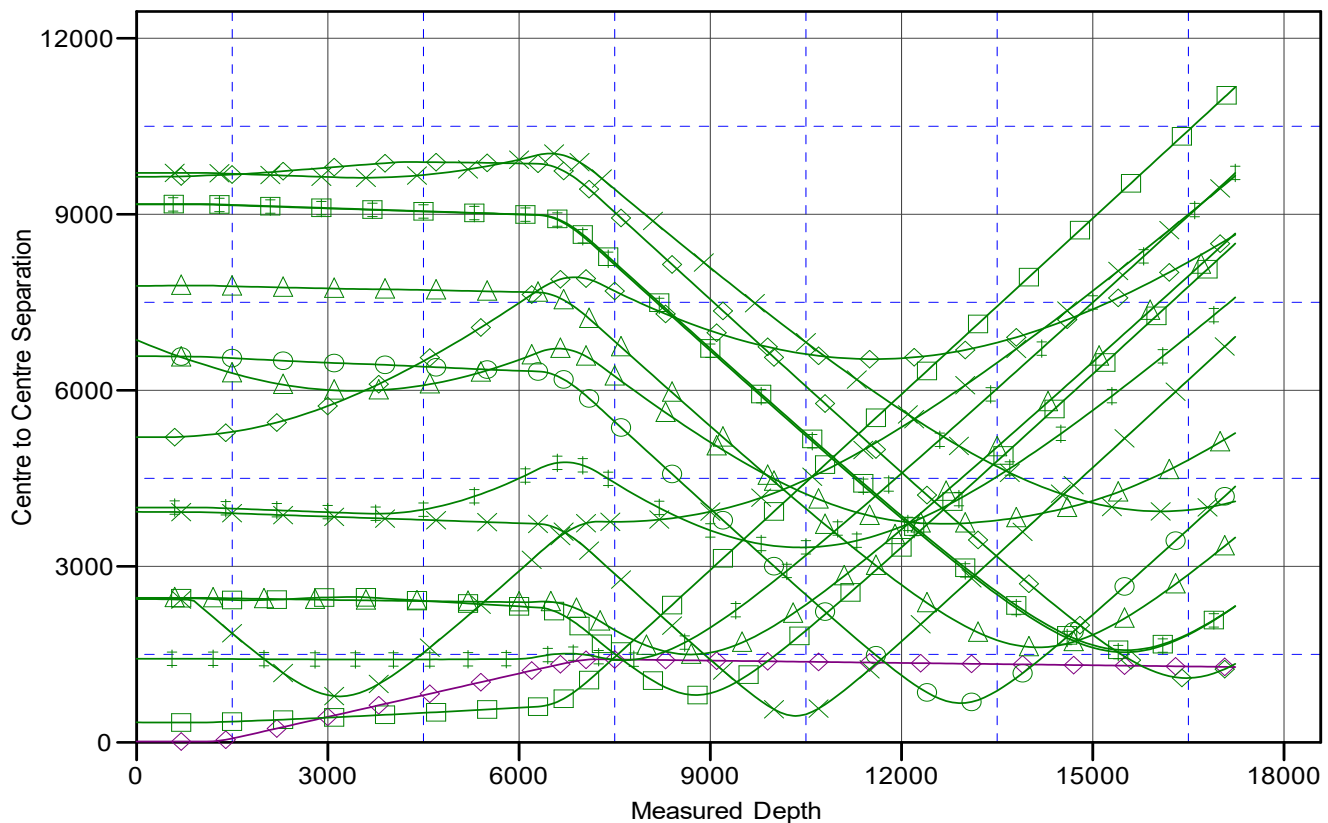
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit 612H

Coordinate System is US State Plane 1983, New Mexico Western Zone

Grid Convergence at Surface is: 0.24°

Ladder Plot



LEGEND

(O) Rosa Unit 100, OH, OH V0	(O) Rosa Unit 100C, OH, OH V0	(O) Rosa Unit 98, OH, OH V0
(O) Rosa Unit 170, OH, OH V0	(O) Rosa Unit 79, OH, OH V0	(O) Rosa Unit 100E, OH, OH V0
Rosa Unit 614H, OH, Plan#1 V0	(O) Rosa Unit 260A, OH, OH V0	(O) Rosa Unit 79C, OH, OH V0
(O) Rosa Unit 201A, OH, OH V0	(O) Rosa Unit 100B, OH, OH V0	(O) Rosa Unit 260, OH, OH V0
(O) Rosa Unit 18B, OH, OH V0	(O) Rosa Unit 18C, OH, OH V0	
(O) Rosa Unit 18A, OH, OH V0	(O) Rosa Unit 140, OH, OH V0	

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 612H
Project:	Rio Arriba, NM (NAD83)	TVD Reference:	6287+30 @ 6317.00usft (H&P 530)
Reference Site:	Rosa Unit 10	MD Reference:	6287+30 @ 6317.00usft (H&P 530)
Site Error:	0.00 usft	North Reference:	True
Reference Well:	Rosa Unit 612H	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 #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to 6287+30 @ 6317.00usft (H&P 530)

Offset Depths are relative to Offset Datum

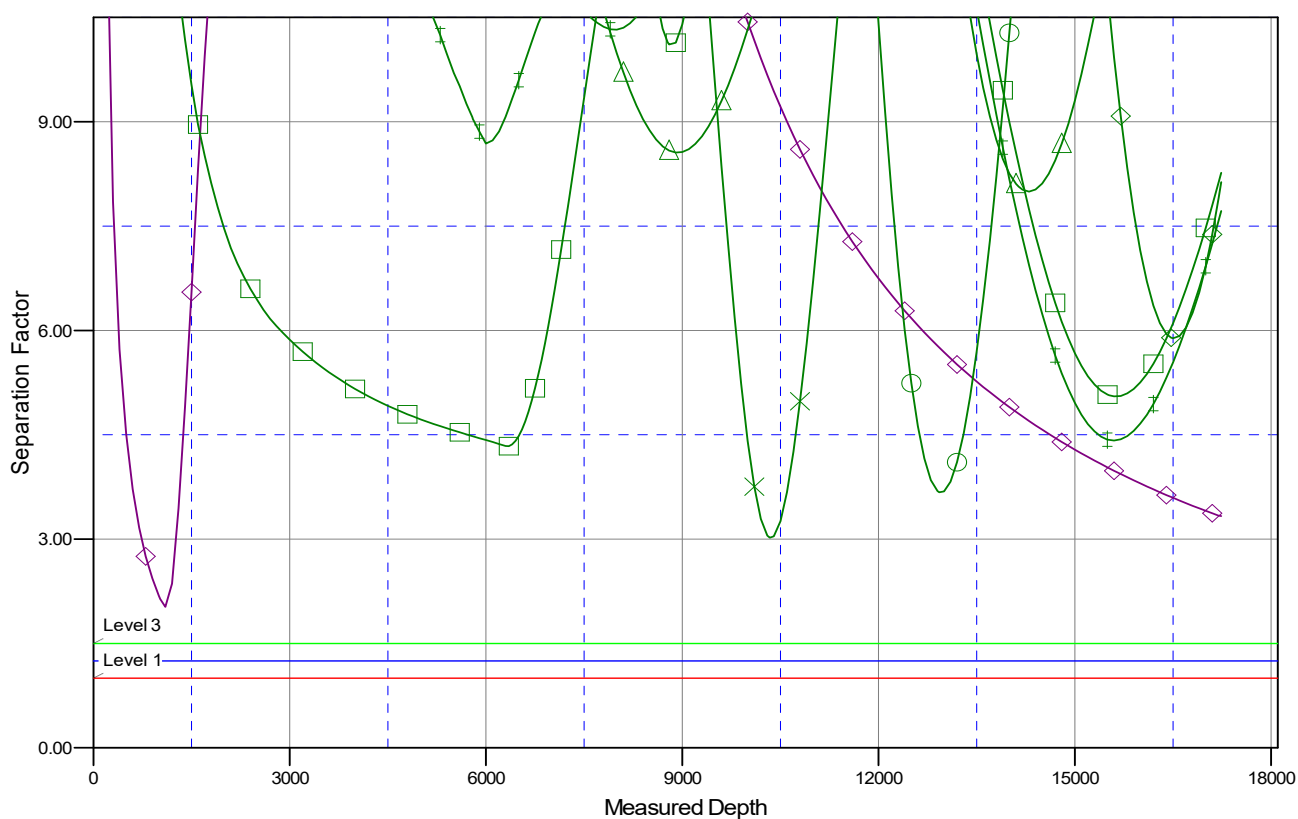
Central Meridian is -107.833334

Coordinates are relative to: Rosa Unit 612H

Coordinate System is US State Plane 1983, New Mexico Western Zone

Grid Convergence at Surface is: 0.24°

Separation Factor Plot



LEGEND

(C) Rosa Unit 100, OH, OH V0	(C) Rosa Unit 100C, OH, OH V0	(C) Rosa Unit 98, OH, OH V0
(C) Rosa Unit 170, OH, OH V0	(C) Rosa Unit 79, OH, OH V0	(C) Rosa Unit 100E, OH, OH V0
Rosa Unit 614H, OH, Plan#1 V0	(C) Rosa Unit 260A, OH, OH V0	(C) Rosa Unit 79C, OH, OH V0
(C) Rosa Unit 201A, OH, OH V0	(C) Rosa Unit 100B, OH, OH V0	(C) Rosa Unit 260, OH, OH V0
(C) Rosa Unit 188, OH, OH V0	(C) Rosa Unit 18C, OH, OH V0	
(C) Rosa Unit 18A, OH, OH V0	(C) Rosa Unit 140, OH, OH V0	

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

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District II
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Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 270013

CONDITIONS

Operator: LOGOS OPERATING, LLC 2010 Afton Place Farmington, NM 87401	OGRID: 289408
	Action Number: 270013
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	If cement is not circulated to surface on the surface casing or any intermediate casing string, then a CBL is required to verify where the cement is behind the casing and if a remedial job is needed,	10/11/2023